



ANNUAL REPORT 2012

CIBERDEM

Centro de Investigación Biomédica en Red de Diabetes y Enfermedades Metabólicas Asociadas
Spanish Biomedical Research Network in Diabetes and Associated Metabolic Disorders

Contents

Prologue

Letter from the Scientific Director	4
Management report	5
Research results	6
Project management	10
Training programme	12
Fundraising	15
Social awareness activities	17
More about Ciberdem	19

Research

Di@betes Study	22
Telemed-diabetes Study	24
Pilchardus Study	25
Medigene Project	26
Ciberdem Projects	27
Biobank	30
Metabolomics Platform	32
Programmes	33
Groups	41

Epilogue

Principal Investigator index	129
Keyword index	130
Publications index	131
Credits	144

2012

ANNUAL REPORT

Prologue

Management report

In Spain, there are 5,300,000 people with diabetes, a figure which amply justifies the existence and raison d'être of Ciberdem¹.

Since its creation, five years ago, Ciberdem has consolidated its position as a public centre of excellence for scientific investigation thanks to the work of its research groups, which in 2012 placed the Consortium among the top ten Spanish institutions with the highest normalized impact factors².

In spite of the world recession, Ciberdem has searched for alternatives to optimize its resources and obtain external funding in order to guarantee that it can continue to operate well. The key is our human capital. Thanks to efforts made, there has been an increase in the transfer of knowledge by means of collaborative agreements with several companies. It has also increased its participation in competitive national and European calls with a view to stimulating training and mobility.

The Scientific Management Office has been fundamental to the successful execution of Ciberdem's annual strategic action plan because it provided researchers with all the support and tools necessary for them to carry out their work. This year, several research projects have been developed: MEDIGENE (Seventh Framework Programme - Health), Pilchardus, the Telemed-Diabetes study and the DIATRAIN Mobility Programme (Marie Curie Actions-COFUND) and others.

Ciberdem is committed to the popularization of science, which is why several activities directed at both diabetics and the general public were organized with the collaboration of researchers, patients' associations, foundations, societies and companies.

Our challenge for the future will be to guarantee a solid research structure through a policy of financial stability which will ensure that researchers have a conducive environment in which to carry out their investigation to improve the health and quality of life of people with diabetes.

Johanna Rivera
Managing Director, Ciberdem

¹ Di@bet.es Study, Ciberdem, Spain

² SCImago Institutions Ranking (SIR) 2012

Research results

Publications*: 167

Impact Factor: 955.167

Impact Factor average: 5.720

Q1 indicator (High Quality Publications)**: 79,5%

First decile: 47

Q1: 82

Q2: 38

IntraCIBER: 26

InterCIBER: 27

International: 20

Research grants***: 165

National: 119

International: 29

Private funds: 17

Clinical trials: 41

Clinical practice guidelines: 6

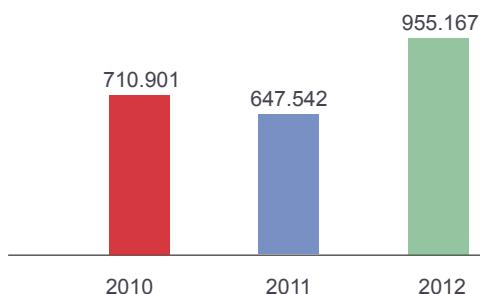
PhD theses: 15

Patents: 5

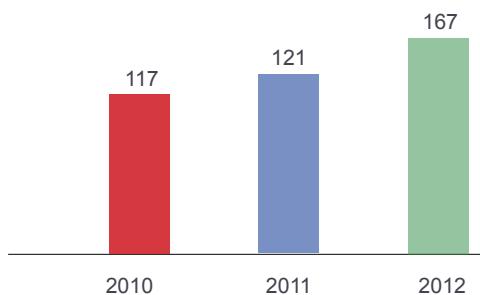
Spin-offs: 1

Awards: 7

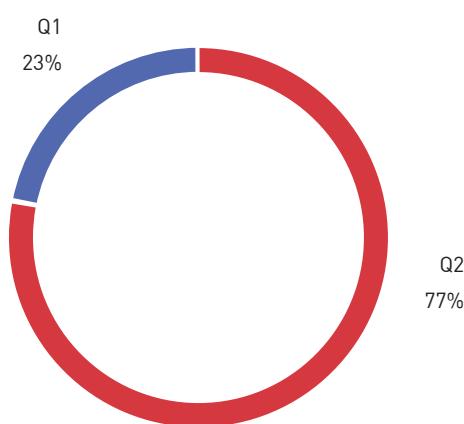
Evolution of Ciberdem's publications by number of Impact Factor (2010-2012)



Evolution of Ciberdem's publications by number of publications (2010-2012)



Publications 2012



*Of the 77% of publications in the first quartile, 57% were in the first decile

Publications

In 2012, Ciberdem published a total of 167 scientific articles in the first and second quartiles of their speciality, 27% more than in 2011. It is worth noting that the total number of articles published was higher, but here we refer, for reasons of scientific excellence, only to those in the first and second quartiles.

Of these 167 articles, 77% (129) were in the first quartile and of these, 57% (47) were in the first decile of their specialist category.

* Only those published in 2012, with Ciberdem listed among the affiliations, which are related to Ciberdem's field of research and are located in the first or second quartile of their subject category are included. Sources: JCR 2011 and PubMed.

** Ratio of publications that an institution publishes in the most influential scholarly journals of the world. Journals considered for this indicator are those ranked in the first quartile (25%) in their categories as ordered by SJR indicator. Source: SIR World Report 2012, SCImago.

*** Through Associate Institutions.

The total impact factor was 955.167 (source: ISI Web of Knowledge), which gives an average impact factor of 5.720. If we take into account the fact that the average impact factor in the endocrinology and metabolism category in the ISI Web of Knowledge is 2.478, the quality of the scientific work done by Ciberdem becomes apparent.

Finally, according to SCImago Institutions Ranking (SIR) 2012, Ciberdem is ranked among the top ten Spanish institutions with the highest percentage of publications in the first quartile (Q1). The ICONO analysis of the Fundación Española para la Ciencia y la Tecnología (FECYT) shows that the top ten institutions classified under this indicator have a high Normalized Impact factor, in the majority of cases significantly above the average worldwide impact.

In conclusion, Ciberdem consolidated its scientific production and increased its levels of quantity, excellence and quality, both in general terms and in terms of every one of its scientific programmes.

Projects

As a consortium, in 2012, CIBERDEM presented 11 applications for funding in response to public calls in Spain and 8 in response to European calls. Here are the details of the successful applications:

European calls

Albert Renold Fellowships

European Foundation for the Study of Diabetes (EFSD)

Budget: 3,100.00 €

Current status (June 2013): Finished

Albert Renold Fellowships

European Foundation for the Study of Diabetes (EFSD)

Budget: 3,170.00 €

Current status (June 2013): Finished

National calls

As part of the Strategic Health Action of the Ministry of the Economy and Competitiveness and the Carlos III Health Institute, a Health Research Project grant was obtained.

Efectos de los ácidos grasos de la dieta sobre la expresión y cambios epigenéticos del sistema de transporte de ácidos grasos mediado por VEGF-b en rata

Principal Investigator: Eva García Escobar

Budget: 56,265.00 €

Reference: PI12/01293

Current status (June 2013): Granted/Implemented (under development)

National Programme for Non-directed Fundamental Research Projects (Ministry of the Economy and Competitiveness and the European Regional Development Fund (ERDF). Identification of metabolic pathways in retinal neurodegeneration induced by hyperglycaemia and ischaemia using a metabolomic and proteomic approach

Principal Investigator: Oscar Yanes

Budget: 157,300.00 €

Duration: 3 years

Reference: SAF2011-30578

Current status (June 2012): Implemented (under development)

Transfer of Knowledge and Innovation

Patents

New in 2012:

Adeno-Associated Viral Vectors Useful for Transducing Adipose Tissue

Patent application number: EP12382314.8

Inventors: Fàtima Bosch and Verónica Jiménez

Universitat Autònoma de Barcelona

Methods for DNA rearrangements analysis

Patent application number: 300077376

Inventors: Felipe J Chaves, AB García-García, Sebastian Blesa

Hospital Clínico Universitario de Valencia

Antibodies or fragments thereof for use in the treatment of ocular diseases

Patent application number: EP12382161

Inventors: Simó R, Hernández C

Hospital Universitari Vall d'Hebron

Electrode assembly for generating electric field pulses to perform electroporation to a biological sample

Patent application number: PCT/EP2012/058587

Inventors: Tomás García Sánchez, Xavier Rosell Ferrer, Ramón Bragós Bardia, Ana M. Gómez Foix, María Guitart De la Rosa, Beatriz Sánchez Ortiz

Universitat de Barcelona

Uso de colágeno VI soluble para la fabricación de un medicamento para el tratamiento de enfermedades asociadas a hiperglucemia, composición farmacéutica, método y uso de un medio líquido extracelular para incrementar la captura de glucosa

Patent application number: ES 201231787

Inventors: Cecilia Jimenez Mallebrera, Ana M. Gómez Foix and Oscar Osorio Conles

Universitat de Barcelona

Active in 2012:

Empleo de anticuerpos anti-beta-lactoglobulina en el diagnóstico y seguimiento de la celiaquía

Patent application form: P201131979

Inventors: Franz Martín, Bernat Soria, Mª Ángeles Ortega

Institución: Universidad Pablo de Olavide

Fundación Progreso y Salud - Universidad Pablo de Olavide

Gene therapy composition for use in diabetes treatment

Patent application number: EP10169309.1

Priority country: Europe

Priority date: 12 July 2010

Inventors: F Bosch, E Ayuso, D Callejas

Universitat Autònoma de Barcelona

Telomerase reverse transcriptase for protection against ageing

Patent application number: EP10168341.5

Priority country: Europe

Priority date: 2 July 2010

Inventors: MA Blasco, B Bernardes, F Bosch, E Ayuso
Universitat Autònoma de Barcelona and Centro Nacional de Investigaciones Oncológicas

Composition comprising an androgen receptor blocker and an insulin sensitizing agent and use thereof for treatment of polycystic ovary syndrome

Patent application number: PCT/BE 02/00052

Inventors: F de Zegher, L Ibáñez
University of Leuven and Universitat de Barcelona

Uso de la proinsulina para la elaboración de una composición farmacéutica neuroprotectora, composición terapéutica que la contiene y sus aplicaciones

Patent application number: ES2331342B1

Inventors: EJ de la Rosa Cano, F de Pablo Dávila, P Boya Tremoleda, S Corrochano Sánchez, P de la Villa Polo, R Barhoum Tannous and F Bosch Tubert
CIB-CSIC, Universitat Autònoma de Barcelona and Universidad de Alcalá de Henares

A method for the in vitro proliferation of cells coming from tissues of endodermic origin

Patent application number: P201030365

Inventors: A Khoo, F Martín, B Soria
FPS-UPO

Salicylate Conjugates Useful for Treating Metabolic Disorders

Patent application number: US 2009/0298923A1

Inventors: Mayoux E, Martí L, García-Vicente S, Serrano M, Mian A, Zorzano A
Genmedica Therapeutics

Marcadores genéticos del riesgo de sufrir reestenosis

Patent application number: 200900507

Inventors: Andrés V, Silvestre C, Fernández P, Sánchez PL, Fernández-Avilés F, Chaves FJ
Fina Biotech, SLU

Formulación tópica oftálmica de péptidos

Patent application number: P200931242

Inventors: R Simó, C Hernández, J Fernández, M Gómez, R Jordana, J Farrera, B Bonsati
Institut de Recerca Hospital Universitari Vall d'Hebron and BCN Peptides SA

Composiciones de terapia génica para prevenir y/o tratar enfermedades autoinmunes

Patent application number: P200930442

Inventors: Xavier Anguela, Sabrina Tafuro, Fàtima Bosch
Universitat Autònoma de Barcelona

Use of catecholamine for the differentiation of stem cells to cardiomyocytes

Patent application number: PCT/ES09/070339

Inventors: Catalina Hernández, Flora de Pablo, Óscar Bártulos, Amelia Aránega
CIB/CSIC and Universidad de Jaén

Method to differentiate embryonic stem cells towards definitive endoderm

Patent application number: P200930250

Inventors: Francisco J Bedoya, Juan R Tejedo, Bernat Soria, Sergio Mora, Gladys Cahuana, Franz Martín, Karim Hmadcha
UPO-Fundación Progreso y Salud

Composition for prevention or treatment of Diabetes Mellitus

Patent application number: P200900829

Inventors: Francisco Javier Navarro, Franz Martín, Patricia Moreno, Verónica Rivero, Elvira León
UPO-Fundación Progreso y Salud

Stem cells of the islets of Langerhans and their use in treating diabetes mellitus

Patent application number: 11/410412, US 7544510

Inventors: Habener J, Abraham E, Zulewski H, Thomas MK, Vallejo M

The General Hospital Corporation (Massachusetts General Hospital, Boston)

Stem cells and their use in transplantation

Patent application number: 10/984645, US 7438902

Inventors: Habener JF, Zulewski H, Abraham E, Vallejo M, Faustman D, Thomas M

Nutrición interactiva versión 1.0

Patent application number: MA-01203-2008

Inventors: Gabriel Olveira, Manuel Rosa (IT manager)

Fibrosis quística versión 1.0

Patent application number: MA-01204-2008

Inventors: Gabriel Olveira, Manuel Rosa (IT manager)

Alimento funcional con efectos en la prevención de enfermedades cardiovasculares

Patent application number: 20080487

Inventors: Ramírez B, Anglès MN, Reguant J, Solà R, Godàs G

Clinical practice guidelines

Guía de Práctica Clínica sobre Diabetes tipo 1

Guías de práctica clínica en el SNS. Plan de Calidad para el Sistema Nacional de Salud del Ministerio de Sanidad y Política Social. Agencia de Evaluación de Tecnologías Sanitarias del País Vasco-Osteba

D.L: VI 130-2012

Guía Clínica sobre el inicio del Tratamiento con infusión subcutánea continua de insulina y monitorización continuada de la glucosa

M Jansá, M Vidal, M Giménez, I Conget

Unitat de Diabetis. Servei d'Endocrinologia i Nutrició. Institut Clínic de Malalties Digestives i Metabòliques. Hospital Clínic i Universitari de Barcelona (2012)

Health and fertility in World Health Organization group 2 anovulatory women

Baird DT, Balen A, Escobar-Morreale HF, Evers JL, Fauquier BC, Franks S, Glasier A, Homburg R, La Vecchia C, Devroey

P, Diedrich K, Fraser L, Gianaroli L, Liebaers I, Sunde A, Tapanainen JS, Tarlatzis B, Van Steirteghem A, Veiga A, Crosignani PG, Evers JL
Hum Reprod Update, 18, 586-599 (2012)

Epidemiology, diagnosis and management of hirsutism: a consensus statement by the Androgen Excess and Polycystic Ovary Syndrome Society
Escobar-Morreale HF, Carmina E, Dewailly D, Gambineri A, Kelestimur F, Moghetti P, Pugeat M, Qiao J, Wijeyaratne CN, Witchel SF, Norman RJ
Hum Reprod Update, 18, 146-170 (2012)

Guía salud del catálogo de Guías del Sistema Nacional de Salud

Guía de Educación Terapéutica: al inicio de tratamiento con infusión subcutánea de insulina (ISCI)
Barrio R, Andia V, Vázquez F, Salgado Y, Valverde M, Jansá M, Flores M, Galindo M
Sociedad Española de Diabetes
Instituciones: Hospital de Cruces, Hospital Clínico San Carlos, Hospital Ramón y Cajal, CAP Balàfia, Mutua Terrasa, Hospital Gregorio Marañón
D.L: M-38313-2012

Spin-Offs

Beyond Food SL
Description: Support to industry for the validation of functional food
Researchers: L Masana, R Solà, JC Vallvé, J Ribalta, J Girona, C Prats
Collaborating institution: Universitat Rovira i Virgili

Transfer agreements

Ciberdem:
Object of the contract: Search for compounds modulating exocytosis with applications in the treatment of type 2 diabetes
Company: BRAINco Biopharma SL
Ciberdem Groups: Joan Vendrell, Anna Maria Gómez-Foix and Anna Novials

Through Associate Institutions:

Object of the contract: Development of integrative systems biology approaches
Company: Agilent Technologies
Budget: 184,000.00€
PI Xavier Correig

Object of the contract: Development of a metabolomics platform for the study of metabolic disorders caused by obesity
Company: Bioorganic Research and Services, SL (Bionaturis)
Budget: 65,000.00 €
PI Xavier Correig

Object of the contract: Development of substrates for the detection of metabolites using maldi-tof-tof equipment
Company: Bruker Española S.A.
Budget: 60,000.00€
PI Xavier Correig

Object of the contract: Transfer of human material under the nPOD (network Pancreas Organ Donation) programme
Company: University of Florida
Budget: 57,000.00€
PI Eduard Montanya

Object of the contract: Development of molecular variants and analogues of somatostatin with potential application in diabetic retinopathy
Company: BCN Peptides
Budget: 64,000.00 €
PI Rafael Simó

Object of the contract: Clinical development of a non-invasive system for monitoring capillary glycaemia
Company: Sabir Medical, SL
Budget: 35,000.00 €
PI Rafael Simó

Object of the contract: Desarrollo de anticuerpos monocionales
Company: Fundación Progreso y Salud, Junta de Andalucía
Budget: 103,400.00 €
PI Franz Martín

Object of the contract: Asesoría Técnica nutricional para Deportistas
Company: Gesalus-Real Betis Balompié
Budget: 15,733.33 €
PI Franz Martín

Innovation

Ciberdem:
Name of project: Diabetes a la carta (see [page 15](#) for more)
Description: Therapeutic education programme for people with type 2 diabetes mellitus
Type of activity: Technical
PIs Anna Novials and Ramon Gomis

Project Management

Introduction

The Spanish Biomedical Research Centre in Diabetes and Associated Metabolic Disorders (Ciberdem) aims to obtain additional competitive funding to develop research into diabetes and associated metabolic disorders.

Currently, Ciberdem's project management department is involved in all project phases, giving support to our researchers in the preparation and presentation of proposals, and also the submission, implementation and justification of funded projects. Ciberdem aims to expand its presence in the worldwide scientific community in its specific research field. The strengthening of national, international and intersectorial collaboration in research will help us to obtain more and better scientific outcomes with high translational impact.

Objectives

To achieve excellence, to obtain competitive funding and to monitor projects from implementation to justification.

To give support in the preparation of proposals by researchers in the consortium.

To internationalize Spanish biomedical research, in particular as regards Ciberdem's main lines of research into diabetes and associated metabolic disorders.

To promote the creation of stable collaboration frameworks between the industry and Ciberdem in the area of diabetes research and treatment.

To encourage and motivate researchers to participate in national and international calls and seize opportunities to take part in different kinds of programmes through the newsletter and direct contact.

Coordination

Francesc Martí, Ciberdem Project Manager.

Achievements in 2012

Ciberdem's own actions

These are transversal initiatives implemented by members of the consortium and in some cases with the collaboration of external personnel. These translational projects try to answer complex questions which could not be resolved by one group working alone and will prove of benefit to diabetic patients and the healthcare system in general.

In 2012, several research actions were underway while others, although they had finished, were still producing results and new publications. They were:

1) TheDi@bet.es Study, which is the first national epidemiological study in providing the Spanish health authorities with real figures relating to the prevalence of type 2 diabetes (diagnosed as such or not) in addition to other relevant parameters. In the context of the project, 6 papers were published in 2012 and more than 10 others were submitted or are in preparation. For more information see [page 22](#).

2) Ciberdem projects defined as translational initiatives

resulting from internal collaborative work: NEURORET-DIAB, INGENFRED, MODIAB, DIASOBS, GIDIPRED, ANTIBECCELL, METADIAB, ENDODIAB, IODURE and STEMOP. Some of these projects continued with external funding and produced new publications. For more information see [page 27](#).

3) Teemed-diabetes Study, a multicentre research trial designed to evaluate the impact on costs and efficacy of a telematic control system. The project started in 2011 and at the end of 2012 some preliminary results had been obtained. For more information see [page 24](#).

4) Pilchardus Study, a clinical research project that hypothesizes that a sardine-rich diet can improve metabolic control in patients with type 2 diabetes mellitus. For more information see [page 25](#).

National grants obtained

During 2012, a proposal submitted under the Proyectos de Investigación en Salud subprogramme of the Acción Estratégica de Salud call of the Spanish Ministry of the Economy and Competitiveness and the Carlos III Health Institute received a grant. This project, "Effect of dietary fatty acids on the expression and epigenetics modifications of the fatty acids transporter system mediated by vegf-b in rats", is directed by Dr Eva García and is funded for 3 years.

National grants implemented

Non-oriented Fundamental Research Projects

Implementation began of the project "Identification of metabolic pathways in retinal neurodegeneration induced by hyperglycaemia and ischaemia using a metabolomic and proteomic approach" which is directed by Dr Oscar Yanes and funded by the 2011 call of the Proyectos de investigación fundamental no orientada of the Spanish Ministry of the Economy and Competitiveness and the European Regional Development Fund (ERDF) (SAF2011-30578).

Publications of SAF2011-30578

A guideline to univariate statistical analysis for LC/MS-based untargeted metabolomics-derived data

Vinaixa M, Samino S, Sáez I, Duran J, Guinovart JJ, Yanes O
Metabolites, 2, 775-795, (2012)

[doi:10.3390/metabo2040775](https://doi.org/10.3390/metabo2040775)

Assessment of compatibility between extraction methods for NMR- and LC/MS-based metabolomics

Beltran A, Suárez M, Rodríguez MA, Vinaixa M, Samino S,

Arola L, Correig X, Yanes O

Anal Chem, 84, 5838-5844 (2012)

[PMID 22697410](https://pubmed.ncbi.nlm.nih.gov/22697410/)

Nanostructure Initiator Mass Spectrometry for Tissue Imaging in Metabolomics: Future Prospects and Perspectives

Calavia R, Annanouch F, Correig X, Yanes O

Miguel Servet

Implementation began of the project "Characterization of the Lipin family in human adipocytes" which is directed by Dr Mercedes Miranda and funded by the 2011 Miguel Servet subprogramme of the Acción Estratégica de Salud call of the Spanish Ministry of the Economy and Competitiveness and the Carlos III Health Institute (CP11/00021).

Proyectos de Investigación en Salud

Implementation continued during 2012 of two projects, one directed by Dr Mercedes Miranda - "Phosphatidate phosphatases regulation of cellular functions by controlling phospholipid biosynthesis and its relation with obesity" (PI10-00967) - and the other by Dr Josep Julve - "HDL functionality in diabetes mellitus and hyperhomocysteinaemia: studies in patients and animal models" (PI10-00277) - which were funded by the Spanish Ministry of the Economy and Competitiveness and the Carlos III Health Institute. Several high level publications were produced:

Publications PI10-00967

FABP4 dynamics in obesity: discrepancies in adipose tissue and liver expression regarding circulating plasma levels
Queipo-Ortuño MI, Escoté X, Ceperuelo-Mallafré V, Garrido-Sánchez L, Miranda M, Clemente-Postigo M, Pérez-Pérez R, Peral B, Cardona F, Fernández-Real JM, Tinahones FJ, Vendrell J

PLoS One, 7, e48605 (2012)

PMID 23139800

Resveratrol induces antioxidant defence via transcription factor Yap1p

Escoté X, Miranda M, Menoyo S, Rodríguez-Porrata B, Carmona-Gutiérrez D, Jungwirth H, Madeo F, Cordero RR, Mas A, Tinahones F, Clotet J, Vendrell J

Yeast, 29, 251-63 (2012)

PMID 22674736

Publications PI10-00277

Identification of a novel mutation in the ANGPTL3 gene in two families diagnosed of familial hypobetalipoproteinemia without APOB mutation

Martín-Campos JM, Roig R, Mayoral C, Martínez S, Martí G, Arroyo JA, Julve J, Blanco-Vaca F

CCA, 413, 552-555 (2012)

PMID 22155345

International grants obtained

Two Albert Renold Fellowships For Young Scientists, funded by the European Foundation for the Study of Diabetes, were awarded to Dr Sara García and Dr Eva García.

International grants implemented

MEDIGENE (Genetic and environmental factors of insulin resistance syndrome and its long-term complications in immigrant Mediterranean populations), an FP7 Cooperation

Programme (HEALTH-F2-2011-279171), started at the beginning of 2012 and was coordinated for Ciberdem by Dr Ramon Gomis.

During 2012, work was done in WP1 "Anthropologic studies and GWAS in ethnic populations" and WP2 "Ancient DNA studies in Tarragona" and internal collaborations between the research groups of Dr Ramon Gomis, Dr Anna Novials and Dr Luis Castaño were established. An Ancient Roman DNA Biobank was created in collaboration with Ciberdem's Biobank and the Institut Català d'Arqueologia Clàssica (ICAC). In addition, a workshop in Bioinformatics for MEDIGENE's participants was organized in Barcelona by Ciberdem and the University of Montpellier I. For more information see [page 26](#).

The DIATRAIN project (DIAbetes Trans-national Research Advancement for Investigators), led by Dr Ramon Gomis, is a Marie Curie COFUND programme cofunded by Ciberdem and the European Commission. This mobility programme involves two post-doctoral mobility schemes, one incoming and one outgoing. In the incoming programme, two-year fellowships were awarded to Dr Anthony Beucher to stay with the group of Dr Jorge Ferrer and to Dr Izortze Santin to stay with the group of Dr Luis Castaño. Also, in the outgoing programme, three fellowships were awarded to Ciberdem doctors to complete stays in renowned international research institutions.

Future challenges

The Project Management Department wishes to establish stronger interactivity with all the groups in Ciberdem and also to increase their participation in national and international calls in order to obtain additional funding for our projects and in this way enrich the scientific outcomes of the consortium. Ciberdem is actively involved in the creation of several pilot actions for the European Community's Joint Programming Initiative "A Healthy Diet for a Healthy Life", a programme that will study the relationship between diet, exercise and health.

Our principal goals are to increase the rate of success of our proposals in competitive calls and also to attract investment from the private sector to fund and sponsor our own projects such as the previously mentioned Pilchardus Study. Obtaining this funding will allow Ciberdem to increase its research efforts, which as always will continue to be into the prevention, treatment and cure of diabetes and its associated metabolic disorders.

Training programme

Introduction

The training of research staff was envisaged right from the start of Ciberdem and has been at the very centre of strategic action plan design ever since, especially the training of predoctoral staff and specialists with tenure. The aim of the teaching programme is to encourage the acquisition and transfer of knowledge, both basic and clinical, among the research staff under training in the groups which make up Ciberdem in order to achieve the general research objectives as defined, while at the same time making better use of the resources available. The teaching programme represents an investment in our younger staff and in the future of the consortium itself.

Objectives

Our objectives are to create and implement a research staff training programme aimed especially at predoctoral researchers which will help participants to consolidate their investigative career, improve their future prospects and bring added value to the groups to which they belong; to enhance the methodological, technical, communicative and organizational skills of the younger members of the research staff and improve their scientific capacity in general; and to increase mobility, communication and the transfer of scientific knowledge between the groups which make up Ciberdem in order to develop their scientific proficiency, both basic and clinical.

Coordination

Fàtima Bosch, Ciberdem Principal Investigator.

Achievements in 2012

Renewal of contracts for predoctoral research staff

Objective: A commitment to support young researchers so that they can carry out their work in the field of diabetes in a group of excellence linked to Ciberdem. In 2012, Ciberdem renewed the contracts of predoctoral grant holders as shown below:

Name: Elehazara Rubio Martín

Activity: The role of adipose tissue and adipokines in the development of type 2 diabetes. A population cohort study

Name: Verónica Moreno Viedma

Activity: The function of IRS-2 in the differentiation of embryonic stem cells from insulin-producing cells

5th Annual Meeting

A meeting point for the whole CIBERDEM community. The day was organized as a Scientific Symposium.

Objectives:

- To encourage mutual knowledge of the different basic and clinical research projects of each group, whichever programme they belong to.

- To encourage networking and relations between members of CIBERDEM in order to establish links for new projects and collaborative work.

Date: 25-26 October 2012

Venue: Auditorium of the Centro Esther Koplowitz, Barcelona

Number of presentations: 31 oral presentations, divided into 4 sessions

Number of participants: 104 CIBERDEM researchers



5th Annual Meeting.

III Clinical Symposium on Research into Diabetes and Associated Metabolic Disorders

The Third Clinical Symposium organized jointly with the MSD pharmaceutical company. Aimed at professional clinicians.

Objective: To create an environment for the dissemination and exchange of research results.

Papers were given by international speakers as well as speakers from Spain and members of CIBERDEM.

Date: 26-27 October 2012

Venue: Hotel Fira Palace, Barcelona

Hours of classes: 6 hours of classes, divided into 5 sessions

Number of presentations: 9 oral presentations

Number of participants: 101 attendees, including 36 CIBERDEM researchers

One-day conference: "Imagining the future. Research into diabetes"

This seminar was organized by the Instituto de Investigación Biomédica de Málaga (IBIMA), the coordinator was Dr Federico Soriguer and it was sponsored by Novo Nordisk; Ciberdem was also involved.

Date: 22 June 2012

Venue: Hotel Barceló, Málaga

Number of presentations: 6 oral presentations divided into 2 round tables and a keynote lecture

Number of participants: 100 researchers

Diabetes and arteriosclerosis pre-congress satellite symposium

The objective of this symposium is to review and discover the latest trends in topics involved in the fight against this disease: epidemiology, prevention, early diagnosis, and treatment, whether it be pharmacological, nutritional or related to healthy lifestyles. It was made possible thanks to the sponsorship of MSD and organized by Ciberdem, whose coordinator is Dr Lluís Masana.

Date: 5-6 June 2012

Venue: Hotel Imperial Tarraco, Tarragona

Number of presentations: 15 oral presentations divided into 4 sessions

Number of participants: 108, of which 33 were members of CIBERDEM

www.searteriosclerosis.org



Presentations during the symposium.

Diabetes and New Technologies. V ISCIII Course

A course which aims to contribute to the training of professionals to familiarize them and bring them up to date with new technological advances which are playing an important role as diagnostic and therapeutic tools in the present-day treatment of diabetes. The course, in which 20 experts are involved, is led by Dr Federico Casimiro Soriguer and coorganized by the Diabetes Unit of the Clinical Management Unit for Endocrinology and Nutrition of the Hospital Regional-Universitario Carlos Haya; Ciberdem also participates.

Date: 30-31 March 2012

Venue: NH Málaga, Málaga

Number of presentations: 5 oral communications and 14 workshops

Number of participants: 70 researchers

Workshop: "HDL: From Biology to Clinical Practice"

A workshop attended by recognized experts in the field of HDL. Led by Dr Francisco Blanco Vaca and coorganized by COST Action BM0904 (HDLnet), the Spanish Arteriosclerosis Society (SEA), the Department of Biochemistry of the Hospital Santa Creu i Sant Pau, Barcelona, and Ciberdem.

Date: 25 January 2012

Venue: Department of Biochemistry of the Hospital Santa Creu i Sant Pau, Barcelona

Number of presentations: 6 oral presentations divided into 2 sessions

Number of participants: 115 researchers

Training periods

Objective: For junior and senior researchers to spend short periods (a maximum of three months) in other laboratories to broaden their scientific knowledge in specific techniques, collaborate with other groups and develop joint experiments. In 2012, two training periods of this type were made possible thanks to Ciberdem.

Theses defended and directed by researchers attached to Ciberdem

In 2012, a total of 15 doctoral theses were read.

CBATEG Seminars (UAB-Ciberdem)

Organized by the Transgenic animal models and gene therapy approaches for diabetes group (PI Fàtima Bosch) during 2012 at the UAB, Bellaterra, Spain.

23 February: The analysis of the genome of an albino gorilla reveals inbreeding depression in wild populations. Given by Dr Tomàs Marqués-Bonet, Institut Català de Recerca i Estudis Avançats (ICREA), Institut de Biologia Evolutiva (IBE), UPF-CSIC, Barcelona.

28 March: Systemic AAV vector delivery for the treatment of haemophilia. Given by Dr Federico Mingozzi, Center for Cellular and Molecular Therapeutics, The Children's Hospital of Philadelphia, USA.

7 May: Tregs, Tregs and more Tregs. Given by Prof. David Klitzmann, Prof. of Immunology, Pierre et Marie Curie University & Medical School; Chief of Biotherapy, Pitié-Salpêtrière Hospital, Paris, France.

30 May: Development of gene and cell therapies for retinal disorders. Given by Prof. Robin Ali, Division of Molecular Therapy, Institute of Ophthalmology, University College London (UCL), UK.

15 June: A therapeutic strategy for cancer redirected for obesity. Given by Dr Manuel Serrano, Grupo de Supresión Tumoral, Centro Nacional de Investigaciones Oncológicas (CNIO), Madrid, Spain.

22 June: Gene and stem cell therapy for diabetes. Given by Prof. Roy Calne, University of Cambridge, UK.

26 June: ZFN-mediated genome editing for haemophilia. Given by Dr Xavier Anguera, Associate, Howard Hughes Medical Institute, Center for Cellular and Molecular Therapeutics, The Children's Hospital of Philadelphia, USA.

17 July: Presentation of the most important basic research papers at the 72nd ADA Congress. Given by Dr David Cano,

Instituto de Biomedicina (IBiS), Hospital Universitario Virgen del Rocío, Seville and Dr Efrén Riu (CBATEG).

27 July: Delivery of AAV vectors in the presence of neutralizing antibodies. Given by Dr Federico Migozzi, Center for Cellular and Molecular Therapeutics, The Children's Hospital of Philadelphia, USA.

Diabetes and Obesity Research Lab Seminars (Idibaps-Ciberdem)

Organized by the Metabolic and molecular disturbances in diabetes group (PI Anna Novials) during 2012 in Centro Esther Koplowitz (CEK), Barcelona, Spain.

27 February: Molecular mechanisms of insulin resistance. The role of IRS2 and PTP1B. Given by Ángela Martínez Valverde, Instituto de Investigaciones Biomédicas Alberto Sols and Ciberdem, Spain.

19 March: Diabetes and Obesity Research Lab Seminar: Importance of cell-cell communication in vascular endothelial cells and pancreatic beta cells. Given by Eckhard Lammert, Heinrich-Heine-Universität, Düsseldorf, Germany.

23 April: Diabetes and Obesity Research Lab Seminar: Non-invasive *in vivo* imaging of pancreatic beta cell function and survival. Given by Per-Olof Berggren, Karolinska Institutet, Stockholm, Sweden.

21 May: Diabetes and Obesity Research Lab Seminar: Parasympathetic dysfunction and insulin resistance. Given by Paula Macedo, Universidade Nova de Lisboa, Portugal.

25 June: Diabetes and Obesity Research Lab Seminar: Body adiposity and type 2 diabetes. Given by Javier Gómez-Ambrosi, Universidad de Navarra, Spain.

16 July: Diabetes and Obesity Research Lab Seminar: Repairing deficient beta cell mass. Given by Bernard Portha, Université Paris Diderot, France.

Fundraising

www.investigaladiabetes.org



Introduction

In its effort to continue supporting the work of its research groups, Ciberdem has designed and implemented since 2010 a strategic fundraising plan with two clearly defined lines of action: on the one hand, actions aimed at private individuals, and on the other, those aimed at the business community.

Objectives

To raise the level of awareness of the problem of diabetes in Spain in order to obtain the active participation of key sectors of society and thus raise funds for research into diabetes.

To involve diabetics and their families in actions which allow them to support research into diabetes.

To inform people of what Ciberdem research groups are doing.

To build and strengthen alliances with our stakeholders.

In order to achieve these objectives, Ciberdem continues to implement its "Investiga la diabetes" initiative, which is non-profit-making and aims to promote research projects to help prevent, treat and cure diabetes.

Achievements in 2012

Fundraising Events

Talks were held in different cities to inform people of what Ciberdem groups are doing and at the same time to raise funds.

"Diabetes a la carta"

23 November 2012. Alt Maresme, Barcelona

Auditorium of the Centro Cultural at Malgrat de Mar, Barcelona

Speaker: Serafín Murillo

Organized by: Asociación de Diabéticos de Cataluña (ADC)-Alt Maresme

"Mirando al futuro: Lo último en investigación de la diabetes"

24 November 2012. Barcelona

Speakers: PI Anna Novials and Serafín Murillo

Auditorium of La Pedrera, Barcelona

With the collaboration of: Novartis, ADC-Barcelona and Ciberdem

"Jornada de divulgación de la diabetes: Protejamos nuestro futuro"

10 November 2012. Oviedo

Príncipe Felipe Conference Centre

Workshop: Diabetes a la carta, Fundación Alícia

Organized by: Fundación SED, ASDIPAS, SED, IDF and Ciberdem

"Diabetes a la carta"

27 June 2012. Girona

Speakers: Fundación Alícia and Serafín Murillo

Organized by: ADC-Girona and Ciberdem

Ciberdem firmly believes in and is committed to the popularization of science, this is why since it was first set up, every November (the month of World Diabetes Day), it has held a public awareness event for diabetics, their families, friends and the public in general (see [page 17](#) for more).

Research project: Pilchardus



"Pilchardus"** is a study to test the hypothesis that a diet rich in sardine (pilchardus) protein can improve metabolic control in patients with type 2 diabetes mellitus as compared to a control diet without sardines. It is innovative because few projects have tackled the role of proteins in the diet in regulating insulin sensitivity and glucose homeostasis. There is evidence that this study will also provide information on changes in other parameters such as inflammation, changes in the composition of microbiota, blood pressure, weight and the distribution of body fat, among others.

In 2012, a collaboration agreement was signed with the Fundación Catalunya-La Pedrera, which made a donation of 60,000 € to the project. The Conservas Cerqueira cannning company also collaborated: they supplied all the tinned sardines needed for the trial. Thanks to these collaborations, and the work of the investigators involved, the project got underway in 2012 (see [page 25](#) for more).

An education and innovation project



"Diabetes a la carta". A therapeutic education project which puts forward a new alternative for the prevention and treatment of diabetes. The aim of this initiative is to provide new tools for people with type 2 diabetes, their families and friends, to manage their daily food intake in a more balanced, enjoyable and healthy way.

One of the partners in the initiative is the Fundación Alícia, Alimentación y Ciencia, a centre researching into food whose president is the chef, Ferran Adrià. Thanks to this contribution, there is a multidisciplinary group of researchers, dieticians, cooks, educators and designers, among others.

In order to implement and publicize these actions, we are able to count on the help of Esteve, a laboratory which is committed to research leading to better quality of life for diabetics.

During 2012, various actions were carried out, for example the www.diabetesalacarta.org website was regularly updated with dynamic, educational content. Since its launch on World Diabetes Day in 2011, the site has clocked up over 70,000 visits.

*A fish of the clupeid family, closely related to the anchovy and herring.

Future challenges

Ciberdem will seek to establish and consolidate strategic alliances with its stakeholders with the aim of promoting our groups' research. It will also promote the development of innovative initiatives to involve the business sector and improve the health and quality of life of diabetes sufferers.



"Diabetes a la carta" tablecloths.

Social awareness activities

Ciberdem was present in different cities throughout Spain to increase public awareness of the scientific work it is carrying out.

Speakers: Ciberdem researchers

Target public: patients' associations and the general public

5th Public Awareness Event

The 5th Ciberdem Public Awareness Event was held at the Príncipe Felipe Conference Centre in Oviedo on 10 November 2012.

Present at this edition were such important institutions as the Fundación de la Sociedad Española de Diabetes, the Federación de Diabéticos Españoles, the Sociedad Española de Diabetes, the Federación Internacional de la Diabetes, the Asociación de Diabéticos del Principado de Asturias (ASDIPAS) and Ciberdem. The Fundación Alícia and several pharmaceutical companies were also involved. The programme included exhibitions and interactive activities with the aim of showing those in attendance the latest advances in diabetes research.



5th Public Awareness Event.

The 9 CIBERs in Science Week

In the context of the 2012 Science Week, the 9 Spanish Biomedical Research Centres for Excellence (CIBERs) offered two round tables on translational research. Dr Ángela Martínez Valverde represented the consortium in the Madrid round table and Dr Ramon Gomis did so at the Barcelona round table. The events were moderated by Teresa Bomboi and Isabel Sastre of the Subdirección General de Redes y Centros de Investigación Cooperativa del Instituto de Salud Carlos III (ISCIII).

Café Gijón, Madrid, 6 November 2012

Ciber-bbn: Pablo Laguna

Ciberdem: Ángela Martínez

Ciberehd: Rafael Banares

Ciberer: Francesc Palau

Ciberes: M^a Victoria del Pozo

Ciberesp: Miguel Delgado

Ciberned: Miguel Medina

Ciberobn: José Antonio Fernández

Cibersam: Víctor Pérez

CEK, Barcelona, 20 November 2012

Ciber-bbn: Rosa Villa

Ciberdem: Ramon Gomis

Ciberehd: Jaume Bosch

Ciberer: Antònia Ribes

Ciberes: Josep María Montserrat

Ciberesp: Ángela Domínguez

Ciberned: Eduardo Tolosa

Ciberobn: José Antonio Fernández

Cibersam: Miquel Bernardo Arroyo



World Diabetes Day.



Madrid Science Week.



Barcelona Science Week.

runners usually ingest fewer carbohydrates than non-sufferers. However, diabetic runners consumed more carbohydrates immediately prior to the race. A possible explanation for this behaviour could be that diabetics regulate their carbohydrate intake in accordance with their levels of glycaemia and the type of exercise they are about to perform, especially to avoid hypoglycaemic episodes during the activity.

mueveteporladiabetes.org

Mirando al futuro: Lo último en investigación de la diabetes

24 November 2012. Barcelona

Speakers: PI Anna Novials and Serafín Murillo, Ciberdem researcher

Auditorium of La Pedrera, Barcelona

With the collaboration of: Novartis, ADC-Barcelona and Ciberdem

4th Diabetes and Sport Seminar

15-16 December 2012. Tenerife

Speakers: PI Anna Novials and Serafín Murillo

Organized by: Fundación para la Diabetes and the Asociación para la Diabetes de Tenerife

Diabetes. Sport as part of the treatment

29 Febrero 2012. Barcelona

Speaker: Serafín Murillo

World Diabetes Day

14 November 2012

Ciberdem collaborated in the organization of activities in the framework of World Diabetes Day

Walk for Diabetes

11 November 2012. Barcelona

CIBERDEM collaborated in the fun walk organized by the Asociación de Diabéticos de Cataluña

Ciberdem present in: Health Policy and Diabetes

14 November 2012. Madrid

Speaker: PI Enrique Blázquez

Ciberdem took part in this event of the Real Academia Nacional de Medicina and the International Diabetes Federation

Ciberdem study in the 1st Diabetes Fun Run

18 November 2012. Madrid

Ciberdem collaborated with the Fundación para la Diabetes and the Asociación de Diabéticos de Madrid in a study to analyse the behaviour and attitudes of diabetics in a long-distance race. The aim of the study was twofold: on the one hand to discover the nutritional strategies of a large group of runners with type 1 diabetes, and on the other to compare the results obtained with those of runners not suffering from the disease. This would make it possible to find out how diabetes affects dietary preparation for a race of this type.

158 valid questionnaires were obtained from the 565 adults who took part in the race: 31 from diabetic runners and 127 from non-diabetics. The conclusions were that diabetic

More about Ciberdem

Introduction

The Centro de Investigación Biomédica en Red de Diabetes y Enfermedades Metabólicas Asociadas (Ciberdem) is a public research consortium which was founded on 3 December 2007 and is financed by the Instituto de Salud Carlos III (ISCIII) and the Ministerio de Ciencia e Innovación (MICINN). Ciberdem is made up of 31 research groups based in different hospitals, universities and research centres throughout Spain. The main aim of Ciberdem is to promote research into diabetes and associated metabolic disorders, identifying the genes which predispose to these diseases and the environmental factors which contribute to their development; to discover the molecular mechanisms involved in the alteration of insulin secretion and signalling; to determine the molecular and cellular mechanisms involved in the formation and destruction of pancreatic beta cells; to study strategies for substitution of this cell mass; and to investigate the signals which link obesity and diabetes. Of special interest is research into the complications of diabetes and associated metabolic disorders.

Ciberdem is divided into four Research Programmes:

- Programme 1. Molecular and physiological determinants of lifestyle in diabetes/obesity. Population studies for genetic-epigenetic association analysis in type 2 diabetes mellitus and related traits
- Programme 2. Mechanisms promoting the development of diabetes and its vascular complications. Associated disorders and co-morbidities. Strategies for prevention and treatment
- Programme 3. Impact of beta cell dysfunction and plasticity on the natural history of diabetes. Development of novel treatment strategies
- Programme 4. Use of biomedical approach systems to develop personalized therapies for diabetes

Management Committee

President

Joaquín Arenas, Director of the Instituto de Salud Carlos III (ISCIII)

Vice President

Margarita Blázquez, Subdirector General de Redes y Centros de Investigación Cooperativa (ISCIII)

Members

Dolores González, Consejo Superior de Investigaciones Científicas (CSIC)

Rosa Valenzuela, Fundación Centro de Investigación Príncipe Felipe

Rafael Carmena, Fundación Hospital Clínico Universitario de Valencia

Emilià Pola, Fundación IDIBELL

Oriol de Solà-Morales, Fundació Institut d'Investigació Sanitària Pere Virgili

X. Comella, Fundació Institut de Recerca Hospital Universitari Vall d'Hebron

Itziar Lourdes Ochotorena, Fundación Instituto Mediterráneo para el Avance de la Biotecnología Sanitaria

Emili Bargalló, Fundación para la Investigación y Docencia Sant Joan de Déu

Carmen Ayuso, Fundación Jiménez Díaz

Margarida Corominas, Fundació Privada Institut de Recerca Biomèdica

Carmen Garaizar, Fundación Vasca de Innovación e Investigación Sanitarias

Jaume Kulisevsky, Institut de Recerca Hospital de la Santa Creu i Sant Pau

Pastora Martínez, Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS)

Miguel López-Bravo, Servicio Madrileño de Salud

Ferran Sancho, Universitat Autònoma de Barcelona

Xavier Meneses, Universitat de Barcelona

Joaquín Plumet, Universidad Complutense de Madrid

Fernando Borrás, Universidad Miguel Hernández

José Manuel Rosado, Universidad Pablo de Olavide

Secretary

Johanna Rivera, Ciberdem Managing Director

Permanent Commission

President

Margarita Blázquez, Subdirector General de Redes y Centros de Investigación Cooperativa (ISCIII)

Members

Joaquín Plumet, Universidad Complutense de Madrid (UCM)

Carmen Garaizar, Fundación Vasca de Innovación e Investigación Sanitarias

Rafael Carmena, Fundación Hospital Clínico Universitario de Valencia

Oriol de Solà-Morales, Fundació Institut d'Investigació Sanitària Pere Virgili

Secretary

Johanna Rivera, Ciberdem Managing Director

Steering Committee

Luis Castaño, Scientific Director and President of the Steering Committee

Anna Novials, Assistant Scientific Director and Coordinator Programme 3

Rafael Carmena, Coordinator Programme 1

Manuel Benito, Coordinator Programme 2

Antonio Zorzano, Coordinator Programme 4

Fàtima Bosch, Training Programme Coordinator

Johanna Rivera, Managing Director and Secretary of the Steering Committee

External Scientific Committee

President

José M Ordovás, Tufts University, Boston (USA)

Members

Francesc Xavier Pi-Sunyer, Columbia University, New York (USA)
Decio Eizirik, Université libre de Bruxelles (Belgium)
Antonio Vidal-Puig, University of Cambridge (UK)
Ele Ferrannini, Università di Pisa (Italy)

Research Groups

Madrid

PIs Carmen Álvarez (Univ. Complutense), Manuel Benito (Univ. Complutense), Enrique Blázquez (Univ. Complutense), Héctor F Escobar Moreale (Hospital Ramón y Cajal), Flora de Pablo (CSIC Research Centre), Manuel Serrano Ríos (Hospital Clínico), Mario Vallejo (CSIC Research Centre), María Luisa Villanueva Peñacarrillo (Fundación Jiménez Díaz), Ángela Martínez Valverde (Univ. Complutense)

Valladolid

PI Jesús Balsinde (CSIC Research Centre)

Vizcaya

PI Luis Castaño (Hospital de Cruces)

Barcelona

PIs Francisco Blanco Vaca (Hospital Sant Pau), Fàtima Bosch (CBATEG Research Centre), Anna Novials (IDIBAPS Research Centre), Jorge Ferrer (IDIBAPS Research Centre), Ramon Gomis (IDIBAPS Research Centre), Manuel Vázquez Carrera (Univ. Barcelona), Anna M Gómez Foix (Univ. Barcelona), Joan J Guinovart (IRB Research Centre), Antonio Zorzano (IRB Research Centre), Eduard Montanya (Hospital Bellvitge), Rafael Simó (Hospital Valld'Hebron), Lourdes Ibáñez (Hospital Sant Joan de Déu)

Tarragona

PIs Xavier Correig (Metabolomics Platform), Joan J Vendrell (Hospital Joan XXIII), Lluís Masana (Hospital Sant Joan Reus)

Valencia

PIs Rafael Carmena (Hospital Clínico), Deborah Burks (Príncipe Felipe Research Centre)

Alicante

PI Angel Nadal (Univ. Miguel Hernández)

Málaga

PI Federico Soriguer (Hospital Carlos Haya)

Sevilla

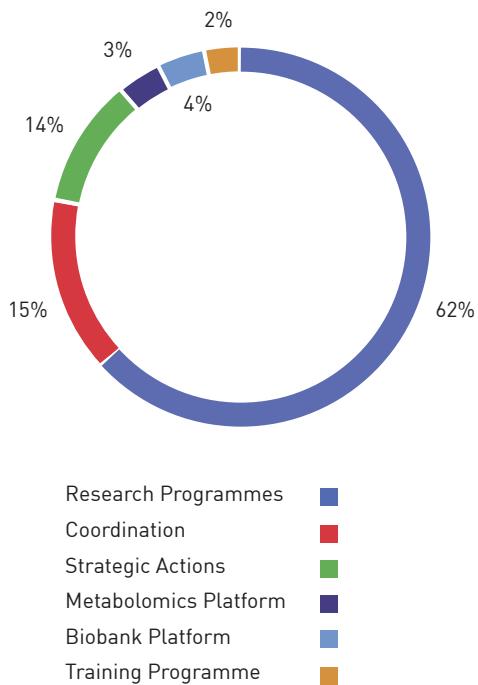
PI Franz Martín (CABIMER Research Centre)

Management Office

Johanna Rivera, Managing Director
Tania Fernández, Executive Secretary
Francesc Martí, Project Management
Marta Vidal and Joana Balfegó, Knowledge Management and Communication
Libertad Montaño and Carme Bardia, Human Resources
Antonio Santaliestra, Accounting and Purchasing Agent
Maria Rosa Vázquez, Administrative Assistant

Human Resources

In 2012, Ciberdem had a total of 386 researchers; of which 103 belonged to Ciberdem's own staff (including the Management Office) and 283 were attached staff. The following graph shows a breakdown of Ciberdem's own staff by category and type of contract.



Financial Highlights

In 2012, Ciberdem expended a total of 3,315,591.85 €, broken down as follows:

Research Programmes: 2,041,184.51 €

Coordination: 512,793.31 €

Strategic Actions: 472,346.23 €

Metabolomics Platform: 101,827.95 €

Biobank: 125,439.85 €

Training Programme: 62,000.00 €

*External funds: 321,648.62€

2012

ANNUAL REPORT

Research

Di@bet.es Study

www.ciberdem.org/estudio_diabetes



Field work regions.

Introduction

Attempts to halt the growing presence of diabetes in Spanish society, a cause of concern for both public and private healthcare systems, require reliable and accurate data on the incidence of diabetes in different groups within the Spanish population. Di@bet.es, a joint initiative of the Spanish Diabetes Society (SED) and Ciberdem, was born with the goal of providing improved knowledge of the epidemiology of diabetes in Spain.

Ciberdem, primary funding organization of Di@bet.es, believes firmly in the importance of the epidemiological information that the study will provide as a point of reference for measuring the success of its programmes. The results of this study will assist Ciberdem groups in focusing their research on relevant pursuits and will allow public and private institutions to formulate more efficient and effective strategies for diabetes prevention, diagnosis, treatment and research.

Objectives

To determine the overall incidence (known and unknown) of type 2 diabetes mellitus in a representative sample of the Spanish population.

To determine the relationship between the incidence of type 2 diabetes mellitus and the nutritional habits and physical activity of the individuals within the sample, as well as relevant information regarding their demographic and genetic characteristics.

To provide a scientific tool for assessing institutional health strategies. To determine the incidence of impaired fasting glucose and impaired glucose tolerance, insulin-resistance, hypertension, dyslipidaemia, obesity, and metabolic syndrome in a representative sample of the Spanish population.

To determine the relationship between the incidence of these disorders and the nutritional habits and physical activity of the individuals within the sample.

To provide a collection of human serum samples for carrying out

studies on the analysis of gene-environment interaction in the pathogenesis of diabetes.

Steering Committee

Direction Federico Soriguer (Hospital Carlos Haya-IMABIS, Málaga, and Ciberdem)

Coordination Gemma Pascual (Ciberdem Management Office) and Gemma Rojo (Hospital Carlos Haya- IMABIS, Málaga, and Ciberdem)

Northern region Field work coordination and Management: Luis Castaño (Hospital de Cruces, Bilbao, and Ciberdem) Field work: Alicia Cobo, Ana María Megido

Northeastern region Field work coordination: Albert Goday (Hospital del Mar de Barcelona) Management: Ramon Gomis (Hospital Clínic de Barcelona, IDIBAPS, and Ciberdem) Field work: Alba Arocás, Laura Esquius, Rosario Suárez, María Dolores Zomeño

Eastern region Field work coordination: Miguel Catalá (Hospital Clínico de Valencia and Ciberdem) Management: Rafael Carmena (Hospital Clínico de Valencia and Ciberdem) Field work: Clara Bixquert, Nieves Brito

Central region Field work coordination: Alfonso Calle (Hospital San Carlos de Madrid) Management: Manuel Serrano Ríos (Hospital San Carlos de Madrid and Ciberdem) Field work: Isabel Alonso, Enrique Mañas

Southern region Field work coordination: Gemma Rojo (Hospital Carlos Haya-IMABIS, Málaga, and Ciberdem) Management: Federico Soriguer (Hospital Carlos Haya- IMABIS, Málaga, and Ciberdem) Field work: Rocío Badía, Isabel Guillén

Other Steering Committee members Alfonso López Alba (Hospital Universitario de Canarias, Tenerife), Elena Bordiu (Hospital San Carlos de Madrid), Roser Casamitjana (Hospital Clínic de Barcelona, IDIBAPS, and Ciberdem), Conxa Castell (ConSELL Assessor sobre la Diabetis, Direcció General de Salut Pública, Generalitat de Catalunya, Barcelona), Elias Delgado (Hospital General de Asturias), Edelmiro Menéndez (Hospital Universitario Central de Asturias), Josep Franch (Centre d'Atenció Primària Raval Sud, Barcelona), José A Vázquez (Hospital de Cruces, Bilbao), Sonia Gaztambide (Hospital de Cruces, Bilbao, and Ciberdem), Juan Girbés (Hospital Arnau de Vilanova de Valencia), María Teresa Martínez Larrad (Hospital San Carlos de Madrid and Ciberdem), Emilio Ortega (Hospital Clínic de Barcelona, IDIBAPS, and Ciberdem), Inmaculada Mora (Hospital Universitario de Canarias, Tenerife), Sergio Valdés (Hospital Carlos Haya- IMABIS, Málaga, and Ciberdem),

and Joan J Vendrell (Hospital Joan XXIII de Tarragona and Ciberdem)

Achievements in 2012

The Di@bet.es Study has allowed us to know for the first time the real situation in Spain as regards the total prevalence of type 2 diabetes and other cardiometabolic risk factors such as obesity, metabolic syndrome, hypertension and so on and the relationship between them. It has also provided information about the degree of adherence of patients to health programmes (this being an important part in the treatment of diabetes and obesity, as well as other chronic diseases) and confirms once again the close association between preventable risks and modifiable habits (diet, exercise, obesity, etc) and cardiometabolic risk. The study also confirms the positive effects, previously observed in other studies, of olive oil on patients' health. The results of this study will change our understanding of the national prevalence of some of the cardiovascular risk factors, which will have consequences not only in planning, but also in the precision of many of the diagnostic tests carried out by clinicians.

In 2012, the databases were analysed and several publications were produced. Also, the project (Prevalence of diabetes in Spain and associated risk factors) financed by the Spanish Ministry of Economy and Competitiveness and the Carlos III Health Institute was implemented. This project is coordinated by Federico Soriguer and consists of four different subprojects:

- 1- The identification of exome genetic variants associated with DM2 (PI: JF. Chávez, Group of Dr Carmena)
- 2- Genetic susceptibility to the development of type 2 diabetes and its cardiovascular complications in the Spanish population. (PI: Elías Delgado)
- 3- The study of tweak/cd163 as a possible biomarker for type 2 diabetes. (PI: Matilde Rodríguez Chacón, Group of Dr Vendrell)
- 4- Thyroid hormones and body weight. The role in obesity risk of variants in the thyroid hormone receptor alpha gene. (PI: Federico Soriguer)

Publications

Evaluation of Health-Related Quality of Life according to Carbohydrate Metabolism Status: A Spanish Population-Based Study (Di@bet.es Study)

Marcuello C, Calle-Pascual AL, Fuentes M, Runkle I, Soriguer F, Goday A, Bosch-Comas A, Bordiu E, Carmena R, Casamitjana R, Castaño L, Castell C, Catalá M, Delgado E, Franch J, Gatzambide S, Girbés J, Gomis R, Gutiérrez G, López-Alba A, Martínez-Larrad MT, Menéndez E, Mora-Peces I, Ortega E, Pascual-Manich G, Rojo-Martínez G, Serrano-Ríos M, Valdés S, Vázquez JA, Vendrell J

Int J Endocrinol, doi 10.1155/2012/872305 (2012)

PMID 22848215

Iodine intake in the adult population. Di@bet.es study

Soriguer F, García-Fuentes E, Gutierrez-Repiso C, Rojo-Martínez G, Velasco I, Goday A, Bosch-Comas A, Bordiu E, Calle A, Carmena R, Casamitjana R, Castaño L, Castell C, Catalá M, Delgado E, Franch J, Gatzambide S, Girbes J, Gomis R, Gutierrez G, Lopez-Alba A, Martínez-Larrad MT, Menéndez

E, Mora-Peces I, Ortega E, Pascual-Manich G, Serrano-Ríos M, Valdés S, Vazquez JA, Vendrell J
Clin Nutr, 31, 882-888 (2012)
PMID 22560740

Prevalence of diabetes mellitus and impaired glucose regulation in Spain: the Di@bet.es Study

Soriguer F, Goday A, Bosch-Comas A, Bordiu E, Calle-Pascual A, Carmena R, Casamitjana R, Castaño L, Castell C, Catalá M, Delgado E, Franch J, Gatzambide S, Girbes J, Gomis R, Gutierrez G, Lopez-Alba A, Martínez-Larrad MT, Menéndez E, Mora-Peces I, Ortega E, Pascual-Manich G, Rojo-Martínez G, Serrano-Ríos M, Valdés S, Vazquez JA, Vendrell J
Diabetologia, 55, 88-93 (2012)
PMID 21987347

Future challenges

The utilization of the information obtained in this field study will contribute in the future to new knowledge on diabetes and other biomedical problems studied. In this regard, more than 10 publications are in preparation at the time of publication of this report.

Some of our future goals include:

- Developing the coordinated project.
- Designing a study for the incidence of diabetes in the same population.
- Designing a diabetes prevention programme for the same population.

Telemed-diabetes Study

www.ciberdem.org/telemed-diabetes

Introduction

The costs associated with type 1 diabetes mellitus are high, for both patient and family, as well as for the healthcare system: a) Healthcare costs - hospital days, visits, medication and care; b) Other costs not included in healthcare expenses - reduction or loss of productivity due to high morbidity and premature mortality; c) Intangibles - life expectancy and quality of life. Different programmes of healthcare quality have been designed to cope with this reality by promoting basic research, clinical education in healthcare and the social integration of patients. As previous studies have shown, in order to prevent or delay chronic complications it is optimal to obtain good metabolic control through a system of intensified treatment when results of glycated haemoglobin are higher than recommended. The Telemed-diabetes Study is crucial for comparing cost and efficiency parameters of two control optimization programmes through face-to-face healthcare visits and by replacing some of these visits with a telematic communication system. It is a multicentre study developed by Ciberdem and the five participating centres are the Hospital Clínic de Barcelona, the Hospital Carlos Haya in Málaga, the Hospital Clínico de Madrid, the Hospital de Cruces in Barakaldo and the Hospital Clínico de Valencia.

Objectives

The main objective is to assess the impact of the Medical Guard Diabetes® (MGD) system on the efficiency of the clinical and economic management of the human resources and materials allocated to a programme of optimization of metabolic control in patients with type 1 diabetes mellitus, with particular reference to the degree of metabolic control and quality of life of the patients. This telematic communication system conveys the results of capillary blood glucose, insulin dose, carbohydrate intake during meals and other events, from the patient's home or elsewhere to the medical team through a web server.

Telemed-diabetes is a multicentre, randomized, prospective, comparative, open study which it is hoped will reveal the effectiveness and utility of the telematic communication program through the assessment and comparison of the two groups of patients in respect of the following results:

- Metabolic control of diabetes: results of glycated haemoglobin and frequency of hypoglycaemic and hyperglycaemic crisis.
- Costs of visits considering the time needed by the patient, expenses of travel to the hospital and impossibility of performing usual activities (school, work) due to face-to-face healthcare visits in the hospital, compared with the costs of medical visits carried out remotely, with the help of the telematic communication system used.

Steering Committee

Coordinator Enric Esmatjes (Hospital Clínic de Barcelona and Ciberdem)

Expert collaborator Oriol Solà Morales (Agència d'Informació,

Avaluació i Qualitat en Salut

Organizations involved Insight Consulting & Research (Monitorization and follow-up of the study) and Pulso Ediciones SL (Telematic communication system Medical Guard Diabetes®)

Promotor Spanish Biomedical Research Centre in Diabetes and Associated Metabolic Disorders (Ciberdem) - Instituto de Salud Carlos III, Spanish Ministry of the Economy and Competitiveness (ISCIII, MEC)

Participating centres:

Enric Esmatjes, Margarita Jansà and Daria Roca (Hospital Clínic de Barcelona and Ciberdem)

Marisol Ruiz de Adana, Francisca Linares and Mercedes Guerrero (Hospital Carlos Haya-IMABIS, Málaga and Ciberdem)
Federico Vázquez and Aníbal Aguayo (Hospital de Cruces, Bilbao, and Ciberdem)

Sergio Martínez-Hervás and Nieves Brito (Hospital Clínico de Valencia and Ciberdem)

Natalia Pérez-Ferrer and Laura del Valle (Hospital San Carlos, Madrid, and Ciberdem)

Achievements in 2012

A total of 153 patients were recruited in 2011 and divided in two groups, a control group (hospital visits) and an intervention group (hospital visits substituted by telemedicine). In April 2012, follow-up of these patients finished and the database with data on the first six months was closed. The study finished with 118 patients and preliminary results analysed at the end of 2012 suggest that telemedicine, applied to patients with DM1 which is being treated using MDI, and with inappropriate metabolic control, is a valid strategy comparable to face-to-face visits as far as glycaemic control, acquisition of knowledge, quality of life and therapeutic adherence is concerned, with a significant reduction in time spent, especially for the patient.

Future challenges

Final results will be presented in 2013.

Pilchardus Study

Introduction

Pilchardus is a clinical research project which aims to test the hypothesis that a diet rich in sardines can improve metabolic control in patients with type 2 diabetes mellitus. Ciberdem is the driving force behind this multicentre study, coordination is by the Hospital Clínic de Barcelona and associated hospitals are the Hospital de la Vall d'Hebron in Barcelona and the Hospital Regional Universitario Carlos Haya.



Objectives

The objectives of the study are to evaluate the effects of a diet rich in sardines on glycaemic control, inflammation markers, blood pressure, lipid metabolism and intestinal microbiota in patients either recently diagnosed with type 2 diabetes or not undergoing pharmacological treatment. The aim is to include 62 patients in the study and divide them at random into an intervention group (sardine diet) and a control group (normal diet). The diet consists of the substitution of a part of the daily protein intake with 100 g of sardine, five days a week for six months. The sardines are supplied in tins or processed in other ways. The Galician fish-canning company Cerqueira collaborated by providing free of charge all the tins of sardines required for the study, and the food investigation centre Fundación Alícia, led by chef Ferran Adrià, created a wide variety of sardine-based dishes so that patients can avoid monotony at mealtimes.

Executive Committee

Coordinator Ramon Gomis

Investigators Rafael Simó, Federico Soriguer, Anna Novials and Xavier Correig (Metabolomics Platform)

With the participation of Fundación Alicia, Fundación Catalunya-La Pedrera and Conservas Cerqueira, S.A.

Achievements 2012

In 2012, work was carried out on the design and printing of the informed consent forms and data collection sheets and on the materials needed for the nutrition education sessions. Dishes were selected from those designed by the Fundación Alícia for use in the study and their nutritional content was analysed.

The first monitoring visits were made to the different hospitals participating in the study and recruitment of patients was initiated.

Runner up in the Ecotendencias CosmoCaixa video competition.

Future Challenges

The Pilchardus study is planned to end in mid-November 2013. The main results obtained will determine the effects of long-term sardine consumption on glucose levels and glycosylated haemoglobin values. They will also provide information on its effects on inflammation markers and cardiovascular risk factors

associated with type 2 diabetes (blood pressure and lipid profile).

The study will generate new scientific knowledge in the field of nutrition in diabetes which will make it possible to envisage new applications in the treatment of type 2 diabetes and make dietary recommendations based on sardines for patients with diabetes and other metabolic diseases associated with obesity.

The culinary use of sardines will also be improved, as will the eating habits of patients, their families and those around them. Taking into account the forecasts of an increase in the prevalence of type 2 diabetes over the next five years, the results of this novel study will have an impact on public health because they will lay the foundations for new studies in the field of nutrition strategies in type 2 diabetes.



Dishes created by the Fundación Alícia for the intervention diet.

Collaborator



Sponsor

**Fundació
Catalunya
La Pedrera**

CONSERVAS CERQUEIRA S.A.

Medigene Project

Introduction

This is a multinationally coordinated project whose aim is to investigate the genetic and environmental factors involved in the aetiopathogenesis of insulin resistance syndrome in Mediterranean populations and is a four-year collaborative project between Ciberdem and other European institutions. It is subsidized by the European Commission under its Framework Programme FP7-Health-2011-two-stage (project number 279171) and is coordinated by Florin Grigorescu of the Université Montpellier I, France, assisted by Ramon Gomis (Ciberdem).

Objectives

Implementation of the project began in 2012. Ciberdem is involved in several work packages and is responsible for various deliverables.

Achievements

In 2012, the following achievements were made:

- a) An analysis of Ciberdem's Biobank databases in order to define the Mediterranean population to be studied.
- b) Preparation of the separation technique for genomic and mitochondrial DNA from molars from the Roman population buried in the Roman necropolis at Tarragona and other sites in the area. Collaboration with the Institut Català d'Arqueologia Clàssica.
- c) Organization of a training course in Barcelona on the handling of data from genetic and molecular databases.

Ciberdem participants:

UPV-EHU: Luis Castaño

IDIBAPS Group: Ramon Gomis

IDIBAPS Group: Anna Novials

IISPV: Lluís Masana

Other possible Ciberdem groups depending on milestones to be developed.



Ciberdem Projects

www.ciberdem.org/projects

Introduction

Ciberdem seeks to achieve scientific excellence in research and encourage bench-to-bed as well as bed-to-bench transition. In order to achieve these goals, it promotes collaboration between basic and clinical research groups to prioritize translational research in the network. To this end, 14 initiatives, based mainly on diabetes and its complications, were implemented during 2009-2010, 10 of them continued through 2011. These initiatives planted the seed for creating new projects and still continue to produce results.

Ciberdem forges synergies between its members and launches initiatives that can offer an attractive opportunity to build up collaborations with other centres outside the consortium, whether national or international, because these projects can be seen as a pool of scientific knowledge that involves several Spanish research groups of excellence in diabetes at the same time.

Objectives

To develop scientific actions focused on diabetes and its metabolic disorders with a high impact on research.

To improve collaboration among researchers, mainly between clinical and basic research groups, with a minimum participation of 3 research groups and a maximum of 8 at any one time, at least one of them being a clinical group.

To forge alliances between researchers through joint work on the design and implementation of the projects.

To demonstrate the competitiveness of researchers and the innovation of their collaborative projects.

To establish initiatives that a single research group can not embark upon alone.

Achievements in 2012

The original fourteen Ciberdem projects officially ended on the 31st of December, 2010. Ten of them continued to be funded during 2011 and finished their work the same year. However, these projects still produced results during 2012 and here is an update.

Ciberdem Projects were presented to the wider national and international scientific community; oral presentations were made at several congresses worldwide and many original articles were published in international peer review journals.

Publications

Beneficial effects of fenofibrate in retinal pigment epithelium by the modulation of stress and survival signaling under diabetic conditions

Miranda S, González-Rodríguez Á, García-Ramírez M, Revuelta-Cervantes J, Hernández C, Simó R, Valverde ÁM
J Cell Physiol, 227, 2352-2362 (2012)
[PMID 21826649](#)

Neuroprotection in diabetic retinopathy
Hernández C, Simó R

Curr Diab Rep, 12, 329-337 (2012)

[PMID 22581259](#)

Usefulness of the vitreous fluid analysis in the translational research of diabetic retinopathy

Simó-Servat O, Hernández C, Simó R
Mediators Inflamm, 2012, 872978 (2012)
[PMID 23028204](#)

Neurodegeneration is an early event in diabetic retinopathy: therapeutic implications

Simó R, Hernández C; European Consortium for the Early Treatment of Diabetic Retinopathy (EUROCONDOR)
Br J Ophthalmol, 96, 1285-1290 (2012)
[PMID 22887976](#)

Deleterious effects of neuronal accumulation of glycogen in flies and mice

Duran J, Tevy MF, Garcia-Rocha M, Calbó J, Milán M, Guinovart JJ
EMBO Mol Med, 4, 719-729 (2012)
[PMID 22549942](#)

Metabolomics approach for analyzing the effects of exercise in subjects with type 1 diabetes mellitus

Brugnara L, Vinaixa M, Murillo S, Samino S, Rodriguez MA, Beltran A, Lerin C, Davison G, Correig X, Novials A
PLoS ONE, 7, e40600 (2012)
[PMID 22792382](#)

De novo lipogenesis in adipose tissue is associated with course of morbid obesity after bariatric surgery

Garrido-Sánchez L, Vendrell J, Fernández-García D, Ceperuelo-Mallafré V, Chacón MR, Ocaña-Wilhelmi L, Alcaide J, Tinahones FJ, García-Fuentes E
PLoS One, 7(2): e31280 (2012)
[PMID 22384010](#)

Zinc-alpha 2-glycoprotein gene expression in adipose tissue is related with insulin resistance and lipolytic genes in morbidly obese patients

Garrido-Sánchez L, García-Fuentes E, Fernández-García D, Escoté X, Alcaide J, Perez-Martinez P, Vendrell J, Tinahones FJ
PLoS One, 7, e33264 (2012)
[PMID 22442679](#)

TNF- α inhibits PPAR β/δ activity and SIRT1 expression through NF- κ B in human adipocytes

Serrano-Marco L, Chacón MR, Maymó-Masip E, Barroso E, Salvadó L, Wabistch M, Garrido-Sánchez L, Tinahones FJ, Palomer X, Vendrell J, Vázquez-Carrera M
Biochim Biophys Acta, 1821, 1177-1185 (2012)
[PMID 22683888](#)

A nontargeted proteomic approach to the study of visceral and subcutaneous adipose tissue in human obesity
Insenser M, Montes-Nieto R, Vilarrasa N, Lecube A, Simó R, Vendrell J, Escobar-Morreale HF
Mol Cell Endocrinol, 363, 10-19 (2012)
[PMID 22796336](#)

FABP4 dynamics in obesity: discrepancies in adipose tissue and liver expression regarding circulating plasma levels
Queipo-Ortuño MI, Escoté X, Ceperuelo-Mallafré V, Garrido-Sánchez L, Miranda M, Clemente-Postigo M, Pérez-Pérez R, Peral B, Cardona F, Fernández-Real JM, Tinahones FJ, Vendrell J
PLoS One, 7, e48605 (2012)
[PMID 23139800](#)

PGC-1 α induces mitochondrial and myokine transcriptional programs and lipid droplet and glycogen accumulation in cultured human skeletal muscle cells
Mormeneo E, Jimenez-Mallebrera C, Palomer X, De Nigris V, Vázquez-Carrera M, Orozco A, Nascimento A, Colomer J, Lerín C, Gómez-Foix AM
PLoS ONE, 7, e29985 (2012)
[PMID 22272266](#)

Future challenges

New publications are in preparation and some of the projects will continue with different sources of funding.

The 10 Ciberdem Projects

Identification of neurodegenerative mechanisms that promote the development of diabetic retinopathy: the role of insulin signalling and apoptosis. NEURONET-DIAB

The molecular mechanisms which mediate the development of diabetic retinopathy (DR) remain unknown. Insulin and IGF-I signalling play important roles in the development and survival of retinal cells. Our hypothesis is that resistance to insulin/IGF-I in the retina disables the molecular mechanisms which protect retinal cells against stress and apoptosis, thereby triggering neurodegeneration and DR. The results will provide a rational basis for developing novel strategies to detect, prevent and treat DR in its earliest stages.

Groups: Deborah Burks, Ángela Martínez Valverde, Rafael Simó. Project coordinator: Deborah Burks

Cooperative population and database studies for genetic association analysis in T2DM and related traits. INGENFRED

Type 2 diabetes mellitus (T2DM) is a complex disease resulting from the interaction of environmental and genetic factors. The genetics of several functional systems in T2DM have not been dissected. The project aims to develop genetic T2DM studies, integrating different populations and databases, considering the interaction between genetic and environmental factors with the aim of developing future projects that will ultimately lead to clinical applications.

Groups: Rafael Carmena, Francisco Blanco Vaca, Manuel Serrano Ríos, Federico Soriguer. Project coordinator: Felipe Javier Chaves

Clinical, genetic and functional characterization of monogenic diabetes: from the bench to the bedside. MODIAB

Monogenic diabetes (MD) accounts for 1-2% of diabetes cases and is often misdiagnosed. Knowledge of the genetic aetiology of diabetes enables better treatment, prediction, disease progression, screening of relatives and genetic counselling. The project aims to determine aspects such as new genetic causes of MD, novel functional information for pancreatic beta cells and the importance of new regulatory sequences through the discovery of mutations in known genes.

Groups: Luis Castaño, Enrique Blázquez, Jorge Ferrer, Mario Vallejo. Project coordinator: Luis Castaño

Determinants of insulin resistance and glucose tolerance disorders (including diabetes) in severe obesity and their changes after bariatric surgery-induced weight loss. DIASOBS

Obese patients submitted to bariatric surgery present a marked weight loss that frequently normalizes abnormalities in glucose tolerance because obesity is the major risk factor for this kind of disorder. This project focuses on the identification of risk factors for insulin resistance, abnormal glucose tolerance and diabetes in severely obese patients, as well as on the identification of the determinants of the resolution of these disorders following the marked and sustained weight loss usually attained after bariatric surgery.

Groups: Héctor F Escobar Morreale, Xavier Correig, Eduard Montanya, Rafael Simó, Joan J Vendrell. Project coordinator: Héctor F Escobar Morreale

Glycogen-induced dysfunctions in the pancreas and retina and their involvement in the ethiogenesis of diabetes mellitus. GIDIPRED

The project is based on the idea that, contrary to the general belief which considered glycogen to be beneficial for cells, the deposition of glycogen may be deleterious for certain cell types. The aim is to study the alterations induced by this abnormal accumulation in pancreatic beta cells, neurons, and retinal cells. The working hypothesis is that the accumulation of this polysaccharide in these cell types contributes to the induction of apoptosis and therefore the pathological consequences associated with diabetes mellitus, namely reduced insulin secretion and retinopathy.

Groups: Joan J Guinovart, Ramon Gomis, Rafael Simó. Project coordinator: Joan J Guinovart

The production of monoclonal antibodies which selectively react with cell surface molecules on human pancreatic beta cells. ANTIBECELL

So far, it has not been possible to obtain an antibody that recognizes human beta cells, although the identification of these pancreatic cells *in vitro* and *in vivo* is highly desired. In this project we propose a novel immunization strategy making it possible to obtain immune response against antigens expressed poorly and to search for antibodies against receptors on the cell surface of pancreatic beta cells. The objective achievement opens new perspectives for studies in regeneration, development and cell

therapy using islets.

Groups: Franz Martín, Eduard Montanya, Angel Nadal. Project coordinator: Juan Tejedo

Comparative metabolomic analysis for the detection of biomarkers in diabetes. METADIAB

In METADIAB, metabolomics is used to determine, thanks to the information provided by the endogenous metabolite profile, which metabolites are altered in diabetes. The changes that we aim to study are the consequences produced by high concentrations of glucose and lipids (glucolipotoxicity) in the islet pancreatic metabolome. Another aspect in which we are interested is the evaluation of the metabolomic effects induced by physical exercise in both type 1 and 2 diabetes mellitus. As a result, we will improve our knowledge in these situations and discover candidate biomarkers of the disease.

Groups: Xavier Correig, Ramon Gomis, Anna Novials. Project coordinator: Xavier Correig

Mechanisms of endothelial dysfunction in diabetes: the role of amylin and circulating endothelial cells. ENDODIAB

The main aetiology for death and for a high percentage of morbidity in patients with diabetes is vascular disease. Thus, this project aims to investigate circulating endothelial cells (CECs) as markers of endothelial dysfunction in diabetic patients; to determine the role of amylin in endothelial function; and to investigate the presence of preclinical atherosclerosis by assessing endothelial function in patients with type 1 diabetes mellitus, type 2 diabetes mellitus and obesity.

Groups: Anna Novials, Ramon Gomis, María Luisa Villanueva Peñacarrillo. Project coordinator: Anna Novials

The impact of overnutrition, diabetes-obesity and undernutrition on the regulation of energy homeostasis in the central nervous system. From animal models to humans. IODURE

Increasing evidence suggests that the central nervous system plays a crucial role in regulating energy homeostasis through crosstalk with adipose tissue and the endocrine pancreas. The objective of the project is to investigate how the brain reacts to metabolic challenges associated with overnutrition, diabetes-obesity and undernutrition. It is expected that novel mechanisms responsible for the dysregulation of energy homeostasis which leads to obesity and diabetes will be identified.

Groups: Manuel Serrano Ríos, Carmen Álvarez, Enrique Blázquez, Deborah Burks, Mario Vallejo. Project coordinator: Manuel Serrano Ríos

Adult adipose tissue-derived progenitor cells: the influence of the clinical phenotype and adipose depot origin in their biological properties. STEMOP

The objective of this project is to test for differential behaviour in adult pre-adipocytes and adipocytes derived from adipose tissue mesenchymal stem cells (ad-MSC) obtained from lean and obese subjects and also to characterize adipose derived cells from a molecular and lipidomic perspective. The expected result is the identification of the differences in adMSC (from subcutaneous and visceral depots) that exist between lean and obese subjects.

Groups: Joan J Vendrell, Jesús Balsinde, Anna María Gómez Foix, Eduard Montanya, Rafael Simó, Manuel Vázquez Carrera, Antonio Zorzano. Project coordinator: Joan J Vendrell

Biobank

www.clinicbiobanc.org



Introduction and objectives

The Ciberdem Biobank is a scientific and technological platform which coordinates the collection, processing, storage and retrieval of biological samples in the field of diabetes and other metabolic diseases, which may then be utilized by Ciberdem research groups and by other scientific institutions in their experiments and projects. The Biobank, thanks to its experience and expertise in this field, holds one of the most important collections of samples of metabolic disorders in southern Europe, bringing great added value to the biomedical research conducted by Ciberdem. Structured into nodes with multiple collection and processing sites, the Biobank allows for the immediate storage of samples following blood extraction in order to ensure the highest quality possible. Through the centralized coordination of sample management, the Biobank also ensures the traceability of its samples, as required by the recently approved Biomedical Research Act. The coordinating node of the Ciberdem Biobank obtained the ISO9001 quality certification in December 2009.

Scientific services

The main services provided by the Biobank consist of the following:

Design and management of a large metabolic disorder sample collection, involving donor recruitment; data registration; informed consent management; serum and plasma storage; DNA purification and storage; lymphocyte isolation and immortalization; and quality management.

Assurance of traceability.

Quality control of the stored samples.

Organization of an internal database for the analysis of samples and data.

Management of sample request proposals through the coordination of the Scientific External Committee and the Ethics Committee.

Personalized assistance in sample management.

Coordinating node

IDIBAPS (Barcelona, Spain): **Principal investigator** Ramon Gomis, Anna Novials **Coordinator** Anna Bosch **Associate researcher** Laura Brugnara **Lab technician** Anna Morales,

Regina Cañaveras **Lab manager** Esther Barnadas **Lab technician and quality control manager** Verónica Fernández

Nodes

Hospital Joan XXIII (Tarragona, Spain): **Principal investigator** Joan Vendrell **Research assistant** Lluís Gallart **Lab technician** Miriam Campos

Hospital Sant Joan (Reus, Spain): **Principal investigator** Lluís Masana **Research assistant** Jordi Merino **Lab technician** Jordina Saladié, Carme Buixadera

Hospital de Cruces (Barakaldo, Spain): **Principal investigator** Luis Castaño **Research assistant and lab manager** Inés Urrutia **Research assistant and dietician** Teba González

Hospital Clínico San Carlos (Madrid, Spain): **Principal investigator** Manuel Serrano Ríos

Hospital Carlos Haya (Málaga, Spain): **Principal investigator** Federico Soriguer **Associate researcher** Gemma Rojo **Research assistant** Francisca Linares **Nurse** María Fontalba

Hospital Clínico (Valencia, Spain): **Principal investigator** Rafael Carmena **Associate researcher** Javier Chaves **Research assistant** Esther Benito **Lab technician** Verónica González

Hospital de Sant Pau (Barcelona, Spain): **Principal investigator** Francesc Blanco Vaca **Associate researcher** Jesús Martín

Facilities

The Coordinating Node of the Biobank centralizes the organization of Biobank sample management and is therefore endowed with the most advanced technology available for this purpose: automated DNA extraction platform (Chemagen system, magnetic beads); liquid handling station (Tecan EVO150), cell immortalization facility (P2 level safety lab); liquid nitrogen tanks; continuous monitoring of environmental conditions from storage systems; -150 °C freezers; bar-code readers and printers; nanodrop spectrophotometer; and nitrogen and cryogen free controlled rate freezers.

The Biobank is equipped with the following facilities within each Node, permitting the immediate storage of samples taken: -80 °C freezers; micronic system for the storage of samples in standardized aliquots; and web-based IT infrastructure.

Achievements in 2012

During 2012, the Biobank collected samples from more than 100 new donors. Since the Biobank already contained samples from more than 5000 donors affected by the most widespread metabolic diseases in Spain, the newly collected samples belong, for the most part to patients affected by the rare variety

of diabetes called MODY, resulting in one of the best MODY collections anywhere in Spain. As previously established, all of the donors completed an extensive questionnaire with personal clinical data, demographic information, and exercise and food habits, which have been entered in the Biobank clinical database. Overall, the Biobank freezers and tanks stored more than 200,000 aliquots, which were coded and registered in a specially designed database.

As the sample and data repository has achieved a considerable size, several groups from Ciberdem have decided to request samples for their research projects. Most of them used DNA, but serum, plasma or PBMCs were also supplied. The projects which have used samples from the Ciberdem Biobank during 2012 are as follows:

- Estudio de TWEAK/CD163 como posibles biomarcadores de diabetes Tipo 2 (T2D) en la cohorte di@betes. Aspectos moleculares locales en el tejido adiposo. PI: Dr Matilde Rodríguez-Chacón
- Renal Disease & Diabetes Mellitus Type 2. PI: Dr Rafael Ortega Basagoiti
- Epigenetic study of DNA methylation differences in T2DM, obesity and controls. PI: Dr Ramon Gomis
- Estudio de la implicación de los genes reloj en la fisiopatología de la obesidad y la diabetes tipo 2. PI: Dr Ramon Gomis
- Hormonas tiroideas y peso corporal. Papel de variantes en el gen del receptor alpha de las hormonas tiroideas en el riesgo de obesidad. PI: Dr Federico Soriguer
- Interacción ambiente y diabetes: Efecto del ejercicio físico sobre la modulación de microRNAs circulantes implicados en la evolución de la diabetes. PI: Dr Anna Novials
- Sistema SREBP: Mutaciones y Diabetes mellitus. PI: Dr Ana Bárbara García García
- Mutaciones en SREBP2 como posible causa de diabetes mellitus: Identificación, estudio poblacional y funcional. PI: Dr Felipe Javier Chaves Martínez
- Utilización de marcadores séricos en el cribado y diagnóstico de la diabetes familiar de inicio juvenil por mutación del factor nuclear hepático 1- α . PI: Dr Antonio Jesús Blanco Carrasco
- Genetic and environmental factors of insulin resistance syndrome and its long-term complications in immigrant Mediterranean populations. IP: Dr Ramon Gomis

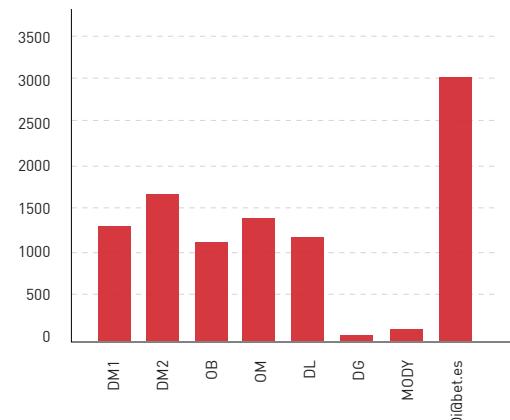
All the available samples from the Ciberdem Biobank have an extended set of associated data in the BCGene database. This database, physically located in the IDIBAPS servers, hosts demographic, clinical, and analytical data associated with the Biobank samples and offers secure access to all the Biobank nodes, guarantees donor confidentiality and ensures sample traceability. Data access is provided by the data manager once a request has been made to the Biobank Committees and approved.

Another great achievement of 2012 has been the development of ancient DNA extraction techniques, providing the grounds for the establishment of a DNA bank of the ancient population of the Roman city of Tarraco, in the framework of the MEDIGENE

project funded by the EU with 3 M €. This DNA bank will be unique in the world and will provide a basis for the study of the origin and evolution of many diseases.

Future challenges

Now that the Biobank has been established and consolidated, the main goal for the coming years is to continue to provide as many samples as possible in order to facilitate projects of outstanding quality which could not be carried out without the collaboration of different sample providers. Finally, the last big challenge for the Ciberdem Biobank will be to include prospective cohorts of people affected by metabolic disorders in its sample catalogue.



Available cases from the Ciberdem Biobank, 2008-2011. Left to right: Diabetes Type 1, Diabetes Type 2, Obesity, Morbid Obesity, Dyslipidaemia, MODY Diabetes, Gestational Diabetes, Di@bet.es Study.

Metabolomics Platform

www.metabolomicsplatform.com



Introduction and objectives

The Metabolomics Platform is a joint research facility created by the URV (Universitat Rovira i Virgili, Tarragona, Spain) and Ciberdem. The mission of the Metabolomics Platform is to offer metabolomic services to the biomedical and clinical research community of both Ciberdem and the URV. The main objective of the Metabolomics Platform is to work as an integrative facility and act as a consulting site which becomes fully involved in the metabolomics-related experiments proposed by the groups. Our collaboration starts with the defining of goals, dimension and characteristics of the sample set, as well as experiment design. Later on, the raw data is processed by our team and we are involved in the interpretation of the results, delivering sound, significant and useful clinical conclusions for the different research groups.

The equipment currently available in high field NMR, GC-MS and LC-MS allows high throughput analytical measurements of body fluids (i.e. serum and urine) as well as tissues or biopsies from humans and/or animal models (rats, mice, etc). The use of advanced statistical, chemometric, multivariate and artificial-intelligence algorithms allows us to turn large measurement datasets into metabolic fingerprinting or profiling results, and ultimately into useful clinical information.

Our goal is to introduce metabolomics as a potential tool for clinical diagnostics and elucidate unknown mechanisms associated with disease. The Metabolomics Platform is particularly addressed to the needs of Ciberdem and URV groups, however, its services and potential scientific collaborations are available to other biomedical research groups in Spain and worldwide.

Coordination

Principal Investigator Xavier Correig

Scientific Coordinator Oscar Yanes

Associate researchers Jesús Brezmes, Nicolau Cañellas, Radu Ionescu **Research assistants** Miguel Ángel Rodríguez, Maria Vinaixa, Antoni Beltran, Rosa Ras

Scientific equipment

The Platform currently manages and has full access to the

following NMR technology:

600 MHz Bruker Avance III + cryoprobe + ScanJet

500 MHz Bruker Avance III + HR-MAS probe

The Rovira i Virgili University shares three mass spectrometers with the Metabolomics Platform.

-NMR: the existing spectrometers will be complemented with new probes to measure 19F, 13C, 31P and 15N.

-Mass Spectrometry:

2 LC-Q-TOF

2 LC-QqQ

1 GC-TOF

1 GC-QqQ

1 GC-QTOF

1 LTQ Orbitrap Velos Pro + ETD

1 MALDI-TOF/TOF

2 liquid handling systems

The integration of the Metabolomics Platform in the Centre for Omic Sciences, will represent an excellent opportunity to combine the results from several omic experiments (genomics, transcriptomics, proteomics and metabolomics) and integrate the data from a systems biology approach.

For more information see [page 64](#).

Achievements in 2012

During 2012, the Metabolomics Platform was fully integrated in the Centre for Omic Sciences (<http://omicscentre.com/>), and is now ready to offer a complete set of NMR- and MS-based metabolomic services to Ciberdem groups. During 2012, the Metabolomics Platform worked on Ciberdem collaborations in the areas of diabetic dyslipidaemias, insulin resistance related to polycystic ovary syndrome, and diabetes and exercise. In 2012, the Platform began 12 projects with Ciberdem groups and other institutions in the areas of nutrition and health, metabolomic experiments with cell cultures, phenotyping of animal models, and so on. The number of serum samples processed was over 3000, comprising serum/plasma, urine, tissue extracts and cell cultures.

Future challenges

In 2013, the Metabolomics Platform will continue developing new metabolomic technologies, in particular: dynamic metabolomic studies (fluxomics) based on 13C, tissue metabolite imaging with MALDI-TOF spectrometers, data integration from different omic experiments, etc. In parallel, the platform will develop targeted metabolomic services based on GC-QQQ or LC-QQQ MS.

Programme 1

Molecular and physiological determinants of lifestyle in diabetes/obesity. Population studies for genetic/ epigenetic association analysis in type 2 diabetes mellitus and related traits

Publications*: 35

Impact Factor: 208.833

Impact Factor average: 5.967

First decile: 6

Q1: 21

Q2: 8

IntraCIBER: 7

InterCIBER: 7

International: 6

Research grants**: 37

National: 26

International: 6

Private funds: 5

Clinical trials: 8

Patents: 1

Spin-Off: 1

PhD theses: 2

Awards: 1

Letter from the Scientific Programme Coordinator

The main objectives of this programme include: (a) the study of strategies for generating nutritional guidelines in lifestyle studies and in diabetes/obesity prevention; (b) the impact of nutritional states (overnutrition, diabetes-obesity and undernutrition) on the regulation of energy homeostasis in the central nervous system; (c) studies focused on body fat amount and distribution in childhood and predisposition to type 2 diabetes; (d) the characterization of low HDL syndromes in type 2 diabetes; (e) population studies focused on the relationship between genetic and environmental factors of insulin resistance syndrome and its long-term complications in immigrant Mediterranean populations; (f) cooperative-population and database studies searching for genetic association in type 2 diabetes mellitus and related traits.

Among the studies carried out during the year, it is important to highlight the results obtained in the Di@bet.es Study, analysing the relationship between environment, genes and prevalence of diabetes mellitus in Spain; as well as the significant number of publications derived from this study.

As a direct outcome of the work performed by the different groups during 2012, a total of thirty-five scientific papers were published. Six of them were in journals in the first decile of the speciality and twenty-one in journals in the first quartile. The accumulated impact factor for this period was 208.833, with an average impact factor per article of 5.967. Furthermore, seven of the papers were collaborative efforts between Ciberdem groups, seven with research groups from other CIBERs and six were international collaborations.

Regarding other scientific activities of Programme 1 during 2012, two doctoral theses directed by Ciberdem researchers were defended, eight clinical research trials were conducted and one spin-off was generated as a result of their search activity.

Rafael Carmena

* Only those published in 2012, with Ciberdem listed among the affiliations, which are related to Ciberdem's field of research and are located in the first or second quartile of their subject category are included. Sources: JCR 2011 and PubMed. ** Through Associate Institutions.

Objectives

- Strategies for generating nutritional guidelines in lifestyle studies and in diabetes/obesity prevention.
- The impact of overnutrition, diabetes-obesity and undernutrition on the regulation of energy homeostasis in the central nervous system. From animal models to humans.
- Body fat amount and distribution in childhood and predisposition to type 2 diabetes.
- Environment, genes and prevalence of diabetes mellitus in Spain. Di@bet.es Study.
- Cooperative-population and database studies for genetic association analysis in type 2 diabetes mellitus and related traits.
- Genetic and environmental factors of the insulin resistance syndrome and its long-term complications in immigrant Mediterranean populations.
- Characterization of low HDL syndrome in type 2 diabetes.

Groups

Endocrinology and metabolism PI Carmen Álvarez

Brain glucose sensor, satiety control, insulin resistance and type 2 diabetes

PI Enrique Blázquez

Dyslipidaemia, inflammation and endothelial dysfunction PI Rafael Carmena

Metabolomics Platform PI Xavier Correig

Lipids and Arteriosclerosis Research Unit PI Lluís Masana

Metabolic and molecular disturbances in diabetes PI Anna Novials

Diabetobe PI Manuel Serrano Ríos

Endocrinology and Nutrition Service PI Federico Soriguer

Programme 2

Mechanisms promoting the development of diabetes and its vascular complications. Associated disorders and co-morbidities. Strategies for prevention and treatment

Publications*: 56

Impact Factor: 257.443

Impact Factor average: 4.597

First decile: 15

Q1: 25

Q2: 16

IntraCIBER: 9

InterCIBER: 7

International: 5

Research grants**: 46

National: 31

International: 6

Private funds: 9

Clinical trials: 14

Clinical practice guidelines: 1

Patents: 1

PhD theses: 4

Awards: 4

Letter from the Scientific Programme Coordinator

A critical point in the progression to type 2 diabetes is pancreatic beta cell insulin secretion failure. Indeed, that failure is usually accompanied by reduction of pancreatic beta cell mass. In this context, we have investigated the role of endoplasmic reticulum stress and autophagy in pancreatic beta cell survival. Our data clearly indicate that autophagy plays a protective role in endoplasmic reticulum stress-mediated beta cell death that may postpone beta cell mass reduction. In addition, we have demonstrated the role played by IGFBP-3 in the regulation of beta cell mass during obesity through cross talk between adipose tissue and pancreatic beta cells and the regulatory role of raf-1 kinase in pancreatic beta cell proliferation.

Regarding vascular complications of type 2 diabetes, evidence has been provided that hyperglycaemia after recovery from hypoglycaemia worsens endothelial function and increases oxidative stress and inflammation in healthy control subjects and subjects with type 1 diabetes. Also, arterial stiffness is increased in patients with type 1 diabetes without cardiovascular disease: a potential role of low-grade inflammation. Fatty acid-binding protein 4 impairs the insulin-dependent nitric oxide pathway in vascular endothelial cells. Alpha-tocopherol and BAY 11-7082 reduce vascular cell adhesion molecules in human aortic endothelial cells. Regarding diabetic retinopathy, we have demonstrated the usefulness of vitreous fluid analysis in translational research and have shown that neurodegeneration is an early event in diabetic retinopathy. Finally, structural damage in diabetic nephropathy is associated with TNF- α system activity.

Regarding metabolic diseases associated with type diabetes, we have demonstrated the essential role of protein tyrosine phosphatase 1B in obesity-induced inflammation and peripheral insulin resistance during aging and also, the role played by retinoic acid receptor-related orphan nuclear receptor γ 1 (ROR γ 1) as a novel player determinant of insulin sensitivity in morbid obesity. De novo lipogenesis in adipose tissue is associated with course of morbid obesity after bariatric surgery. Predictive factors have been found of excess body weight loss 1 year after laparoscopic bariatric surgery. Apolipoprotein E gene mutations have been found in subjects with mixed hyperlipidaemia and a clinical diagnosis of familial combined hyperlipidaemia. Also, FABP4 predicts atherogenic dyslipidaemia development. Finally, the complement system and small HDL particles are associated with subclinical atherosclerosis in SLE patients.

Manuel Benito

* Only those published in 2012, with Ciberdem listed among the affiliations, which are related to Ciberdem's field of research and are located in the first or second quartile of their subject category are included. Sources: JCR 2011 and PubMed. ** Through Associate Institutions.

Objectives

- The identification of neurodegenerative mechanisms which promote the development of diabetic retinopathy: the role of insulin signalling and apoptosis.
- Glycogen-induced dysfunctions in the pancreas and retina and their involvement in the ethiopathogenesis of diabetes mellitus.
- Mechanisms of endothelial dysfunction in diabetes: the role of amylin and circulating endothelial cells.
- The influence of insulin resistance and the compensatory response of the endocrine pancreas on endothelial/vascular damage.

Groups

Diabetes and cardiovascular PI Manuel Benito

Metabolic disease and cardiovascular risk PI Francisco Blanco Vaca

Proinsulin and tyrosine hydroxylase/dopamine effects in cardiac development PI Flora de Pablo

Diabetes and obesity: biopathology and cellular plasticity PI Ramon Gomis

Metabolic engineering and diabetes therapy PI Joan J Guinovart

Lipids and Arteriosclerosis Research Unit PI Lluís Masana

Diabetes and Metabolism Research Group PI Rafael Simó

Molecular mechanisms of insulin resistance and sensitivity in peripheral tissues PI Ángela Martínez Valverde

Diabetes and Metabolic Associated Diseases Research Group PI Joan J Vendrell

Molecular characteristics, and action of incretins, the physiopathology of glucose, lipids and bone metabolism PI María Luisa Villanueva Peñacarrillo

Programme 3

Impact of beta cell dysfunction and plasticity on the natural history of diabetes. Development of novel treatment strategies

Publications*: 34

Impact Factor: 228.803

Impact Factor average: 6.729

First decile: 12

Q1: 15

Q2: 7

IntraCIBER: 4

InterCIBER: 4

International: 5

Research grants**: 51

National: 40

International: 10

Private funds: 1

Clinical trials: 16

Clinical practice guidelines: 3

Patents: 1

PhD theses: 6

Awards: 2

Letter from the Scientific Programme Coordinator

The ten research groups comprising Programme 3 of Ciberdem focus their ongoing studies on the effects of beta-cell alterations on the natural history of diabetes, and the development of novel strategies for treatment and prevention. Together, their efforts resulted in a very high level of scientific productivity during 2012, including thirty-three original publications, ten more than in the previous year. Furthermore, almost 80% of these fall within the first quartile, with a dozen in the top decile. The large number of collaborations involving the programme on both the national and international level continue to enhance its overall development and also the results achieved.

Programme 3 bridges basic and clinical research. In terms of clinical research, clinical trials related to intervention studies on the type 1 diabetic population, along with the phenotypic and genetic characterization of monogenic diabetes, have to begun to yield significant results. As for basic research, the development of new gene therapy strategies, efforts to differentiate stem cells or other cell-sources into insulin-producing cells, and the understanding of molecular mechanisms that induce pancreatic damage and regeneration, in addition to the cross-talk of islets with other key tissues, in particular, adipose tissue, continue to represent important research lines producing exciting, high-impact discoveries.

Areas with great promise for our research include the field of epigenetics, the complexity of genomic programming and the transcriptional networks implicated in beta-cell functioning. In this sense, work conducted thus far by Programme 3 has already had important repercussions in both the scientific community and in social networks. Finally, the six doctoral theses successfully defended over the past year attest to the Programme's commitment to training and preparing its young investigators for the challenges of tomorrow in beta-cell research for treating diabetes.

In summary, we consider that the ongoing efforts of all investigators included in Programme 3 have continued to translate into excellent results, just as we hoped and expected.

Anna Novials

* Only those published in 2012, with Ciberdem listed among the affiliations, which are related to Ciberdem's field of research and are located in the first or second quartile of their subject category are included. Sources: JCR 2011 and PubMed. ** Through Associate Institutions.

Objectives

- Recovery of functionally impaired metabolic tissues.
- Clinical, genetic and functional characterization of monogenic diabetes: from bench to bedside.
- Production of monoclonal antibodies which selectively react with cell-surface molecules in human pancreatic beta cells.
- Comparative metabolomic analysis for the detection of biomarkers in diabetes.

Groups

Transgenic animal models and gene therapy approaches for diabetes PI Fàtima Bosch

Laboratory of Molecular Endocrinology PI Deborah Burks

Hospital Universitario Cruces Diabetes Research Group PI Luis Castaño

Genomic programming of beta cells PI Jorge Ferrer

Diabetes and obesity: biopathology and cellular plasticity PI Ramon Gomis

Islet cell and stem cell physiology PI Franz Martín

Group of Research into Diabetes and Metabolism PI Eduard Montanya

Unit of Cell Physiology and Nutrition IB-UMH PI Angel Nadal

Metabolic and molecular disturbances in diabetes PI Anna Novials

Transcriptional mechanisms of pancreatic function PI Mario Vallejo

Programme 4

Use of biomedical approach systems to develop personalized therapies for diabetes

Publications*: 42

Impact Factor: 260.088

Impact Factor average: 6.193

First decile: 14

Q1: 21

Q2: 7

IntraCIBER: 6

InterCIBER: 9

International: 4

Research grants**: 31

National: 22

International: 7

Private funds: 2

Clinical trials: 3

Clinical practice guidelines: 2

Patents: 2

PhD theses: 3

Letter from the Scientific Programme Coordinator

Programme 4 comprises ten research groups and includes both basic and clinical researchers. The research activity of Programme 4 is focused on the use of systems biology approaches and other state-of-the art biomedical methods oriented to understanding the pathophysiological mechanisms altered in diabetes, and to developing personalized therapies for diabetes and its chronic complications. A priority of the Programme is to promote the development of translational research.

During the year 2012, the groups included in Programme 4 published a total of forty-two scientific articles, fourteen of them appearing in journals in the first decile of the speciality. The accumulated impact factor (IF) for this period was 260 (an average impact factor of 6.19). Projects developed by the Principal Investigators of the Programme were funded by thirty-one grants, seven of them international. In addition, a total of three clinical research trials were conducted, three PhD theses supervised by investigators of the Programme were defended, and two new clinical guidelines were published.

A number of major scientific achievements were made by members of the Programme, acting as senior scientists. Some of the most important are the following:

a) The identification of a new class of islet-cell genes relevant to beta-cell programming and diabetes pathophysiology (Morán et al., *Cell Metab.* 2012); b) Demonstration that the mitochondrial fusion protein mitofusin-2 regulates insulin signalling and glucose homeostasis (Sebastian et al., *PNAS* 2012); c) Demonstration of the existence of substantial metabolic heterogeneity in polycystic ovary syndrome, strongly influenced by obesity (Escobar-Morreale et al., *Clin. Chem.* 2012); d) Neonatal nutrition influences endocrinology more readily than body composition of infants born small for gestational age (de Zegher et al., *Diabetes* 2012); e) TNF- α plays an important role downregulating SHBG in chronic low-grade inflammatory diseases such as obesity and type 2 diabetes (Simó et al., *Diabetes* 2012); f) GRK2, a G-protein-coupled receptor kinase, regulates energy expenditure and brown fat function in mice (Vila-Bedmar et al., *FASEB J.*).

Antonio Zorzano

* Only those published in 2012, with Ciberdem listed among the affiliations, which are related to Ciberdem's field of research and are located in the first or second quartile of their subject category are included. Sources: JCR 2011 and PubMed. ** Through Associate Institutions.

Objectives

- Determinants of insulin resistance and glucose tolerance disorders (including diabetes) in severe obesity and their changes after bariatric-surgery-induced weight loss.
- Adult adipose-tissue-derived progenitor cells: the influence of the clinical phenotype and adipose depot origin on their biological properties.

Groups

The Eicosanoid Research Division PI Jesús Balsinde

Diabetes, Obesity and Human Reproduction PI Héctor F Escobar Morreale

Genomic programming of beta cells PI Jorge Ferrer

Mechanisms of control of glucose and fatty acid metabolism in skeletal muscle cells and metabolic impairment in atrophy PI Anna Maria Gómez Foix

Prenatal growth restriction and subsequent risks for type 2 diabetes and cardiovascular disease PI Lourdes Ibáñez

Group of Research into Diabetes and Metabolism PI Eduard Montanya

Diabetes and Metabolism Research Group PI Rafael Simó

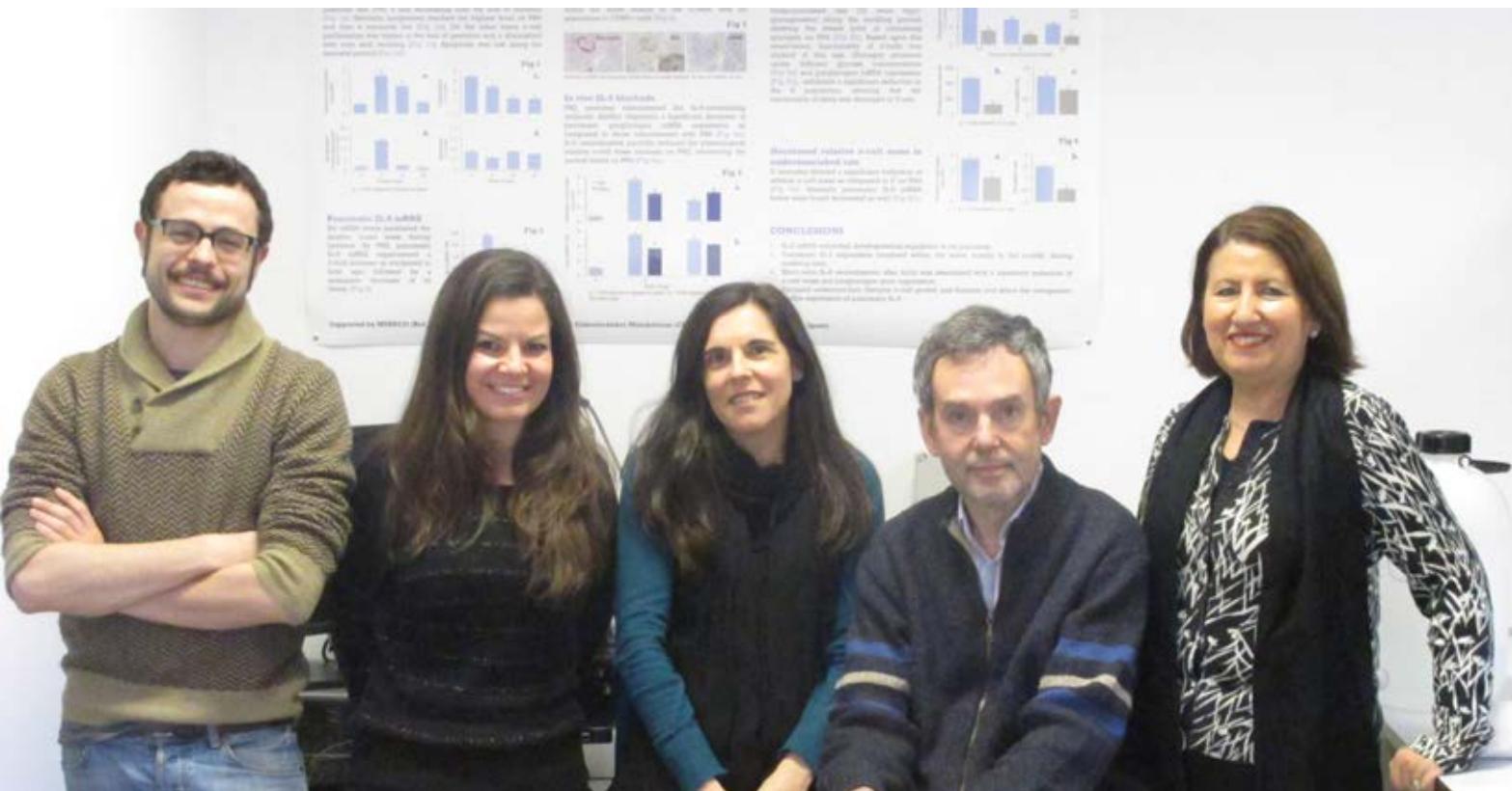
Pharmacological targets in inflammation and metabolic diseases PI Manuel Vázquez Carrera

Diabetes and Metabolic Associated Diseases Research Group PI Joan J Vendrell

Heterogenic and polygenic diseases. Genexartis PI Antonio Zorzano

Endocrinology and metabolism

Departamento de Bioquímica y Biología Molecular II, Facultad de Farmacia, Universidad Complutense de Madrid
www.ucm.es/info/biomol2



Principal Investigator Carmen Álvarez cavarez@farm.ucm.es **Associate researchers** Fernando Escrivá, María Ángeles Martín

Postdoctoral fellow Elisa Fernández **PhD students** Juan de Toro, Esther Lizárraga

Publications: 1

Research grants: 2

Programmes

Programme 1. Molecular and physiological determinants of lifestyle in diabetes/obesity. Population studies for genetic-epigenetic association analysis in type 2 diabetes mellitus and related traits.

Keywords

Islet degeneration and damage. Beta-cell signal transduction. Insulin action. Insulin sensitivity and resistance. Gastroentero pancreatic factors.

Main lines of research

The identification of the cellular and molecular mechanisms that link poor perinatal growth and increased risk of metabolic syndrome and type 2 diabetes in adult life through the use of animal models of nutritional manipulation: maternal undernutrition followed or not by overnutrition. To this end we have focused on:

a) the effect of nutrients on the growth, death and function of

pancreatic alfa and beta cells: involvement of different growth factors.

b) the potential role of incretins (GLP-1 and GIP) in the relationship between intrauterine growth restriction and the development of type 2 diabetes in adulthood: study of the entero-insular axis.

c) changes in insulin/glucagon plasma levels and liver sensitivity associated with early undernutrition which could alter the available substrates for the growing brain.

d) the impact of early undernutrition on insulin and leptin hypothalamic responses and the hypothalamic expression of orexigenic and anorexigenic factors (NPY, POMC).

e) the effect of early undernutrition followed by an over-caloric diet on obesity risk and white adipose tissue metabolism.

Publications

Early undernutrition induces glucagon resistance and insulin hypersensitivity in the liver of suckling rats
Lizárraga-Mollinedo E, Fernandez-Millan E, de Toro Martín J,

Research grants

Estudio de los mecanismos de resistencia a insulina: implicaciones en obesidad, diabetes y síndrome metabólico

Programas de I+D entre Grupos de investigación en Biomedicina 2010

Comunidad de Madrid, P2010/ BMD-2423: 2012-2015

Principal Investigator: Manuel Ros Pérez

Associate investigators: Fernando Escrivá, Carmen Álvarez, Manuel Benito, Ángela Martínez Valverde

Autonomous Community project. Programme 1

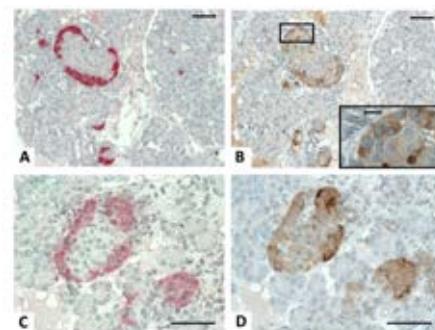
Mecanismos moleculares y celulares implicados en la patogénesis de la obesidad y DM2 en ratas sometidas a subnutrición materna y posteriormente realimentadas con dieta grasa

Ministerio de Educación y Ciencia, BFU 2011-25420:

2012-2014

Principal Investigator: Carmen Álvarez

National project. Programme 1



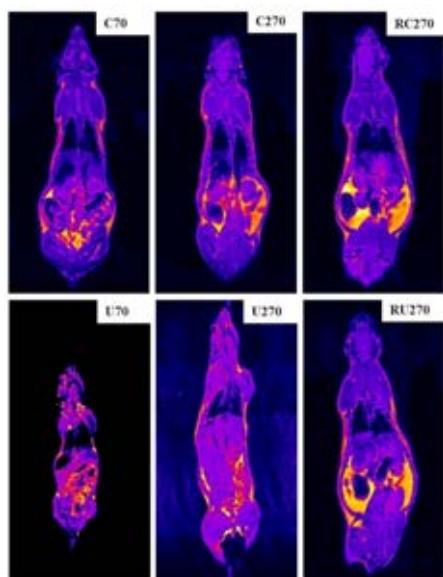
Representative images of immunohistochemical localization of glucagon (A-C), IL-6 (B) and IL6-R (D) in serial sections of rat pancreases on postnatal day 4. Scale bars on large images, 50 μm ; on inset, 10 μm .

Scientific collaborations within Ciberdem

IODURE: The impact of overnutrition, diabetes-obesity, and undernutrition on the regulation of energy homeostasis in the central nervous system. From animal models to humans

Coordinator: Manuel Serrano Ríos

Ciberdem groups: Álvarez C, Serrano-Ríos M, Blázquez E, Burks D, Vallejo M



Assessment of adipose tissue content by resonance magnetic imaging in Wistar rats at different ages (70 and 270 days) and nutritional status (control, C; undernourished, U; rehabilitated with hypercaloric foods, R).

The Eicosanoid Research Division

Instituto de Biología y Genética Molecular, Consejo Superior de Investigaciones Científicas, Valladolid
www.balsinde.org



Principal Investigator Jesús Balsinde jbalsinde@ibgm.uva.es **Associate researchers** María Ángeles Balboa, Olimpio Montero

Postdoctoral fellows Clara Meana, Julio Rubio, Alma Astudillo, Juan Pablo Rodríguez **PhD students** Luis Gil de Gómez, Lucía Peña, Carlos Guijas, Gema Lordén **Lab manager** Montserrat Duque

Publications: 4 Research grants: 2 PhD theses: 1

Programmes

Programme 4. Use of biomedical approach systems to develop personalized therapies for diabetes.

Keywords

Cytokines. Lipid metabolism. Lipid signalling. Phospholipases.

Main lines of research

- Regulatory roles of eicosanoids in diabetes and obesity.
- Lipid profiling by mass spectrometry; lipidomic and metabolipidomic approaches.
- Biosynthesis and degradation of lipid droplets during cell activation.
- Regulation of ω-6 and ω-3 fatty acid availability; roles of phospholipases A2 and lipins.

Publications

Phospholipid sources for adrenic acid mobilization in RAW 264.7 macrophages. Comparison with arachidonic acid
Guijas C, Astudillo AM, Gil-de-Gómez L, Rubio JM, Balboa MA, Balsinde J

Biochim Biophys Acta, 1821, 1386-1393 (2012)
[PMID 22824377](https://pubmed.ncbi.nlm.nih.gov/22824377/). Q1. IF 5.269. Programme 4

Simultaneous activation of p38 and JNK by arachidonic acid stimulates the cytosolic phospholipase A2-dependent synthesis of lipid droplets in human monocytes

Guijas C, Pérez-Chacón G, Astudillo AM, Rubio JM, Gil-de-Gómez L, Balboa MA, Balsinde J
J Lipid Res, 53, 2343-2354 (2012)
[PMID 22949356](https://pubmed.ncbi.nlm.nih.gov/22949356/). Q1. IF 5.559. Programme 4

Lipin-2 reduces proinflammatory signaling induced by saturated fatty acids in macrophages

Valdearcos M, Esquinas E, Meana C, Peña L, Gil-de-Gómez L,

Balsinde J, Balboa MA

J Biol Chem, 287, 10894-10904 (2012)

PMID 22334674. Q1. IF 4.773. Programme 4

Dynamics of arachidonic acid mobilization by inflammatory cells

Astudillo AM, Balgoma D, Balboa MA, Balsinde J

Biochim Biophys Acta, 1821, 249-256 (2012)

PMID 22155285. Q1. IF 5.269. Programme 4

Research grants

Estudio por espectrometría de masas del perfil lipidómico de macrófagos humanos polarizados

Ministerio de Educación y Ciencia, BFU2010-18826/BMC: 2011-2013

Principal Investigator: Jesús Balsinde

National project. Programme 4

Regulación de los procesos inflamatorios por lipina: papel en la transducción de señal en macrófagos humanos

Ministerio de Ciencia e Innovación, SAF2010-18831: 2011-2012

Principal Investigator: María Ángeles Balboa

National project. Programme 4

Scientific collaborations within Ciberdem

STEMOB: Adult adipose tissue-derived progenitor cells: the influence of the clinical phenotype and adipose depot origin on their biological properties

Coordinator: Joan J Vendrell

Ciberdem groups: Balsinde J, Vendrell J, Zorzano A, Gómez-Foix AM, Montanya E, Simó R, Vázquez-Carrera M

PhD theses

Localización y función de la lipina-1 en macrófagos

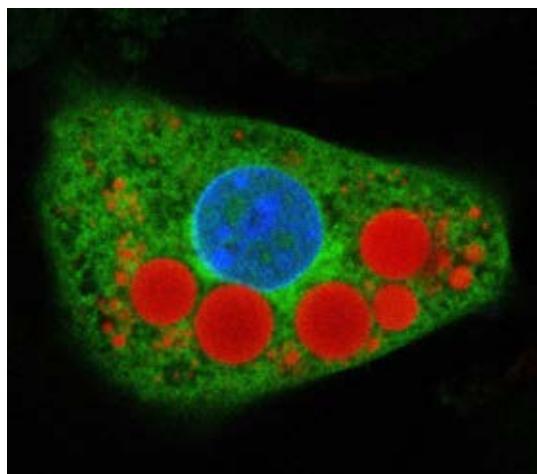
Author: Esperanza Esquinas

Thesis advisor: Jesús Balsinde

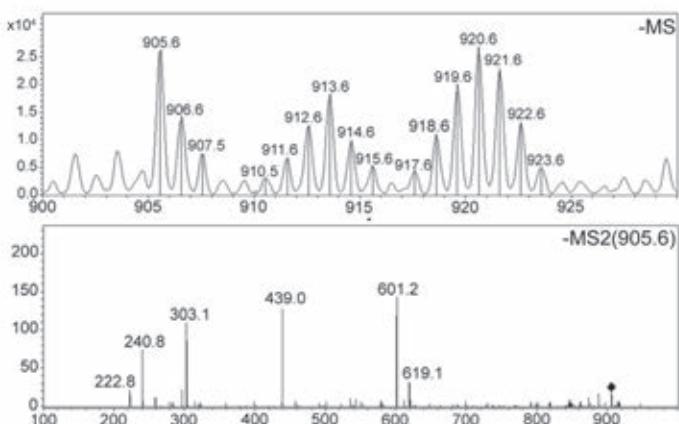
University: Universidad de Valladolid

Thesis defense date: July 6, 2012

Programme 4



A GFP-c PLA2 construct (green) expressed in 3T3-L1 adipocytes localizes primarily in the cytoplasm. Lipid droplets are stained in red and the nucleus in blue.



Phospholipid analysis by mass spectrometry.

Diabetes and cardiovascular

Facultad de Farmacia, Universidad Complutense de Madrid
www.ucm.es/info/biomol2



Principal Investigator Manuel Benito benito@farm.ucm.es **Associate researchers** Óscar Escribano, Almudena Gómez, Carlos Guillén **Postdoctoral fellows** Iria Nieto, Beatriz Gozalbo **PhD students** Alberto Bartolomé, Liliana Perdomo, Sabela Fernández Castroviejo, Vanesa Viana **Post-graduate students** Beatriz Martínez, Selene Barros, Ana García, Nuria Beneit **Lab manager** Gema García **Lab technician** Silvia Fernández **Administrative staff** Elena González

Publications: 3 Research grants: 2 PhD theses: 1

Programmes

Programme 2. Mechanisms promoting the development of diabetes and its vascular complications. Associated disorders and co-morbidities. Strategies for prevention and treatment.

Keywords

Beta-cell signal transduction. Autophagy. Endothelium. Insulin sensitivity and resistance. Macrovascular disease. Obesity.

Main lines of research

A- Compensatory mechanisms to hepatic insulin resistance:
- The role of the liver-pancreas endocrine axis in triggering beta-cell hyperplasia.
- The role of autophagy and ER stress in the regulation of beta-cell pancreatic mass in vivo.
- The role of TSC1/TSC2 and m-TORC1 in the regulation of ER stress and autophagy in pancreatic cell lines.

B- New mouse models to study energy balance, body weight regulation and vascular complications.

- Brown adipose tissue-specific knockout of IGF-1R and IGF-1R/IR DKO.

Publications

Brown fat lipodatrophy and increased visceral adiposity through a concerted adipocytokines overexpression induces vascular insulin resistance and dysfunction

Gómez-Hernández A, Otero YF, de las Heras N, Escribano O, Cachofeiro V, Lahera V, Benito M
Endocrinology, 153, 1242-1255 (2012)
PMID 22253415. Q1. IF 4.459. Programme 2

GRK2 contribution to the regulation of energy expenditure and brown fat function

Vila-Bedmar R, Garcia-Guerra L, Nieto-Vazquez I, Mayor F Jr,

Lorenzo M, Murga C, Fernández-Veledo S
FASEB J, 26, 3503-3514 (2012)
PMID 22516294. 1st decile. IF 5.712. With other Ciberdem groups: Vendrell J. Programme 2

Autophagy plays a protective role in endoplasmic reticulum stress-mediated pancreatic β cell death
Bartolome A, Guillen C, Benito M
Autophagy, 8, 1-12 (2012)
PMID 22951927. Q1. IF 7.453. Programme 2

Research grants

Papel de la formación y función del tejido adiposo marrón sobre la patogénesis de la obesidad: recuperación de la función termogénica marrón como terapia antiobesidad

Plan Nacional I+D+I, SAF2011/22555: 2012-2014

Principal Investigator: Manuel Benito

Associate investigators: O.Escribano, A. Gómez, B. Gozalbo, C. Guillén, I. Nieto

National project. Programme 2

Estudio de los mecanismos de resistencia a insulina: implicaciones en obesidad, diabetes y síndrome metabólico

Programas de I+D entre Grupos de investigación en Biomedicina 2010. Comunidad de Madrid, P2010/ BMD-2423: 2012-2015

Principal Investigator: Manuel Ros Pérez

Associate investigators: Fernando Escrivá, Carmen Álvarez, Manuel Benito, Ángela Martínez Valverde

Autonomous Community project. Programme 2

PhD theses

Papel del TSC2/mTORC1 en proliferación, autofagia y estrés de retículo endoplasmático en célula beta pancreática

Author: Bartolomé Herranz

Thesis advisor: Manuel Benito

University: Universidad Complutense de Madrid

Thesis defense date: December 18, 2012

Programme 2



Laboratory.

Metabolic disease and cardiovascular risk

Hospital de la Santa Creu i Sant Pau, Servei de Bioquímica i Endocrinologia i Institut de Recerca (IIB Sant Pau). Universitat Autònoma de Barcelona. Barcelona
www.santpau.cat



Principal Investigator Francisco Blanco Vaca fblancova@santpau.cat **Associate researchers** Joan Carles Escolà, Jesús María

Martín, Antonio Pérez, Josep Julve **Lab technicians** Carme Mayoral, Rosa Roig, David Santos

Publications: 4 Research grants: 8 Clinical trials: 3

Programmes

Programme 2. Mechanisms promoting the development of diabetes and its vascular complications. Associated disorders and co-morbidities. Strategies for prevention and treatment.

Keywords

Lipid metabolism. Metabolic syndrome. Macrovascular disease. Nutrition. Clinical diabetes.

Main lines of research

- HDL: modulation by diet and role in diabetes mellitus and atherothrombotic cardiovascular disease development.
- Genetics of dyslipidaemia, type 2 diabetes and hyperhomocysteinaemia.
- Development of experimental-biochemistry and molecular-biology techniques and their application to clinical laboratory practice (innovation).

Publications

Identification of a novel mutation in the ANGPTL3 gene in two families diagnosed of familial hypobetalipoproteinemia without APOB mutation

Martín-Campos JM, Roig R, Mayoral C, Martínez S, Martí G, Arroyo JA, Julve J, Blanco-Vaca F

Clin Chim Acta, 413, 552-555 (2012)

[PMID 22155345. Q1. IF 2.535. Programme 2](https://pubmed.ncbi.nlm.nih.gov/22155345/)

Effect of improving glycemic control in patients with type 2 diabetes mellitus on low-density lipoprotein size, electronegative low-density lipoprotein and lipoprotein-associated phospholipase A2 distribution

Sánchez-Quesada JL, Vinagre I, de Juan-Franco E, Sánchez-Hernández J, Blanco-Vaca F, Ordóñez-Llanos J, Pérez A

Am J Cardiol, 110, 67-71 (2012)

[PMID 22481012. Q2. IF 3.368. Programme 2](https://pubmed.ncbi.nlm.nih.gov/22481012/)

Acute Psychological Stress Accelerates Reverse Cholesterol Transport via Corticosterone-Dependent Inhibition of Intestinal Cholesterol Absorption
Silvennoinen R, Escola-Gil JC, Julve J, Rotllan N, Llaverias G, Metso J, Valedor AF, He J, Yu L, Jauhainen M, Blanco-Vaca F, Kovanen PT, Lee-Rueckert M
Circ Res, 111, 1459-1469 (2012)
PMID 22931956. 1st decile. IF 9.489. Programme 2

Relationship between the degree of glycemic control and diabetes characteristics and hyperglycemia treatment in type 2 diabetes. DIABES Study
Pérez A, Franch J, Cases A, González Juanatey JR, Conthe P, Gimeno E, Matali A
Med Clin (Barc), 138, 505-511 (2012)
PMID 22118974. Q2. IF 1.385. Programme 2

Research grants

HDL: from biological understanding to clinical exploitation
COST Actions, European Union, BM0904: 2010-2014
Principal Investigator: Dimitris Kardassis
Associate investigators: Blanco Vaca F, Gómez-Coronado D, Chroni A, Jauhainen M, Savolainen M, von Eckardstein A, Kontush A, Staels B, Shunkert H, Nofer JR, Calabresi L, Bernini F, Kuivenhoven JA, Karlsson H
European project. Programme 2

Efectos sistémicos del síndrome de las apneas durante el sueño. Análisis mediante modelos animales y estudios en humanos
ISCIII, PI08/1211: 2009-2012
Principal Investigator: Mayos M
Associate investigator: Pérez A
National project. Programme 2

Funcionalidad de HDL en diabetes mellitus e hiperhomocisteinemia
ISCIII, PI1000277: 2011-2013
Principal Investigator: Josep Julve
National project. Programme 2

Análisis funcional de las propiedades antiaterogénicas de las HDL (transporte reverso de colesterol específico de macrófagos *in vivo* y capacidad antioxidante) en modelos animales de diabetes mellitus y arteriosclerosis
ISCIII, PI09/00178: 2010-2012

Principal Investigator: Joan Carles Escolà Gil
Associate investigators: Roig R, Santos D, Méndez J
National project. Programme 2

Grup de recerca d'estructura de lipoproteïnes, dislipèmies i altres factors de risc cardiovascular
AGAUR, Generalitat de Catalunya, 2009SGR1205: 2009-2014
Principal Investigator: Ordóñez Llanos J
Associate investigators: Blanco Vaca F, Julve J, Escolà Gil JC, Benítez S, Sánchez Quesada JL
Autonomous Community project. Programme 2

Funcionalidad de las lipoproteínas de alta densidad (HDL) y efectos pleiotrópicos en diabetes, retinopatía y cáncer de mama

ISCIII, PI11/01076: 2011-2013
Principal Investigator: Francisco Blanco Vaca
Associate investigators: Jesús M. Martín Campos, Carmen Mayoral, Rosa Roig
National project. Programme 2

Prevalencia de arteriosclerosis y factores patogénicos relacionados con el control glucémico de la diabetes tipo 1 de larga duración
Sociedad Española de Diabetes 2012: 2012-2013
Principal Investigator: Antonio Pérez
Private funds. Programme 2

Propiedades antiaterogénicas de las HDL en presencia de hiperhomocisteinemia: análisis y búsqueda de biomarcadores mediante técnicas proteómicas
Fundación Española de Arteriosclerosis, Beca SEA/FEA Almirall: 2010-2012
Principal Investigator: Francisco Blanco Vaca
Associate investigator: Julve J
Private funds. Programme 2

Scientific collaborations within Ciberdem

INGENFRED: Cooperative population and database studies for genetic association analysis in T2DM and related traits
Coordinator: Felipe Javier Chaves
Ciberdem groups: Blanco-Vaca F, Carmena R, Serrano- Ríos M, Soriguer F, Carmena R

Ciberdem Biobank

Coordinator: Anna Novials
Ciberdem Biobank nodes: Blanco-Vaca F, Gomis R, Novials A, Vendrell J, Masana L, Castaño L, Serrano-Ríos M, Soriguer F, Carmena R

Clinical trials

Estudio epidemiológico transversal y multicéntrico para conocer el grado de control de la hemoglobina glicosilada en pacientes con diabetes mellitus tipo 2 atendidos en atención primaria (estudio Diabcontrol)

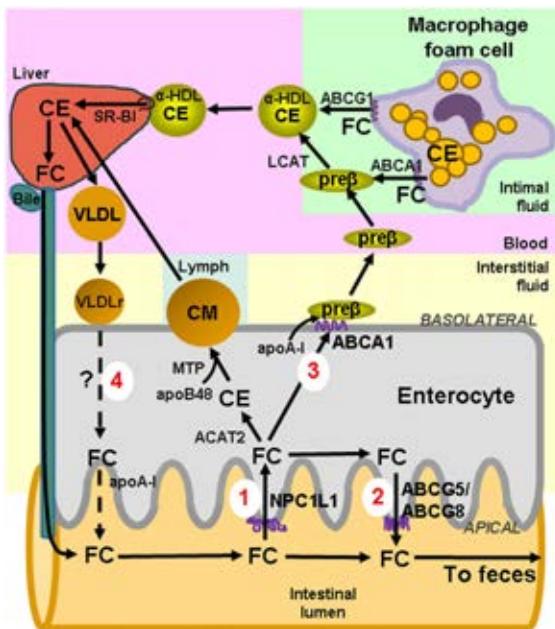
DMM-01 SIT 11: 2012
Coordinator: Antonio Pérez
Programme 2

Estudio epidemiológico, retrospectivo y transversal para evaluar la prescripción de ejercicio físico a los pacientes con diabetes tipo 2 por parte de los médicos de atención primaria y especialistas

EST-DIA-2012-01: 2012-2013
Coordinator: Antonio Pérez
Programme 2

A randomized, 2-way crossover, placebo controlled single dose study to evaluate the effect of the functional fruit concentrate on postprandial glycaemic response and the bioavailability of phenolic compounds in prediabetic and diabetic subjects

CIM/11/900/02: 2012-2013
Coordinator: RM Antoni Joan
Associate researcher: Antonio Pérez
Programme 2



Reverse cholesterol transport pathway.

Brain glucose sensor, satiety control, insulin resistance and type 2 diabetes

Universidad Complutense de Madrid
www.ucm.es



Principal Investigator Enrique Blázquez eblazquez@med.ucm.es **Associate researchers** Elvira Álvarez, María Ángeles Navas,

Isabel Roncero, Juan Miguel Ruiz Albusac, María del Carmen Sanz, Esther Velázquez **Lab manager** Verónica Hurtado Carneiro

Publications: 4

Research grants: 4

Programmes

Programme 1. Molecular and physiological determinants of lifestyle in diabetes/obesity. Population studies for genetic-epigenetic association analysis in type 2 diabetes mellitus and related traits.

Keywords

Genetics type 2 diabetes. Incretins. Obesity. Insulin sensitivity and resistance. Insulin action. Carbohydrate metabolism. Biomarkers and imaging.

Main lines of research

- Modifications of cerebral glucose metabolism in pathophysiological states related to feeding behaviour.
- The effects of GLP-1 and GLP-2 on the expression and activity of hypothalamic metabolic sensors and characterization of the neuroprotective role of these peptides.
- The effect of GLP-2 on the proliferation of cultured rat astrocytes.

-Signalling and the biological effects of GLP-1 on mesenchymal stem cells of human bone marrow and mouse embryonic stem cells - its effect on cell differentiation.

-Molecular diagnosis of monogenic diabetes (MODY) and the functional characterization of MODY mutations.

Publications

Functional characterization of MODY2 mutations highlights the importance of the fine-tuning of glucokinase and its role in glucose sensing

García-Herrero CM, Rubio-Cabezas O, Azriel S, Gutierrez-Nogués A, Aragónés A, Vincent O, Campos-Barros A, Argente J, Navas MA
PLoS ONE, 7, e30518 (2012)

[PMID 22291974](#). Q1. IF 4.092. Programme 1

Glucagon-like peptide 1 (GLP-1) can reverse AMP-activated protein kinase (AMPK) and S6 kinase (P70S6K) activities induced by fluctuations in glucose levels in hypothalamic areas

involved in feeding behaviour

Hurtado-Carneiro V, Sanz C, Roncero I, Vazquez P, Blazquez E, Alvarez E

Mol Neurobiol, 45, 348-361 (2012)

PMID 22311299. Q1. IF 5.735. With other Ciberdem groups: de Pablo F. Programme 1

Glucagon-Like Peptide-2 (GLP-2) modulates the cGMP signalling pathway by regulating the expression of the soluble guanylyl cyclase receptor subunits in cultured rat astrocytes

Velázquez E, Blázquez E, Ruiz-Albusac JM

Mol Neurobiol, 46, 242-250 (2012)

PMID 22806360. Q1. IF 5.735. Programme 1

Glucokinase (GCK) mutations and their characterization in MODY2 children of southern Italy

Capuano M, Garcia-Herrero CM, Tinto N, Carluccio C, Capobianco V, Coto I, Cola A, Iafusco D, Franzese A, Zagari A, Navas MA, Sacchetti L

PLoS ONE, 7, e38906 (2012)

PMID 22761713. Q1. IF 4.092. With other international groups.

Programme 1

Research grants

Efectos de los péptidos semejantes al glucagón GLP-1 y GLP-2 y otros péptidos anorexigénicos y orexigénicos sobre el metabolismo de la glucosa y el contenido de serotonina y su relector 1A en cerebro de rata

Ministerio de Ciencia e Innovación, SAF2009-11297: 2010-2012

Principal Investigator: Enrique Blázquez

Associate investigators: M del Carmen Sanz Miguel, José Antonio Zueco Alegre, Luís García García, Pedro A Barrio Caballero

National project. Programme 1

Programa de Creación y Consolidación de Grupos de Investigación UCM-Santander Grupo "Sensores cerebrales de glucosa, control de la saciedad, obesidad y diabetes tipo 2"

UCM-Santander, GR35/10A: 2011-2012

Principal Investigator: Elvira Álvarez

Private funds. Programme 1

Análisis de los mecanismos de regulación de la glucoquinasa y su implicación en diabetes

PI10/00424: 2012

Principal Investigator: María Ángeles Navas Hernández

National project. Programme 1

Análisis de los mecanismos moleculares de regulación de proteínas implicadas en diabetes monogénicas

Universidad Complutense-Comunidad de Madrid, CCG10-UCM/BIO-4728: 2012

Principal Investigator: María Ángeles Navas Hernández

Autonomous Community project. Programme 1

Scientific collaborations within Ciberdem

IODURE: The impact of overnutrition, diabetes-obesity, and undernutrition on the regulation of energy homeostasis in the central nervous system. From animal models to humans

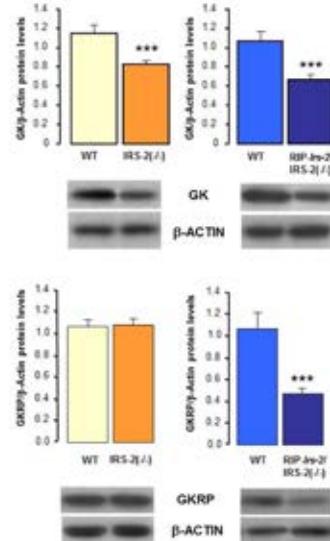
Coordinator: Manuel Serrano Ríos

Ciberdem groups: Blázquez E, Alvarez C, Serrano-Ríos M, Burks D, Vallejo M

MODIAB: Clinical, genetic and functional characterization of monogenic diabetes: from the bench to the bedside

Coordinator: Luis Castaño

Ciberdem groups: Blázquez E, Castaño L, Ferrer J, Vallejo M



Analysis of GK and GKRP protein expression in liver from IRS2-/-, RIP-Irs-2/IRS2-/-IRS2-(-/-) and their wild type mice.



AMPK and S6K1 activation in hypothalamic areas from fasted and re-fed obese and lean control Zucker rats.

Transgenic animal models and gene therapy approaches for diabetes

Centre de Biotecnologia Animal i Teràpia Gènica, Universitat Autònoma de Barcelona
<http://cbateg.uab.cat>



Principal Investigator Fàtima Bosch fatima.bosch@uab.cat **Associate researchers** Ana Carretero, Tura Ferré, Sylvie Franckhauser, Miquel García, Xavier Leon, Maria Molas, Sergio Antonio Muñoz, Víctor Nacher, Marc Navarro, Pedro José Otaegui, Anna Pujol, Martí Pumarola, Efren Riu, Jesús Ruberte, Virginia Haurigot **Postdoctoral fellows** Eduard Ayuso, Alba Casellas, Laia Vilà, Ricardo Lage, Ivel Elias, Verónica Jiménez, Pilar Villacampa **PhD students** David Callejas, Albert Ribera, Carles Roca, Meritxell Morró, Cristina Mallol, Iris Grifoll, Sara Marcó **Lab technicians** Jennifer Barrero, Marta Moya, Mireia Zaguirre **Administrative staff** Montse Bellido

Publications: 6 Research grants: 9 PhD theses: 3 Patents: 1

Programmes

Programme 3. Impact of beta cell dysfunction and plasticity on the natural history of diabetes. Development of novel treatment strategies.

Keywords

Beta-cell signal transduction. Gene therapy. Insulin sensitivity and resistance. Retinopathy.

Main lines of research

-The study of the causes and pathophysiological mechanisms of diabetes mellitus using transgenic animal models.
-Analysis of the role of metabolic pathways in the development of insulin resistance and obesity, and the investigation of the molecular mechanisms involved in secondary complications

(retinopathy, neuropathy).

-The development of new gene-therapy approaches for the treatment of diabetes mellitus based on:
a) the manipulation of skeletal muscle and the liver to increase glucose uptake and
b) engineering the endocrine pancreas *in vivo* to regenerate beta-cell mass.

Publications

Molecular signature of the immune and tissue response to non-coding plasmid DNA in skeletal muscle after electrotransfer
Mann CJ, Anguela XM, Montané J, Obach M, Roca C, Ruzo A, Otaegui P, Mir LM, Bosch F
Gene Ther, 19, 1177-1186 (2012)
[PMID 22170344](https://pubmed.ncbi.nlm.nih.gov/22170344/). Q1. IF 3.710. Programme 3

Adipose Tissue Overexpression of Vascular Endothelial Growth Factor Protects Against Diet-Induced Obesity and Insulin Resistance

Elias I, Franckhauser S, Ferré T, Vilà L, Tafuro S, Muñoz S, Roca C, Ramos D, Pujol A, Riu E, Ruberte J, Bosch F

Diabetes, 61, 1801-1813 (2012)

PMID 22522611. 1st decile. IF 8.286. Programme 3

Telomerase gene therapy in adult and old mice delays aging and increases longevity without increasing cancer

Bernardes de Jesus B, Vera E, Schneeberger K, Tejera AM, Ayuso E, Bosch F, Blasco MA

EMBO Mol Med, 4, 691-704 (2012)

PMID 22585399. 1st decile. IF 10.333. Programme 3

LRH-1-dependent glucose sensing determines intermediary metabolism in liver

Oosterveer MH, Mataki C, Yamamoto H, Harach T, Moullan N, van Dijk TH, Ayuso E, Bosch F, Postic C, Groen AK, Auwerx J, Schoonjans K

J Clin Invest, 122, 2817-2826 (2012)

PMID 22772466. 1st decile. IF 13.069. With other international groups. Programme 3

Vascular Endothelial Growth Factor-Mediated Islet Hypervasculization and Inflammation Contribute to Progressive Reduction of β -Cell Mass

Agudo J, Ayuso E, Jimenez V, Casellas A, Mallol C, Salavert A, Tafuro S, Obach M, Ruzo A, Moya M, Pujol A, Bosch F

Diabetes, 61, 2851-2861 (2012)

PMID 22961079. 1st decile. IF 8.286. Programme 3

Long-term retinal PEDF overexpression prevents neovascularization in a murine adult model of retinopathy

Haurigot V, Villacampa P, Ribera A, Bosch A, Ramos D, Ruberte J, Bosch F

PLoS One, e41511 (2012)

PMID 22911805. Q1. IF 4.092. Programme 3

Research grants

Identification of the genes regulated by the SIRT1 histone deacetylase and their contribution in the pathogenesis of type 2 diabetes and obesity

EU, Marie Curie International Reintegration Grant, MIRGCT-2007-207745: 2008-2012

Principal Investigator: Efrén Riu

European project. Programme 3

Analysis of a new pathway to import iron into the retina: role of ferritin as iron carrier and implications in radical detoxification
FCT Fundação para a ciência e a tecnologia. Ministério da ciência, tecnologia e ensino superior (Portugal), PTDC/SAU-ORG/110856/2009: 2011-2014

Principal Investigator: Jesús Ruberte

European project. Programme 3

In vivo selection of genes and miRNAs improving beta cell mass
BETASEL, Juvenile Diabetes Research Foundation (17-2012-27): 2012-2014

Principal Investigator: Fàtima Bosch

International project. Programme 3

Senescencia celular en los vasos sanguíneos de la retina: implicaciones de P16 en el cross-linking enzimático del colágeno de la membrana basal durante el envejecimiento

ISCIII, PS09/01152: 2010-2013

Principal Investigator: Jesús Ruberte

National project. Programme 3

Generación de una librería AAV-CRE para la obtención de ratones mutantes condicionales

Ministerio de Educación y Ciencia, SAF2010-10507-E: 2011-2012

Principal Investigator: Fàtima Bosch

National project. Programme 3

Equipamiento para la producción de vectores de terapia génica a gran escala

Ministerio de Educación y Ciencia, Infraestructura Científico-Tecnológica, UNAB10-4E-156: 2011-2013

Principal Investigator: Fàtima Bosch

National project. Programme 3

Ajut per a grups de recerca consolidats

Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR). Generalitat de Catalunya, SGR 224: 2009-2013

Principal Investigator: Fàtima Bosch

Autonomous Community project. Programme 3

Estudio de los cambios en la remodelación de cromatina por la sobreexpresión en tejido adiposo de HMGA1 y su implicación en el desarrollo de obesidad y resistencia a la insulina

Ministerio de Educación y Ciencia, Plan Nacional I+D+I. SAF2011-23649: 2012

Principal Investigator: Efrén Riu

National project. Programme 3

Ingeniería genética del músculo esquelético para expresar insulina y/o glucoquinasa para el tratamiento de la diabetes mellitus

Ministerio de Educación y Ciencia, Plan Nacional I+D+I. SAF2011-24698: 2012-2014

Principal Investigator: Fàtima Bosch

National project. Programme 3

PhD theses

Proliferative retinopathy: Study of the contribution of neuroglial alterations and development of gene therapy approaches

Author: Pilar Villacampa Alcubierre

Thesis advisor: Fàtima Bosch and Virginia Haurigot

University: Universitat Autònoma de Barcelona

Thesis defense date: May 31, 2012

Programme 3

Implicaciones de p16INK4a y SIRT1 en la formación de microaneurismas en las retinas humanas durante el envejecimiento

Author: Mariana López Lupo

Thesis advisor: Jesús Ruberte and Víctor Nacher

University: Universitat Autònoma de Barcelona

Thesis defense date: June 15, 2012

Programme 3

Treatment of Diabetes and long-term survival following insulin and glucokinase Gene Therapy: a proof-of-concept study in dogs

Author: David Callejas Castiñeiras

Thesis advisor: Fàtima Bosch Tubert

University: Universitat Autònoma de Barcelona

Thesis defense date: December 20, 2012

Programme 3

Patents

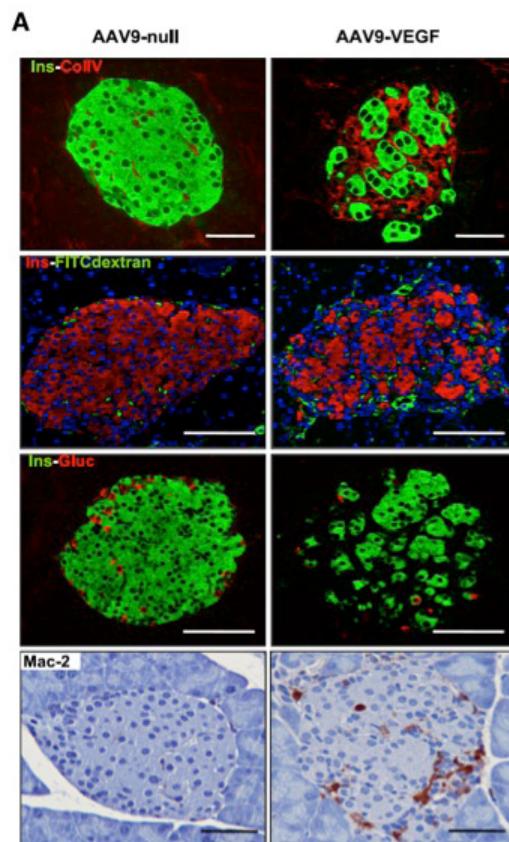
Adeno-Associated Viral Vectors Useful for Transducing Adipose Tissue

Patent application number: EP12382314.8

Inventors: Fàtima Bosch, Verónica Jiménez

UE

Programme 3



AAV-mediated VEGF overexpression in β -cells increased vascularization and inflammation. Two-month-old wild-type (WT) mice were injected with VEGF-expressing (AAV9-VEGF) or nonexpressing (null) AAV9 vectors (1012 vector genomes/mouse). Ten days after AAV injection, vasculature structure was revealed by immunostaining for collagen IV (red) and insulin (green) (top panel). VEGF-treated islets showed increased basement membrane compared with AAV-null. FITC-dextran (green) together with insulin (red) immunostaining was used to label functional blood vessels (top middle panel). Insulin (green) and glucagon (red) expression showed islet disorganization (bottom middle panel). Macrophage infiltration in AAV-VEGF-injected animals was determined by Mac-2 immunostaining 10 days after AAV injection (bottom panel). Scale bars 100 μ m.

Laboratory of Molecular Endocrinology

Centro de Investigación Príncipe Felipe, Valencia
www.cipf.es



Principal Investigator Deborah Burks dburks@cipf.es **Postdoctoral fellows** Silvia Sanz, Carlos Acosta, Luke Noon, Cristina

Fuente **PhD students** Juan Martín Aldana, Verónica Moreno, Richard Griffith **Lab technician** Arantxa Leal

Publications: 5 Research grants: 2 PhD theses: 1

Programmes

Programme 3. Impact of beta cell dysfunction and plasticity on the natural history of diabetes. Development of novel treatment strategies.

Keywords

Beta-cell signal transduction. Insulin sensitivity and resistance. Islet degeneration and damage. Retinopathy. Obesity. Stem cells.

Main lines of research

- Regulation of the cell-cycle in pancreatic beta cells.
- The role of IRS-2 signals in the differentiation of human pluripotent stem cells to progenitors of pancreas and liver.
- IRS-2 signalling in the regulation of neuronal function.
- The role of insulin/IGF-I signalling in diabetic retinopathy.
- The role of IRS2 in adipocyte progenitors and development of obesity.

Publications

IRS2 signalling is required for the development of a subset of sensory spinal neurons

Chirivella L, Cano-Jaimez M, Pérez-Sánchez F, Herraez L, Carretero J, Fariñas I, Burks DJ, Kirstein M

Eur J Neurosci, 35, 341-352 (2012)

PMID 22288475. Q2. IF 3.631. With other CIBERs: CIBERNED. Programme 3

IRS2-deficient mice show sensorineural hearing loss that is delayed by concomitant PTP1B loss of function

Murillo-Cuesta S, Camarero G, González-Rodríguez A, La Rosa LR, Burks DJ, Avendaño C, Valverde AM, Varela-Nieto I

Mol Med, 18, 260-269 (2012)

PMID 22160220. Q1. IF 3.757. With other Ciberdem groups: Valverde, A.

Programme 3

IRS-2 deficiency impairs NMDA receptor-dependent long-term potentiation

Martin ED, Sanchez-Perez A, Trejo JL, Martin-Aldana JA, Cano M, Pons S, Acosta C, Menes L, White MF, Burks DJ

Cereb Cortex, 22, 1717-1727 (2012)

PMID 21955917. 1st decile. IF 6.544. Programme 3

Development of a human extracellular matrix for applications related with stem cells and tissue engineering

Escobedo-Lucea C, Ayuso-Sacido A, Xiong C, Prado-López S, del Pino MS, Melguizo D, Bellver-Estellés C, Gonzalez-Granero S, Valero ML, Moreno R, Burks DJ, Stojkovic M

Stem Cell Rev, 8, 170-183 (2012)

PMID 21710145. Q1. IF 3.739. With other CIBERs: CIBERNED. Programme 3

Neurodegeneration is an early event in diabetic retinopathy: therapeutic implications

Simó R, Hernández C; European Consortium for the Early Treatment of Diabetic Retinopathy (EUROCONDOR)

Br J Ophthalmol, 96, 1285-90 (2012)

PMID 22887976. Q1. IF 2.902. With other Ciberdem groups:

Simó R, Valverde A. With other international groups.

Programme 3

Research grants

Neurodegeneration as an early event in the Pathogenesis of Diabetic Retinopathy: A multicentric, prospective, phase II-III, open randomized controlled trial to assess the efficacy of neuroprotective drugs administered topically to prevent or arrest Diabetic Retinopathy

European Consortium for the Early Treatment of Diabetic Retinopathy (EUROCONDOR), FP7-278040-2. FP7-HEALTH-2011: 2012- 2015

Principal Investigator: Rafael Simó

Associate Researchers: J. Cunha-Vaz, A.K. Sjolie, E. Midena, F. Bandello, P. Massin, G. Lang, P. Scanlon, S. Harding, C. Egan, M. Porta, J. Gibson, J.GarciaArumi, A. Martinez Valverde, D. Burks, IDF Europa, BCN Peptides, CAIBER

European project. Programme 3

Innovative strategies to generate human hepatocytes

FP7, InnovaLIV: 2011-2014

Principal Investigator: Deborah Burks

European project. Programme 3

Scientific collaborations within Ciberdem

NEURONET-DIAB: Identification of neurodegenerative mechanisms that promote the development of diabetic retinopathy: the role of insulin signalling and apoptosis

Coordinator: Deborah Burks

Ciberdem groups: Burks D, Valverde AM, Simó R

IODURE: The impact of overnutrition, diabetes-obesity, and undernutrition on the regulation of energy homeostasis in the central nervous system. From animal models to humans

Coordinator: Manuel Serrano Ríos

Ciberdem groups: Burks D, Alvarez C, Blázquez E, Serrano-Ríos M, Vallejo M

PhD theses

The Role of IRS2 in Testicular Development

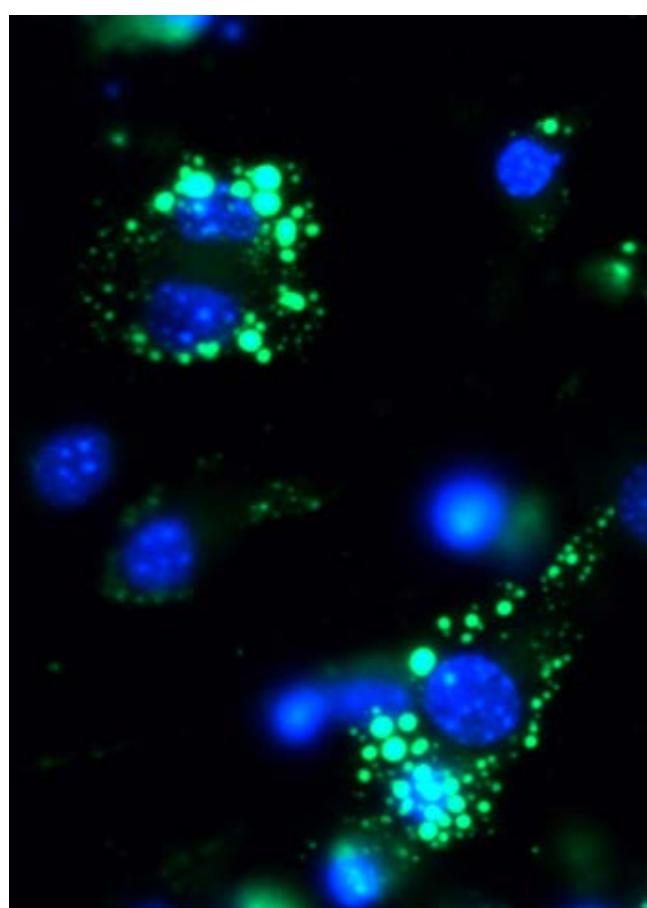
Author: Richard Griffith

Thesis advisor: Deborah Burks

University: Universitat Autònoma de Barcelona

Thesis defense date: September 26, 2012

Programme 3



Adipocyte progenitors in early stages (day 4) of differentiation as revealed by the accumulation of lipids. Nuclei are marked with DAPI (blue) and lipid droplets with BODIPY (green).

Dyslipidaemia, inflammation and endothelial dysfunction

Servicio de Endocrinología y Nutrición, Fundación Investigación Hospital Clínico Universitario de Valencia
www.incliva.es



Principal Investigator Rafael Carmena rafael.carmena@uv.es **Associate researchers** Juan Francisco Ascaso, Miguel Catalá, Felipe Javier Chaves, Sergio Martínez Hervás, José Tomás Real **Postdoctoral fellows** Ana Bárbara García, Marta Peiró **Lab manager** Sebastián Blesa **Lab technicians** Esther Benito, Nieves Brito

Publications: 7 Research grants: 8 PhD theses: 1 Patents: 1

Programmes

Programme 1. Molecular and physiological determinants of lifestyle in diabetes/obesity. Population studies for genetic-epigenetic association analysis in type 2 diabetes mellitus and related traits.

Keywords

Insulin sensitivity and resistance. Lipid metabolism. Macrovascular disease. Metabolic syndrome.

Main lines of research

Our research lines include: mixed dyslipidaemias, diabetes mellitus and insulin-resistance; genetic diagnosis of primary hypercholesterolaemias and cardiovascular risk; postprandial lipidaemia and arteriosclerosis in diabetes and other insulin-resistant states; insulin-resistance, inflammation and oxidative stress; diabetic foot-diagnosis, prevention and treatment; and genetic factors regulating BMI and abdominal obesity.

It is well known that the degree of arterial damage and the age

of onset of arteriosclerosis varies in patients with diabetes or primary dyslipidaemias. This seems to indicate the existence of other ill-defined contributing factors. We are investigating the role of oxidative stress (OS), inflammation, insulin resistance, and prediabetic states as possible candidates.

Publications

Plasma homocysteine levels are independently associated with the severity of peripheral polyneuropathy in type 2 diabetic subjects
González R, Pedro T, Martínez-Hervás S, Civera M, Priego MA, Catalá M, Chaves FJ, Ascaso JF, Carmena R, Real JT
J Peripher Nerv Syst, 17, 191-196 (2012)
[PMID 22734904](https://pubmed.ncbi.nlm.nih.gov/22734904/). Q2. IF 2.800. Programme 1

Subclinical carotid atherosclerosis in patients with familial combined hyperlipidemia. Two years follow-up after treatment with high doses of atorvastatin
Martínez-Hervás S, Priego A, Lorente R, Molina M, Navarro-

Hidalgo MI, Real JT, Ascaso JF
Med Clin (Barc), 138, 1-6 (2012)
PMID 21429534. Q2. IF 1.385. Programme 1

Metabolomic profiling in blood from umbilical cords of low birth weight newborns
Ivorra C, García-Vicent C, Chaves FJ, Monleón D, Morales JM, Lurbe E
J Transl Med, 10, 142 (2012)
PMID 22776444. Q2. IF 3.474. With other CIBERs: CIBEROBN. Programme 1

Iodine intake in the adult population.

Di@bet.es study
Soriguer F, Garcia-Fuentes E, Gutierrez-Repiso C, Rojo Martinez G, Velasco I, Goday A, Bosch-Comas A, Bordiu E, Calle A, Carmena R, Casamitjana R, Castano L, Castell C, Catala M, Delgado E, Franch J, Gaztambide S, Girbes J, Gomis R, Gutierrez G, Lopez-Alba A, Martinez-Larrad MT, Menendez E, Mora-Peces I, Ortega E, Pascual-Manich G, Serrano-Rios M, Valdes S, Vazquez JA, Vendrell J
Clin Nutr, 31, 882-888 (2012)
PMID 22560740. Q1. IF 3.731. With other Ciberdem groups: Castaño, L, Soriguer F, Gomis R, Serrano-Ríos M, Vendrell J. Programme 1

Prevalence of diabetes mellitus and impaired glucose regulation in Spain: the Di@bet.es Study
Soriguer F, Goday A, Bosch-Comas A, Bordiu E, Calle-Pascual A, Carmena R, Casamitjana R, Castano L, Castell C, Catala M, Delgado E, Franch J, Gaztambide S, Girbes J, Gomis R, Gutierrez G, Lopez-Alba A, Martinez-Larrad MT, Menendez E, Mora-Peces I, Ortega E, Pascual-Manich G, Rojo-Martinez G, Serrano-Rios M, Valdes S, Vazquez JA, Vendrell J
Diabetologia, 55, 88-93 (2012)
PMID 21987347. 1st decile. IF 6.814. With other Ciberdem groups: Castaño L, Gomis, R, Soriguer F, Serrano-Ríos M, Vendrell J. Programme 2

Polymorphisms of the UCP2 gene are associated with body fat distribution and risk of abdominal obesity in Spanish population
Martinez-Hervas S, Mansego ML, de Marco G, Martinez F, Alonso MP, Morcillo S, Rojo-Martinez G, Real JT, Ascaso JF, Redon J, Martin Escudero JC, Soriguer F, Chaves FJ
Eur J Clin Invest, 42, 171-178 (2012)

PMID 21883184. Q1. IF 3.018. With other Ciberdem groups: Soriguer F. Programme 1

Common variants of the liver fatty acid binding protein gene influence the risk of type 2 diabetes and insulin resistance in Spanish population.

Mansego ML, Martínez F, Martínez-Larrad MT, Zabena C, Rojo G, Morcillo S, Soriguer F, Martín-Escudero JC, Serrano-Ríos M, Redon J, Chaves FJ

PLoS One, e31853 (2012)

PMID 22396741. Q1. IF 4.092. With other Ciberdem groups: Soriguer F, Serrano-Ríos M. Programme 1

Publications arising from international clinical trials
Effects of dalcetrapib in patients with a recent acute coronary syndrome

Schwartz GG, Olsson AG, Abt M, Ballantyne CM, Barter PJ, Brumm J, Chaitman BR, Holme IM, Kallend D, Leiter LA, Leitersdorf E, McMurray JJ, Mundl H, Nicholls SJ, Shah PK, Tardif JC, Wright RS; dal-OUTCOMES Investigators
N Engl J Med, 367, 2089-99 (2012)
PMID 23126252. 1st decile. IF 53.298.

Plant sterols and cardiovascular disease: a systematic review and meta-analysis

Genser B, Silbernagel G, De Backer G, Bruckert E, Carmena R, Chapman MJ, Deanfield J, Descamps OS, Rietzschel ER, Dias KC, März W
Eur Heart J, 33, 444-51 (2012)
PMID 22334625. 1st decile. IF 10.478.

Research grants

Markers for Subclinical Cardiovascular Risk Assessment
EU-MASCARA, HEALTH 2011.2.4.2-2: 2011-2015
Principal Investigator: Josep Redon Mas
European project. Programme 1

Perfil de expresión de ARN en linfomonocitos tras sobrecarga oral con grasa insaturada en dos modelos con resistencia a la insulina: obesidad abdominal y diabetes tipo 2
ISCIII, PI10/00511: 2011-2013

Principal Investigator: Juan Francisco Ascaso
National project. Programme 1

Estudio de los factores implicados en el desarrollo de enfermedades de alto riesgo cardiovascular y sus complicaciones

Conselleria de Educación. Generalitat Valenciana, PROMETEO 2009/029: 2009-2012
Principal Investigator: Rafael Carmena
Autonomous Community project. Programme 1

ISIC-INCLIVA

Conselleria de Educación. Generalitat Valenciana, ISIC2012/018: 2012-2013
Ayuda a Grupos de investigación de Excelencia para la Constitución y Acreditación de Institutos Superiores de Investigación Cooperativa

Principal Investigator: Rafael Carmena
Associate researchers: Juan F. Ascaso, Jose T Real, Josep Redon, Felipe J. Chaves
Autonomous Community project. Programme 1

Identificación de variantes genéticas en el exoma asociadas con diabetes tipo 2

ISCIII, PI11/00726: 2012-2014

Principal investigator: Felipe Javier Chaves
National project. Programme 1

Perfil de expresión de ARN en linfomonocitos tras sobrecarga oral con grasa insaturada en dos modelos con resistencia a la

insulina: obesidad abdominal y diabetes tipo 2
Ayudas Complementarias a Proyectos de Investigación,
ACOMP/2012/068: 2012
Principal Investigator: Juan Francisco Ascaso
Autonomous Community project. Programme 1

Implicación funcional de SREBP2 en el metabolismo de la glucosa
Fundación Incliva: 2011-2012
Principal Investigator: Ana Bárbara García
Private funds. Programme 1

Asociación de los niveles plasmáticos de vitamina D con el desarrollo de arteriosclerosis, y su modulación por polimorfismos en el gen del receptor de la vitamina D
Fundación Incliva: 2011-2012
Principal Investigator: Sergio Martínez Hervás
Private funds. Programme 1

Scientific collaborations within Ciberdem

INGENFRED: Cooperative population and database studies for genetic association analysis in T2DM and related traits
Coordinator: Felipe Javier Chaves
Ciberdem groups: Carmena R, Blanco-Vaca F, Serrano- Ríos M, Soriguer F

Di@bet.es Study: 1st epidemiological study of the prevalence of type 2 diabetes in Spain
Coordinator: Federico Soriguer
Ciberdem groups: Carmena R, Soriguer F, Castaño L, Gomis R, Serrano-Ríos M, Vendrell J

Telemed-diabetes Study
Coordinator: Enric Esmatjes
Ciberdem groups: Carmena R, Gomis R, Serrano-Ríos M, Soriguer F, Castaño L

Ciberdem Biobank
Coordinator: Anna Novials
Ciberdem Biobank nodes: Carmena R, Gomis R, Novials A, Vendrell J, Masana L, Castaño L, Serrano-Ríos M, Soriguer F, Blanco-Vaca F

PhD theses

Control metabólico e infeccioso en pacientes críticos mediante la administración de una dieta enteral específica para diabetes suplementada con glutamina
Author: María del Mar Juan Díaz
Thesis advisor: Juan Francisco Ascaso
University: Universitat de València
Thesis defense date: January 1, 2012

Patents

Methods for DNA rearrangements analysis
Patent application number: 300077376
Inventors: Felipe J Chaves, AB García-García, Sebastian Blesa
UE
Programme 1



Flowgrams of pyrosequencing reaction from one DNA fragment and identification of a genetic variation between reference sequence (upper panel) and sample (middle panel), and analysis of differences between both sequences (lower panel).

Hospital Universitario Cruces Diabetes Research Group

Hospital Universitario Cruces, UPV-EHU, Barakaldo
www.hospitalcruces.com



Principal Investigator Luis Castaño lcastano@osakidetza.net **Associate researchers** María Ángeles Aniel Quiroga, Jose Ramon

Bilbao, María Ángeles Busturia, Alicia Cortázar, Sonia Gatzambide, Itxaso Rica, Federico Vázquez, Amaia Vela, Javier Santamaria

Sandi **Postdoctoral fellows** Rosa María Martínez, Miriam Ramírez, Sonsoles Morcillo, Anibal Aguayo, María Ortiz Espejo **Research**

assistant Inés María Urrutia **PhD students** Teba González, Tamara López, Leticia Plaza, Nora Fernández, Teresa Velyas,

Amaia Jauregui Miguel **Lab managers** Galder Gutiérrez, Gustavo Pérez de Nanclares **Nurses** Javier Rioja, Mª Concepción Gil

Administrative staff Sorkunde Rivero

Publications: 4

Research grants: 8

Clinical trials: 3

Clinical practice guidelines: 3

Awards: 1

Programmes

Programme 3. Impact of beta cell dysfunction and plasticity on the natural history of diabetes. Development of novel treatment strategies.

Keywords

Clinical diabetes. Genetics type 1 diabetes. Monogenic diabetes. Oral pharmacological agents. Prediction/ prevention of type 1 diabetes.

Main lines of research

-The identification of additional genetic susceptibility markers for type 1 diabetes and related autoimmune disorders in the extended MHC (6p21) and other regions using high throughput genotyping.

-The study of immune mediators of disease development,

characterization of novel autoantigens/antibodies and cell populations in patients: Th1, Th2 and Th17 responses.

-The identification of new genes responsible for monogenic diabetes by genome wide analysis (both CGI and CGH approaches).

-The molecular and clinical characterization of monogenic diabetes and new therapeutic strategies for KATP channel alterations.

-The prediction and prevention of type 1 diabetes.

-The control of diabetes complications.

-The epidemiology of diabetes.

Publications

Permanent neonatal diabetes caused by creation of an ectopic

splice site within the INS gene

Garin I, Perez de Nanclares G, Gastaldo E, Harries LW, Rubio-

Cabezas O, Castano L
PloS One, 7, e29205 (2012)
PMID 22235272. Q1. IF 4.092. Programme 3

Consumption of cow's milk is associated with lower risk of type 2 diabetes mellitus. A cross-sectional study
Morcillo S, Atencia JA, Ortega A, Bilbao JR, Rubio-Martin E, Rojo-Martinez G, Esteva I, Valdes S, Oliveira G, Castano L
International Dairy Journal, 26, 162-165 (2012)
S0958694612000787. Q1. IF 2.401. With other Ciberdem groups: Martin F, Soriguer F. Programme 3

Iodine intake in the adult population.

Di@bet.es study

Soriguer F, Garcia-Fuentes E, Gutierrez-Repiso C, Rojo-Martinez G, Velasco I, Goday A, Bosch-Comas A, Bordiu E, Calle A, Carmena R, Casamitjana R, Castano L, Castell C, Catala M, Delgado E, Franch J, Gatzambide S, Girbes J, Gomis R, Gutierrez G, Lopez-Alba A, Martinez-Larrad MT, Menendez E, Mora-Peces I, Ortega E, Pascual-Manich G, Serrano-Rios M, Valdes S, Vazquez JA, Vendrell J
Clin Nutr, 31, 882-888 (2012)

PMID 22560740. Q1. IF 3.731. With other Ciberdem groups: Carmena, R, Soriguer F, Gomis R, Serrano-Ríos M, Vendrell J. Programme 1

Prevalence of diabetes mellitus and impaired glucose regulation in Spain: the Di@bet.es Study
Soriguer F, Goday A, Bosch-Comas A, Bordiu E, Calle-Pascual A, Carmena R, Casamitjana R, Castano L, Castell C, Catala M, Delgado E, Franch J, Gatzambide S, Girbes J, Gomis R, Gutierrez G, Lopez-Alba A, Martinez-Larrad MT, Menendez E, Mora-Peces I, Ortega E, Pascual-Manich G, Rojo-Martinez G, Serrano-Rios M, Valdes S, Vazquez JA, Vendrell J
Diabetologia, 55, 88-93 (2012)

PMID 21987347. 1st decile. IF 6.814. With other Ciberdem groups: Carmena R, Gomis, R, Soriguer F, Serrano-Ríos M, Vendrell J. Programme 2

Publications arising from international clinical trials

Heterogeneity in the systems of pediatric diabetes care across the European Union.

Cinek O, Sumník Z, de Beaufort C, Rurik I, Vazeou A, Madácsy L, Papo NL, Danne T; SWEET group
Pediatr Diabetes, Suppl 16, 5-14 (2012)
PMID 22931219. Q2. IF 2.160

Growth differences between North American and European children at risk for type 1 diabetes
Nucci AM, Becker DJ, Virtanen SM, Cuthbertson D, Softness B, Huot C, Wasikowa R, Dosch HM, Akerblom HK, Knip M; TRIGR Study Group
Pediatr Diabetes, 13, 425-431 (2012)
PMID 22251851. Q2. IF 2.160

Publications in collaboration with international consortiums

GAD65 antigen therapy in recently diagnosed type 1 diabetes mellitus
Ludvigsson J, Krisky D, Casas R, Battelino T, Castaño L,

Greening J, Kordonouri O, Otonkoski T, Pozzilli P, Robert JJ, Veeze HJ, Palmer J, Samuelsson U et al.
N Engl J Med, 366, 433-42 (2012)
PMID 22296077. 1st decile. IF 53.298

Research grants

Genetic and environmental factors of insulin resistance syndrome and its long-term complications in immigrant Mediterranean populations
MEDIGENE. FP7-279171-1. HEALTH.2011.2.4.3-4: 2012-2013
Principal investigator: Florin Grigorescu
Associate investigators: R Gomis, L Castaño
European project. Programme 3

Diabetes Neonatal y de comienzo precoz: Caracterización molecular y fenotipo
Ministerio de Sanidad y Consumo
ISCIII, PS09/01492: 2010-2012
Principal Investigator: Luis Castaño
Associate investigators: Fernández Ramos C, Busturia MA, Rica I, Martínez R, Rodríguez A, Blarduni E, Chueca M, Oyarzabal M
National project. Programme 3

Biología de sistemas de la autoinmunidad: la Enfermedad Celíaca como modelo
ISCIII, PI10/00310: 2011-2014
Principal Investigator: Jose Ramon Bilbao
National project. Programme 3

Etiopatogenia de los trastornos autoinmunes: Diabetes mellitus tipo 1 y Enfermedad Celíaca
Departamento de Educación - Gobierno Vasco, IT-472-07: 2007-2012
Principal Investigator: Luis Castaño
Associate investigators: Vitoria JC, Gatzambide S, Bilbao JR
Autonomous Community project. Programme 3

Detección precoz y cribado poblacional de Diabetes en el País Vasco. Prevalencia de Diabetes en Euskadi
Departamento de Sanidad y Consumo. Gobierno Vasco, 2010111058: 2011-2014
Principal Investigator: Sonia Gatzambide
National project. Programme 3

Caracterización de la modulación de la ruta NFkB por iMALT en un modelo celular de enfermedad celíaca. Valoración de su utilización como terapia alternativa a la dieta sin gluten
GV(SAIO10-PE10BF03): 2010- 2012
Principal Investigator: Jose Ramon Bilbao
Associate investigator: Luis Castaño
Autonomous Community project. Programme 3

Mejora del manejo y seguimiento de pacientes con pie diabético mediante la implantación de una unidad multidisciplinar de pie diabético. Análisis prospectivo
Departamento de Sanidad. Gobierno Vasco, kronik11/073: 2011- 2013
Principal Investigator: Pilar Vela
Associate investigator: Alicia Cortazar
Autonomous Community project. Programme 3

Caracterización clínica y molecular de la diabetes monogénica (neonatal y de comienzo precoz). Implicaciones terapéuticas
Departamento de Sanidad y Consumo. Gobierno Vasco, 2010111185: 2011-2014

Principal Investigator: Luis Castaño
Autonomous Community project. Programme 3

Scientific collaborations within Ciberdem

MODIAB: Clinical, genetic and functional characterization of monogenic diabetes: from the bench to the bedside

Coordinator: Luis Castaño
Ciberdem groups: Castaño L, Blázquez E, Ferrer J, Vallejo M

Di@bet.es Study: 1st epidemiological study of the prevalence of type 2 diabetes in Spain

Coordinator: Federico Soriguer

Ciberdem groups: Castaño L, Soriguer F, Carmena R, Gomis R, Serrano-Ríos M, Vendrell J

Telemed-diabetes Study

Coordinator: Enric Esmatjés

Ciberdem groups: Castaño L, Carmena R, Gomis R, Serrano-Ríos M, Soriguer F

Ciberdem Biobank

Coordinator: Anna Novials Ciberdem

Biobank nodes: Castaño L, Gomis R, Novials A, Vendrell J, Masana L, Serrano-Ríos M, Soriguer F, Carmena R, Blanco-Vaca F

MEDIGENE: Genetic and environmental factors of insulin resistance syndrome and its long-term complications in immigrant Mediterranean populations

Coordinator: Ramon Gomis

Ciberdem groups: Castaño L, Gomis R, Novials A

Clinical trials

Telemed-Diabetes

2011- 2012

Coordinator: Federico Vázquez

Programme 3

Estudio multicéntrico, doble ciego, aleatorizado, controlado con PLACEBO y de grupos paralelos, para evaluar los eventos cardiovasculares durante el tratamiento con LIXISENATIDE en pacientes con diabetes tipo 2 después de un Síndrome Coronario Agudo. Estudio ELIXA

NCT01147250: 2011- 2016

Coordinator: Sonia Gatzambide

Programme 3

RECORD: four year observational follow-up

49653/231: 2009-2012

Coordinator: Sonia Gatzambide

Programme 3

Clinical practice guidelines

Guía de Práctica Clínica sobre Diabetes tipo 1

Plan de Calidad para el Sistema Nacional de Salud del

Ministerio de Sanidad y Política Social. Agencia de Evaluación de Tecnologías Sanitarias del País Vasco-Osteba
DL VI 130-2012 (2012)
Programme 3

Guía salud del catálogo de Guías del Sistema Nacional de Salud (2012)

Programme 3

Guía de Educación Terapéutica: al inicio de tratamiento con infusión subcutánea de insulina (ISCI)

Barrio R, Andia V, Vázquez F, Salgado Y, Valverde M, Jansa M, Flores M, Galindo M

Sociedad Española de Diabetes

DL M-38313-2012 (2012)

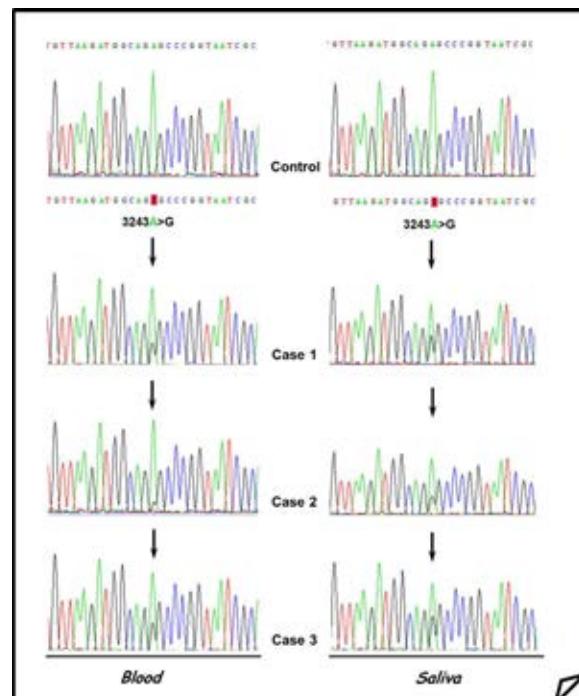
Programme 3

Awards

Premio Comisión de Premios Becas y Ayudas de la SED. Convocatoria de plazas como revisor de los congresos de la ADA (2012)

Awardee: Federico Vázquez

Programme 3



Three case of Maternally Inherited Diabetes and Deafness (MIDD).

Metabolomics Platform

Universitat Rovira i Virgili, Institut d'Investigació Sanitària Pere Virgili, Tarragona
www.metabolomicsplatform.com



Principal Investigator Xavier Correig xavier.correig@urv.cat **Coordinator** Oscar Yanes **Associate researchers** Jesús Brezmes,

Nicolau Cañellas **Research assistants** Miguel Ángel Rodríguez, MariaVinaixa, Antoni Beltran **Postdoctoral fellow** Radu Ionescu

PhD students Roger Mallol, Sara Samino, Núria Amigó, Josep Gómez, Ruben Barrilero, Dídac Vilalta, Xavier Domingo

Administrative staff Serena Pujol

Publications: 9 Research grants: 4

Programmes

Programme 1. Molecular and physiological determinants of lifestyle in diabetes/obesity. Population studies for genetic-epigenetic association analysis in type 2 diabetes mellitus and related traits.

Keywords

Metabolomics. Lipids, lipoproteins. Retinopathy. Bioinformatics. Biomarkers and Imaging.

Main lines of research

- NMR lipoprotein characterization for the study of dyslipidaemias.
- A serum profiling method for the study of insulin resistance and diabetes in population studies.
- The development and study of advanced statistical, chemometric, multivariate and artificial intelligence algorithms which will allow large measurement datasets.
- Non-radioactive isotopomers for the study of metabolic profiling and its flux in cultured cells and animal models.

-The study of diabetic retinopathy.

-The study of tissue imaging and body fluid profiling with NIMS (Nanostructure Initiator Mass Spectrometry).

Publications

Innovation: Metabolomics: the apogee of the omics trilogy
Patti GJ, Yanes O, Siuzdak G
Nat Rev Mol Cell Biol, 13, 263-269 (2012)
PMID 22436749. 1st decile. IF 39.123. With other international groups. Programme 1

Metabolomics implicates altered sphingolipids in chronic pain of neuropathic origin

Patti GJ, Yanes O, Shriver LP, Courade JP, Tautenhahn R, Manchester M, Siuzdak G
Nat Chem Biol, 8, 232-234 (2012)
PMID 22267119. 1st decile. IF 14.690. With other international groups. Programme 1

Nanostructure Initiator Mass Spectrometry for tissue imaging in metabolomics: Future prospects and perspectives
Calavia R, Annanouch FE, Correig X, Yanes O
J Proteomics, 75, 5061-5068 (2012)
PMID 22580361. Q1. IF 4.878. Programme 1

Particle size measurement of lipoprotein fractions using diffusion-ordered NMR spectroscopy
Mallol R, Rodríguez MA, Heras M, Vinaixa M, Plana N, Masana L, Morris GA, Correig X
Anal Bioanal Chem, 402, 2407-2415 (2012)
PMID 22293969. Q1. IF 3.778. With other Ciberdem groups: Masana L. Programme 1

The metabolome of induced pluripotent stem cells reveals metabolic changes occurring in somatic cell reprogramming
Panopoulos AD, Yanes O, Ruiz S, Kida YS, Diep D, Tautenhahn R, Herreras A, Batchelder EM, Plongthongkum N, Lutz M, Berggren WT, Zhang K, Evans RM, Siuzdak G, Izpisua Belmonte JC
Cell Res, 22, 168-177 (2012)

PMID 22064701. Q1. IF 8.190. With other international groups. Programme 1

Assessment of compatibility between extraction methods for NMR- and LC/MS-based metabolomics
Beltran A, Suarez M, Rodriguez MA, Vinaixa M, Samino S, Arola L, Correig X, Yanes O
Anal Chem, 84, 5838-5844 (2012)

PMID 22697410. 1st decile. IF 5.856. Programme 1

(1)H-NMR-based metabolomic analysis of the effect of moderate wine consumption on subjects with cardiovascular risk factors
Vazquez-Fresno R, Llorach R, Alcaro F, Rodriguez MA, Vinaixa M, Chiva-Blanch G, Estruch R, Correig X, Andres-Lacueva C
Electrophoresis, 33, 2345-2354 (2012)

PMID 22887155. Q1. IF 3.303. With other CIBERs: CIBEROBN. Programme 1

Metabolomics approach for analyzing the effects of exercise in subjects with type 1 diabetes mellitus
Brugnara L, Vinaixa M, Murillo S, Samino S, Rodriguez MA, Beltran A, Lerin C, Davison G, Correig X, Novials A
PLoS ONE, 7, e40600 (2012)
PMID 22792382. Q1. IF 4.092. With other Ciberdem groups: Novials A. Programme 1

Metabolic heterogeneity in polycystic ovary syndrome is determined by obesity: plasma metabolomic approach using GC-MS
Escobar-Morreale HF, Samino S, Insenser M, Vinaixa M, Luque-Ramírez M, Lasunción MA, Correig X
Clin Chem, 58, 999-1009 (2012)
PMID 22427353. 1st decile. IF 7.905. With other Ciberdem groups: Escobar-Morreale, H. With other CIBERs: CIBEROBN. Programme 4

Research grants

Identificación de rutas metabólicas en la neurodegeneración de la retina inducida por hiperglucemia e isquemia mediante una

aproximación de metabolómica y proteómica
SAF2011-30578: 2012-2014
Principal Investigator: Oscar Yanes
National project. Programme 1

Dislipemia y resistencia a la insulina en pacientes infectados por el vih-1 tratados con fármacos antirretrovirales: implicación de adipokinas y estudio metabolómico
Ministerio de Sanidad, Servicios Sociales e Igualdad, EC11-293: 2012
Principal Investigator: Francesc Vidal Marsal
Associate investigator: Xavier Correig
National project. Programme 1

Dislipemia aterógena de la obesidad, síndrome metabólico y diabetes tipo 2: caracterización metabólica y mecanismos patogénicos
FIS, PI081409: 2009-2012
Principal Investigator: Lluís Masana
Associate investigator: Jesús Brezmes
National project. Programme 1

Caracterización bioquímica, metabólica y genética de la hipertrigliceridemia asociada a alto riesgo cardiovascular
FIS, PI081579: 2009-2012
Principal Investigator: Josep Ribalta
Associate investigator: Nicolau Cañellas
National project. Programme 1

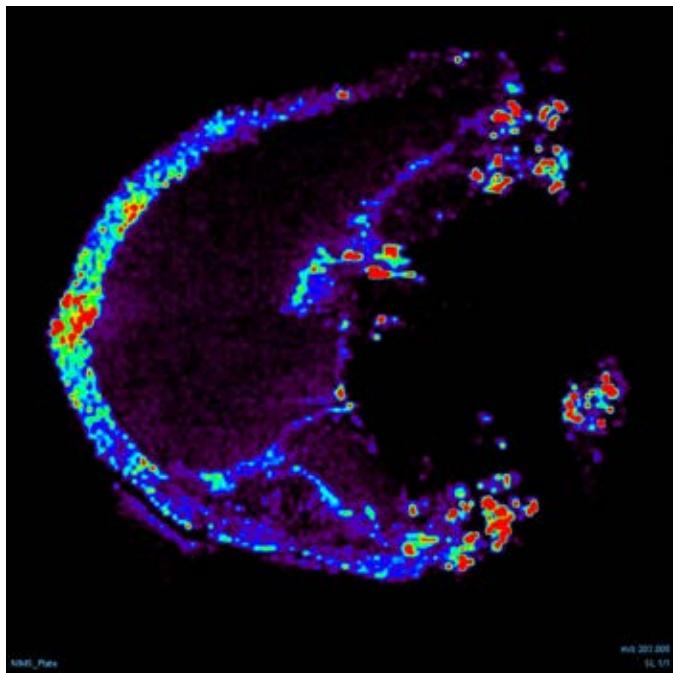
Scientific collaborations within Ciberdem

DIASOBS: Determinants of insulin resistance and glucose tolerance disorders, including diabetes, in severe obesity and their changes after bariatric surgery-induced weight loss
Coordinator: Héctor F Escobar Morreale
Ciberdem groups: Correig X, Montanya E, Escobar- Morreale HF, Simó R, Vendrell J

METADIAB: Comparative metabolomic analysis for the detection of biomarkers in diabetes
Coordinator: Xavier Correig
Ciberdem groups: Correig X, Gomis R, Novials A

Pilchardus Study: A sardine diet intervention study to assess benefits to the metabolic profile in type 2 diabetes mellitus patients
Coordinator: Ramon Gomis
Ciberdem groups: Novials A, Simó R, Soriguer F
Platforms: Metabolomics Platform, Biobank

For more information see [page 32](#)



NIMS images obtained from eye tissues.

Proinsulin and tyrosine hydroxylase (TH) physiopathology in development

Centro de Investigaciones Biológicas, Consejo Superior de Investigaciones Científicas, Madrid
www.cib.csic.es



Principal Investigator Flora de Pablo fdepablo@cib.csic.es **Associate researcher** Catalina Hernández **Postdoctoral fellow**

Patricia Vázquez **Lab technician** Cayetana Murillo

Publications: 1 Research grants: 1 PhD theses: 1

Programmes

Programme 2. Mechanisms promoting the development of diabetes and its vascular complications. Associated disorders and co-morbidities. Strategies for prevention and treatment.

Keywords

Proinsulin. Islet development. Insulin action. Cardiac complications.

Main lines of research

-To study the physiological role of proinsulin and the consequences of inappropriately high levels during cardiogenesis. Hyperproinsulinaemia occurs in obese/type II diabetic women and its relation to foetal cardiac malformations needs to be clarified. In a maternally independent model of development, high proinsulin expression led to a decrease in atrial specific gene expression and up to 60% malformed hearts. We are now studying a non-hyperglycaemic mouse model of

high circulating proinsulin.

-TH gene is upstream of the insulin gene in a conserved genome cluster. We study the role of atypical catecholaminergic cells in developing mouse pancreas. Their function is still undefined. We found that during secondary transition, TH+ cells are required to maintain normal Ngn3 expressing endocrine precursors and the pool of insulin+ cells.

Publications

Glucagon-like peptide 1 (GLP-1) can reverse AMP-activated protein kinase (AMPK) and S6 kinase (P70S6K) activities induced by fluctuations in glucose levels in hypothalamic areas involved in feeding behaviour

Hurtado-Carneiro V, Sanz C, Roncero I, Vazquez P, Blazquez E, Alvarez E

Mol Neurobiol, 45, 348-361 (2012)

PMID 22311299. Q1. IF 5.735. With other Ciberdem groups:

Blázquez E.

Programme 1

Research grants

Regulación y función del locus TH/INS en el desarrollo

embrionario y la diferenciación

BFU2010-15868: 2011-2013

Principal Investigator: Flora de Pablo

National project. Programme 1

PhD theses

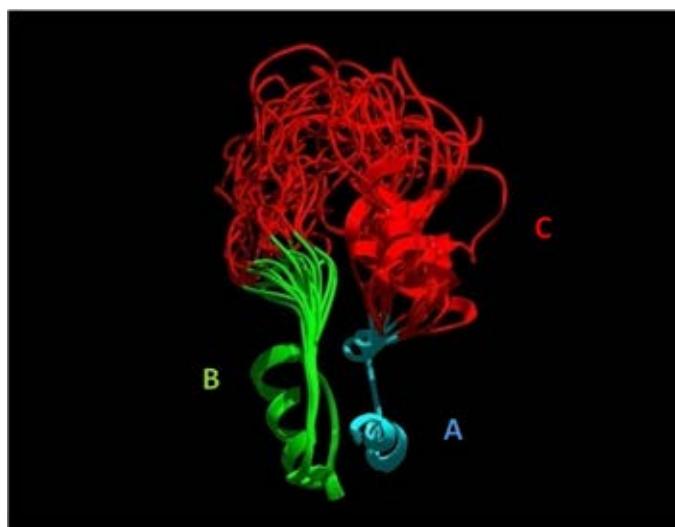
Acción del locus Th-insulina en la cardiogénesis

Author: Enrique Martínez Campos

Thesis advisor: Catalina Hernández-Sánchez

University: Universidad Autónoma de Madrid

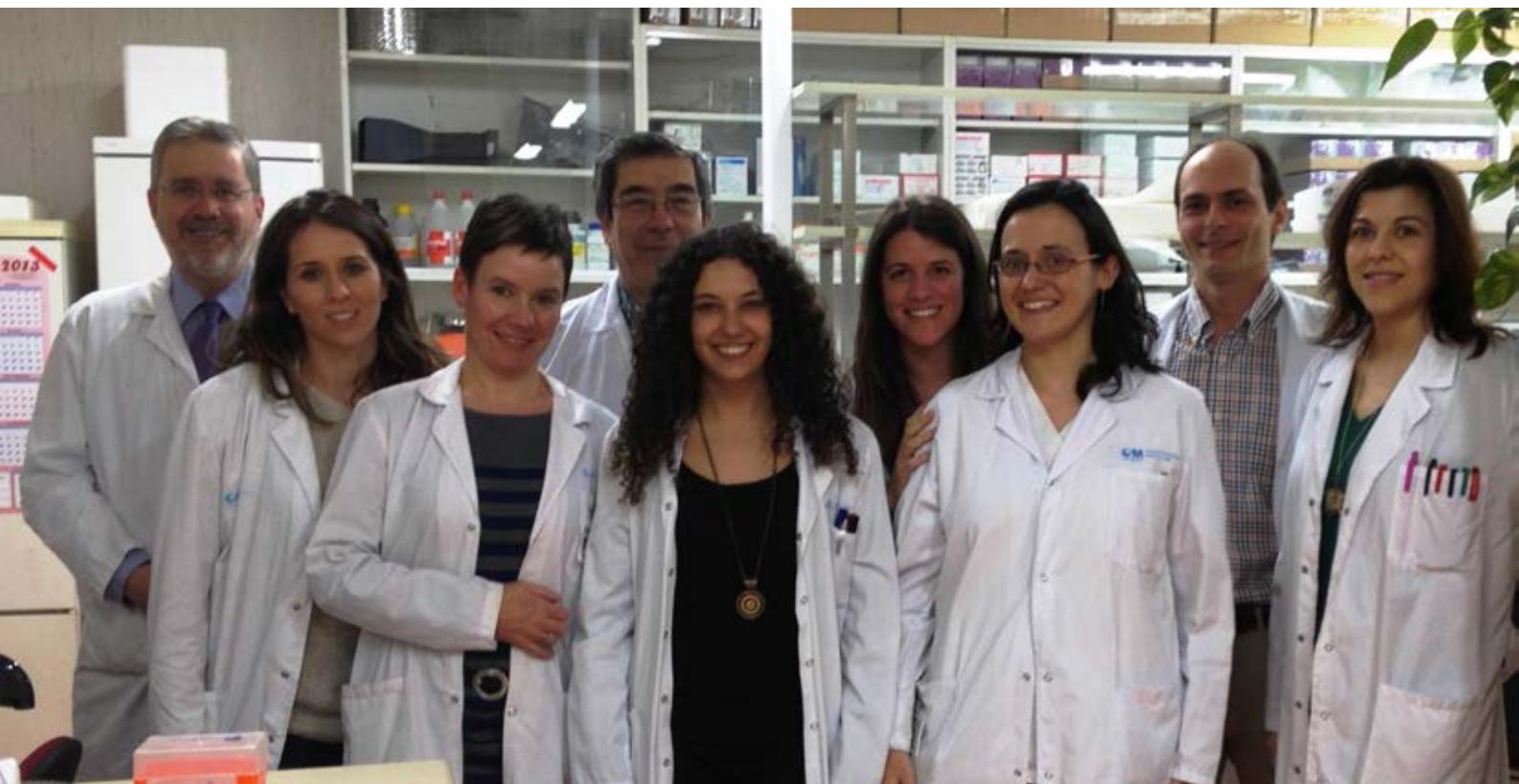
Thesis defense date: April 4, 2012



The structural model of human proinsulin highlights its conformational variability. The B-chain is in green, A-chain in cyan and C-peptide in red (model courtesy of Mario García de Lacoba, CIB, CSIC).

Diabetes, Obesity and Human Reproduction

Universidad de Alcalá, Hospital Universitario Ramón y Cajal and Instituto Ramón y Cajal de Investigación Sanitaria IRYCIS,
Madrid
www.hrc.es



Principal Investigator Héctor F Escobar Morreale hescobarm.hrc@salud.madrid.org **Associate researchers** Francisco Álvarez Blasco, Susana Borruel Nacenta, María Rosa Insenser, Manuel Luque Ramírez, María Ángeles Martínez, José Luis San Millán, Miriam Ojeda **Postdoctoral fellow** Mora Murri Pierri **PhD student** Macarena Alpañés **Lab manager** Elena Fernández

Publications: 9 Research grants: 1 Clinical practice guidelines: 2

Programmes

Programme 4. Use of biomedical approach systems to develop personalized therapies for diabetes.

Keywords

Biomarkers and imaging. Insulin sensitivity and resistance. Polycystic ovary syndrome. Proteomics. Sex hormones. Sex.

Main lines of research

The influence of the balance between androgens and oestrogens on the development of abdominal adiposity and visceral adipose tissue dysfunction in humans as pathogenetic factors of insulin resistance and diabetes, including:

- a) an integrated approach to the influence of sex hormones on the amount and dysfunction of visceral and subcutaneous fat as studied by clinical research, molecular genetics, molecular biology, transcriptomics, proteomics and metabolomics.
- b) the identification of pathogenetic markers of diabetes in

severe obesity and predictors of diabetes remission after bariatric surgery.

c) the role of disordered iron metabolism on the metabolic associations of polycystic ovary syndrome.

d) the effects of sex hormones on the metabolic and inflammatory effects of macronutrients.

Publications

Epidemiology, diagnosis and management of hirsutism: a consensus statement by the Androgen Excess and Polycystic Ovary Syndrome Society

Escobar-Morreale HF, Carmina E, Dewailly D, Gambineri A, Kelestimur F, Moghetti P, Pugeat M, Qiao J, Wijeyaratne CN, Witchel SF, Norman RJ

Hum Reprod Update, 18, 146-170 (2012)

PMID 22064667. 1st decile. IF 9.234. With other international groups. Programme 4

Health and fertility in World Health Organization group 2 anovulatory women
 ESHRE Capri Workshop Group
 Hum Reprod Update, 18, 586-599 (2012)
PMID 22611175. 1st decile. IF 9.234. With other international groups. Programme 4

Iron metabolism and the polycystic ovary syndrome
 Escobar-Morreale HF
 Trends Endocrinol Metab, 23, 509-515 (2012)
PMID 22579050. 1st decile. IF 8.115. Programme 4

Management of postmenopausal virilization
 Alpañés M, González-Casbas JM, Sánchez J, Pián H, Escobar-Morreale HF
 J Clin Endocrinol Metab, 97, 2584-2588 (2012)
PMID 22669303. Q1. IF 5.967. Programme 4

Prevalence of functional disorders of androgen excess in unselected premenopausal women: a study in blood donors
 Sanchón R, Gambineri A, Alpañés M, Martínez-García MÁ, Pasquali R, Escobar-Morreale HF
 Hum Reprod, 27, 1209-1216 (2012)
PMID 22343706. 1st decile. IF 4.475. Programme 4

Metabolic heterogeneity in polycystic ovary syndrome is determined by obesity: plasma metabolomic approach using GC-MS
 Escobar-Morreale HF, Samino S, Insenser M, Vinaixa M, Luque-Ramírez M, Lasunción MA, Correig X
 ClinChem, 58, 999-1009 (2012)
PMID 22427353. 1st decile. IF 7.905. With other Ciberdem groups: Correig X. With other CIBERs: CIBEROBN. Programme 4

Surgical management of metabolic dysfunction in PCOS
 Escobar-Morreale HF
 Steroids, 77, 312-316 (2012)
PMID 22172592. Q2. IF 2.829. Programme 4

Common variants in the sex hormone-binding globulin gene (SHBG) and polycystic ovary syndrome (PCOS) in Mediterranean women
 Martínez-García MÁ, Gambineri A, Alpañés M, Sanchón R, Pasquali R, Escobar-Morreale HF
 Hum Reprod, 27, 3569-3576 (2012)
PMID 23001781. 1st decile. IF 4.475. Programme 4

A nontargeted proteomic approach to the study of visceral and subcutaneous adipose tissue in human obesity
 Insenser M, Montes-Nieto R, Vilarrasa N, Lecube A, Simó R, Vendrell J, Escobar-Morreale HF
 Mol Cell Endocrinol, 363, 10-19 (2012)
PMID 22796336. Q2. IF 4.192 . With other Ciberdem groups: Montanya E, Simó R, Vendrell J. Programme 4

Research grants

Respuesta hormonal, metabólica, inflamatoria y oxidativa a los diferentes macronutrientes de la dieta: influencia de los esteroides sexuales

FIS PI1100357: 2012- 2015

Principal Investigator: Hector F Escobar Morreale
 Associate researchers: Jose Luis San Millán, Francisco Álvarez Blasco, Manuel Luque Ramírez, Susana Boruel Nacente, David Martí Sanchez, Elena Fernandez Duran, Macarena Alpanes Buesa, Mª Angeles Martínez García, María Insenser Nieto, Miriam Ojeda Ojeda
 National project. Programme 4

Scientific collaborations within Ciberdem

DIASOBS: Determinants of insulin resistance and glucose tolerance disorders, including diabetes, in severe obesity and their changes after bariatric surgery-induced weight loss
 Coordinator: Héctor F Escobar Morreale

Ciberdem groups: Escobar-Morreale HF, Correig X, Montanya E, Simó R, Vendrell J

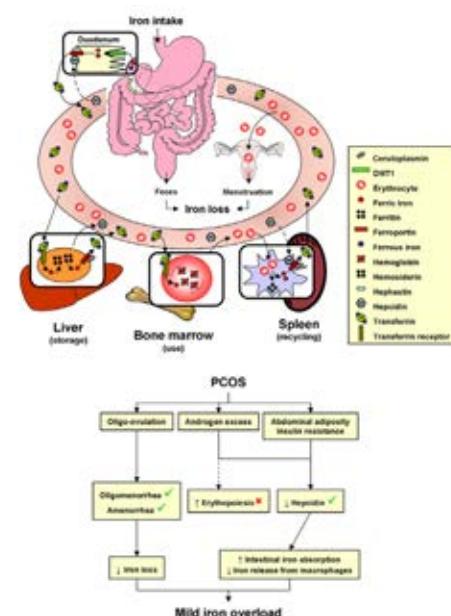
Clinical practice guidelines

Epidemiology, diagnosis and management of hirsutism: a consensus statement by the Androgen Excess and Polycystic Ovary Syndrome Society

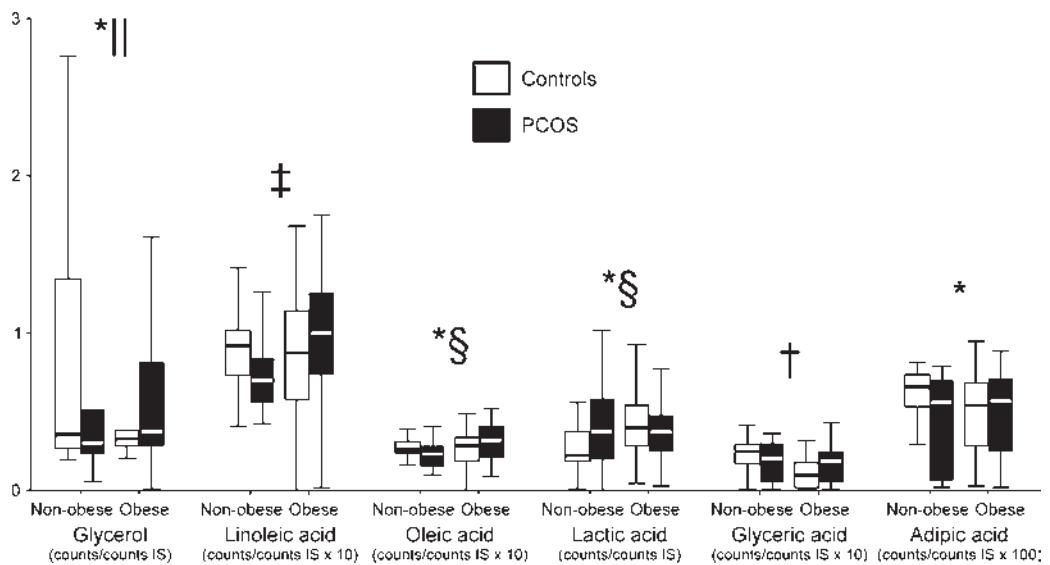
Escobar-Morreale HF, Carmina E, Dewailly D, Gambineri A, Kelestimur F, Moghetti P, Pugeat M, Qiao J, Wijeyaratne CN, Witchel SF, Norman RJ
 Hum Reprod Update, 18, 146-170 (2012)

Health and fertility in World Health Organization group 2 anovulatory women

Baird DT, Balen A, Escobar-Morreale HF, Evers JL, Faußer BC, Franks S, Glasier A, Homburg R, La Vecchia C, Devroey P, Diedrich K, Fraser L, Gianaroli L, Liebaers I, Sunde A, Tapanainen JS, Tarlatzis B, Van Steirteghem A, Veiga A, Crosignani PG, Evers JL
 Hum Reprod Update, 18, 586-99 (2012)



Metabolism of iron and mechanisms leading to mild iron overload in polycystic ovary syndrome (PCOS).



Metabolites showing statistically significant interactions between PCOS and obesity, suggesting that not all tissues of non-obese patients with PCOS are insulin resistant, whereas the extent of insulin resistance is broader in obese patients and dominates the metabolic picture. Data are m/zRT intensities normalized to internal standard succinic-d4 acid. The box plot includes the median (horizontal line) and the interquartile range, and the whiskers indicate the minimum and maximum data values.

Genomic programming of beta cells

Institut d'Investigacions Biomèdiques August Pi i Sunyer, Barcelona
www.betacellregulation.net



Principal Investigator Jorge Ferrer jferrer@clinic.ub.es **Postdoctoral fellows** Ildem Akerman, Lorenzo Pasquali, Miguel Ángel Maestro, Marta Batlle, Santiago Rodriguez, Loris Mularoni, Anthony Beucher, Meritxell Rovira, Inês Cebola **Research assistant** Natalia Castro **PhD students** Myriam Solar, Ignasi Moran, Mar Armengol, Nikolina Nakic, Miguel A Correa **Lab manager** Carme Sanahuja **Lab technicians** Xavier Garcia, Vanesa Grau

Publications: 4 Research grants: 6 PhD theses: 1

Programmes

Programme 3. Impact of beta cell dysfunction and plasticity on the natural history of diabetes. Development of novel treatment strategies.

Programme 4. Use of biomedical approach systems to develop personalized therapies for diabetes.

Keywords

Genetics type 2 diabetes. Insulin synthesis. Islet degeneration and damage. Islet development. Islet transplantation. Monogenic diabetes.

Main lines of research

- Mouse genetic analysis of beta-cell regulation.
- Understanding the epigenome of pancreatic beta cells and its implications for the development, plasticity and growth of beta cells.
- The regeneration of pancreatic beta cells.

Publications

GATA6 haploinsufficiency causes pancreatic agenesis in humans

Allen HL, Flanagan SE, Shaw-Smith C, De Franco E, Akerman I, Caswell R; the International Pancreatic Agenesis Consortium, Ferrer J, Hattersley AT, Ellard S
Nat Genet, 44, 20-22 (2012)

PMID 22158542. 1st decile. IF 35.532. With other international groups. Programme 3

Gene expression dynamics after murine pancreatitis unveils novel roles for Hnf1 α in acinar cell homeostasis

Molero X, Vaquero EC, Flández M, González AM, Ortiz MA, Cibrián-Uhalte E, Servitja JM, Merlos A, Juanpere N, Massumi M, Skoudy A, Macdonald R, Ferrer J, Real FX
Gut, 61, 1187-1196 (2012)

PMID 21948943. 1st decile. IF 10.111. With other Ciberdem groups: Novials A. With other CIBERs: CIBERHED. Programme 3

GATA believe it: new essential regulators of pancreas development
Rodríguez-Seguí S, Akerman I, Ferrer J
J Clin Invest, 122, 3469-3471 (2012)
PMID 23006323. 1st decile. IF 13.069. Programme 3

Human β Cell Transcriptome Analysis Uncovers lncRNAs That Are Tissue-Specific, Dynamically Regulated, and Abnormally Expressed in Type 2 Diabetes

Morán I, Akerman I, van de Bunt M, Xie R, Benazra M, Nammo T, Arnes L, Nakić N, García-Hurtado J, Rodríguez-Seguí S, Pasquali L, Sauty-Colace C, Beucher A, Scharfmann R, van Arensbergen J, Johnson PR, Berry A, Lee C, Harkins T, Gmyr V, Pattou F, Kerr-Conte J, Piemonti L, Berney T, Hanley N, Gloyn AL, Sussel L, Langman L, Brayman KL, Sander M, McCarthy MI, Ravassard P, Ferrer J
Cell Metab, 16, 435-448 (2012)
PMID 23040067. 1st decile. IF 13.668. With other international groups. Programme 3

Research grants

Linking non-coding RNAs to beta-cell programming efforts
NIH, NIDDK / LINC-BETA - 2U01 DK072473-06: 2011-2012
Principal Investigator: Jorge Ferrer
European project. Programme 3

Collaborative European Effort to Develop Diabetes Diagnosis
University of Exeter, CE-FP7-HealthB07:

2008-2012
Principal Investigator: Jorge Ferrer
European project. Programme 4

Biology of Liver and Pancreatic Development and Disease
University of Birmingham, CE-FP7-PEOPLE-ITN-08, Marie Curie Training Network: 2009-2013
Principal Investigator: Jorge Ferrer
European project. Programme 4

Mapping the human pancreatic islet-cell cisregulome
EFSD/LILLY-11-1-001: 2012-2013
Principal Investigator: Lorenzo Pasquali
European project. Programme 3

Diabetes Research on patient stratification
CE-IMI10-3rd(2stg). EFPIA-IMI Project: 2012-2017
Principal Investigator: Jorge Ferrer
European project. Programme 4

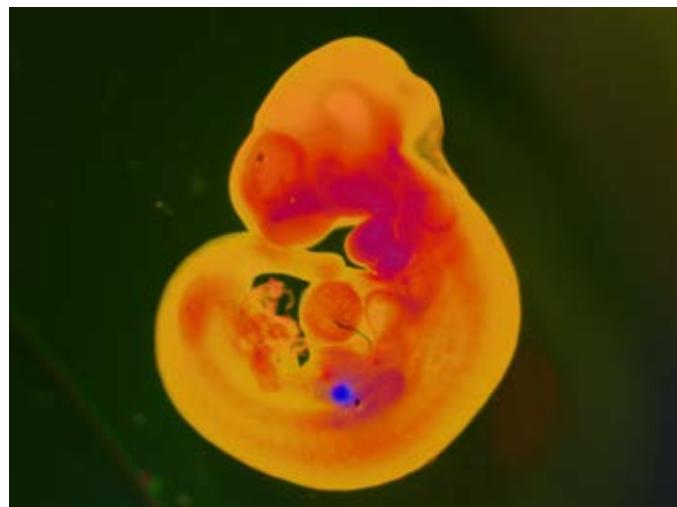
Regulación Epigenética de las Células Beta y Diabetes
SAF2011-27086: 2012-2014
Principal Investigator: Jorge Ferrer
National project. Programme 3

Scientific collaborations within Ciberdem

MODIAB: Clinical, genetic and functional characterization of monogenic diabetes: from the bench to the bedside
Coordinator: Luis Castaño
Ciberdem groups: Ferrer J, Castaño L, Blázquez E, Vallejo M

PhD theses

Plasticity of duct cells in the embryonic and postnatal pancreas
Author: Myriam Solar Abboud
Coordinator: Jorge Ferrer Marrades
University: Universitat de Barcelona
Thesis defense date: February 10, 2012



In toto staining of pancreas from embryo mouse at E10.5 stage.

Mechanisms of control of glucose and fatty acid metabolism in skeletal muscle cells and metabolic impairment in atrophy

Departament de Bioquímica i Biologia Molecular, Facultat de Biologia, Universitat de Barcelona
www.bq.ub.es



Principal Investigator Anna Maria Gómez Foix agomezfoix@ub.edu **Associate researcher** Cèlia García **Research assistants**

Maria Guitart de la Rosa, Marta Montori **PhD students** Emma Mormeneo, Oscar Osorio **Lab manager** Anna Orozco

Publications: 2 Research grants: 2 Patents: 2

Programmes

Programme 4. Use of biomedical approach systems to develop personalized therapies for diabetes.

Keywords

Insulin sensitivity and resistance. Lipid metabolism. Carbohydrate metabolism.

Main lines of research

-Mechanisms of control of skeletal muscle glycogen metabolism. Differential functionality of the protein phosphatase 1 (PP1) glycogen-associated regulatory subunits present in human skeletal muscle GM (PPP1R3A), PTG (PPP1R3C), PPP1R6 (PPP1R3D) and PPP1RE.

-Metabolic control role of the fatty acid transport protein 1 (FATP1) in muscle and deleterious effect in high-fat-diet induced diabetes.

-Transcriptional and metabolic adaptations of noninnervated cultured primary human myotubes compared to human skeletal muscle.

Publications

PGC-1 α induces mitochondrial and myokine transcriptional programs and lipid droplet and glycogen accumulation in cultured human skeletal muscle cells

Mormeneo E, Jimenez-Mallebrera C, Palomer X, De Nigris V, Vázquez-Carrera M, Orozco A, Nascimento A, Colomer J, Lerín C, Gómez-Foix AM

PLoS ONE, 7, e29985 (2012)

PMID 22272266. Q1. IF 4.092. With other Ciberdem groups: Vázquez Carrera M. Programme 4

Muscle fiber atrophy and regeneration coexist in collagen VI-deficient human muscle: role of calpain-3 and nuclear factor- κ B signaling

Paco S, Ferrer I, Jou C, Cusí V, Corbera J, Torner F, Gualandi F, Sabatelli P, Orozco A, Gómez-Foix AM, Colomer J, Nascimento A, Jimenez-Mallebrera C

J Neuropathol Exp Neurol, 71, 894-906 (2012)

PMID 22975586. Q1. IF 4.258. Programme 4

Research grants

Estudio de los mecanismos de disfuncionalidad del proceso metabólico del glucógeno asociados a la atrofia en células de músculo esquelético humano

Ministerio de Ciencia e Innovación, SAF 2009-07559:

2010-2012

Principal Investigator: Anna Maria Gómez Foix

National project. Programme 4

Acreditació de Grup de Recerca de Catalunya
Generalitat de Catalunya, 2009 SGR 10: 2009-2013

Principal Investigator: Anna Maria Gómez Foix

Autonomous Community project. Programme 4

Scientific collaborations within Ciberdem

STEMOB: Adult adipose tissue-derived progenitor cells: the influence of the clinical phenotype and adipose depot origin on their biological properties

Coordinator: Joan J Vendrell

Ciberdem groups: Gómez-Foix AM , Vendrell J, Zorzano A, Balsinde J, Montanya E, Simó R, Vázquez-Carrera M

Patents

Electrode assembly for generating electric field pulses to perform electroporation to a biological sample

Patent application number: PCT/EP2012/058587

Inventors: Tomás García Sánchez, Xavier Rosell Ferrer, Ramón Bragós Bardia, ana M. Gómez Foix, María Guitart De la Rosa, Beatriz Sánchez Ortiz

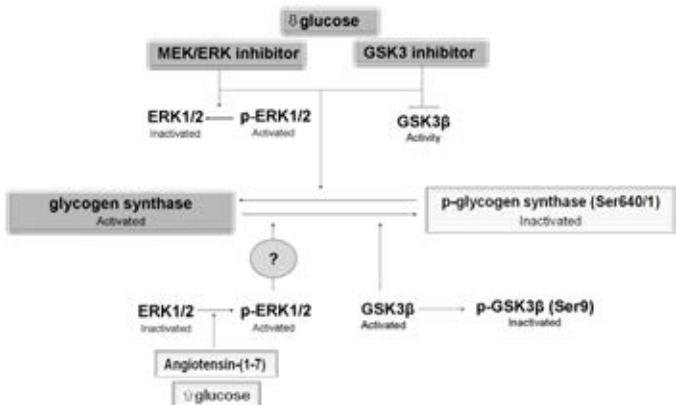
Programme 4

Uso de colágeno VI soluble para la fabricación de un medicamento para el tratamiento de enfermedades asociadas a hiperglucemia, composición farmacéutica, método y uso de un medio líquido extracelular para incrementar la captura de glucosa

Patent application number: ES 201231787

Inventors: Cecilia Jimenez Mallebrera, Ana M. Gómez Foix y Oscar Osorio Conles

Programme 4



Role of ERK1/2 in the regulation of muscle cell GS activity. The diagram depicts GS activity regulation in response to changes in ERK1/2 activity activating phosphorylation and describes the effects of angiotensin-(1-7) on this pathway and the influence of low or high glucose presence.

Diabetes and obesity: biopathology and cellular plasticity

Institut d'Investigacions Biomèdiques August Pi i Sunyer, Barcelona
www.idibaps.org



Principal Investigator Ramon Gomis ramon.gomis@idibaps.es **Associate researchers** Roser Casamitjana, Ignacio Conget, Enric Esmatjes, Liliam Flores, Rosa Gasa, Felicia Hanzu, Marga Giménez, Belén Nadal, Marcelina Parrizas, Josep Vidal, Emilio Ortega, Sara Cervantes, Marc Claret, Rita Malpique **Postdoctoral fellows** Rebeca Fernández, Sandra Rebiffat, Elena Gonzalez, Eduardo Fernández, Elaine Vieira **PhD students** Joana Duarte, Miriam Ejarque, Katerina Papageorgiou, Silvia Canivell, Marc Schneeberger, Marta Padras, Hugo Alves, Ana Lucía Castillo, Mariona Balfegó **Lab technicians** Yaiza Esteban, Ainhoa García

Publications: 13 Research grants: 13 Clinical trials: 8 Clinical practice guides: 1 PhD theses: 1

Programmes

Programme 2. Mechanisms promoting the development of diabetes and its vascular complications. Associated disorders and co-morbidities. Strategies for prevention and treatment.

Programme 3. Impact of beta cell dysfunction and plasticity on the natural history of diabetes. Development of novel treatment strategies.

Keywords

Clinical diabetes. Endothelium. Islet degeneration and damage. Islet development. Nutrition.

Main lines of research

-The effects of pancreatic-mesenteric adipose tissue on beta-

cell plasticity.

-Crosstalk between adipose tissue and endothelium in obesity and type 2 diabetes: the role of adipocytokines in the aetiology and development of the atherothrombotic complications in both diseases.

-The molecular determinants involved in pancreatic beta-cell apoptosis and regeneration: clinical applications.

-Transcriptional networks which control beta-cell population and function.

-Metabolic and molecular targets of the antidiabetic effect of sodium tungstate.

-The role of the hypothalamus in energy homeostasis control in obesity.

-Epigenetic regulation of adipogenesis.

-Genetic determinants involved in the risk of type 2 diabetes.

Publications

Prevalence of diabetes mellitus and impaired glucose regulation in Spain: the Di@bet.es Study

Soriguer F, Goday A, Bosch-Comas A, Bordiu E, Calle-Pascual A, Carmena R, Casamitjana R, Castano L, Castell C, Catala M, Delgado E, Franch J, Gatzambide S, Girbes J, Gomis R, Gutierrez G, Lopez-Alba A, Martinez-Larrad MT, Menendez E, Mora-Peces I, Ortega E, Pascual-Manich G, Rojo-Martinez G, Serrano-Rios M, Valdes S, Vazquez JA, Vendrell J
Diabetologia, 55, 88-93 (2012)

PMID 21987347. 1st decile. IF 6.814. With other Ciberdem groups: Carmena R, Castaño L, Soriguer F, Serrano-Rios M, Vendrell J. Programme 2

Expression of TMEM16A and SLC4A4 in human pancreatic islets

Hanzu FA, Gasa R, Bulur N, Lybaert P, Gomis R, Malaisse WJ, Beauwens R, Sener A
Cell Physiol Biochem, 29, 61-64 (2012)

PMID 22415075. Q2. IF 2.857. With other international groups. Programme 3

Role of IGFBP-3 in the regulation of β-cell mass during obesity: adipose tissue/β-cell cross talk

Palau N, Rebuffat SA, Altirriba J, Piquer S, Hanzu FA, Gomis R, Barbera A
Endocrinology, 153, 177-187 (2012)

PMID 2206731. Q1. IF 4.459. Programme 2

The role of Raf-1 kinase inhibitor protein in the regulation of pancreatic beta cell proliferation in mice

Pardo FN, Altirriba J, Pradas-Juni M, García A, Ahlgren U, Barberà A, Slebe JC, Yáñez AJ, Gomis R, Gasa R
Diabetologia, 55, 3331-3340 (2012)

PMID 22926403. 1st decile. IF 6.814. Programme 3

Anti-obesity sodium tungstate treatment triggers axonal and glial plasticity in hypothalamic feeding centers

Amigó-Correig M, Barceló-Batllo S, Soria G, Krezymer A, Benani A, Péneau L, Tudela R, Planas AM, Fernández E, Carmona Mdel C, Gomis R
PLoS One, 7, e39087 (2012)

PMID 22802935. Q1. IF 4.092. Programme 3

Long-term safety and efficacy of linagliptin as monotherapy or in combination with other oral glucose-lowering agents in 2121 subjects years exposure in 24-week phase III trials with type 2 diabetes: up to 2 followed by a 78-week open-label extension

Gomis R, Owens DR, Taskinen MR, Del Prato S, Patel S, Pivovarova A, Schlosser A, Woerle HJ
Int J Clin Pract, 66, 731-740 (2012)

PMID 22691164. Q1. IF 2.415. With other international groups. Programme 3

Predictive factors of excess body weight loss 1 year after laparoscopic bariatric surgery

Ortega E, Morínigo R, Flores L, Moize V, Ríos M, Lacy AM, Vidal J
Surg Endosc, 26, 1744-1750 (2012)

PMID 22234587. 1st decile. IF 4.013. Programme 2

Long-term effects of sleeve gastrectomy and Roux-en-Y gastric bypass surgery on type 2 diabetes mellitus in morbidly obese subjects

Jiménez A, Casamitjana R, Flores L, Viaplana J, Corcelles R, Lacy A, Vidal J
Ann Surg, 256, 1023-1029 (2012)
PMID 22968072. 1st decile. IF 7.492. Programme 2

Prediction of whole-body and segmental body composition by bioelectrical impedance in morbidly obese subjects

Jiménez A, Omaña W, Flores L, Coves MJ, Bellido D, Perea V, Vidal J
Obes Surg, 22, 587-593 (2012)
PMID 22506280. 1st decile. IF 3.286. Programme 2

Comparable early changes in gastrointestinal hormones after sleeve gastrectomy and Roux-En-Y gastric bypass surgery for morbidly obese type 2 diabetic subjects

Romero F, Nicolau J, Flores L, Casamitjana R, Ibarzabal A, Lacy A, Vidal J
Surg Endosc, 26, 2231-2239 (2012)
PMID 22302537. 1st decile. IF 4.013. Programme 2

Iodine intake in the adult population. Di@bet.es study

Soriguer F, Garcia-Fuentes E, Gutierrez-Repiso C, Rojo-Martinez G, Velasco I, Goday A, Bosch-Comas A, Bordiu E, Calle A, Carmena R, Casamitjana R, Castano L, Castell C, Catala M, Delgado E, Franch J, Gatzambide S, Girbes J, Gomis R, Gutierrez G, Lopez-Alba A, Martinez-Larrad MT, Menendez E, Mora-Peces I, Ortega E, Pascual-Manich G, Serrano-Rios M, Valdes S, Vazquez JA, Vendrell J
Clin Nutr, 31, 882-888 (2012)

PMID 22560740. Q1. IF 3.731. With other Ciberdem Groups: Carmena, R, Soriguer F, Castaño L, Serrano-Ríos M, Vendrell J. Programme 1

Diabetes as a case study of chronic disease management with a personalized approach: The role of a structured feedback loop

Ceriello A, Barkai L, Christiansen JS, Czupryniak L, Gomis R, Harno K, Kulzer B, Ludvigsson J, Némethyová Z, Owens D, Schnell O, Tankova T, Taskinen MR, Vergès B, Weitgasser R, Wens J

Diabetes Res Clin Pract, 98, 5-10 (2012)

PMID 22917639. Q2. IF 2.754. With other Ciberdem groups: Novials A. With other international groups. Programme 2

Evidence that hyperglycemia after recovery from hypoglycemia worsens endothelial function and increases oxidative stress and inflammation in healthy control subjects and subjects with type 1 diabetes

Ceriello A, Novials A, Ortega E, La Sala L, Pujadas G, Testa R, Bonfigli AR, Esposito K, Giugliano D
Diabetes, 61, 2993-2997 (2012)

PMID 22891214. 1st decile. IF 8.286. With other Ciberdem groups: Novials A. Programme 2

Publications arising from international clinical trials

Basal insulin and cardiovascular and other outcomes in dysglycemia

ORIGIN Trial Investigators, Gerstein HC, Bosch J, Dagenais

GR, Díaz R, Jung H, Maggioni AP, Pogue J, Probstfield J, Ramachandran A, Riddle MC, Rydén LE, Yusuf S
N Engl J Med, 367, 319-328 (2012)
PMID 22686416. 1st decile. IF 53.298

n-3 fatty acids and cardiovascular outcomes in patients with dysglycemia
ORIGIN Trial Investigators, Bosch J, Gerstein HC, Dagenais GR, Díaz R, Dyal L, Jung H, Maggiano AP, Probstfield J, Ramachandran A, Riddle MC, Rydén LE, Yusuf S
N Engl J Med, 367, 309-318 (2012)
PMID 22686415. 1st decile. IF 53.298

The use and efficacy of continuous glucose monitoring in type 1 diabetes treated with insulin pump therapy: a randomised controlled trial
Battelino T, Conget I, Olsen B, Schütz-Fuhrmann I, Hommel E, Hoogma R, Schierloh U, Sulli N, Bolinder J; SWITCH Study Group
Diabetologia, 55, 3155-3162 (2012)
PMID 22965294. 1st decile. IF 6.814

Research grants

Genetic and environmental factors of insulin resistance syndrome and its long-term complications in immigrant Mediterranean population
MEDIGENE. FP7-279171-1.HEALTH.2011.2.4.3-4: 2011-2014
Principal investigator: Florin Grigorescu
Associate investigators: R Gomis, L Castaño
European project. Programme 2

The role of adipose tissue in obesity: beta-cell crosstalk (ADIBET)
FP7 PEOPLE-2007-3-1-IAPP, 218131: 2008-2012
Principal Investigator: Ramon Gomis
European project. Programme 3

Mitochondrial fusion protein Mitofusin 1 in POMC neurons: potential regulator of energy homeostasis
EFSD/Lilly Fellowship: 2012-2014
Principal Investigator: Marc Claret
European project. Programme 2

The role of LSD1 histone demethylase in adipogenesis
Ministerio de Ciencia e Innovación, BFU2009-09988: 2010-2012
Principal Investigator: Marcelina Parrizas
National project. Programme 3

The role of miRNAs in hypothalamic populations of neurons upon energy and glucose homeostasis: potential targets for obesity and diabetes treatment
ISCIII, CP09/00233: 2010-2012
Principal Investigator: Marc Claret
National project. Programme 2

MicroRNAs hipotalámicos y regulación del metabolismo energético: posibles dianas terapéuticas para el tratamiento de la obesidad y la diabetes

ISCIII, PI10/01074: 2011-2013
Principal Investigator: Marc Claret
National project. Programme 2

Determinantes moleculares de la plasticidad de la célula beta en diabetes: efectos del tungstato sódico
SAF2010-19527: 2011-2013
Principal Investigator: Ramon Gomis
National project. Programme 3

Diabetes experimental, investigació cel·lular i molecular en models de diabetes experimental
Agència de Gestió d'Ajuts Universitaris i de Recerca. Generalitat de Catalunya, 2009 SGR1426: 2009-2013
Principal Investigator: Ramon Gomis
Autonomous Community project. Programme 3

Estudio aleatorizado prospectivo sobre los efectos del tratamiento médico intensivo con o sin bypass gástrico en Y de Roux, sobre el grueso de la íntima media carotídea en enfermos con obesidad grado I
Agència d'Avaluació de Tecnologia i Recerca Mèdiques, Generalitat de Catalunya: 2009-2012
Principal Investigator: Josep Vidal
Autonomous Community project. Programme 2

GLP-1 y resolución a largo plazo de diabetes mellitus tipo 2 tras cirugía bariátrica: 2012-2014
Principal Investigator: Josep Vidal
National project. Programme 2

Grosor de íntima media (GIMC) y presencia de placa carotídea (PC) como discriminador de riesgo cardiovascular al diagnóstico de la diabetes tipo 2 y tras tratamiento de la enfermedad
FIS 11/1723: 2012-2013
Principal Investigator: Emilio Ortega
National project. Programme 2

Role of hypothalamic mitochondrial fusion in appetite and body weight control: potential therapeutical target for the treatment of obesity
RecerCaixa, 2010ACUP_00275: 2011-2013
Principal Investigator: Marc Claret
Private funds. Programme 2

Plasticity of beta-cell mass and type 2 diabetes
Fundación Marcelino Botín: 2010-2012
Principal Investigator: Ramon Gomis
Private funds. Programme 3

Scientific collaborations within Ciberdem

METADIAB: Comparative metabolomic analysis for the detection of biomarkers in diabetes
Coordinator: Xavier Correig
Ciberdem groups: Gomis R, Correig X, Novials A

ENDODIAB: Mechanisms of endothelial dysfunction in diabetes: the role of amylin and circulating endothelial cells

Coordinator: Anna Novials

Ciberdem groups: Gomis R, Novials A, Villanueva Peñacarrillo ML

GIDIPRED: Glycogen-induced dysfunctions in the pancreas and retina and their involvement in the ethiogenesis of diabetes mellitus

Coordinator: Joan J Guinovart

Ciberdem groups: Gomis R, Guinovart JJ, Simó R

Di@bet.es Study: 1st epidemiological study of the prevalence of type 2 diabetes in Spain

Coordinator: Federico Soriguer

Ciberdem groups: Gomis R, Soriguer F, Carmena R, Castaño L, Serrano-Ríos M, Vendrell J

Telemed-diabetes Study

Coordinator: Enric Esmatjes

Ciberdem groups: Gomis R, Carmena R, Serrano-Ríos M, Soriguer F, Castaño L

Ciberdem Biobank

Coordinator: Anna Novials

Ciberdem Biobank nodes: Gomis R, Novials A, Vendrell J, Masana L, Castaño L, Serrano-Ríos M, Soriguer F, Carmena R, Blanco-Vaca F

Pilchardus Study: A sardine diet intervention study to assess benefits to the metabolic profile in type 2 diabetes mellitus patients

Coordinator: Ramon Gomis

Ciberdem groups: Novials A, Simó R,

Soriguer F

Platforms: Metabolomics Platform, Biobank

MEDIGENE: Genetic and environmental factors of insulin resistance syndrome and its long-term complications in immigrant Mediterranean populations

Coordinator: Ramon Gomis

Ciberdem groups: Castaño L, Gomis R, Novials A

Clinical Trials

Multicenter trial, international, randomized and 2x2 factorial to assess the effects of Lantus (glargin insulin) compared to the standard treatment with omega 3 fatty acids compared to placebo, in the decrease of cardiovascular morbility and mortality in high risk patients with altered fasting glucose (AFG), decrease of glucose tolerance (TGD) or type 2 diabetes in initial steps

HOE901/4032: 2003-2012

Coordinator: Ramon Gomis

Programme 2

Ensayo en fase 3 de 24 semanas, internacional aleatorizado de grupos paralelos, doble ciego y controlado con placebo con un período de extensión de 24 semanas para evaluar la eficacia y seguridad de la dapaglificina añadida al tratamiento de los pacientes con DM2 que tienen un control insuficiente de la glucemia con insulina

D1690C00006: 2008-2012

Coordinator: Ramon Gomis

Programme2

Efecto de liraglutida en el peso corporal en sujetos no diabéticos obesos o con sobrepeso y comorbilidad. Ensayo clínico aleatorizado, doble-ciego, controlado con placebo, grupos paralelos, multicéntrico, multinacional, con estratificación de sujetos a 56 o 160 semanas de tratamiento basadas en el estatus prediabético en la aleatorización

2008-001049-24: 2011-2015

Coordinator: Ramon Gomis

Programme2

Ensayo clínico fase III, de 24 semanas de duración y 28 semanas de seguimiento, multicéntrico, aleatorizado, doble ciego, estratificado por edad, controlado con placebo para evaluar la eficacia y seguridad de dapagliflozina 10mg una vez al día, en pacientes DM2, con historia de enfermedad cardiovascular e hipertensión arterial y, que presenten mal control glucémico con su tratamiento habitual

D1690C00018: 2010-12

Coordinator: Ramon Gomis

Programme 2

Estudio de fase III, multicéntrico, internacional, aleatorizado, de grupos paralelos, doble ciego, de seguridad cardiovascular de BI10773 (10mg y 25mg administrados por vía oral una vez al día) comparado con el tratamiento habitual en pacientes con diabetes mellitus de tipo 2 con un riesgo cardiovascular aumentado

2010-2012

Coordinator: Josep Vidal

Programme2

Estudio clínico para evaluar la eficacia y seguridad de un complemento nutricional como adyuvante en la mejora del perfil lipídico y el control de peso

2010-2012

Coordinator: Josep Vidal

Programme 2

Protocolo de estudio para la validación del conjunto grupo mínimo de datos (Minimum Data Set, MDS) en España

2011-2012

Coordinator: Josep Vidal

Programme 2

Glucose Control in Type 2 Diabetes Mellitus with insulin pump therapy. Opt2mise

2011-2012

Coordinator: Ignacio Conget

Programme 2

Clinical practice guidelines

Guía Clínica sobre el inicio del tratamiento con infusión subcutánea continua de insulina y monitorización continuada de la glucosa

M Jansá, M Vidal, M Giménez, I Conget

Unitat de Diabetes. Servei d'Endocrinologia i Nutrició. Institut Clínic de Malalties Digestives i Metabòliques. Hospital Clínic i Universitari de Barcelona

Programme 2

PhD theses

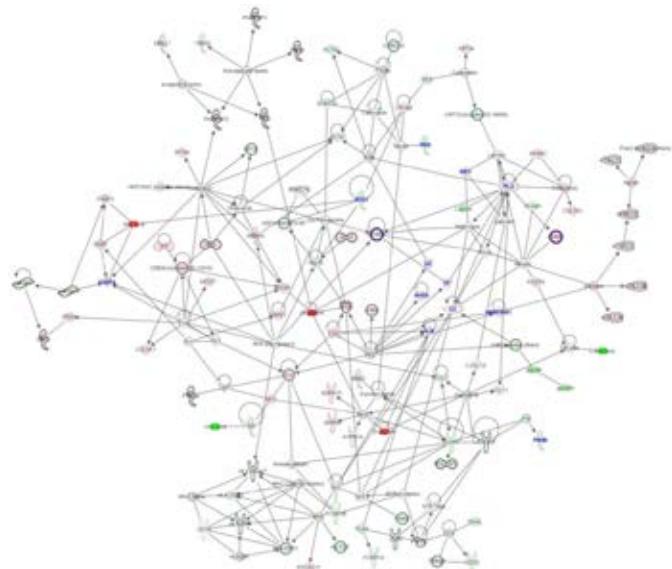
Relació entre neurogenina3 i la via de senyalització Wnt en la formació de les cèl·lules beta pancreàtiques

Author: Gemma Pujadas Rovira

Thesis advisors: Ramon Gomis, Rosa Gasa

University: Universitat de Barcelona

Thesis defense date: June 15, 2012



Transcriptomic variations in islets with changes in peripancreatic adipose tissue gene expression and protein and metabolite secretion in obesity.

Metabolic engineering and diabetes therapy

Institut de Recerca Biomèdica, Barcelona
www.irbbarcelona.org



Principal Investigator Joan J Guinovart guinovart@irbbarcelona.org **Associate researchers** Joaquim Calbó, María del Mar García

Postdoctoral fellows Jordi Duran, Christopher Sinadinos, Iliana López-Soldado **Research assistant** Anna Adrover **PhD students**

Carles Martínez, Isabel Sáez, Jordi Vallès, Giorgia Testoni, Felipe Slebe, Mireia Díaz **Lab technicians** Juan Ignacio Mir, Emma Veza,

Manuel Gris **Administrative staff** Carolina Sánchez

Publications: 5 Research grants: 5 PhD theses: 1

Programmes

Programme 2. Mechanisms promoting the development of diabetes and its vascular complications. Associated disorders and co-morbidities. Strategies for prevention and treatment.

Keywords

Carbohydrate metabolism. Insulin sensitivity and resistance. Islet degeneration and damage. Metabolic syndrome. Retinopathy.

Main lines of research

-The control mechanisms of glucose storage in the liver and their alterations in diabetes mellitus. Characterization of novel compounds with anti-diabetic action.
-The role of glycogen metabolism in the glucose-sensing function of pancreatic beta cell and liver.

-The consequences of altered glycogen deposition in various tissues in diabetes mellitus and in several neurodegenerative diseases.

Publications

Deleterious effects of neuronal accumulation of glycogen in flies and mice
Duran J, Tevy MF, Garcia-Rocha M, Calbó J, Milán M, Guinovart JJ
EMBO Mol Med, 4, 719-729 (2012)
[PMID 22549942. 1st decile. IF 10.333. Programme 2](https://pubmed.ncbi.nlm.nih.gov/22549942/)

Tungstate reduces the expression of gluconeogenic enzymes in STZ rats
Nocito L, Zafra D, Calbó J, Domínguez J, Guinovart JJ
PLoS One, 7, e42305 (2012)
[PMID 22905122. Q1. IF 4.092. Programme 2](https://pubmed.ncbi.nlm.nih.gov/22905122/)

Lyase activity of glycogen synthase: Is an elimination/addition mechanism a possible reaction pathway for retaining glycosyl transferases?

Díaz A, Díaz-Lobo M, Grados E, Guinovart JJ, Fita I, Ferrer JC
IUBMB Life, 64, 649-658 (2012)

PMID: 22648728. Q2. IF 3.514. Programme 2

Anti-diabetic and anti-obesity agent sodium tungstate enhances GCN pathway activation through Glc7p inhibition
Rodríguez-Hernandez CJ, Guinovart JJ, Murguia JR
FEBS Lett, 586, 270-276 (2012)

PMID: 22245679. Q2. IF 3.538. Programme 2

DOR/Tp53inp2 and Tp53inp1 constitute a metazoan gene family encoding dual regulators of autophagy and transcription
Sancho A, Duran J, García-España A, Mauvezin C, Alemu EA, Lamark T, Macias MJ, DeSalle R, Royo M, Sala D, Chicote JU, Palacín M, Johansen T, Zorzano A

PLoS One, 7, e34034 (2012)

PMID: 22470510. Q1. IF 4.092. With other Ciberdem groups: Zorzano A. With other CIBERs: CIBERER. Programme 4

Research grants

The dark side of a bright molecule: Determinants of glycogen-induced cell dysfunction

Human Frontier Science Program, IO HFSP-J Guinovart: 2011-2014

Principal Investigator: Joan J Guinovart

European project. Programme 2

Ayudas de apoyo a grupos de investigación

Generalitat de Catalunya (AGAUR), SGR2009-1176: 2009-2013

Principal Investigator: Joan J Guinovart

Autonomous Community project. Programme 2

The role of glycogen metabolism in the pancreatic beta cell

EFSD/Novo Nordisk Programme: 2012-2014

European Foundation for the Study of Diabetes (EFSD)

Principal Investigator: Joan J Guinovart

Private funds. Programme 2

Luces y sombras del glucógeno: alteraciones en el metabolismo del glucógeno en diabetes, neurodegeneración y envejecimiento

BFU2011-30554-C02-01: 2012-2014

Principal Investigator: Joan J Guinovart

National project. Programme 2

Modulación de la acumulación patológica de glucógeno: dianas terapéuticas para el tratamiento de las Glucogenosis

Areces 2011, Fundación Ramon Areces: 2012-2015

Principal Investigator: Joan J Guinovart

Private funds. Programme 2

Scientific collaborations within Ciberdem

GIDIPRED: Glycogen-induced dysfunctions in the pancreas and retina and their involvement in the ethiogenesis of diabetes mellitus

Coordinator: Joan J Guinovart

Ciberdem groups: Guinovart JJ, Gomis R, Simó R

PhD theses

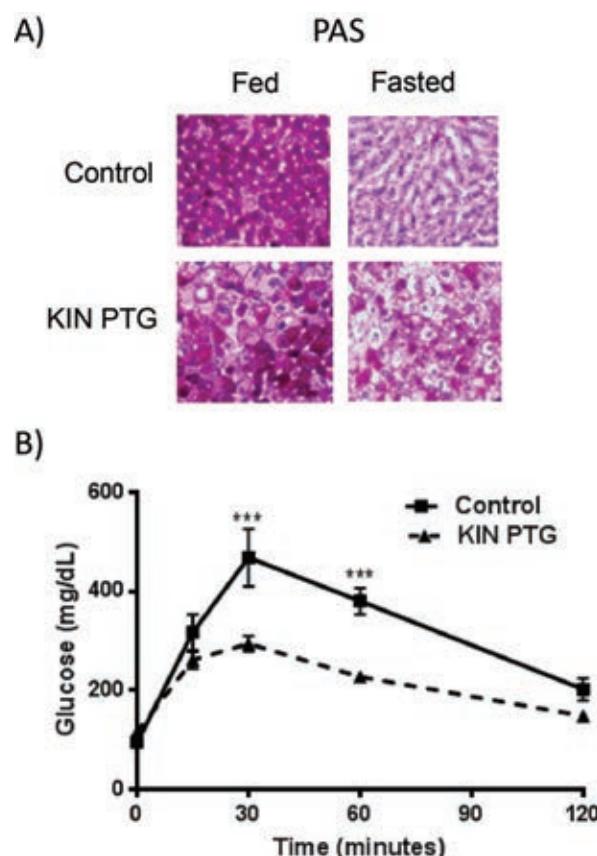
Estudio del metabolismo del glucógeno en la función neuronal y su implicación en la enfermedad de Lafora y el envejecimiento

Author: Jordi Vallès Ortega

Thesis advisor: Joan J Guinovart

University: Universitat de Barcelona

Thesis defense date: March 30, 2012



We wanted to demonstrate that enhanced accumulation of glycogen in the liver improves glucose tolerance. Therefore, we generated transgenic mice expressing protein targeting to glycogen (PTG), an activator of glycogen synthase, specifically in the liver. These animals accumulate massive amounts of glycogen in the liver and show an enhanced glucose tolerance.

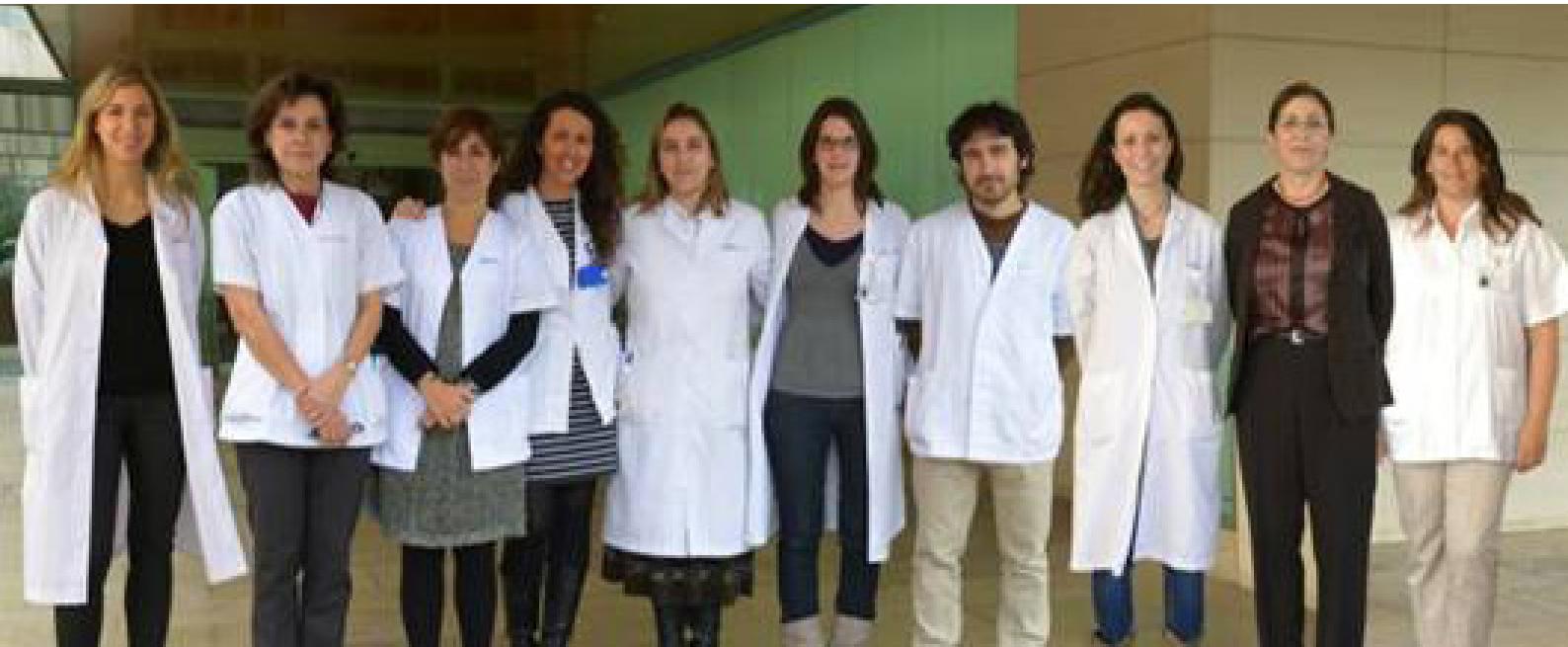
A) PAS staining (pink) of liver sections of control and KIN PTG animals.

B) Glucose tolerance test in control and KIN PTG animals.

Prenatal growth restriction and subsequent risks for type 2 diabetes and cardiovascular disease

Hospital Sant Joan de Déu, Universitat de Barcelona

www.hsjdbc.org



Principal Investigator Lourdes Ibáñez libanez@hsjbcn.org **Associate researchers** Paula Casano, María Victoria Marcos, María Dolores Gómez-Roig **Postdoctoral fellows** Marta Díaz, David Sánchez Infantes **Research assistant** Gemma Aragónés **PhD students** Giorgia Sebastiani, Miriam Pérez Cruz

Publications: 8 Research grants: 10 Clinical trials: 2 PhD theses: 1 Awards: 1

Programmes

Programme 4. Use of biomedical approach systems to develop personalized therapies for diabetes.

Keywords

Cytokines. Insulin sensitivity and resistance. Metabolic syndrome. Oral pharmacological agents. Paediatrics. Prediction/prevention of type 2 diabetes.

Main lines of research

-The influence of early nutrition on growth patterns, body composition, endocrine-metabolic profile and future cardiovascular risks in small-for-gestational-age (SGA) newborns.

-The association of specific SNPs with catch-up growth characteristics, body composition and abdominal fat partitioning in SGA children.

-The association between placental expression and methylation (epigenetic changes) of genes involved in glucose and lipid metabolism, inflammation and adipogenesis on longitudinal

growth, glucose metabolism and risk factors for cardiovascular disease and type 2 diabetes in newborns born SGA, appropriate-for gestational-age (AGA) and large-for-gestational-age (LGA).

-The usefulness of insulin sensitizers as modifiers of cardiovascular and type 2 diabetes mellitus risk factors, body composition, pubertal onset and progression in SGA girls with excessive catch-up growth and advanced and rapidly progressive puberty.

-The effects of low-dose combinations of insulin sensitizers and antiandrogens on cardiovascular risk parameters, body fat, ovulation and gene expression in adipose tissue in adolescents with ovarian hyperandrogenism, hyperinsulinism and cardiovascular risk factors.

-The influence of genetic polymorphisms on the clinical response to insulin sensitization.

Publications

Soluble fatty acid synthase relates to bone biomarkers in prepubertal children
Prats-Puig A, Puig T, Sitjar C, Mas-Parareda M, Grau-Cabrera

P, Soriano-Rodríguez P, Montesinos-Costa M, Diaz M, de Zegher F, Ibáñez L, Bassols J, López-Bermejo A
Osteoporos Int, 23, 2053-2058 (2012)
PMID 21877200. Q1. IF 4.580. Programme 4

Relative hypoadiponectinemia, insulin resistance, and increased visceral fat in euthyroid prepubertal girls with low-normal serum free thyroxine

Prats-Puig A, Sitjar C, Ribot R, Calvo M, Clausell-Pomés N, Soler-Roca M, Soriano-Rodríguez P, Osiniri I, Ros-Miquel M, Bassols J, de Zegher F, Ibáñez L, López-Bermejo A
Obesity, 20, 1455-1461 (2012)

PMID 21738234. Q1. IF 4.284. Programme 4

Ethinyl estradiol-cyproterone acetate versus low-dose pioglitazone-flutamide-metformin for adolescent girls with androgen excess: divergent effects on CD163, TWEAK receptor, ANGPTL4, and LEPTIN expression in subcutaneous adipose tissue

Díaz M, Chacón MR, López-Bermejo A, Maymó-Masip E, Salvador C, Vendrell J, de Zegher F, Ibáñez L
J Clin Endocrinol Metab, 97, 3630-3638 (2012)

PMID 22791755. Q1. IF 5.967. With other Ciberdem groups: Vendrell J. Programme 4

Carotid intima-media thickness at 7 years of age: relationship to C-reactive protein rather than adiposity

Osiniri I, Sitjar C, Soriano-Rodríguez P, Prats-Puig A, Casas-Satre C, Mayol L, de Zegher F, Ibáñez L, Bassols J, López-Bermejo A

J Pediatr, 160, 276-280 (2012)

PMID 21875718. 1st decile. IF 4.115. Programme 4

Abundance of circulating preadipocyte factor 1 in early life
de Zegher F, Díaz M, Sebastiani G, Martín-Ancel A, Sánchez-Infantes D, López-Bermejo A, Ibáñez L

Diabetes Care, 35, 848-849 (2012)

PMID 22338099. 1st decile. IF 8.087. Programme 4

Body composition and circulating high-molecular-weight adiponectin and IGF-I in infants born small for gestational age: breast- versus formula-feeding

de Zegher F, Sebastiani G, Diaz M, Sánchez-Infantes D, Lopez-Bermejo A, Ibáñez L

Diabetes, 61, 1969-1973 (2012)

PMID 22648385. 1st decile. IF 8.286. Programme 4

Placental expression of peroxisome proliferator-activated receptor γ (PPAR γ): relation to placental and fetal growth

Díaz M, Bassols J, López-Bermejo A, Gómez-Roig MD, de Zegher F, Ibáñez L

J Clin Endocrinol Metab, 97, E1468-1472 (2012)

PMID: 22689692. Q1. IF 5.967. Programme 4

On the potential of metformin to prevent preterm delivery in women with polycystic ovary syndrome - an epi-analysis

Vanky E, de Zegher F, Díaz M, Ibáñez L, Carlsen SM

Acta Obstet Gynecol Scand, 91, 1460-1464 (2012)

PMID 23006146. Q2. IF 1.771. Programme 4

Research grants

Infant manifestations of adult obesity susceptibility genotypes
Research Unit, European Society for Paediatric Endocrinology, ESPE Research Unit Grant: 2010-2012

Principal Investigators: Lourdes Ibáñez, Ken Ong, Francis de Zegher, David Dunger, Barbara Heude, Marie-Aline Charles
Coordinator: Ken Ong

European project. Programme 4

Intrauterine restriction and endocrine-metabolic abnormalities (proficient post-doc contracts in health research «Sara Borrell»)
MICINN-ISCIII, CD10/00234: 2010-2014

Principal Investigator: David Sánchez Infantes
National project. Programme 4

Intensificación de la actividad investigadora en el SNS

ISCIII, INT10/205: 2011-2012

Principal Investigator: Lourdes Ibáñez
National project. Programme 4

Efectos endocrino-metabólicos y sobre la adiposidad visceral de la administración de metformina a dosis bajas en niños prepuberales con bajo peso al nacer par la edad gestacional, recuperación postnatal espontánea de peso y talla, y marcadores de riesgo

ISCIII, EC08/00160: 2009-2012

Principal Investigator: Lourdes Ibáñez
National project. Programme 4

Ayuda para contratos de formación en investigación “Rio Hortega” - Nuria Sanz

ISCIII, CM10/00094: 2011-2014

Principal Investigator: Lourdes Ibáñez
National project. Programme 4

Efectos sobre marcadores de riesgo cardiovascular de la adición de metformina al tratamiento con hormona de crecimiento en pacientes prepuberales con antecedentes de peso bajo al nacer para la edad gestacional y sin recuperación de talla postnatal

ISCIII, TRA-131: 2010-2012

Principal Investigator: Paula Casano
National project. Programme 4

Endocrine-metabolic profile and body composition in infants born large-for-gestational age

Hospital Sant Joan de Déu, AFR 09/00020: 2009-2012

Principal Investigator: Lourdes Ibáñez
Associate investigator: Miriam Pérez Cruz
National project. Programme 4

The influence of the erythrocyte fatty acid profile (as a surrogate of lipid intake in pregnant women during the third trimester) on postnatal growth, and on the adipokine profile in newborns born both small and appropriate for gestational age

Hospital Sant Joan de Déu, AFR 10/00026: 2010-2012

Principal Investigator: Lourdes Ibáñez
Associate investigator: Nuria Sanz
Autonomous Community project. Programme 4

Repercussió de les alteracions prenatales i perinatales en el desenvolupament postnatal

Agència de Gestió d'Ajuts Universitaris i de Recerca, 2009SGR828: 2009-2013

Principal Investigator: Lourdes Ibáñez

Autonomous Community project. Programme 4

Determinantes genéticos del crecimiento prenatal y postnatal: asociación con marcadores precoces de riesgo cardiovascular y síndrome metabólico

PI11/02403: 2012-2015

Principal Investigator: Lourdes Ibáñez

Associate investigators: Edurne Mazarico, Paula Casano, Marta Diaz, Joan Sabrià, Luis del Rio, David Sanchez-Infante, Nuria Sanz, Giorgia Sebastiani

National project. Programme 4

The effects of metformin on cardiovascular risk factors in prepubertal children born small for gestational age without postnatal catch-up growth, currently treated with growth hormone

Pfizer, PCP00046: 2009-2012

Principal Investigator: Lourdes Ibáñez

Associate investigators: Paula Casano, Marta Díaz, Carme Valls, María Victoria Marcos

Private funds. Programme 4

Clinical trials

Efectos endocrino-metabólicos y sobre la adiposidad visceral de la administración de metformina a dosis bajas en niños prepúberales con bajo peso al nacer por la edad gestacional, recuperación postnatal espontánea de peso y talla, y marcadores de riesgo

ISCIII2009-009944-21: 2009-2012

Coordinator: Lourdes Ibáñez

Efectos sobre marcadores de riesgo cardiovascular de la adición de metformina al tratamiento con hormona de crecimiento en pacientes prepúberales con antecedentes de peso bajo al nacer para la edad gestacional y sin recuperación de talla postnatal

ISCIII2009-016246-12: 2009-2012

Coordinator: Paula Casano Sancho

PhD theses

Prevalencia de ovarios poliquísticos en adolescentes sanas y en adolescentes con antecedente de pubarquia precoz. Nuevas aportaciones de la ecografía tridimensional

Author: Nuria Conde Cuevas

Thesis advisor: Lourdes Ibáñez

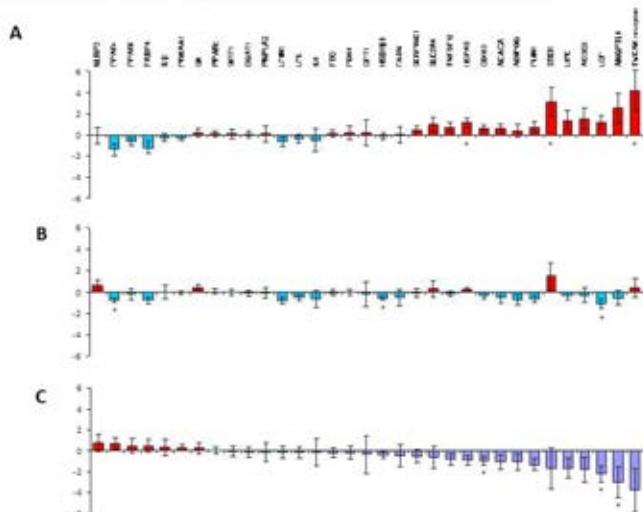
University: Universitat de Barcelona

Thesis defense date: April 27, 2012

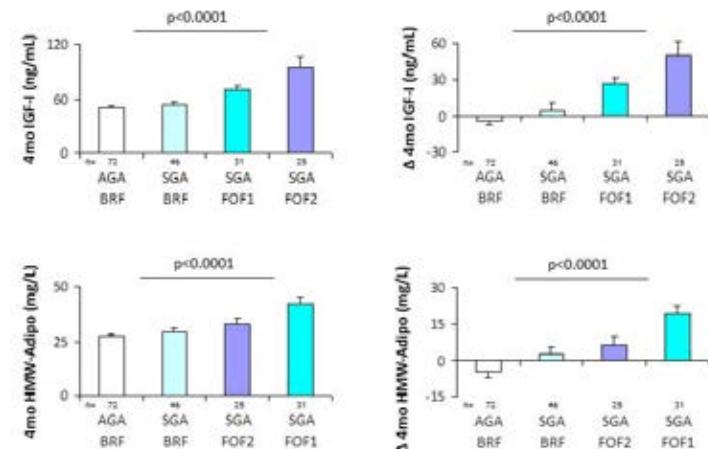
Awards

Premio Frederik Paulsen a la Investigación. Sociedad Española de Endocrinología Pediátrica (2012)

Awardee: Lourdes Ibáñez Toda



Results of gene expression analyses in subcutaneous tissue of adolescent girls with androgen excess who were randomized to receive ethynodiolide-proneacetate (EE-CA, N=14) or low-dose pioglitazone-flutamide-metformin (PioFluMet, N=17) for 12 months. Histograms show mean and SEM results for 0-12 months changes in gene expression for EE-CA (upper panel, A) and PioFluMet-treated girls (middle panel, B). The lower panel (C) shows the between-treatment differences in 0-12 mo changes in gene expression. Significant within- and between-treatment differences in gene expression are marked with asterisks.



Results of circulating TGF-I and high-molecular weight (HMW) adiponectin at age 4 mo (left panels) and changes thereof between birth and age 4 mo in breast-fed (BRF) infants born appropriate-for-gestational age (AGA) and in infants born small-for-gestational age (SGA) who were either breastfed (BRF) or formula-fed (FOF) with formula 1 (FOF1) or 2 (FOF2). Mean and SEM are shown. P values are from general linear models.

Islet cell and stem cell physiology

Universidad Pablo de Olavide, Centro Andaluz de Biología Molecular y Medicina Regenerativa, Sevilla
www.cabimer.es



Principal Investigator Franz Martín fmarber@upo.es **Associate researchers** Francisco Bedoya, Genoveva Berná, Gladys Cahuana, Remedios Ramírez, Bernat Soria, Juan Tejedo, Anabel Rojas, Ángeles Ortega, Abdelkrim Hmadcha **PhD students** Manuel Carrasco, Rafael Tapia, Estefanía Caballano, Carmen Salguero, Irene Delgado, Enrique Jurado, Daniela Pezolla, Emilio López **Lab technicians** Raquel Araujo, Irene Díaz Contreras, Antonio Cárdenas, Ana Belén Hitos

Publications: 2 Research grants: 15 Clinical trials: 3

Programmes

Programme 3. Impact of beta cell dysfunction and plasticity on the natural history of diabetes. Development of novel treatment strategies.

Keywords

Beta-cell signal transduction. Islet degeneration and damage. Islet development. Nutrition.

Main lines of research

- The study of interactive pathways implicated in 'stemness'.
- The role of NO in embryonic stem cell differentiation and survival.
- Transcriptional network operating during pancreas development.
- The differentiation of human embryonic stem cells (hESCs) to beta-cell like.

- The obtention of IPS and differentiation to beta-cell like.
- The role of endothelial factors in adult islet-cell proliferation.
- The regulation of beta-cell survival.
- Clinical trials for diabetes complications.
- Glucotoxicity and lipotoxicity.

Publications

GATA4 and GATA6 control mouse pancreas organogenesis
Carrasco M, Delgado I, Soria B, Martín F, Rojas A
J Clin Invest, 122, 3504-3515 (2012)
[PMID 23006330](#). 1st decile. IF 13.069. Programme 3

Consumption of cow's milk is associated with lower risk of type 2 diabetes mellitus. A cross-sectional study
Morcillo S, Atencia JA, Ortega A, Bilbao JR, Rubio-Martin E, Rojo-Martinez G, Esteval Valdes S, Oliveira G, Castano L
International Dairy Journal, 26, 162-165 (2012)

S0958694612000787. Q1. IF 2.401. With other Ciberdem groups: Castaño L, Soriguer F. Programme 3

Research grants

Diabetes mellitus cell therapy: the role of intercellular signalling pathways and intracellular material transfer

ISCIII, PI-10/00964: 2011-2013

Principal Investigator: Bernat Soria

National project. Programme 3

Cell therapy for critical lower-limb ischemia in type 2 diabetes insulinized patients: a study of insulin demand

MSPS/Dirección General de terapias Avanzadas, TRA-120: 2010-2012

Principal Investigator: Bernat Soria

National project. Programme 3

Uso del óxido nítrico para generar líneas celulares a partir de células madre y progenitores de origen adulto

MICINN, IPT-2011-1615-900000: 2011-2014

Principal Investigators: Bernat Soria, Juan Tejedo

National project. Programme 3

Métodos para la verificación del cumplimiento de la dieta en caso de intolerancia alimentarias mediante la detección de marcadores serológicos

MICINN, IPT-2011-0952-900000: 2011-2014

Principal Investigator: Franz Martín

National project. Programme 3

Investigación y desarrollo de nuevas posibilidades de aplicaciones terapéuticas en el aceite de oliva

MICINN, IPT-060000-2010-028: 2010-2013

Principal Investigator: Franz Martín

National project. Programme 3

Guía para la sustantación de declaraciones en salud en alimentos: funciones inmune, cognitiva y síndrome metabólico

MICINN, IPT-20111008: 2011-2014

Principal Investigator: Franz Martín

National project. Programme 3

The role of endothelial factors in the obtention of insulinsecreting cells from adult pancreatic stem cells

Consejería de Salud, Junta de Andalucía, PI00022/2008: 2009-2012

Principal Investigator: Franz Martín

Associate investigators: Patricia Moreno, Elvira León, Verónica Rivero, Javier Navarro

Autonomous Community project. Programme 3

Transcriptional control during endoderm pancreas development

Consejería de Salud, Junta de Andalucía, PI0008/10: 2010-2012

Principal Investigator: Anabel Rojas

Associate investigators: Raquel Araujo, Genoveva Berná, Gladys M Cahuana

Autonomous Community project. Programme 3

Obtención de células productoras de insulina a partir de células

pluripotenciales (Terapia celular de la diabetes mellitus) Consejería de Innovación, Ciencia y Empresa. Junta de Andalucía, CTS-6505: 2011-2013
Principal Investigator: Bernat Soria
Autonomous Community project. Programme 3

Regulación del estado de autorenovación y pluripotencia de células troncales embrionarias por el óxido nítrico
Consejería de Salud, Junta de Andalucía, PI-0723: 2011-2012
Principal Investigator: Juan Tejedo
Autonomous Community project. Programme 3

Optimización de la producción de endodermo definitivo
Consejería de Salud, Junta de Andalucía, PI 0105/2010: 2011-2013
Principal Investigator: Francisco Bedoya
Autonomous Community project. Programme 3

Red Española de Terapia Celular
RETICS, RD06/0010/0025: 2007-2012
Principal Investigator: Bernat Soria
Associate investigators: Francisco Bedoya, Juan Tejedo, Franz Martín, Karim Hmadcha
National project. Programme 3

Elaboración de una novedosa bebida de naranja de baja graduación alcohólica y evaluación de su potencial efecto beneficioso para la salud
Consejería de Innovación, Ciencia y Empresa. Junta de Andalucía, CTS-4026: 2010-2012
Principal Investigator: Soledad Fernández Pachón
Autonomous Community project. Programme 3

Guía para la sustantación de declaraciones en salud en alimentos: funciones inmune, cognitiva y síndrome metabólico
Ministerio de Ciencia e Innovación, IPT-045032-2011-21: 2012-2014
Principal Investigator: Franz Martín
Associate investigators: Genoveva Berna
National Project. Programme 3

Interacciones mesenquima-epitelio mediadas por el factor de transcripción GATA4 en la formación del hígado y del páncreas

FIS PI11/01125: 2012-2014

Principal Investigator: Anabel Rojas

Associate investigators: Irene Delgado

National project. Programme 3

Scientific collaborations within Ciberdem

ANTIBECELL: The production of monoclonal antibodies which selectively react with cell surface molecules on human pancreatic beta cells

Coordinator: Juan Tejedo

Ciberdem groups: Martín F, Montanya E, Nadal A

Clinical trials

Ensayo clínico fase I/II multicéntrico, abierto y aleatorizado para el estudio del uso de células troncales mesenquimales de tejido

adiposo (CeTMAd) como terapia de regeneración celular en el síndrome de isquemia crónica crítica de miembros inferiores en pacientes no diabéticos

ISCIII CeTMAd/ICC/2009, 2009-013554-32: 2009 -2013

Coordinator: Ruiz Salmeron R

Programme 3

Uso de células troncales mesenquimales de tejido adiposo (CeTMAd) como terapia de regeneración celular en el síndrome de isquemia crónica crítica de miembros inferiores en pacientes diabéticos

ISCIII CeTMAd/ICPD/2008, 2008-001837-88: 2008-2013

Coordinator: De la Cuesta A

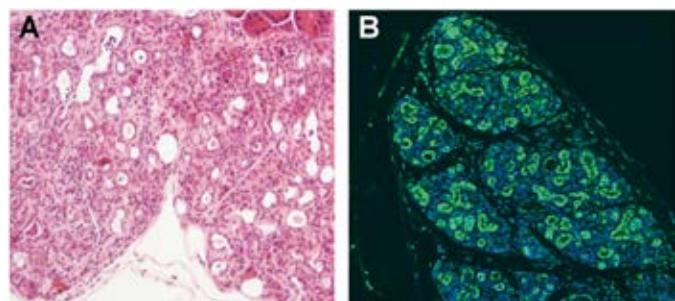
Programme 3

Ensayo clínico fase I/II multicéntrico, abierto, aleatorizado y controlado para el estudio del uso de las células madre como terapia celular en isquemia crítica de miembros inferiores en pacientes diabéticos tipo 2 insulinizados: estudios de las necesidades de insulina

ISCIII CeTMMoTa/ICPDI/2010, 2010-019774-33 : 2010-2013

Coordinator: Bernat Soria

Programme 3



Modelo de pancreatitis inducida por ceruleína. A: Hematoxilina-eosina de metaplasias ductales. B: Inmunohistoquímica mostrando expresión de Sox9 en las lesiones metaplásicas.

Lipids and Arteriosclerosis Research Unit

Institut d'Investigació Sanitària Pere Virgili, Hospital Universitari Sant Joan de Reus
www.iispv.cat



Principal Investigator Lluís Masana luis.masana@urv.cat **Research directors** Josep Ribalta, Rosa Solà **Senior researchers** Anna Cabré, Joan Carles Vallvé **Associate researchers** Núria Plana, Raimon Ferré **Nutritionist** Jordi Merino **Postdoctoral fellows** Montserrat Guardiola, Rosa Maria Valls, Sandra Guaita, Úrsula Catalán **PhD students** Anna Pedret, Paula Saavedra, Daiana Ibarretxe, Alba Bosquet, Iris Oliva **Lab manager** Josefa Girona **Lab technicians** Mercedes Heras, Carme Buixadera, Sara Fernández, Roser Rosales **Administrative staff** Silvia Solé

Publications: 16 Research grants: 7 Clinical trials: 6 PhD theses: 1 Spin-offs: 1 Awards: 2

Programmes

Programme 1. Molecular and physiological determinants of lifestyle in diabetes/obesity. Population studies for genetic-epigenetic association analysis in type 2 diabetes mellitus and related traits.

Programme 2. Mechanisms promoting the development of diabetes and its vascular complications. Associated disorders and co-morbidities. Strategies for prevention and treatment.

Keywords

Insulin sensitivity and resistance. Metabolic syndrome. Biomarkers and imaging. Endothelium. Macrovascular disease. Nutrigenomics.

Main lines of research

-Atherogenic dyslipidaemia in diabetes, obesity and metabolic

syndrome.

- The characterization of plasma lipoprotein subclasses by NMR, metabolomics and lipidomics.
- Adipose tissue dysfunction as a major determinant of AD.
- Fatty Acid-Binding Proteins (FABPs) and insulin resistance in different tissues.
- Fatty acids and adipokine-induced endothelial dysfunction.
- AD and subclinical atherosclerosis.
- FFA, extracellular matrix and artery wall dysfunction in diabetes.
- The epigenetics of atherosclerosis.
- The impact of nutrition on metabolic and cardiovascular risk.
- Nutrigenomics.

Publications

APOA5 gene expression in the human intestinal tissue and its response to in vitro exposure to fatty acid and fibrate
Guardiola M, Alvaro A, Vallvé JC, Rosales R, Solà R, Girona J,

Serra N, Duran P, Esteve E, Masana L, Ribalta J
Nutr Metab Cardiovasc Dis, 22, 756-762 (2012)
PMID 21489765. Q1. IF 3.731. Programme 1

Small artery dilation and endothelial markers in cardiovascular risk patients
Aragonès G, Ferré R, Girona J, Plana N, Merino J, Heras M, Masana L
Eur J Clin Invest, 42, 34-41 (2012)
PMID 21631467. Q1. IF 3.018. Programme 2

Two variants in the fibulin2 gene are associated with lower systolic blood pressure and decreased risk of hypertension
Vallvé JC, Serra N, Zalba G, Fortuño A, Beloqui O, Ferre R, Ribalta J, Masana L
PLoS ONE, 7, e43051 (2012)
PMID 22912785. Q1. IF 4.092. Programme 2

Fatty acid-binding protein 4 impairs the insulin-dependent nitric oxide pathway in vascular endothelial cells
Aragonès G, Saavedra P, Heras M, Cabré A, Girona J, Masana L
Cardiovasc Diabetol, 11:72 (2012)
PMID 22709426. Q2. IF 3.346. Programme 2

Apolipoprotein E gene mutations in subjects with mixed hyperlipidemia and a clinical diagnosis of familial combined hyperlipidemia
Solanas-Barca M, de Castro-Orós I, Mateo-Gallego R, Cofán M, Plana N, Puzo J, Burillo E, Martín-Fuentes P, Ros E, Masana L, Pocoví M, Civeira F, Cenarro A
Atherosclerosis, 222, 449-455 (2012)
PMID 22481068. Q1. IF 3.794. With other CIBERs: CIBERER, CIBEROBN. Programme 2

FABP4 predicts atherogenic dyslipidemia development. The PREDIMED study
Cabré A, Babio N, Lázaro I, Bulló M, García-Arellano A, Masana L, Salas-Salvadó J
Atherosclerosis, 222, 229-234 (2012)
PMID 22420890. Q1. IF 3.794. With other CIBERs: CIBEROBN. Programme 1

Cocoa, hazelnuts, sterols and soluble fiber cream reduces lipids and inflammation biomarkers in hypertensive patients: a randomized controlled trial
Solà R, Valls RM, Godàs G, Perez-Busquets G, Ribalta J, Girona J, Heras M, Cabré A, Castro A, Domenech G, Torres F, Masana L, Anglés N, Reguant J, Ramírez B, Barriach JM
PLoS One, 7, e31103 (2012)
PMID 22383996. Q1. IF 4.092. Programme 2

Lifestyle changes lower FABP4 plasma concentration in patients with cardiovascular risk
Lázaro I, Ferré R, Plana N, Aragonès G, Girona J, Merino J, Heras M, Cabré A, Masana L
Rev Esp Cardiol (Engl Ed), 65, 152-157 (2012)
PMID 22153726. Q2. IF 2.530. Programme 2

Effects of therapeutic lifestyle changes on peripheral artery

tonometry in patients with abdominal obesity
Ferré R, Plana N, Merino J, Aragonès G, Girona J, Heras M, Coll B, Cos R, Masana L
Nutr Metab Cardiovasc Dis, 22, 95-102 (2012)
PMID 20708393. Q1. IF 3.731. Programme 1

Carotid atherosclerosis and lipoprotein particle subclasses in familial hypercholesterolemia and familial combined hyperlipidaemia
Jarauta E, Mateo-Gallego R, Gilabert R, Plana N, Junyent M, de Groot E, Cenarro A, Masana L, Ros E, Civeira F
Nutr Metab Cardiovasc Dis, 22, 591-597 (2012)
PMID 21196102. Q1. IF 3.731. With other CIBERs: CIBEROBN. Programme 2

Complement system and small HDL particles are associated with subclinical atherosclerosis in SLE patients
Parra S, Vives G, Ferré R, González M, Guardiola M, Ribalta J, Castro A
Atherosclerosis, 225, 224-230 (2012)
PMID 23031360. Q1. IF 3.794. Programme 2

Alpha-tocopherol and BAY 11-7082 reduce vascular cell adhesion molecule in human aortic endothelial cells
Catalán U, Fernández-Castillejo S, Pons L, Heras M, Aragónés G, Anglés N, Morelló JR, Solà R
J Vasc Res, 49, 319-328 (2012)
PMID 22572606. Q2. IF 2.651. Programme 2

Inhibition of the transcription factor c-Jun by the MAPK family, and not the NF-κB pathway, suggests that peanut extract has anti-inflammatory properties
Catalán U, Fernández-Castillejo S, Anglés N, Morelló JR, Yebras M, Solà R
Mol Immunol, 52, 125-132 (2012)
PMID 22673210. Q2. IF 2.897. Programme 2

Polyphenol-rich foods exhibit DNA antioxidative properties and protect the glutathione system in healthy subjects
Pedret A, Valls RM, Fernández-Castillejo S, Catalán U, Romeu M, Giralt M, Lamuela-Raventós RM, Medina-Remón A, Arija V, Aranda N, Espinol A, Delgado MA, Solà R
Mol Nutr Food Res, 56, 1025-1033 (2012)
PMID 22760977. 1st decile. IF 4.301. Programme 1

Impact of olive oil phenolic concentration on human plasmatic phenolic metabolites
Rubió L, Valls RM, Macià A, Pedret A, Giralt M, Romero MP, de la Torre R, Covas MI, Solà R, Motilva MJ
Food Chem, 135, 2922-2929 (2012)
PMID 22980891. 1st decile. IF 3.655. Programme 1

Particle size measurement of lipoprotein fractions using diffusion-ordered NMR spectroscopy
Mallol R, Rodríguez MA, Heras M, Vinaixa M, Plana N, Masana L, Morris GA, Correig X
Anal Bioanal Chem, 402, 2407-2415 (2012)
PMID 22293969. Q1. IF 3.778. With other Ciberdem groups: Correig X. Programme 1

Research grants

Dislipemia aterógena de la obesidad, síndrome metabólico y diabetes tipo 2: caracterización metabólica y mecanismos patogénicos

FIS, PI081409: 2009-2012

Principal Investigator: Lluís Masana

Associate investigator: Jesús Brezmes

National project. Programme 2

Caracterización bioquímica, metabólica y genética de la hipertrigliceridemia asociada a alto riesgo cardiovascular

FIS, PI081579: 2009-2012

Principal Investigator: Josep Ribalta

Associate investigator: Nicolau Cañellas

National project. Programme 1

Aceite de oliva virgen y función de las lipoproteínas de alta densidad (HDL), un modelo de preparación especializada de un alimento funcional

Ministerio de Ciencia e Innovación, AGL2009-13517-C03-03: 2008-2012

Research Director: Rosa Solà

National project. Programme 1

Papel de los diferentes tipos de ácidos grasos y de la proteína de unión a ácidos grasos 4 (FABP4) en el remodelado de la pared arterial asociado a pacientes diabéticos

ISCIII, PI10/02547: 2011-2013

Principal Investigator: Joan Carles Vallvé

National project. Programme 2

La fatty acid binding protein adipocitaria (FABP4) modula el estrés del retículo endoplasmático y otros mecanismos de resistencia a insulina inducidos por ácidos grasos

PI11/02216, ISCIII: 2012-2014

Principal Investigators: Lluis Masana, Mercedes Heras

Associate investigators: Anna Cabre, Jordi Merino, Carme Buixadera, Paula Saavedra, Daiana Ibarretxe

National project. Programme 2

Efecte de la dieta Mediterrània sobre el control epigenètic de marcadors inflamatoris

2011LINE-14: 2012

Principal Investigator: Montserrat Guardiola

National project. Programme 1

Efecto de la dieta Mediterránea sobre el control epigenético de marcadores inflamatorios

Beca FEA/SEA 2011, Sociedad Española de Arteriosclerosis: 2012-2013

Principal Investigator: Montserrat Guardiola

Associate investigators: Josep Ribalta, Joan Carles Vallve, Jordi Salas, David Monk, Dolores Corella

Private funds. Programme 1

Scientific collaborations within Ciberdem

Ciberdem Biobank

Coordinator: Anna Novials

Ciberdem Biobank nodes: Masana L, Gomis R, Novials A,

Vendrell J, Castaño L, Serrano-Ríos M, Soriguer F, Carmena R, Blanco-Vaca F

Clinical trials

Estudio de extensión abierto (OLE), controlado y multicéntrico para evaluar la seguridad y la eficacia a largo plazo de AMG 145

2011-001915-29: 2012 - 2017

Coordinator: Lluís Masana

Collaborators: Nuria Plana, Raimon Ferre, Daiana Ibarretxe *Programme 2*

Perfil de seguridad y tolerabilidad a largo plazo de RENG727/SAR236553 en pacientes con alto riesgo cardiovascular con hipercolesterolemia no controlada adecuadamente con su terapia modificadora de lípidos: un estudio aleatorizado, doble ciego, controlado con placebo

2011-002806-59: 2012-2014

Coordinator: Nuria Plana

Collaborators: Lluis Masana, Raimon Ferre, Daiana Ibarretxe *Programme 2*

Estudio multicéntrico y aleatorizado para evaluar la tolerabilidad y eficacia de AMG 145 en el colesterol LDL, en comparación con ezetimiba, en sujetos hipercolesterolémicos incapaces de tolerar una dosis eficaz de un inhibidor de la HMG-CoA reductasa

(ESTUDIO GAUS)

20090159-26: 2011-2012

Coordinator: Lluís Masana

Collaborators: Nuria Plana, Daiana Ibarretxe *Programme 2*

Estudio multicéntrico, controlado con placebo, aleatorizado y a doble ciego para evaluar la tolerabilidad y eficacia de AMG 145 en el colesterol LDL en sujetos con hipercolesterolemia familiar heterocigótica (Estudio RUTHERFORD)

20090158-39: 2011-2012

Coordinator: Lluis Masana

Collaborators: Nuria Plana, Daiana Ibarretxe *Programme 2*

Estudio de 12 semanas internacional, multicéntrico, doble ciego, aleatorizado, con grupos paralelos, controlado con placebo para evaluar la eficacia y la seguridad de niacina de liberación prolongada (LP)/laropiprant sumado a terapia modificadora de lípidos continuada en pacientes con hipercolesterolemia primaria y dislipidemia mixta

2010-021627-27: 2012-2013

Coordinator: Lluis Masana

Collaborators: Nuria Plana, Raimon Ferre, Daiana Ibarretxe *Programme 2*

Ensayo en Fase III de largo plazo, randomizado, en grupos paralelos, doble ciego, controlado con placebo, para evaluar la seguridad y eficacia de 50µg y 100 µg/día de eprotirome en pacientes con hipercolesterolemia familiar heterocigótica que están bajo un tratamiento de referencia habitual adecuado

2011-001483-21: 2011-2012

Coordinator: Lluís Masana

Collaborators: Nuria Plana, Daiana Ibarretxe

Programme 2

PhD theses

Effect of Food Extracts and Bioactive Food Compounds on the Mechanism of Atherosclerosis and Nutritional Biomarkers

Author: Úrsula Catalán Santos

Thesis advisor: Rosa Solà Alberich

University: Universitat Rovira i Virgili (URV)

Thesis defense date: July 13, 2012

Spin offs

Beyond Food SL

Description: Support to industry for the validation of functional food

Researchers: L. Masana, R. Solà, JC. Vallvé, J. Ribalta, J. Girona, C. Prats

Collaborating institution: Universitat Rovira i Virgili

CiberDEM Group: L. Masana

Programme 1

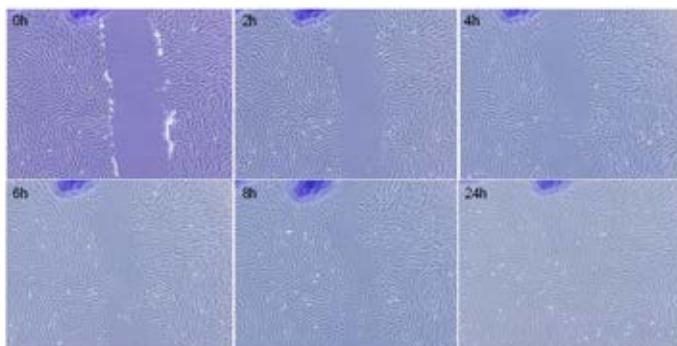
Awards

Premis extraordinaris de doctorat del curs 2010-2011 (2012)

Awardee: Iolanda Lázaro López

Premio FEA/SEA “Dr. Esteve” al trabajo titulado: “FABP4, función endotelial y grosor de la íntima-media carotídeo en pacientes con riesgo cardiovascular” (2012)

Awardees: Gemma Aragónés, Raimon Ferré, Núria Plana, Jordi Merino, Josefa Girona, Lluís Masana



Migration of human artery smooth muscle cells (HCASMC). The cells were cultured in 12-well plates, and after the induction of quiescence, a single scratch wound was created in the centre of the cell monolayer by the gentle removal of the attached cells with a sterile plastic pipette tip. Images of the cells migrating into the wound were taken at 0h and then every 2h until the scratch wound was closed at 24h; the images were compared to quantify the migration rate of the cells. The closure of the wound was considered to represent 100% migration. The cell images were captured using a microscope (Olympus IX71).

Group of Research into Diabetes and Metabolism

Hospital Universitari de Bellvitge, Institut d'Investigació Biomèdica de Bellvitge, Universitat de Barcelona
www.bellvitgehospital.cat / www.idibell.cat / www.ub.edu



Principal Investigator Eduard Montanya montanya@ub.edu **Associate researchers** José Manuel Gómez, Montserrat Nacher, Manuel Pérez, Juan Soler, Noèlia Téllez, Nuria Vilarrasa **Research assistant** Elisabet Estil·les **PhD students** Jorge Caballero, Mar Pairó, Patricia San Jose **Lab technician** Cristofer Garcia Carrasco

Publications: 4 Research grants: 4 Clinical trials: 1

Programmes

Programme 3. Impact of beta cell dysfunction and plasticity on the natural history of diabetes. Development of novel treatment strategies.

Programme 4. Use of biomedical approach systems to develop personalized therapies for diabetes.

Keywords

Islet degeneration and damage. Islet development. Islet transplantation. Gastro-entero pancreatic factors. Obesity.

Main lines of research

The group has two main lines of research: the study of the cellular and molecular biology of pancreatic islet cells and the study of insulin secretion and resistance in obesity. The specific focus of the line of research on pancreatic islets is the mechanisms of destruction, protection and regeneration of pancreatic beta cells with a particular interest in the cell therapy of diabetes. The line of research into obesity is focused on the metabolic and

molecular regulation of insulin resistance by adipose tissue, and the impact of bariatric surgery on glucose metabolism.

Publications

Comparison of liraglutide versus other incretin-related anti-hyperglycaemic agents

Blonde L, Montanya E

Diabetes Obes Metab, 14, 20-32 (2012)

PMID: 22405266. Q2. IF 3.379. Programme 3

A comparison of currently available GLP-1 receptor agonists for the treatment of type 2 diabetes

Montanya E

Expert Opin Pharmacother, 13, 1451-1467 (2012)

PMID: 22725703. Q2. IF 3.205. Programme 3

Efficacy and safety of switching from the DPP-4 inhibitor sitagliptin to the human GLP-1 analog liraglutide after 52 weeks in metformin-treated patients with type 2 diabetes: a

randomized, open-label trial

Pratley RE, Nauck MA, Bailey T, Montanya E, Filetti S, Garber AJ, Thomsen AB, Furber S, Davies M; for the 1860-LIRA-DPP-4 Study Group

Diabetes Care, 35, 1986-1993 (2012)

PMID 22851600. 1st decile. IF 8.087. Programme 3

A nontargeted proteomic approach to the study of visceral and subcutaneous adipose tissue in human obesity

Insenser M, Montes-Nieto R, Vilarrasa N, Lecube A, Simó R, Vendrell J, Escobar-Morreale HF

Mol Cell Endocrinol, 363, 10-19 (2012)

PMID 22796336. Q2. IF 4.192. With other Ciberdem groups: Escobar-Morreale H, Simó R, Vendrell J. Programme 4

Research grants

IMMEEDIA-Immunomodulatory Effects of Exercise in Type 1 Diabetes

IRSES-247472: 2010-2014

Coordinator: R Cobella

Principal Investigator: Eduard Montanya

European project. Programme 4

Diferenciación de células productoras de insulina a partir de células troncales del páncreas adulto. Aplicación en terapia celular de la diabetes

ISCIII, PI10/00636: 2010-2013

Principal Investigator: Eduard Montanya

National project. Programme 3

Grup de Recerca en Diabetes i Metabolisme

Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR)

2009SGR201: 2009-2013

Principal Investigator: Eduard Montanya

Autonomous Community project. Programme 4

Factores pronósticos y fisiopatología de la remisión de la diabetes mellitus tipo 2 tras la cirugía bariátrica

PI 11/01960: 2011-2014

Principal Investigator: Nuria Vilarrasa Garcia

National project. Programme 4

Scientific collaborations within Ciberdem

STEMOB: Adult adipose tissue-derived progenitor cells: the influence of the clinical phenotype and adipose depot origin on their biological properties

Coordinator: Joan J Vendrell

Ciberdem groups: Montanya E, Vendrell J, Zorzano A, Balsinde J, Gómez-Foix AM, Simó R, Vázquez-Carrera M

DIASOBS: Determinants of insulin resistance and glucose tolerance disorders, including diabetes, in severe obesity and their changes after bariatric surgery-induced weight loss

Coordinator: Héctor F Escobar Morreale

Ciberdem groups: Montanya E, Correig X, Escobar- Morreale HF, Simó R, Vendrell J

ANTIBECELL: The production of monoclonal antibodies which selectively react with cell surface molecules on human pancreatic beta cells

Coordinator: Juan Tejedo

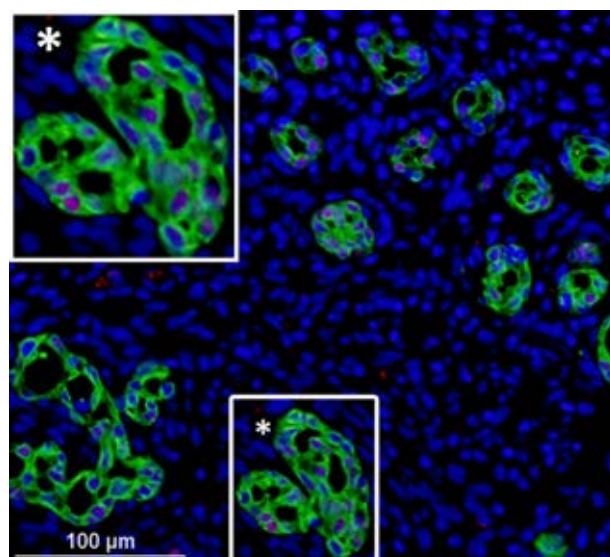
Ciberdem groups: Montanya E, Martín F, Nadal A

Clinical trials

Ensayo clínico aleatorizado comparativo entre análogos de insulina e insulina humana en pacientes hospitalizados tratados con nutrición enteral y que presentan hiperglucemia. Estudio INSULINE

2011-006179-20: 2012-2014

Coordinator: Eduard Montanya



Regenerative ductal cells (KRT20+, green) expressing NKX6.1 (red) in pancreatic remnants after 90%-pancreatectomy. Inset shows a ductal structure with NKX6.1 + nuclei at higher magnification.

Unit of Cell Physiology and Nutrition IB-UHM

Instituto de Bioingeniería, Universidad Miguel Hernández, Elx
<http://diabetes.umh.es>



Principal Investigator Angel Nadal nadal@umh.es **Associate researchers** Esther Fuentes, Elena García, Iván Quesada, Cristina Ripoll, Ana Belén Ropero **Postdoctoral fellows** Paloma Alonso Magdalena, Patricia Ñeco **PhD students** Ernesto Caballero, Marta García Arévalo, Alejandro González, Laura Marroquí, Alba Moratalla, Beatriz Merino, Mónica Lluesma, Esperanza Irles **Lab technicians** María Luisa Navarro, Diego Sevilla, María Salomé Ramón

Publications: 9 Research grants: 5 PhD theses: 2

Programmes

Programme 3. Impact of beta cell dysfunction and plasticity on the natural history of diabetes. Development of novel treatment strategies.

Keywords

Beta-cell signal transduction. Insulin secretion. Insulin sensitivity and resistance. Cytokines.

Main lines of research

-We study the link between endocrine disruptors and type 2 diabetes. We investigate the actions of oestrogens and environmental oestrogenic pollutants in the function of pancreatic alpha and beta cells with an emphasis on the molecular mechanisms involved.

-Signal transduction pathways involved in the function and

pathology of alpha and beta-cells. We study the activation of signalling pathways by leptin receptors. Additionally, we investigate the adaptations of islet-cells to obesity and malnutrition states.

Publications

Role of leptin in the pancreatic β-cell: effects and signaling pathways

Marroquí L, Gonzalez A, Ñeco P, Caballero-Garrido E, Vieira E, Ripoll C, Nadal A, Quesada I
J Mol Endocrinol, 49, R9-17 (2012)
[PMID 22448029](https://pubmed.ncbi.nlm.nih.gov/22448029/). Q2. IF 3.485. Programme 3

Functional and structural adaptations in the pancreatic α-cell and changes in glucagon signaling during protein malnutrition
Marroquí L, Batista TM, Gonzalez A, Vieira E, Rafacho A,

Colleta SJ, Taboga SR, Boschero AC, Nadal A, Carneiro EM, Quesada I
Endocrinology, 153, 1663-1672 (2012)
PMID: 22334714. Q1. IF 4.459. Programme 3

Bisphenol-A acts as a potent estrogen via non-classical estrogen triggered pathways
Alonso-Magdalena P, Ropero AB, Soriano S, García-Arévalo M, Ripoll C, Fuentes E, Quesada I, Nadal Á
Mol Cell Endocrinol, 355, 201-207 (2012)
PMID: 22227557. Q2. IF 4.192. Programme 3

Model for glucagon secretion by pancreatic α-cells
González-Vélez V, Dupont G, Gil A, González A, Quesada I
PLoS One, 7, e32282 (2012)
PMID: 22412861. Q1. IF 4.092. Programme 3

Role of ER β and GPR30 in the endocrine pancreas: A matter of estrogen dose
Ropero AB, Pang Y, Alonso-Magdalena P, Thomas P, Nadal A
Steroids, 77, 951-958 (2012)
PMID: 22306576. Q2. IF 2.829. Programme 3

Insulinotropic effect of the non-steroidal compound STX in pancreatic β-cells
Ropero AB, Alonso-Magdalena P, Soriano S, Juan-Picó P, Roepke TA, Kelly MJ, Nadal A
PLoS ONE, 7, e34650 (2012)
PMID: 22506040. Q1. IF 4.092. Programme 3

Short-term treatment with bisphenol-A leads to metabolic abnormalities in adult male mice
Batista TM, Alonso-Magdalena P, Vieira E, Amaral MEC, Cederroth CR, Nef S, Quesada I, Carneiro EM, Nadal A
PLoS ONE, 7, e33814 (2012)
PMID: 22470480. Q1. IF 4.092. Programme 3

The clock gene rev-erba regulates pancreatic β-cell function: modulation by leptin and high-fat diet
Vieira E, Marroquí L, Batista TM, Caballero-Garrido E, Carneiro EM, Boschero AC, Nadal A, Quesada I
Endocrinology, 153, 592-601 (2012)
PMID: 22166979. Q1. IF 4.459. Programme 3

Rapid insulinotropic action of low doses of bisphenol-A on mouse and human islets of Langerhans: role of estrogen receptor β
Soriano S, Alonso-Magdalena P, García-Arévalo M, Novials A, Muhammed SJ, Salehi A, Gustafsson JA, Quesada I, Nadal A
PLoS ONE, 7, e31109 (2012)
PMID: 22347437. Q1. IF 4.092. With other Ciberdem groups: Novials A. Programme 3

Research grants

Functional and structural adaptations in the alpha-cell and changes glucagon action during obesity
Boehringer-Ingelheim Basic Programme on the Regulation of Secretion and Function of Non-insulin Peptides from the Endocrine Pancreas, 94553 EFSD: 2012-2014
Principal Investigator: Ivan Quesada
European project. Programme 3

Análisis de la función de la leptina y la resistencia a la leptina en células alfa y beta del islote de Langerhans
MICINN, BFU2010-21773: 2011-2013
Principal Investigator: Ivan Quesada
National project. Programme 3

Efectos del Bisfenol-A en la homeostasis de la glucosa, la función del islote de Langerhans y la señalización de insulina en el ratón
BFU2011-28358, Ministerio de Economía y Competitividad: 2012-2014
Principal Investigator: Angel Nadal
National project. Programme 3

Caracterización del efecto insulinotrópico rápido de agonistas específicos del receptor de estrógenos β: implicaciones en el tratamiento de la diabetes. Programa Prometeo para grupos de investigación de excelencia
Generalitat Valenciana, PROMETEO/2011/080: 2012
Principal Investigator: Angel Nadal
Autonomous Community project. Programme 3

Ayuda Complementaria al Proyecto: Análisis de la función de la leptina y la resistencia a la leptina en células alfa y beta del islote de Langerhans
Generalitat Valenciana, ACOMP/2012/145: 2012
Principal Investigator: Ivan Quesada
Autonomous Community project. Programme 3

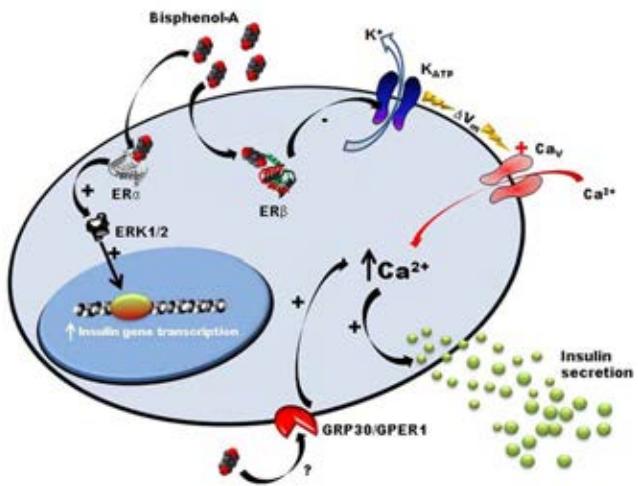
Scientific collaborations within Ciberdem

ANTIBECELL: The production of monoclonal antibodies which selectively react with cell surface molecules on human pancreatic beta cells
Coordinator: Juan Tejedo
Ciberdem groups: Nadal A, Martín F, Montanya E

PhD theses

Regulación por leptina de la proliferación de la célula alfa pancreática
Author: Ernesto Caballero Garrido
Thesis advisor: Ivan Quesada
University: Universidad Miguel Hernández
Thesis defense date: March 2, 2012

Regulación de la secreción y expresión de glucagón en la célula alfa pancreática por la leptina
Author: Laura Marroquí Esclápez
Thesis advisor: Ivan Quesada
University: Universidad Miguel Hernández
Thesis defense date: March 9, 2012



Model of BPA action on pancreatic β -cells.

Metabolic and molecular disturbances in diabetes

Institut d'Investigacions Biomèdiques August Pi i Sunyer, Barcelona
www.idibaps.org



Principal Investigator Anna Novials anovials@clinic.ub.es **Associate researchers** Antonio Ceriello, Pablo García-Rovés, Carles Lerín, Joan Marc Servitja **Postdoctoral fellows** Gema Alcaraz **Research assistants** Serafín Murillo, Laura Brugnara **PhD students** Montse Visa, Lisa Cadavez, Alba Moreno **Lab technician** Carlos Castaño

Publications: 9 Research grants: 10 Clinical trials: 2 Awards: 1

Programmes

Programme 1. Molecular and physiological determinants of lifestyle in diabetes/obesity. Population studies for genetic-epigenetic association analysis in type 2 diabetes mellitus and related traits.

Programme 3. Impact of beta cell dysfunction and plasticity on the natural history of diabetes. Development of novel treatment strategies.

Keywords

Islet amyloid polypeptide/amylin. Islet degeneration and damage. Exercise. Endothelium. Clinical diabetes.

Main lines of research

-Mechanisms of pancreatic islet dysfunction in type 2 diabetes mellitus, in particular, the process of cytotoxicity as induced by amyloidogenesis.
-Signalling and transcriptional networks in the pancreatic beta cell, mainly related to the modulation of the transcriptional

programme under stress conditions.

-Impact of lifestyle on diabetes: metabolic and molecular responses to exercise and nutrition in diabetic patients and animal models.

-Impact of glucose oscillations on cardiovascular complications of diabetes: mechanisms of endothelial dysfunction.

Publications

Rapid insulinotropic action of low doses of bisphenol-A on mouse and human islets of Langerhans: role of estrogen receptor β Soriano S, Alonso-Magdalena P, García-Arévalo M, Novials A, Muhammed SJ, Salehi A, Gustafsson JA, Quesada I, Nadal A PLoS ONE, 7, e31109 (2012)
[PMID 22347437](#). Q1. IF 4.092. With other CiberDEM groups: Nadal A. Programme 3

Diabetes as a case study of chronic disease management with a personalized approach: The role of a structured feedback loop Ceriello A, Barkai L, Christiansen JS, Czupryniak L, Gomis R,

Harno K, Kulzer B, Ludvigsson J, Némethyová Z, Owens D, Schnell O, Tankova T, Taskinen MR, Vergès B, Weitgasser R, Wens J

Diabetes Res Clin Pract, 98, 5-10 (2012)

PMID 22917639. Q2. IF 2.754. With other Ciberdem groups: Gomis R. With other international groups. Programme 2

Evidence that hyperglycemia after recovery from hypoglycemia worsens endothelial function and increases oxidative stress and inflammation in healthy control subjects and subjects with type 1 diabetes

Ceriello A, Novials A, Ortega E, La Sala L, Pujadas G, Testa R, Bonfigli AR, Esposito K, Giugliano D

Diabetes, 61, 2993-2997 (2012)

PMID 22891214. 1st decile. IF 8.286. With other Ciberdem groups: Gomis R. Programme 2

Metabolomics approach for analyzing the effects of exercise in subjects with type 1 diabetes mellitus

Brugnara L, Vinaixa M, Murillo S, Samino S, Rodriguez MA, Beltran A, Lerin C, Davison G, Correig X, Novials A

PLoS ONE, 7, e40600 (2012)

PMID 22792382. Q1. IF 4.092. With other Ciberdem groups: Correig X. Programme 1

Nurr1 protein is required for N-methyl-D-aspartic acid (NMDA) receptor-mediated neuronal survival

Barneda-Zahonero B, Servitja JM, Badiola N, Minano-Molina AJ, Fado R, Saura CA, Rodriguez-Alvarez J

J Biol Chem, 287, 11351-11362 (2012)

PMID 22294685. Q1. IF 4.773. With other CIBERs: CIBERNED. Programme 3

High fat intake leads to acute postprandial exposure to circulating endotoxin in type 2 diabetic subjects

Harte AL, Varma MC, Tripathi G, McGee KC, Al-Daghri NM, Al-Attas OS, Sabico S, O'Hare JP, Ceriello A, Saravanan P, Kumar S, McTernan PG

Diabetes Care, 35, 375-3782 (2012)

PMID 22210577. 1st decile. IF 8.087. With other international groups. Programme 2

Self-monitoring of blood glucose in type 2 diabetes: is the debate (finally) ending?

Ceriello A

Diabetes Res Clin Pract, 97, 1-2 (2012)

PMID 22503946. Q2. IF 2.754. Programme 2

HbA(1c) targets for type 2 diabetes: how many, ...how far!

Giugliano D, Ceriello A, Esposito K

Diabetes Res Clin Pract, 96, 414-415 (2012)

PMID 21963106. Q2. IF 2.754. Programme 2

Gene expression dynamics after murine pancreatitis unveils novel roles for Hnf1α in acinar cell homeostasis

Molero X, Vaquero EC, Flández M, González AM, Ortiz MA, Cibrián-Uhalte E, Servitja JM, Merlos A, Juanpere N, Massumi M, Skoudy A, Macdonald R, Ferrer J, Real FX

Gut, 61, 1187-1196 (2012)

PMID 21948943. 1st decile. IF 10.111. With other Ciberdem

groups: Ferrer J. With other CIBERs: CIBEREHD. Programme 3

Publications arising from international clinical trials

Basal insulin and cardiovascular and other outcomes in dysglycemia

ORIGIN Trial Investigators, Gerstein HC, Bosch J, Dagenais GR, Díaz R, Jung H, Maggioni AP, Pogue J, Probstfield J, Ramachandran A, Riddle MC, Rydén LE, Yusuf S

N Engl J Med, 367, 319-28 (2012)

PMID 22686416. 1st decile. IF: 53.298

n-3 fatty acids and cardiovascular outcomes in patients with dysglycemia

ORIGIN Trial Investigators, Bosch J, Gerstein HC, Dagenais GR, Díaz R, Dyal L, Jung H, Maggiano AP, Probstfield J, Ramachandran A, Riddle MC, Rydén LE, Yusuf S

N Engl J Med, 367, 309-18 (2012)

PMID 22686415. 1st decile. IF: 53.298

Book chapters

Book: Carbohydrates - Comprehensive Studies on Glycobiology and Glycotechnology

Chuan-Fa Chang (Ed.)

Intech (2012)

Chapter: Adapting the Consumption of Carbohydrates for Diabetic Athletes

Authors: Novials A, Murillo S

Pages: 355-371

ISBN: 978-953-51-0864-1

DOI: 10.5772/51570

Book: Applications of Immunocytochemistry.

Hesam Dehghani (Ed.)

Intech (2012)

Chapter: The Plasticity of Pancreatic Stellate Cells Could Be Involved in the Control of the Mechanisms that Govern the Neogenesis Process in the Pancreas Gland

Authors: Mato E, Lucas M, Barceló S, Novials A

Pages: 1-25

ISBN: 978-953-51-0229-8

DOI: 10.5772/34189

Research grants

Molecular Mechanisms Underlying the Development of Insulin Resistance: Role of Betaine Supplementation

Marie Curie Action Call, PCIG-GA-2011-293502: 2011-2014

Principal Investigator: Carles Lerín

European project. Programme 1

Regulation and function of microRNAs in pancreatic islets
MICINN, BFU2010-17639: 2010-2012

Principal Investigator: Joan Marc Servitja

National project. Programme 3

Defective antioxidant response in endothelial cells exposed to oscillating glucose: the role of Nrf2

MICINN, PI10/01256: 2011-2013

Principal Investigator: Antonio Ceriello

National project. Programme 2

Diabetis experimental, investigació cel·lular i molecular en models de diabetis experimental

Agència de Gestió d'Ajuts Universitaris i de Recerca. Generalitat de Catalunya, 2009 SGR 1426: 2009-2013

Principal Investigator: Ramon Gomis

Autonomous Community project. Programme 3

Descifrando la respuesta integral capaz de restituir la normoglucemia en ratones con diabetes tipo 2 debido a cambios en su estilo de vida (dieta y/o ejercicio)

BFU2011-24679, Plan Nacional de I + D + i (2008-2011):

2011-2013

Principal Investigator: Pablo Garcia-Roves. *National project. Programme 1*

Implicación del enzima BACE2 en el mecanismo por el cual el péptido pancreático humano IAPP induce alteraciones de la célula beta pancreática en la diabetes tipo 2

Acción Estratégica en Salud – Subprograma de Proyectos de Investigación en Salud. ISCIII (Ministerio de Ciencia e Innovación), PI11/00679: 2012-2014

Principal Investigator: Anna Novials

National project. Programme 3

Circulación microRNAs como biomarcadores para el diagnóstico precoz y pronóstico de la conversión de la diabetes y para monitorizar la respuesta a las intervenciones terapéuticas

Industex, S.L: 2012-2013

Principal Investigator: Anna Novials

Private funds. Programme 1

Metabolic and Biochemical Effects of Betaine on Insulin Sensitivity and Exercise Performance

Ministerio de Ciencia e Innovación, SAF2011-28502:

2012-2014

Principal Investigator: Carles Lerin

National project . Programme 1

Epigenetic control of gene expression in pancreatic islets

EFSD/Lilly Fellowship 2010: 2010-2012

Principal Investigator: Joan Marc Servitja

European project. Programme 3

Unraveling Novel Molecular Mechanisms Underlying the Development of Insulin Resistance

European Foundation for the Study of Diabetes (EFSD)/ Eli Lilly: 2010-2013

Principal Investigator : Carles Lerin

European project. Programme 1

Scientific collaborations within Ciberdem

METADIAB: Comparative metabolomic analysis for the detection of biomarkers in diabetes

Coordinator: Xavier Correig

Ciberdem groups: Novials A, Correig X, Gomis R

ENDODIAB: Mechanisms of endothelial dysfunction in diabetes, the role of amylin and circulating endothelial cells

Coordinator: Anna Novials

Ciberdem groups: Novials A, Gomis R,

Villanueva-Peña Carrillo ML

Ciberdem Biobank

Coordinator: Anna Novials

Ciberdem Biobank nodes: Novials A, Gomis R, Vendrell J, Masana L, Castaño L, Serrano-Ríos M, Soriguer F, Carmena R, Blanco-Vaca F

Pilchardus Study: A sardine diet intervention study to assess benefits to the metabolic profile in type 2 diabetes mellitus patients

Coordinator: Ramon Gomis

Ciberdem groups: Novials A, Simó R, Soriguer F

Platforms: Metabolomics Platform, Biobank

MEDIGENE: Genetic and environmental factors of insulin resistance syndrome and its long-term complications in immigrant Mediterranean populations

Coordinator: Ramon Gomis

Ciberdem groups: Castaño L, Gomis R, Novials A

Clinical trials

Multicenter trial, international, randomized and 2x2 factorial, to assess the effects of Lantus (glargin insulin) compared to the standard treatment with omega 3 fatty acids compared to placebo, in the decrease in cardiovascular morbidity and mortality in high risk patients with altered fasting glucose (AFG), decrease in glucose tolerance (TGD) or type 2 diabetes in initial steps

HOE901/4032: 2004-2012

Coordinator: Anna Novials

A Multicenter, Randomized, Double-Blind, Placebo-Controlled, Parallel Group, Phase 3 Trial to Evaluate the Safety and Efficacy of Dapagliflozin in Subjects with Type 2 Diabetes with inadequately controlled hypertension on an Angiotensin-Converting Enzyme Inhibitor (ACEI) or Angiotensin Receptor Blocker (ARB)

MB102-073: 2011-2012

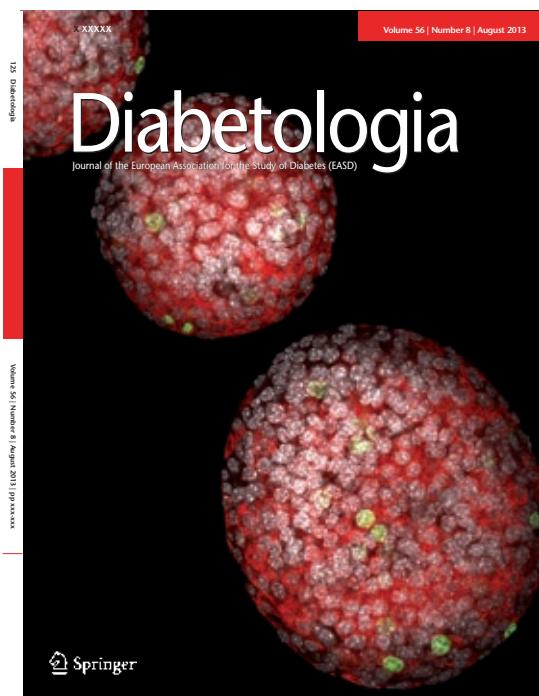
Coordinator: Anna Novials

Awards

Premio Guido Ruffino de Investigación en Educación Terapéutica en Diabetes

Sociedad Española de Diabetes (2012)

Awardee: Serafín Murillo



Confocal micrograph of isolated mouse pancreatic islets cultured at a stimulatory glucose concentration. Insulin is stained in red, proliferating beta cells in green and nuclei in white. In this issue of *Diabetologia* (56: 000–000), Moreno-Asso et al report that glucose regulation of the islet transcriptome is highly conserved across the lifespan of the mouse, although the capacity of glucose to stimulate mitotic genes is selectively and progressively lost during the ageing process.

Diabetobe

Hospital Clínico San Carlos, Madrid
www.madrid.org



Principal Investigator Manuel Serrano Ríos mserrano.hcsc@salud.madrid.org **Associate researchers** María Teresa Martínez Larrad, Jesús Álvarez Fernández Represa, Arturo Corbatón, Carmen Hernandez, Jose Maria Ibarra Rueda, Cristina Fernández

Postdoctoral fellows Nuria Pescador Sanchez **Research assistants** Covadonga Caso, Bernat Jiménez, Yera Lazcano Redondo

Lab technicians Milagros Perez Barba, Angeles Asensio Prianes **Administrative staff** María del Mar González Romero

Publications: 6 Research grants: 4

Programmes

Programme 1. Molecular and physiological determinants of lifestyle in diabetes/obesity. Population studies for genetic-epigenetic association analysis in type 2 diabetes mellitus and related traits.

Keywords

Genetics type 2 diabetes. Metabolic syndrome. Prediction/prevention of type 2 diabetes. Clinical diabetes. Obesity.

Main lines of research

-A genome-wide study of the Spanish population. Search for loci for FG, FI, HbA1C and others.

-A genomic, lipidomic and proteomic study of subcutaneous/abdominal adipose tissue and its relationship to type 2 diabetes and obesity.

-Genes and inflammatory markers in children with obesity and/or metabolic syndrome.

-Analysis of genetic markers, circulating adipokines and insulin-resistance status in obesity and associated metabolic disorders.

-The Segovia Study. The molecular and physiological determinants of lifestyle in diabetes/obesity studies. Analysis of genetic-epigenetic association in obesity type 2 diabetes mellitus. An epidemiological study. MicroRNA obesity and type 2 DM and related conditions.

Publications

A genome-wide approach accounting for body mass index identifies genetic variants influencing fasting glycemic traits and insulin resistance

Manning AK, Hivert MF, Scott RA, Grimsby JL, Bouatia-Naji N, Chen H, Rybin D, et al.

Nat Genet, 44, 659-669 (2012)

PMID 22581228. 1st decile. IF 35.532. With other international groups. Programme 1

Associations between surrogate measures of insulin resistance and waist circumference, cardiovascular risk and the metabolic syndrome across Hispanic and non-Hispanic white populations
Martínez-Larrad MT, Lorenzo C, González-Villalpando C, Gabriel R, Haffner SM, Serrano-Ríos M

Diabet Med, 29, 1390-1394 (2012)

PMID 22681498. Q2. IF 2.902. Programme 1

Functional characterization of TLR4 +3725 G/C polymorphism and association with protection against overweight

Penas-Steinhardt A, Barcos LS, Belforte FS, de Sereday M, Vilariño J, Gonzalez CD, Martínez-Larrad MT, Tellechea ML, Serrano-Ríos M, Poskus E, Frechtel GD, Leskow FC

PLoS One, 7, e50992 (2012)

PMID 23239997. Q1. IF 4.092. With other international groups. Programme 1

Iodine intake in the adult population. Di@bet.es study

Soriguer F, Garcia-Fuentes E, Gutierrez-Repiso C, Rojo-Martinez G, Velasco I, Goday A, Bosch-Comas A, Bordiu E, Calle A, Carmena R, Casamitjana R, Castano L, Castell C, Catala M, Delgado E, Franch J, Gaztambide S, Girbes J, Gomis R, Gutierrez G, Lopez-Alba A, Martinez-Larrad MT, Menendez E, Mora-Peces I, Ortega E, Pascual-Manich G, Serrano-Ríos M, Valdes S, Vazquez JA, Vendrell J

Clin Nutr, 31, 882-888 (2012)

PMID 22560740. Q1. IF 3.731. With other Ciberdem groups: Carmena R, Castaño L, Soriguer F, Gomis R, Vendrell J. Programme 1

Prevalence of diabetes mellitus and impaired glucose regulation in Spain: the Di@bet.es Study

Soriguer F, Goday A, Bosch-Comas A, Bordiu E, Calle-Pascual A, Carmena R, Casamitjana R, Castano L, Castell C, Catala M, Delgado E, Franch J, Gaztambide S, Girbes J, Gomis R, Gutierrez G, Lopez-Alba A, Martinez-Larrad MT, Menendez E, Mora-Peces I, Ortega E, Pascual-Manich G, Rojo-Martinez G, Serrano-Ríos M, Valdes S, Vazquez JA, Vendrell J

Diabetologia, 55, 88-93 (2012)

PMID 21987347. 1st decile. IF 6.814. With other Ciberdem groups: Carmena R, Castaño L, Gomis R, Soriguer F, Vendrell J. Programme 2

Common variants of the liver fatty acid binding protein gene influence the risk of type 2 diabetes and insulin resistance in Spanish population

Mansego ML, Martínez F, Martínez-Larrad MT, Zabena C, Rojo G, Morcillo S, Soriguer F, Martín-Escudero JC, Serrano-Ríos M, Redon J, Chaves FJ

PLoS One, e31853 (2012)

PMID 22396741. Q1. IF 4.092. With other Ciberdem groups: Carmena R, Soriguer F. Programme 1

Publications in collaboration with international consortiums

A genome-wide association search for type 2 diabetes genes in

African Americans

Palmer ND, McDonough CW, Hicks PJ, Roh BH, Wing MR, An SS, Hester JM, Cooke JN, Bostrom MA, Rudock ME, Talbert ME, Lewis JP; DIAGRAM Consortium et al.

PLoS One, 7, e29202 (2012)

PMID 22238593. Q1. IF 4.092

Genome-wide association for abdominal subcutaneous and visceral adipose reveals a novel locus for visceral fat in women
Fox CS, Liu Y, White CC, Feitosa M, Smith AV, Heard-Costa N, Lohman K; GIANT Consortium; MAGIC Consortium; GLGC Consortium, Johnson AD, Foster MC, Greenawalt DM, Griffin P, Ding J, Newman AB, Tylavsky F, Milkovic I, Kritchevsky SB, Launer L, Garcia M, Eiriksdottir G, Carr JJ, Gudnason V, Harris TB, Cupples LA, Borecki IB

PLoS Genet, 8, e1002695 (2012)

PMID 22589738. 1st decile. IF 8.694

Growth differences between North American and European children at risk for type 1 diabetes

Nucci AM, Becker DJ, Virtanen SM, Cuthbertson D, Softness B, Huot C, Wasikowa R, Dosch HM, Akerblom HK, Knip M; TRIGR Study Group

Pediatr Diabetes, 13, 425-31 (2012)

PMID 22251851. 1st decile. IF 2.990

Novel loci for adiponectin levels and their influence on type 2 diabetes and metabolic traits: a multi-ethnic meta-analysis of 45,891 individuals

Dastani Z, Hivert MF, Timpton N, Perry JR, Yuan X, Scott RA, Henneman P, Heid IM, Kizer JR, Lyytikäinen LP, Fuchsberger C, Tanaka T, Morris AP et al.

PLoS Genet, 8, e1002607 (2012)

PMID 22479202. 1st decile. IF 8.694

Research grants

Nutritional Primary Prevention of Type1 Diabetes in Children NIH, QLK1-CT-2002-00372: 2001-2016

Principal Investigator: Manuel Serrano Ríos

European project. Programme 1

Meta-analyses of Glucose and Insulin-Related Traits Consortium MAGIC: 2008-2013

Principal Investigator: Manuel Serrano Ríos

European project. Programme 1

Morbi-Mortalidad y caracterización genotípica en el ámbito rural y urbano de la provincia de Segovia

Lilly S.A.: 2012-2014

Principal Investigator: Manuel Serrano Ríos

Associate investigators: Cristina Fernandez Perez, Maria Teresa Martinez Larrad, Saturio Vega Quiroga, Nuria Pescador Sanchez

National project. Programme 1

Estudio de los mecanismos de resistencia a insulina: Implicaciones de Obesidad, Diabetes y Síndrome Metabólico S2010/BMD-2423: 2012-2013

Principal Investigator: Manuel Serrano Ríos

National project. Programme 1

Scientific collaborations within Ciberdem

INGENFRED: Cooperative population and database studies for genetic association analysis in T2DM and related traits

Coordinator: Felipe Javier Chaves

Ciberdem groups: Serrano-Ríos M, Blanco-Vaca F, Carmena R, Soriguer F

IODURE: The impact of overnutrition, diabetes-obesity, and undernutrition on the regulation of energy homeostasis in the central nervous system. From animal models to humans

Coordinator: Manuel Serrano Ríos

Ciberdem groups: Serrano-Ríos M, Alvarez C, Blázquez E, Burks D, Vallejo M

Di@bet.es Study: 1st epidemiological study of the prevalence of type 2 diabetes in Spain

Coordinator: Federico Soriguer

Ciberdem groups: Serrano-Ríos M, Soriguer F, Carmena R, Castaño L, Gomis R, Vendrell J

Telemed-diabetes Study

Coordinator: Enric Esmatges

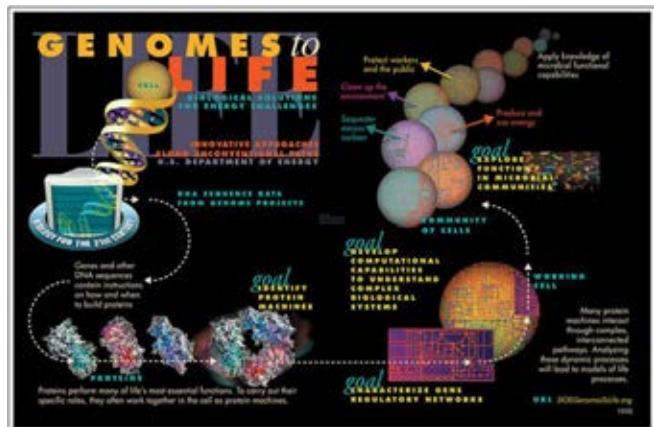
Ciberdem groups: Serrano-Ríos M, Carmena R, Gomis R, Soriguer F, Castaño L

Ciberdem Biobank

Coordinator: Anna Novials

Ciberdem Biobank nodes: Serrano-Ríos M, Gomis R, Novials

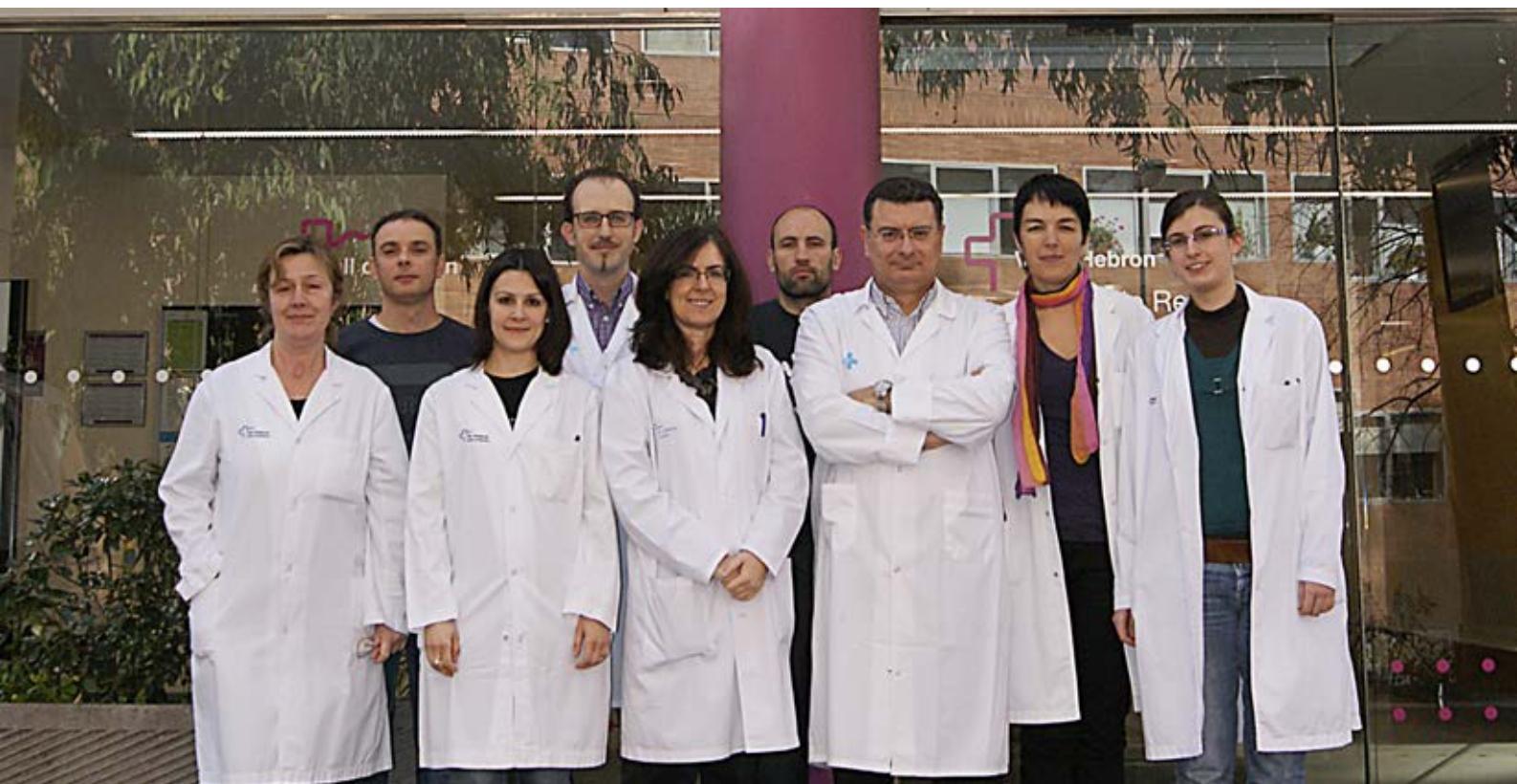
A, Vendrell J, Masana L, Castaño L, Soriguer F, Carmena R, Blanco-Vaca F



Genomes to life.

Diabetes and Metabolism Research Group

Institut de Recerca Hospital Universitari Vall d'Hebron, Barcelona
www.vhir.org



Principal Investigator Rafael Simó rafael.simo@vhir.org **Associate researchers** Cristina Hernández, Albert Lecube, Jordi Mesa,

David Martínez Selva, Josep A Villena **Postdoctoral fellows** Marta García Ramírez, Patricia Bogdanov **Research assistants** Anna

Barbosa, Lidia Corraliza **PhD students** Cristina Sáez **Lab technician** Lorena Ramos

Publications: 17 Research grants: 11 Clinical trials: 5

Programmes

Programme 2. Mechanisms promoting the development of diabetes and its vascular complications. Associated disorders and co-morbidities. Strategies for prevention and treatment.

Programme 4. Use of biomedical approach systems to develop personalized therapies for diabetes.

Keywords

Clinical diabetes. Retinopathy. Lipid metabolism. Metabolic syndrome. Obesity.

Main lines of research

-Physiopathology of diabetic retinopathy: a new approach using integrated biological systems. This is the main area of our research and we are a well-recognized group in this area. We are collaborating with several companies in the study of the mechanisms of action of new molecules for the treatment of diabetic retinopathy.

-Insulin resistance and obesity: new pathogenic candidates and

the study of co-morbidities.

-Endothelial dysfunction, dyslipidaemia and cardiovascular disease in type 2 diabetes.

Publications

Beneficial effects of fenofibrate in retinal pigment epithelium by the modulation of stress and survival signaling under diabetic conditions

Miranda S, González-Rodríguez Á, García-Ramírez M, Revuelta-Cervantes J, Hernández C, Simó R, Valverde ÁM
J Cell Physiol, 227, 2352-2362 (2012)

PMID 21826649. Q1. IF 3.874. With other Ciberdem groups:
Valverde, AM. Programme 2

Alterations in the common pathway of coagulation during weight loss induced by gastric bypass in severely obese patients

Pardina E, Ferrer R, Rivero J, Baena-Fustegueras JA, Lecube A, Fort JM, Vargas V, Catalán R, Peinado-Onsurbe J
Obesity, 20, 1048-1056 (2012)

PMID: 22193919. Q1. IF 4.284. With other CIBERs: CIBEREHD. Programme 2

Potential role of tumor necrosis factor- α in downregulating sex hormone-binding globulin
Simó R, Barbosa-Desongles A, Lecube A, Hernandez C, Selva DM
Diabetes, 61, 372-382 (2012)

PMID 22210320. 1st decile. IF 8.286. Programme 2

Fenofibrate - a potential systemic treatment for diabetic retinopathy?
Wong TY, Simó R, Mitchell P
Am J Ophthalmol, 154, 6-12 (2012)

PMID 22709833. 1st decile. IF 4.223. Programme 2

Molecular Mechanism of TNF α -Induced Down-Regulation of SHBG Expression
Simó R, Barbosa-Desongles A, Sáez-Lopez C, Lecube A, Hernandez C, Selva DM
Mol Endocrinol, 26, 438-446 (2012)

PMID 22301786. Q1. IF 4.544. Programme 2

Update on cardiovascular safety of PPARgamma agonists and relevance to medicinal chemistry and clinical pharmacology
Ciudin A, Hernandez C, Simó R
Curr Top Med Chem, 12, 585-604 (2012)

PMID 22242856. 1st decile. IF 4.174. Programme 2

Proteomic analysis of cerebrospinal fluid from obese women with idiopathic intracranial hypertension: a new approach for identifying new candidates in the pathogenesis of obesity
Lecube A, Poca MA, Colomé N, Bech-Serra JJ, Hernández C, García-Ramírez M, Gándara D, Canals F, Simó R
J Neuroendocrinol, 24, 944-952 (2012)

PMID 22296024. Q2. IF 3.138. Programme 4

Diabetes is the main factor accounting for hypomagnesemia in obese subjects
Lecube A, Baena-Fustegueras JA, Fort JM, Pelegrí D, Hernández C, Simó R
PLoS One, 7, e30599 (2012)

PMID 22291997. Q1. IF 4.092. Programme 2

Neuroprotection in diabetic retinopathy
Hernández C, Simó R
Curr Diab Rep, 12, 329-337 (2012)

PMID: 22581259. Q2. IF 2.496. Programme 2

Arterial stiffness is increased in patients with type 1 diabetes without cardiovascular disease: a potential role of low-grade inflammation
Llauradó G, Ceperuelo-Mallafré V, Vilardell C, Simó R, Freixenet N, Vendrell J, González-Clemente JM
Diabetes Care, 35, 1083-1089 (2012)

PMID 22357186. 1st decile. IF 8.087. With other Ciberdem groups: Vendrell J. Programme 2

Exenatide twice daily versus glimepiride for prevention of glycaemic deterioration in patients with type 2 diabetes with

metformin failure (EUREXA): an open-label, randomised controlled trial

Gallwitz B, Guzman J, Dotta F, Guerci B, Simó R, Basson BR, Festa A, Kiljański J, Sapin H, Trautmann M, Schernthaner G
Lancet, 379, 2270-2278 (2012)

PMID 22683137. 1st decile. IF 38.278. With other international groups. Programme 4

Usefulness of the vitreous fluid analysis in the translational research of diabetic retinopathy

Simó-Servat O, Hernández C, Simó R
Mediators Inflamm, doi:10.1155/2012/872978 (2012)

PMID 23028204. Q2. IF 3.263. Programme 4

Neurodegeneration is an early event in diabetic retinopathy: therapeutic implications

Simó R, Hernández C; European Consortium for the Early Treatment of Diabetic Retinopathy (EUROCONDOR)
Br J Ophthalmol, 96, 1285-1290 (2012)

PMID 22887976. Q1. IF 2.902. With other Ciberdem groups: Burks D, Valverde AM. Programme 2

IL1 β down-regulation of sex hormone-binding globulin production by decreasing HNF-4 α via MEK-1/2 and JNK MAPK pathways

Simó R, Barbosa-Desongles A, Hernandez C, Selva DM
Mol Endocrinol, 26, 1917-1927 (2012)

PMID 22902540. Q1. IF 4.544. Programme 2

Only C-reactive protein, but not TNF- α or IL6, reflects the improvement in inflammation after bariatric surgery

Pardina E, Ferrer R, Baena-Fustegueras JA, Rivero J, Lecube A, Fort JM, Vargas V, Catalán R, Peinado-Onsurbe J
Obes Surg, 22, 131-139 (2012)

PMID 22038572. 1st decile. IF 3.286. With other CIBERs: CIBEREHD. Programme 4

Can augmentation index substitute aortic pulse wave velocity in the assessment of central arterial stiffness in type 1 diabetes?

Llauradó G, Simó R, Villaplana M, Berlanga E, Vendrell J, González-Clemente JM
Acta Diabetol, 49, Suppl 1: 253-257 (2012)

PMID 23053880. Q2. IF 2.784. With other Ciberdem groups: Vendrell J. Programme 2

A nontargeted proteomic approach to the study of visceral and subcutaneous adipose tissue in human obesity

Insenser M, Montes-Nieto R, Vilarrasa N, Lecube A, Simó R, Vendrell J, Escobar-Morreale HF
Mol Cell Endocrinol, 363, 10-19 (2012)

PMID: 22796336. Q2. IF 4.192. With other Ciberdem groups: Escobar-Morreale H, Montanya E, Vendrell J. Programme 4

Publications arising from international clinical trials

Insulin degludec, an ultra-longacting basal insulin, versus insulin glargine in basal-bolus treatment with mealtime insulin aspart in type 2 diabetes (BEGIN Basal-Bolus Type 2): a phase 3, randomised, open-label, treat-to-target non-inferiority trial
Garber AJ, King AB, Del Prato S, Sreenan S, Balci MK, Muñoz-Torres M, Rosenstock J, Endahl LA, Francisco AM, Hollander P;

NN1250-3582 (BEGIN BB T2D) Trial Investigators
Lancet, 379, 1498-1507 (2012)
PMID 22521072. 1st decile. IF 38.278

Research grants

Neurodegeneration as an early event in the pathogenesis of diabetic retinopathy. A study of the mechanisms involved and new therapeutic strategies

European Association for the Study of Diabetes Foundation, EFSD-Sanofi/Aventis: 2011-2012

Principal Investigator: Rafael Simó

Associate investigators: Cristina Hernández, Marta García Ramírez, M Villaruel, Lidia Corraliza, L Ramos

European project. Programme 2

Neuroprotection by enhancing GLP-1R signalling, a new therapeutic strategy in the early stages of diabetic retinopathy

Funding by Novo Nordisk: 2010-2012

Principal Investigator: Rafael Simó

Associate investigators: Cristina Hernández, Marta García Ramírez, Lidia Corraliza, Patricia Bogdanov

European project. Programme 2

Early Prevention of Diabetes Complications in people with hyperglycaemia in Europe (e-PREDICE)

FP7-279074, 7th Framework Programme: 2012-2016

Principal Investigator: J. Tuomilehto (FIRCAVA)

Associate investigators: 35 European institutions, among them the Instituto de Investigación Vall Hebron

European project. Programme 4

European Consortium for the Early Treatment of Diabetic Retinopathy (EUROCONDOR). Neurodegeneration as an early event in the Pathogenesis of Diabetic Retinopathy: A multicentric, prospective, phase II-III, open randomized controlled trial to assess the efficacy of neuroprotective drugs administered topically to prevent or arrest Diabetic Retinopathy

European Comission-FP7-278040-2, 7th Framework Programme: 2012-2016

Principal Investigator: Rafael Simó

Associate investigators: J. Cunha-Vaz, A.K. Sjolie, E. Midena, F. Bandello, P. Massin, G. Lang, P. Scanlon, S. Harding, C. Egan, M. Porta, J. Gibson, J.Garcia Arumi, A. Martinez Valverde, D. Burks, IDF Europa, BCN Peptides, CAIBER

European project. Programme 2

Neurodegeneración en la patogénesis de la retinopatía diabética incipiente. Estudio de los mecanismos implicados a través de un abordaje integrado de biología de sistemas

Ministerio de Ciencia e Innovación, SAF 2009-07408: 2010-2012

Principal Investigator: Rafael Simó

Associate investigator from another Ciberdem group: Miguel Ángel Rodríguez

National project. Programme 2

Impacto del uso de insulina en el cáncer en pacientes con diabetes mellitus tipo 2

Fundación IDIAP Ministerio de Sanidad y Política Social, EC10-

338: 2011-2012

Principal Investigator: Rafael Simó

National project. Programme 2

Depósito de glucógeno en la retina y neurodegeneración: un nuevo mecanismo implicado en la patogénesis de la retinopatía diabética

ISCIII, FIS, PI10/01219: 2010-2013

Principal Investigator: Cristina Hernández

Associate investigators: Marta García Ramírez, Lidia Corraliza

National project. Programme 2

Function of PGC-1 α and PGC-1 α coactivators in adipose tissue. Implications in obesity and insulin resistance

Ministerio de Ciencia e Innovación, RYC-2006-002429:

2007-2012

Principal Investigator: Josep A Villena

National project. Programme 4

Medición de las variaciones de glucosa en sangre de forma no invasiva mediante un pletismógrafo, con el objeto de obtener soluciones, resultados o aplicaciones de uso clínico

Funding by Sabir-Medical: 2011-2012

Principal Investigator: Rafael Simó

Associate investigators: Cristina Hernández, Andreea Ciudin

National project. Programme 4

Estudio de los efectos negativos de la diabetes mellitus tipo 2 sobre la función pulmonar y la respiración durante el sueño (estudio sweetlung)"

Funding by Fundación de la Sociedad Española de Endocrinología y Nutrición (FSEEN): 2012-2014

Principal Investigator: Albert Lecube

Associate investigators: Rafael Simó, Cristina Hernández, Andreea Ciudin

Private Funds. Programme 4

Neurodegeneración en la retinopatía diabética

Funding by Fundación de la Sociedad Española de Endocrinología y Nutrición (FSEEN)

Principal Investigator: Cristina Hernández

Associate investigators: Rafael Simó, Marta García Ramírez, Patricia Bogdanov, Lidia Corraliza

Private Funds. Programme 2

Scientific collaborations within Ciberdem

NEURONET-DIAB: Identification of neurodegenerative mechanisms that promote the development of diabetic retinopathy: the role of insulin signalling and apoptosis

Coordinator: Deborah Burks

Ciberdem groups: Simó R, Burks D, Valverde AM

GIDIPRED: Glycogen-induced dysfunctions in the pancreas and retina and their involvement in the ethiogenesis of diabetes mellitus

Coordinator: Joan J Guinovart

Ciberdem groups: Simó R, Gomis R, Guinovart JJ

STEMOB: Adult adipose tissue-derived progenitor cells: the influence of the clinical phenotype and adipose depot origin on their biological properties

Coordinator: Joan J Vendrell

Ciberdem groups: Simó R, Vendrell J, Zorzano A, Balsinde J, Gómez-Foix AM, Montanya E, Vázquez-Carrera M

DIASOBS: Determinants of insulin resistance and glucose tolerance disorders, including diabetes, in severe obesity and their changes after bariatric surgery-induced weight loss

Coordinator: Héctor F Escobar Morreale

Ciberdem groups: Simó R, Correig X, Montanya E, Escobar-Morreale HF, Vendrell J

Pilchardus Study: A sardine diet intervention study to assess benefits to the metabolic profile in type 2 diabetes mellitus patients

Coordinator: Ramon Gomis

Ciberdem groups: Novials A, Simó R, Soriguer F

Platforms: Metabolomics Platform, Biobank

Clinical trials

Estudio multicéntrico aleatorizado, doble ciego y controlado con placebo para evaluar resultados cardiovasculares después del tratamiento con alogliptina en combinación con la asistencia habitual en sujetos con diabetes tipo 2 y síndrome coronario agudo

SYR-322-302: 2012- 2014

Coordinator: Jorge Mesa

An open label extension to trials assessing the safety and efficacy of BI 10773 as monotherapy in type 2 diabetic patients.

Original study ID 1245.24

EUDRACT 2008-007938-21: 2010-2014

Coordinator: Jorge Mesa

Ensayo Clínico Fase I, Doble Ciego, Controlado con Placebo, de Seguridad del Colirio BCN070660 en pacientes diabéticos tipo II

EudraCT: 2011-000325-77: 2011-2012

Coordinator: Rafael Simó

Impacto de LU2605541 versus insulina glargina en pacientes con diabetes mellitus tipo 2. Estudio IMAGINE (I2R-MC-BIAM)

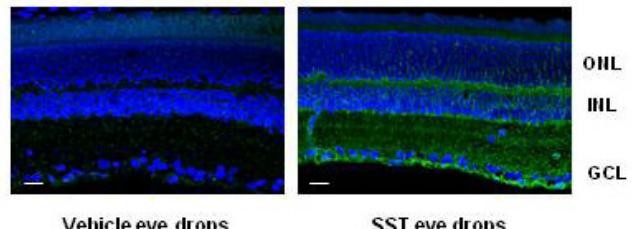
EUDRACT, 2011-001254-29: 2012-2013

Coordinator: Rafael Simó

Ensayo para comparar la eficacia y seguridad de NN5401 frente a insulina glargina en sujetos con Diabetes tipo 2 sin tratamiento previo con insulina

NN5401-3590: 2011-2012

Coordinator: Rafael Simó



Immunofluorescence of GLAST (glutamate/aspartate transporter) in diabetic rats. Topical treatment with somatostatin (SST) eye drops prevented the downregulation of GLAST induced by diabetes. ONL: outer nuclear layer; INL: inner nuclear layer; GCL: ganglion cell layer. Scale bar = 50 µm.

Endocrinology and Nutrition Service

Hospital Regional Universitario Carlos Haya, Málaga
www.carloshaya.net / www.imabis.org



Principal Investigator Federico Soriguer federico.soriguer.sspa@juntadeandalucia.es **Associate researchers** María Cruz Almaraz, Isabel Esteva de Antonio, Juan Miguel Gómez, María Stella González, Gabriel Olveira Fuster, Gemma Rojo-Martínez, Soledad Ruiz de Adana Navas, Sergio Valdés Hernández, Inmaculada González Molero, Francisca Rodríguez Pacheco, Natalia Colomo **Postdoctoral fellow** Eva García Escobar **Research assistants** Sara García Serrano, Francisca Linares Parrado, Gracia María Martín Núñez, Nuria Porras-Martín **Nursing assistants** Mercedes Guerrero, María Fontalba **PhD students** Carolina Gutiérrez Repiso, Elehazara Rubio Martín, Roberto Monastero, Ana Lago **Lab technician** Rebeca Cabrera **Administrative staff** Patricia González

Publications: 13 Research grants: 8 Clinical trials: 8

Programmes

Programme 1. Molecular and physiological determinants of lifestyle in diabetes/obesity. Population studies for genetic-epigenetic association analysis in type 2 diabetes mellitus and related traits.

Keywords

Clinical diabetes. Insulin therapy. Lipid metabolism. Metabolic syndrome. Prediction/prevention of type 2 diabetes.

Main lines of research

- The biomolecular epidemiology of diabetes, obesity and metabolic syndrome (Pizarra Study, Egabro Study, Di@bet.es Study, Di@bet.an Study).
- The study of insulin resistance in patients with extreme obesity undergoing bariatric surgery.
- Fatty acids, insulin resistance and adipocyte metabolism.
- New technologies applied to the treatment of type 1 diabetes.

Publications

Vitamin D and incidence of diabetes: A prospective cohort study
González-Molero I, Rojo-Martínez G, Morcillo S, Gutiérrez-Repiso C, Rubio-Martín E, Almaraz MC, Olveira G, Soriguer F

Clin Nutr, 31, 571-573 (2012)

PMID 22204964. Q1. IF 3.731. Programme 1

Incidence of lower limb amputations in individuals with and without diabetes mellitus in Andalusia (Spain) from 1998 to 2006
Almaraz MC, González-Romero S, Bravo M, Caballero FF, Palomo MJ, Vallejo R, Esteva I, Calleja F, Soriguer F

Diabetes Res Clin Pract, 95, 399-405 (2012)

PMID 22133651. Q2. IF 2.754. Programme 1

Quality of healthcare in type 2 diabetes mellitus in Spain

Soriguer F, Ruiz de Adana MS

Med Clin (Barc), 138, 522-524 (2012)

PMID 22118976. Q2. IF 1.385. Programme 1

High resolution melting curve analysis of DNA samples isolated by different DNA extraction methods

Martín-Núñez GM, Gómez-Zumaquero JM, Soriguer F,

Morcillo S

Clin Chim Acta, 413, 331-333 (2012)

PMID 21946052. Q1. IF 2.535. Programme 1

Validation of the FINDRISC (FINnish Diabetes Risk Score)

for prediction of the risk of type 2 diabetes in a population of southern Spain. Pizarra Study
Soriguer F, Valdés S, Tapia MJ, Esteva I, Ruiz de Adana MS, Almaraz MC, Morcillo S, García Fuentes E, Rodríguez F, Rojo-Martínez G
Med Clin (Barc), 138, 371-376 (2012)
PMID 21939990. Q2. IF 1.385. Programme 1

Polymorphisms of the UCP2 gene are associated with body fat distribution and risk of abdominal obesity in Spanish population
Martinez-Hervas S, Mansego ML, de Marco G, Martinez F, Alonso MP, Morcillo S, Rojo-Martínez G, Real JT, Ascaso JF, Redon J, Martín Escudero JC, Soriguer F, Chaves FJ
Eur J Clin Invest, 42, 171-178 (2012)
PMID 21883184. Q1. IF 3.018. With other Ciberdem groups: Carmen R. Programme 1

Testosterone, SHBG and risk of type 2 diabetes in the second evaluation of the Pizarra cohort study
Soriguer F, Rubio-Martín E, Fernández D, Valdés S, García-Escobar E, Martín-Núñez GM, Esteva I, Almaraz MC, Rojo-Martínez G
Eur J Clin Invest, 42, 79-85 (2012)
PMID 21679181. Q1. IF 3.018. With other CIBERs: CIBEROBN. Programme 1

Iodine intake in the adult population. Di@bet.es study
Soriguer F, Garcia-Fuentes E, Gutierrez-Repiso C, Rojo-Martínez G, Velasco I, Goday A, Bosch-Comas A, Bordiu E, Calle A, Carmen R, Casamitjana R, Castano L, Castell C, Catala M, Delgado E, Franch J, Gatzambide S, Girbes J, Gomis R, Gutierrez G, Lopez-Alba A, Martinez-Larrad MT, Menendez E, Mora-Peces I, Ortega E, Pascual-Manich G, Serrano-Rios M, Valdes S, Vazquez JA, Vendrell J
Clin Nutr, 31, 882-888 (2012)
PMID 22560740. Q1. IF 3.731. With other Ciberdem groups: Carmen R, Castaño L, Gomis R, Serrano-Ríos M, Vendrell J. With other CIBERs: CIBEROBN. Programme 1

Common variants of the liver fatty acid binding protein gene influence the risk of type 2 diabetes and insulin resistance in Spanish population
Mansego ML, Martínez F, Martínez-Larrad MT, Zabena C, Rojo G, Morcillo S, Soriguer F, Martín-Escudero JC, Serrano-Ríos M, Redon J, Chaves FJ
PLoS One, e31853 (2012)
PMID 22396741. Q1. IF 4.092. With other Ciberdem groups: Carmen R, Serrano-Ríos M. With other CIBERs: CIBEROBN. Programme 1

Zinc-alpha 2-glycoprotein gene expression in adipose tissue is related with insulin resistance and lipolytic genes in morbidly obese patients.
Garrido-Sánchez L, García-Fuentes E, Fernández-García D, Escoté X, Alcaide J, Perez-Martínez P, Vendrell J, Tinahones FJ
Plos One, 7, e33264 (2012)
PMID 22442679. Q1. IF 4.092. With other Ciberdem groups: Vendrell J. With other CIBERs: CIBEROBN. Programme 1

Prevention of diabetes mellitus type 2
Soriguer F, Rubio-Martín E, Rojo-Martínez G
Med Clin (Bar), 139, 640-646 (2012)
PMID 22622178. Q2. IF 1.385. Programme 1

Consumption of cow's milk is associated with lower risk of type 2 diabetes mellitus. A cross-sectional study
Morcillo S, atencia JA, Ortega A, Bilbao JR, Rubio-Martin E, Rojo-Martinez G, Esteva I, Valdes S, Oliveira G, Castano L
International Dairy Journal, 26, 162-165 (2012)
S0958694612000787. Q1. IF 2.401. With other Ciberdem groups: Castaño L, Martín F. Programme 1

Prevalence of diabetes mellitus and impaired glucose regulation in Spain: the Di@bet.es Study
Soriguer F, Goday A, Bosch-Comas A, Bordiu E, Calle-Pascual A, Carmen R, Casamitjana R, Castano L, Castell C, Catala M, Delgado E, Franch J, Gatzambide S, Girbes J, Gomis R, Gutierrez G, Lopez-Alba A, Martinez-Larrad MT, Menendez E, Mora-Peces I, Ortega E, Pascual-Manich G, Rojo-Martínez G, Serrano-Ríos M, Valdes S, Vazquez JA, Vendrell J
Diabetologia, 55, 88-93 (2012)
PMID 21987347. 1st decile. IF 6.814. With other Ciberdem groups: Carmen R, Castaño, L, Serrano-Ríos M, Vendrell J. Programme 1

Research grants

REPROBESITY: Search For New Therapeutic Agents Against Complicated Obesity By Reprofiling Existing Drugs
European Union, Seventh Framework Programme, FP7-HEALTH-2007-B: 2009-2012
Principal Investigator: Fernando Rodríguez de Fonseca
European project. Programme 1

Estudio de los polimorfismos de los genes Ar, Er beta y Cyp19, y de reordenaciones en los cromosomas X e Y, en dos poblaciones de personas con trastorno de identidad de género (TIG)

Ministerio de Ciencia e Innovación, Proyectos de Investigación Fundamental no orientada: 2010- 2012
Principal Investigator: Eduardo Pásaro
Associate investigators: Rosa Fernández, Blanca Laffon, Antonio Guillamón, Isabel Esteva, Maricruz Almaraz, Raquel Yahyahoui, Juan Haro, Esther Gómez Gil
National project. Programme 1

Epigenética y Riesgo de diabetes mellitus tipo 2
ISCIII, PS09/0217: 2010-2012
Principal Investigator: Sonsoles Morcillo Espina
Associate investigators: Juan Miguel Gómez Zumaquero, Elehazara Rubio Martín, Gracia María Martín Núñez, Gabriel Oliveira, M Soledad Ruiz de Adana, Isabel Esteva de Antonio
National project. Programme 1

Estudio del papel biológico de la SCD1 como posible mediador entre la obesidad e insulinresistencia en individuos obesos mórbidos desde una aproximación in vivo e in vitro

ISCIII, PS09/01060: 2010-2012

Principal Investigator: Eduardo García Fuentes

Associate investigators: Sara García Serrano, Carolina Gutiérrez Repiso, Gabriel Olveira, Eva García Escobar, José Luis Gallego Perales, Juan García Arnés

National project. Programme 1

Nuevos retos sobre el papel de las hormonas tiroideas en la regulación del peso corporal. Efecto de SNPs en el gen del receptor alpha de las hormonas tiroideas en la respuesta a una intervención sobre estilos de vida mediante dieta mediterránea y ejercicio físico en individuos con prediabetes. Estudio Egabro/Pizarra

Consejería de Salud Junta de Andalucía, PI-0327-2010: 2011-2012

Principal Investigator: Sergio Valdés Hernández

Associate investigators: M Cruz Almaraz, Inmaculada González Molero, Isabel Cardona, Eleazar Rubio Martín

Autonomous Community project. Programme 1

Implicación del Transporte de Ácidos Grasos y del Factor de Crecimiento del Endotelio Vascular B (Vegf-B) en el Desarrollo de Diabetes. Estudio de Prevención Primaria de la Diabetes Tipo 2

Consejería de Salud Junta de Andalucía, PI-0532-2010: 2011-2012

Principal Investigator: Gemma Rojo Martínez

Associate investigators: María José Leña Carrillo, Fuensanta Lima Rubio, Nuria Porras Pérez, Gabriel Olveira Fuster, Araceli Chicano Gálvez, Juan Miguel Gómez Zumaquero

Autonomous Community project. Programme 1

Hormonas tiroideas y peso corporal. Papel de variantes en el gen del receptor alpha de las hormonas tiroideas en el riesgo de obesidad

PI11/02755: 2012-2014

Principal Investigator: Federico J. Casimiro-Soriguer Escofet

Associate investigators: Sergio Valdes Hernandez Inmaculada Gonzalez Molero, Mª Cruz Almaraz Almaraz, Juan Miguel Gomez Zumaquero

National project. Programme 1

Prevención de la Diabetes mellitus tipo 2. Estudio Egabro-Pizarra

Consejería de Innovación Junta de Andalucía, P09-CTS-5125: 2010-2012

Principal Investigator: Gemma Rojo Martínez

Autonomous Community project. Programme 1

Scientific collaborations within Ciberdem

INGENFRED: Cooperative population and database studies for genetic association analysis in T2DM and related traits

Coordinator: Felipe Javier Chaves

Ciberdem groups: Soriguer F, Blanco-Vaca F, Carmena R, Serrano-Ríos M

Di@bet.es Study: 1st epidemiological study of the prevalence of type 2 diabetes in Spain

Coordinator: Federico Soriguer

Ciberdem groups: Soriguer F, Carmena R, Castaño L, Gomis R, Serrano-Ríos M, Vendrell J

Telemed-diabetes Study

Coordinator: Enric Esmatjes

Ciberdem groups: Soriguer F, Carmena R, Gomis R, Serrano-Ríos M, Castaño L

Ciberdem Biobank

Coordinator: Anna Novials Ciberdem

Biobank nodes: Soriguer F, Gomis R, Novials A, Vendrell J, Masana L, Castaño L, Serrano-Ríos M, Carmena R, Blanco-Vaca F

Pilchardus Study: A sardine diet intervention study to assess benefits to the metabolic profile in type 2 diabetes mellitus patients

Coordinator: Ramon Gomis

Ciberdem groups: Novials A, Simó R, Soriguer F

Platforms: Metabolomics Platform, Biobank

Clinical trials

Ensayo clínico con un nuevo suplemento de nutrición enteral por vía oral en pacientes con insuficiencia renal crónica en prediálisis

1834-H-183: 2011-2013

Coordinator: Gabriel Olveira Fuster

Programme 1

Evaluación de la efectividad de la Telemedicina en variables clínicas, metabólicas, psicosociales y en la calidad de vida de pacientes con diabetes tipo 1 tratados con Infusores subcutáneos de Insulina

2011-2012

Coordinator: Soledad Ruiz de Adana

Programme 1

Utilización de la mcg retrospectiva para evaluar las nuevas propuestas insulínicas en el manejo de hiperglucemia inducida por corticoides en el paciente hospitalizado

NN304 – 3614: 2011-2012

Coordinator: Soledad Ruiz de Adana

Programme 1

Ensayo multicéntrico, abierto, aleatorizado, de dos grupos paralelos y con ajuste de dosis para comparar el cambio en el peso de pacientes con sobrepeso u obesos con diabetes tipo 2 tras 26 semanas de tratamiento con insulina detemir una vez al día frente a insulina NPH una vez al día, ambos con insulina aspart en las comidas

NN304 – 3614: 2009-2012

Coordinator: Marta Domínguez López

Programme 1

Estudio descriptivo ProAct

RD000954: 2011-2013

Coordinator: Soledad Ruiz de Adana

Programme 1

PILCHARDUS A sardine diet intervention study to assess benefits to the metabolic profile in type 2 diabetes mellitus patients: 2012

Coordinator: Federico Casimiro Soriguer Escofet

Colaborators: Xavier Correig, Anna Novials

Programme 1

Ensayo Clínico aleatorizado para evaluar la efectividad de un programa de intervención multimodal en pacientes diabéticos tipo 2 prefrágiles y frágiles sobre la fragilidad y la calidad de vida. Estudio MID-FRAIL: 2012-2014

Coordinator: Soledad Ruiz de Adana

Programme 1

Telemed Diabetes: 2012-2014

Coordinator: Soledad Ruiz de Adana

Programme 1



The doctor and the scientist. An original drawing of Stella González Romero (Endocrinologist)

Transcriptional mechanisms of pancreatic function

Instituto de Investigaciones Biomédicas Alberto Sols, Consejo Superior de Investigaciones Científicas, Universidad Autónoma de Madrid
www.iib.uam.es



Principal Investigator Mario Vallejo mvallejo@iib.uam.es **Postdoctoral fellows** Mercedes Mirasierra, Antonio Fernández Pérez

PhD student Laura Ruiz **Lab technician** Ana Belén García Gómez

Publications: 1 Research grants: 1

Programmes

Programme 3. Impact of beta cell dysfunction and plasticity on the natural history of diabetes. Development of novel treatment strategies.

Keywords

Insulin synthesis. Islet degeneration and damage. Islet development. Diabetic pregnancy. Insulin action.

Main lines of research

- The characterization of phenotypic alterations of pancreatic islets in the absence of the homeoprotein Alx3.
- The requirement of Alx3 for the maintenance of glucose homeostasis and metabolic activity in vivo.
- The identification of transcriptional targets regulated by Alx3.
- Alx3 and diabetic pregnancy: the role of Alx3 in the regulation of the development of the neural tube and vulnerability to hyperglycaemic insult in its absence.

Publications

Essential role of protein tyrosine phosphatase 1B in obesity-induced inflammation and peripheral insulin resistance during aging

González-Rodríguez A, Más-Gutierrez JA, Mirasierra M, Fernandez-Pérez A, Lee YJ, Ko HJ, Kim JK, Romanos E, Carrascosa JM, Ros M, Vallejo M, Rondinone CM, Valverde AM Aging Cell, 11, 284-296 (2012)

PMID 22221695. Q1. IF 6.265. With other Ciberdem groups: Valverde AM. Programme 2

Research grants

Funciones pancreáticas y extrapancreáticas del factor de transcripción tipo homeodominio Alx3 en la regulación de la homeostasis metabólica

Ministerio de Economía y Competitividad, BFU2011-24245: 2012- 2014

Principal Investigator: Mario Vallejo

National project. Programme 3

Scientific collaborations within Ciberdem

MODIAB: Clinical, genetic and functional characterization of monogenic diabetes: from the bench to the bedside

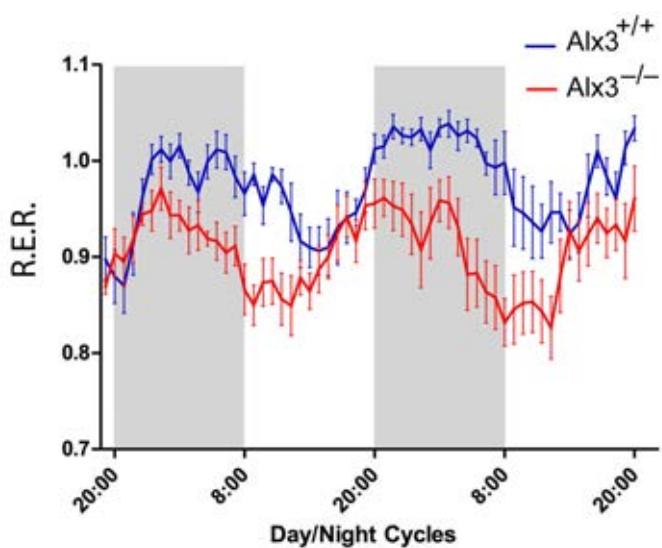
Coordinator: Luis Castaño

Ciberdem groups: Vallejo M, Castaño L, Ferrer J, Blázquez E

IODURE: The impact of overnutrition, diabetes-obesity, and undernutrition on the regulation of energy homeostasis in the central nervous system. From animal models to humans

Coordinator: Manuel Serrano Ríos

Ciberdem groups: Vallejo M, Alvarez C, Blázquez E, Burks D, Serrano-Ríos M



Alx3-deficient mice exhibit reduced energy expenditure. Shown is the respiratory exchange rate (R.E.R.) observed in wild type (blue trace) or Alx3-null (red trace) male mice, observed over a period of 48 hours. Indirect calorimetry measurements were carried out using a Phenomaster apparatus (TSE Systems) by determining O₂ consumption and CO₂ production. Simultaneous measurements of physical activity were also carried out. Night cycles are indicated by shadow. Values represent mean + s.e.m. (n = 8 animals in each group). Statistical significance was determined by ANOVA.

Molecular mechanisms of insulin resistance, insulin sensitivity and diabetic complications

Instituto de Investigaciones Biomédicas Alberto Sols, Consejo Superior de Investigaciones Científicas, Madrid
www.iib.uam.es



Principal Investigator Ángela Martínez Valverde avalverde@iib.uam.es **Postdoctoral fellows** Águeda González, Ana Isabel Arroba, Beatriz Santamaría **PhD students** Virginia Pardo, Maysa Ahmed Abd El-Hamid

Publications: 9 Research grants: 5 Awards: 1

Programmes

Programme 2. Mechanisms promoting the development of diabetes and its vascular complications. Associated disorders and co-morbidities. Strategies for prevention and treatment.

Keywords

Cytokines. Insulin action. Insulin sensitivity and resistance. Retinopathy. Nephropathy.

Main lines of research

-The beneficial effects of PTP1B inhibition by genetic and pharmacological approaches in systemic IRS-2-deficient mice in the enhancement of IRS-1-mediated insulin signalling in the liver.

-The effects of PTP1B deficiency on age-induced inflammation, senescence and peripheral insulin resistance.

-The effects of insulin sensitization by PTP1B deficiency on hepatic regeneration in mice fed on chow or a high-fat diet: molecular mechanisms involved and metabolomic analysis.

-The study of the critical nodes of the insulin-signalling cascade in human biopsies from patients with non-alcoholic hepatic steatosis (NAFLD), steatohepatitis (NASH) and hepatitis virus C infection (HCV).

-Autophagy as a potential mediator of the progression of non-alcoholic hepatic liver disease.

-The role of PTP1B in IGF-I-mediated signalling in the retina: possible benefits of PTP1B inhibition in the impairment of survival of photoreceptor cells by IRS2 deficiency.

-Analysis of the balance between stress and survival signalling pathways in diabetic retinopathy in humans.

-The study of diabetic nephropathy in IRS2-deficient mice: role of the critical nodes of the insulin signalling cascade in podocytes.

Publications

Differential insulin receptor substrate-1 (IRS1)-related modulation of neuropeptide Y and proopiomelanocortin expression in nondiabetic and diabetic IRS2-/- mice
Burgos-Ramos E, González-Rodríguez A, Canelles S,

Baquedano E, Frago LM, Revuelta-Cervantes J, Gómez-Ambrosi J, Frühbeck G, Chowen JA, Argente J, Valverde AM, Barrios V
Endocrinology, 153, 1129-1140 (2012)
PMID 22210743. Q1. IF 4.459. With other CIBERs: CIBEROBN. Programme 2

Pten positively regulates brown adipose function, energy expenditure, and longevity
Ortega-Molina A, Efeyan A, Lopez-Guadamillas E, Muñoz-Martin M, Gómez-López G, Cañamero M, Mulero F, Pastor J, Sonia Martínez S, Romanos E, Gonzalez-Barroso MM, Rial E, Valverde AM, Bischoff JR, Serrano M
Cell Metabolism, 15, 382-394 (2012)
PMID 22405073. 1st decile. IF 13.668. Programme 2

Essential role of protein tyrosine phosphatase 1B in obesity-induced inflammation and peripheral insulin resistance during aging
González-Rodríguez A, Más-Gutierrez JA, Mirasierra M, Fernandez-Pérez A, Lee YJ, Ko HJ, Kim JK, Romanos E, Carrascosa JM, Ros M, Vallejo M, Rondinone CM, Valverde AM
Aging Cell, 11, 284-296 (2012)
PMID 22221695. Q1. IF 6.265. With other Ciberdem Groups: Vallejo M. Programme 2

Studies of naturally occurring friedelane triterpenoids as insulin sensitizers in the treatment type 2 diabetes mellitus
Ardiles AE, González-Rodríguez A, Núñez MJ, Perestelo NR, Pardo V, Jiménez IA, Valverde AM, Bazzocchi IL
Phytochemistry, 84, 116-124 (2012)
PMID 22925829. Q1. IF 3.351. Programme 2

Protein-tyrosine phosphatases are involved in interferon resistance associated with insulin resistance in HepG2 cells and obese mice
García-Ruiz I, Solís-Muñoz P, Gómez-Izquierdo E, Muñoz-Yagüe MT, Valverde AM, Solís-Herruzo JA
J Biol Chem, 287, 19564-19573 (2012)
PMID 22493491. Q1. IF 4.773. Programme 2

Protein-tyrosine phosphatase 1B (PTP1B) deficiency confers resistance to transforming growth factor-β (TGF-β)-induced suppressor effects in hepatocytes
Ortiz C, Caja L, Bertran E, Gonzalez-Rodriguez Á, Valverde AM, Fabregat I,
Sancho PJ Biol Chem, 287, 15263-15274 (2012)
PMID 22427664. Q1. IF 4.773. Programme 2

IRS2-deficient mice show sensorineural hearing loss that is delayed by concomitant PTP1B loss of function
Murillo-Cuesta S, Camarero G, González-Rodríguez A, La Rosa LR, Burks DJ, Avendaño C, Valverde AM, Varela-Nieto I
Mol Med, 18, 260-269 (2012)
PMID 22160220. Q1. IF 3.757. With other Ciberdem groups: Burks D. Programme 3

Beneficial effects of fenofibrate in retinal pigment epithelium by the modulation of stress and survival signaling under diabetic conditions

Miranda S, González-Rodríguez Á, García-Ramírez M, Revuelta-Cervantes J, Hernández C, Simó R, Valverde ÁM
J Cell Physiol, 227, 2352-2362 (2012)
PMID 21826649. Q1. IF 3.874. With other Ciberdem groups: Simó R. Programme 2

Neurodegeneration is an early event in diabetic retinopathy: therapeutic implications
Simó R, Hernández C; European Consortium for the Early Treatment of Diabetic Retinopathy (EUROCONDOR)
Br J Ophthalmol, 96, 1285-1290 (2012)
PMID 22887976. Q1. IF 2.902. With other Ciberdem groups: Burks D, Simó R. Programme 2

Research grants

Estudio de la sensibilidad hepática a la insulina por la inhibición de la proteína tirosina fosfatasa 1B
Ministerio de Ciencia e Innovación, SAF2009-08114: 2010-2012
Principal Investigator: Ángela Martínez Valverde
Associate investigators: Águeda González, Jesús Revuelta, Beatriz Santamaría, Maysa Mobasher, Virginia Pardo
National project. Programme 2

Estudio de los mecanismos de resistencia a insulina: implicaciones en obesidad, diabetes y síndrome metabólico
Programas de I+D entre Grupos de investigación en Biomedicina 2010. Comunidad de Madrid, P2010/ BMD-2423: 2012-2015
Principal Investigator: Manuel Ros Pérez
Associate investigators: Fernando Escrivá, Carmen Alvarez, Manuel Benito, Ángela Martínez Valverde
Autonomous Community project. Programme 2

European Consortium for the Early Treatment of Diabetic Retinopathy (EUROCONDOR). Neurodegeneration as an early event in the Pathogenesis of Diabetic Retinopathy: A multicentric, prospective, phase II-III, open randomized controlled trial to assess the efficacy of neuroprotective drugs administered topically to prevent or arrest Diabetic Retinopathy
European Comission-FP7-278040-2, 7th Framework Programme: 2012-2016
Principal Investigator: Rafael Simó
Associate investigators: J. Cunha-Vaz, A.K. Sjolie, E. Midena, F. Bandello, P. Massin, G. Lang, P. Scanlon, S. Harding, C. Egan, M. Porta, J. Gibson, J. Garcia Arumi, A. Martinez Valverde, D. Burks, IDF Europa, BCN Peptides, CAIBER
European project. Programme 2

The role of PTP1B in hepatocyte apoptosis
Hoffmann-La Roche: 2009-2012
Principal Investigator: Ángela Martínez Valverde
Associate investigators: Águeda González, Maysa Mobasher, Cristina Rondinone
Private Funds. Programme 2

Effect of GLP-1 on the gut-to-liver axis in the hepatoprotection against non-alcoholic fatty liver disease
EFSD/ Amylin Programme 2011: 2011-2013
Principal Investigator: Ángela Martínez Valverde

Scientific collaborations within Ciberdem

NEURONET-DIAB: The identification of neurodegenerative mechanisms that promote the development of diabetic retinopathy: the role of insulin signalling and apoptosis

Coordinator: Deborah Burks

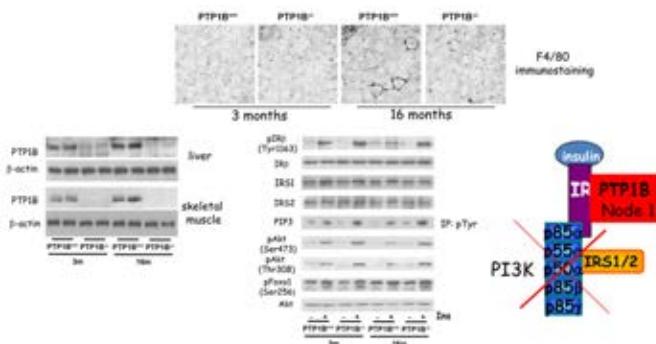
Ciberdem groups: Valverde AM, Burks D, Simó R

Awards

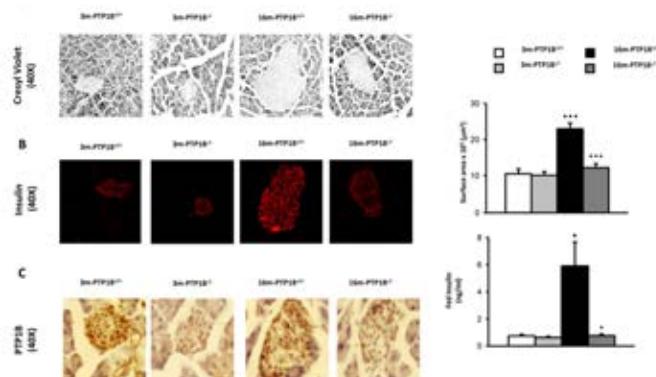
Premio Margarita Lorenzo al mejor trabajo presentado sobre enfermedades metabólicas. Congreso Anual de la Sociedad Española de Bioquímica y Biología Celular (2012)

Awardee: Águeda González-Rodríguez

PTP1B expression in peripheral tissues is up-regulated as a result of



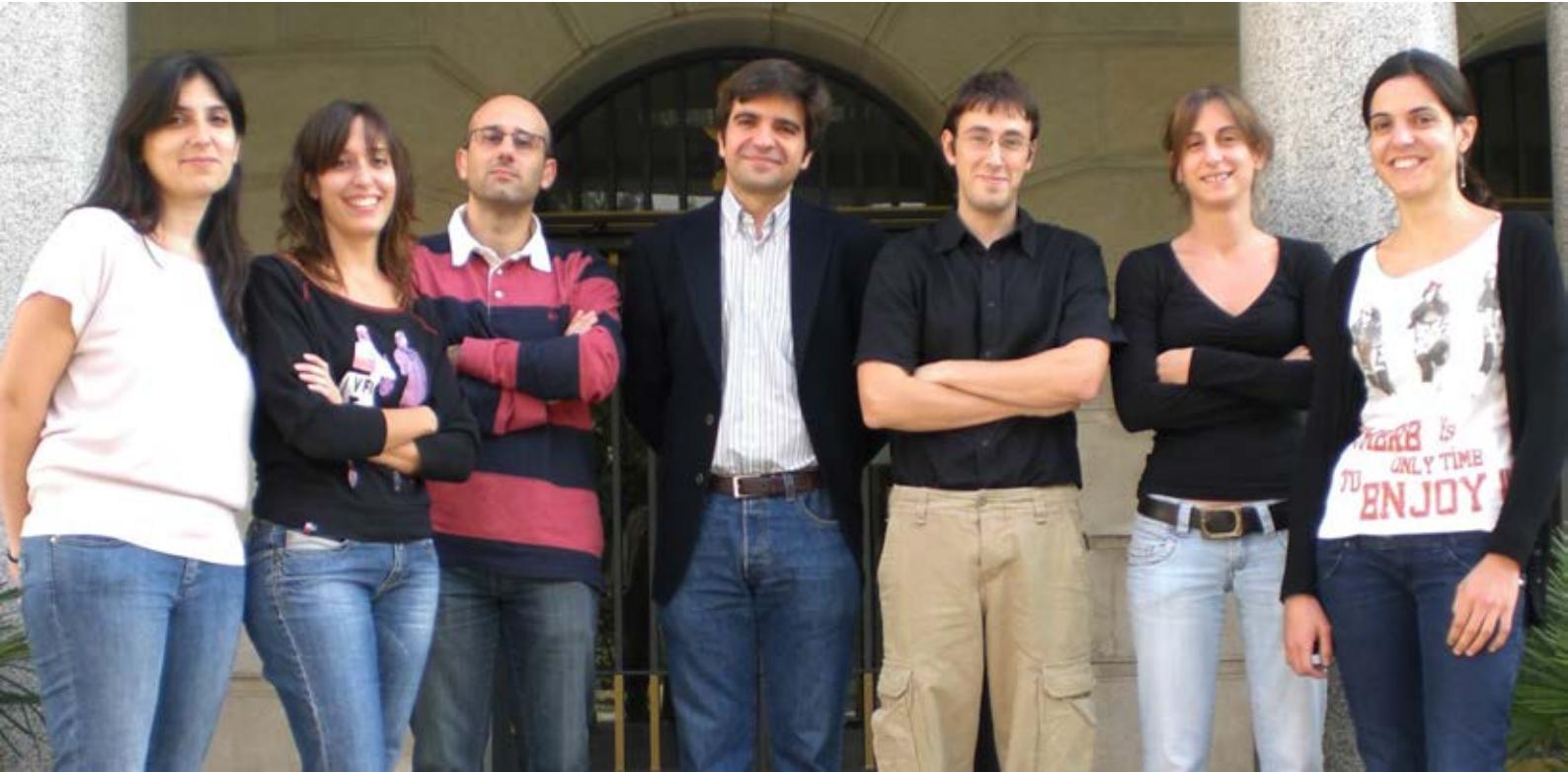
obesity-linked chronic inflammation during aging.



PTP1B deficiency protects against islet hyperplasia and hyperinsulinemia during aging-associated obesity.

Pharmacological targets in inflammation and metabolic diseases

Unitat de Farmacologia, Facultat de Farmàcia, Universitat de Barcelona
www.ub.edu



Principal Investigator Manuel Vázquez Carrera mvazquezcarrera@ub.edu **Postdoctoral fellow** Xavier Palomer, Emma Barroso

PhD students Lucía Serrano Marco, Laia Salvadó, Eva Capdevila

Publications: 4

Research grants: 1

Programmes

Programme 4. Use of biomedical approach systems to develop personalized therapies for diabetes.

Keywords

Insulin sensitivity and resistance. PPAR. Lipid metabolism. Cardiac complications.

Main lines of research

A study of the molecular mechanisms involved in the link between inflammation and insulin resistance:

- evaluating the molecular mechanisms by which PPAR agonists prevent inflammation and insulin resistance,
- studying how monounsaturated fatty acids prevent saturated fatty-acid-induced insulin resistance,
- evaluating the mechanisms through which PPAR agonists may prevent the development of metabolic syndrome, dyslipidaemia and cardiac hypertrophy.

Publications

TNF- α inhibits PPAR β/δ activity and SIRT1 expression through NF- κ B in human adipocytes

Serrano-Marco L, Chacón MR, Maymó-Masip E, Barroso E, Salvadó L, Wabistch M, Garrido-Sánchez L, Tinahones FJ, Palomer X, Vendrell J, Vázquez-Carrera M
Biochim Biophys Acta, 1821, 1177-1185 (2012)

PMID 22683888. Q1. IF 5.269. With other Ciberdem groups:
Vendrell J. With other CIBERs: CIBEROBN. Programme 4

Targeting PPAR β/δ for the treatment of type 2 diabetes mellitus
Salvadó L, Serrano-Marco L, Barroso E, Palomer X, Vázquez-Carrera M

Expert Opin Ther Targets, 16, 209-223 (2012)
PMID 22280315. Q1. IF 3.716. Programme 4

The peroxisome proliferator-activated receptor (PPAR) β/δ agonist GW501516 inhibits IL-6-induced signal transducer

and activator of transcription 3 (STAT3) activation and insulin resistance in human liver cells

Serrano-Marco L, Barroso E, El Kochairi I, Palomer X, Michalik L, Wahli W, Vázquez-Carrera M

Diabetologia, 55, 743-751 (2012)

PMID 22179221. 1st decile. IF 6.814. Programme 4

PGC-1 α induces mitochondrial and myokine transcriptional programs and lipid droplet and glycogen accumulation in cultured human skeletal muscle cells

Mormeneo E, Jimenez-Mallebrera C, Palomer X, De Nigris V, Vázquez-Carrera M, Orozco A, Nascimento A, Colomer J, Lerín C, Gómez-Foix AM

PLoS ONE, 7, e29985 (2012)

PMID 22272266. Q1. IF 4.092. With other Ciberdem groups:

Gómez-Foix AM. Programme 4

Research grants

Vías moleculares que conectan la inflamación con la resistencia a la insulina y la hipertrofia cardíaca. Estudio de los efectos de los ligandos PPAR β/δ , el ácido oleico y las estatinas

Ministerio de Ciencia e Innovación, SAF2009-06939: 2012

Principal Investigator: Manuel Vázquez-Carrera

National project. Programme 4

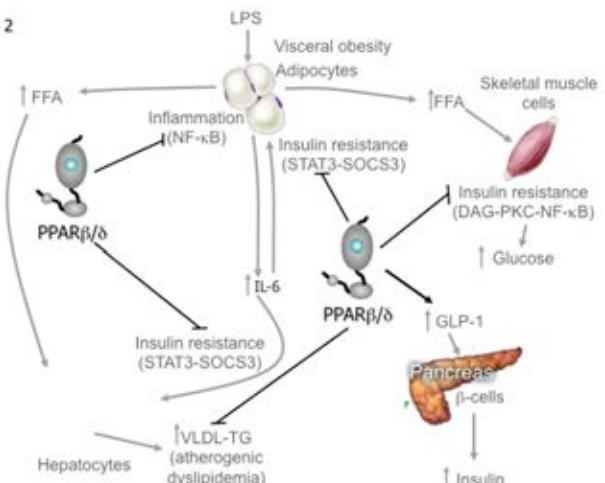
Scientific collaborations within Ciberdem

STEMOB: Adult adipose tissue-derived progenitor cells: the influence of the clinical phenotype and adipose depot origin on their biological properties

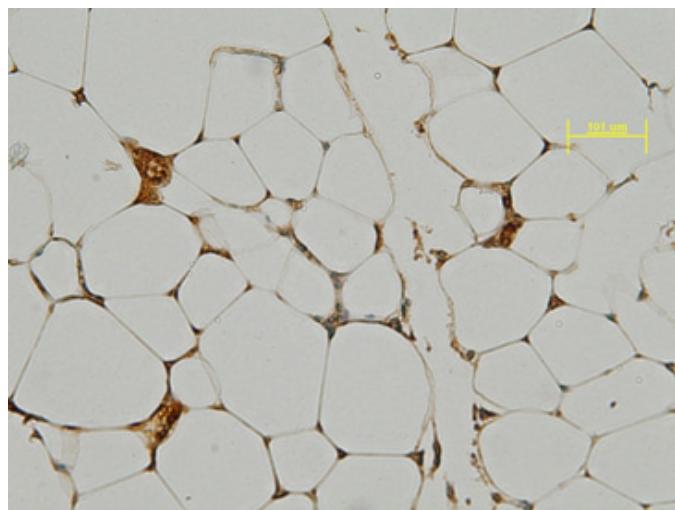
Coordinator: Joan J Vendrell

Ciberdem groups: Vázquez-Carrera M, Vendrell J, Zorzano A, Balsinde J, Gómez-Foix AM, Montanya E, Simó R

Figure 2



Potential mechanism of action involved in the prevention of insulin resistance and type 2 diabetes mellitus following PPAR β/δ activation.



Adipocyte.

Diabetes and Metabolic Associated Diseases Research Group

Hospital Universitari de Tarragona Joan XXIII, Institut d'Investigació Sanitària Pere Virgili
www.iispv.cat



Principal Investigator Joan J Vendrell jvo@comt.es diamet@iispv.cat **Associate researchers** Luís Gallart, Cristina Gutiérrez, Ana Megía, Matilde Rodríguez, Inmaculada Simón, Sonia Fernández, Mercedes Miranda, María Esther Solano, Silvia Daniela Náf

Predoctoral fellows Rosa Elena Yáñez **Postdoctoral fellows** Xavier Escoté, Lourdes Garrido, Olga Gisela Pachón **Lab technicians** Miriam Campos, Francesc Xavier Duran, Elsa Maymó, Kelly Roche, Catalina Núñez, Elena Peña **Administrative staff** Anna Estivill

Publications: 18 Research grants: 10

Programmes

Programme 2. Mechanisms promoting the development of diabetes and its vascular complications. Associated disorders and co-morbidities. Strategies for prevention and treatment.

Programme 4. Use of biomedical approach systems to develop personalized therapies for diabetes.

Keywords

Insulin sensitivity and resistance. Metabolic syndrome. Prediction/prevention of type 2 diabetes. Obesity.

Main lines of research

-Physio-pathological mechanisms inducing insulin resistance during pregnancy. Maternal and neonatal consequences at short and long term follow-up.

-Immunophenotypic characterization of human adipose derived mesenchymal stem cells (hadMSC). Relationship with insulin-resistance, obesity and type 2 diabetes diseases. Human brown adipose tissue.

-Lipid de-regulation of cellular functioning and its consequences in the insulin resistance environment that account in adipose tissue. Role of lipin family.

-Adipose tissue plasticity. Molecular bases of insulin resistance. The role of glycogen metabolism, apoptosis and proliferation events in human adipose tissue.

-Inflammatory events in active metabolic tissues (adipose, muscular and hepatic) and in the cardiovascular system. Contribution to Insulin resistance and metabolic dysfunction.

Publications

Insulin resistance, low-grade inflammation and type 1 diabetes

mellitus

Llauradó G, Gallart L, Tirado R, Megia A, Simón I, Caixàs A, Giménez-Palop O, Berlanga E, Vendrell J, González-Clemente JM
Acta Diabetol, 49, 33-39 (2012)
PMID 21290251. Q2. IF 2.784. Programme 2

The retinoic acid receptor-related orphan nuclear receptor γ1 (ROR γ 1): a novel player determinant of insulin sensitivity in morbid obesity

Tinahones FJ, Moreno-Santos I, Vendrell J, Chacon MR, Garrido-Sánchez L, García-Fuentes E, Macias-González M
Obesity, 20, 488-497 (2012)
PMID 21904299. Q1. IF 4.284. With other CIBERs: CIBEROBN. Programme 4

Structural damage in diabetic nephropathy is associated with TNF-α system activity

Fernández-Real JM, Vendrell J, García I, Ricart W, Vallès M
Acta Diabetol. 49, 301-305 (2012)
PMID 22042131. Q2. IF 2.784. With other CIBERs: CIBEROBN. Programme 2

Zinc-α2-glycoprotein is unrelated to gestational diabetes: anthropometric and metabolic determinants in pregnant women and their offspring

Näf S, Escote X, Yañez RE, Ballesteros M, Simón I, Gil P, Megia A, Vendrell J
PLoS One, 7, e47601 (2012)
PMID 23272038. Q1. IF 4.092. Programme 4

FABP4 dynamics in obesity: discrepancies in adipose tissue and liver expression regarding circulating plasma levels

Queipo-Ortuño MI, Escoté X, Ceperuelo-Mallafré V, Garrido-Sánchez L, Miranda M, Clemente-Postigo M, Pérez-Pérez R, Peral B, Cardona F, Fernández-Real JM, Tinahones FJ, Vendrell J
PLoS One, 7, e48605 (2012)
PMID 23139800. Q1. IF 4.092. With other CIBERs: CIBEROBN. Programme 2

Serum levels of TWEAK and scavenger receptor CD163 in type 1 diabetes mellitus: relationship with cardiovascular risk factors. a case-control study

Llauradó G, González-Clemente JM, Maymó-Masip E, Subías D, Vendrell J, Chacón MR
PLoS One, 7, e43919 (2012)
PMID 22937125. Q1. IF 4.092. Programme 2

Ethinyl estradiol-cyproterone acetate versus low-dose pioglitazone-flutamide-metformin for adolescent girls with androgen excess: divergent effects on CD163, TWEAK receptor, ANGPTL4, and LEPTIN expression in subcutaneous adipose tissue

Díaz M, Chacón MR, López-Bermejo A, Maymó-Masip E, Salvador C, Vendrell J, de Zegher F, Ibáñez L
J Clin Endocrinol Metab, 97, 3630-8 (2012)
PMID: 22791755. Q1. IF 5.967. With other Ciberdem groups: Ibáñez L. Programme 4

The usefulness of HbA1c in postpartum reclassification of gestational diabetes

Megia A, Näf S, Herranz L, Serrat N, Yañez RE, Simón I, Vendrell J
BJOG, 119, 891-894 (2012)
PMID 22530667. Q1. IF 3.407. Programme 4

Leptin and adiponectin, but not IL18, are related with insulin resistance in treated HIV-1-infected patients with lipodystrophy
Veloso S, Escoté X, Ceperuelo-Mallafré V, López-Dupla M, Peraire J, Viladés C, Domingo P, Castro A, Olona M, Sirvent JJ, Leal M, Vendrell J, Richart C, Vidal F
Cytokine, 58, 253-260 (2012)

PMID 22364914. Q2. IF 3.019. With other CIBERs: CIBEROBN. Programme 4

De novo lipogenesis in adipose tissue is associated with course of morbid obesity after bariatric surgery

Garrido-Sánchez L, Vendrell J, Fernández-García D, Ceperuelo-Mallafré V, Chacón MR, Ocaña-Wilhelmi L, Alcaide J, Tinahones FJ, García-Fuentes E
PLoS One, 7, e31280 (2012)
PMID 22384010. Q1. IF 4.092. Programme 4

GRK2 contribution to the regulation of energy expenditure and brown fat function

Vila-Bedmar R, Garcia-Guerra L, Nieto-Vazquez I, Mayor F Jr, Lorenzo M, Murga C, Fernández-Veledo S
FASEB J, 26, 3503-3514 (2012)
PMID 22516294. 1st decile. IF 5.712 . With other Ciberdem groups: Benito M. Programme 2

Iodine intake in the adult population. Di@bet.es study

Soriguer F, García-Fuentes E, Gutierrez-Repiso C, Rojo-Martinez G, Velasco I, Goday A, Bosch-Comas A, Bordiu E, Calle A, Carmena R, Casamitjana R, Castano L, Castell C, Catala M, Delgado E, Franch J, Gatzambide S, Girbes J, Gomis R, Gutierrez G, Lopez-Alba A, Martinez-Larrad MT, Menendez E, Mora-Peces I, Ortega E, Pascual-Manich G, Serrano-Rios M, Valdes S, Vazquez JA, Vendrell J
Clin Nutr, 31, 882-888 (2012)

PMID 22560740. Q1. IF 3.731. With other Ciberdem groups: Carmena R, Castaño L, Soriguer F, Gomis R, Serrano-Rios M. Programme 1

Prevalence of diabetes mellitus and impaired glucose regulation in Spain: the Di@bet.es Study

Soriguer F, Goday A, Bosch-Comas A, Bordiu E, Calle-Pascual A, Carmena R, Casamitjana R, Castano L, Castell C, Catala M, Delgado E, Franch J, Gatzambide S, Girbes J, Gomis R, Gutierrez G, Lopez-Alba A, Martinez-Larrad MT, Menendez E, Mora-Peces I, Ortega E, Pascual-Manich G, Rojo-Martinez G, Serrano-Rios M, Valdes S, Vazquez JA, Vendrell J
Diabetologia, 55, 88-93 (2012)

PMID 21987347. 1st decile. IF 6.814. With other Ciberdem groups: Carmena R, Castaño L, Gomis R, Serrano-Ríos M, Soriguer F

Zinc-alpha 2-glycoprotein gene expression in adipose tissue is related with insulin resistance and lipolytic genes in morbidly

obese patients

Garrido-Sánchez L, García-Fuentes E, Fernández-García D, Escoté X, Alcaide J, Perez-Martinez P, Vendrell J, Tinahones FJ PLoS One, 7, e33264 (2012)

PMID 22442679. Q1. IF 4.092. With other Ciberdem groups: Soríguer F. With other CIBERs: CIBEROBN. Programme 1

A nontargeted proteomic approach to the study of visceral and subcutaneous adipose tissue in human obesity

Insenser M, Montes-Nieto R, Vilarrasa N, Lecube A, Simó R, Vendrell J, Escobar-Morreale HF Mol Cell Endocrinol, 363, 10-19 (2012)

PMID 22796336. Q2. IF 4.192. With other Ciberdem groups: Escobar-Morreale H, Simó R, Montanya E. Programme 4

Arterial stiffness is increased in patients with type 1 diabetes without cardiovascular disease: a potential role of low-grade inflammation

Llauradó G, Ceperuelo-Mallafré V, Vilardell C, Simó R, Freixenet N, Vendrell J, González-Clemente JM Diabetes Care, 35, 1083-9 (2012)

PMID 22357186. 1st decile. IF 8.087. With other Ciberdem groups: Simó R. Programme 2

Can augmentation index substitute aortic pulse wave velocity in the assessment of central arterial stiffness in type 1 diabetes?

Llauradó G, Simó R, Villaplana M, Berlanga E, Vendrell J, González-Clemente JM Acta Diabetol, 49, Suppl 1:S253-7 (2012)

PMID 23053880. Q2. IF 2.784. With other Ciberdem groups: Simó R. Programme 2

TNF- α inhibits PPAR β/δ activity and SIRT1 expression through NF- κ B in human adipocytes

Serrano-Marco L, Chacón MR, Maymó-Masip E, Barroso E, Salvadó L, Wabistch M, Garrido-Sánchez L, Tinahones FJ, Palomer X, Vendrell J, Vázquez-Carrera M Biochim Biophys Acta, 1821, 1177-1185 (2012)

PMID 22683888. Q1. IF 5.269. With other Ciberdem groups: Vázquez Carrera M. With other CIBERs: CIBEROBN. Programme 4

Research grants

Papel de las isoformas circulantes de adiponectina en la diabetes gestacional. Relación con el metabolismo hidrocarbonado y el desarrollo antropométrico fetal

ISCIII, FIS 09/2152: 2010-2012

Principal Investigator: Inmaculada Simón Muela

Associate investigator: Ana Megía

National project. Programme: 2

Papel de las Fosfatato Fosfatases (PAP, Lipin) en la regulación de funciones celulares por medio del control de la biosíntesis de fosfolípidos y su relación con la obesidad

ISCIII, PI 10/00967: 2011-2013

Principal Investigator: Mercedes Miranda Guardiola

National project. Programme: 2

Grup de recerca en diabetis i co-morbiditats associades.

DiReCor

Generalitat de Catalunya, AGAUR, 2009 SGR 01257: 2009-2013

Principal Investigator: Joan Vendrell Ortega

Associate investigators: Miriam Campos, Victoria Ceperuelo, Xavier Escoté, Luís Gallart, Cristina Gutiérrez, Elsa Maymó, Ana Megía, Mercedes Miranda, Matilde Rodríguez, Inmaculada Simón

Autonomous community project. Programme: 2

Variació en la Despesa Energètica en repòs al llarg de la Gestació en la Diabetes Mellitus tipus 1 (DM1), dones amb Diabetes Mellitus Gestacional (DMG) i dones amb tolerància normal a la glucosa en sang (TGN)

2010FI_B 01004, AGAUR: 2010-2012

Principal Investigator: Rosa Elena Yáñez García

Associate investigators: Ana Megía, Joan Vendrell

Autonomous community project. Programme 2

Contratos de investigadores en el Sistema Nacional de Salud "Miguel Servet"

ISCIII, CP 11/00021: 2012-2014

Principal Investigator: Mercedes Miranda Guardiola

National project. Programme 4

Programa de Suport als Grups de Recerca Reconeguts

2010PFR-URV-B2-54: 2011-2013

Principal Investigator: Joan Vendrell Ortega

Associate investigators: Miriam Campos Baguena, Xavier Escote Miro, Luis Gallart Millan, Cristina Gutierrez Fornes, Elsa Maymo Masip, Ana Megia Colet, Mercedes Miranda Guardiola, Silvia Naf Cortes, Matilde Rodriguez Chacon, Inmaculada Simon Muela, Esther Solano Fraile, Xavier Duran Sanmarti, Gisela Pachon Pena, Pilar Gil Lluis, Rosa Elena Yanez Garcia

Autonomous community project. Programme 2

Rellevància del TWEAK i CD163 a la diabetis gestacional. Relació amb la resistència a la insulina, el creixement fetal i l'adipositat del nounat

2010/IISPV/06, Institut d'Investigació Sanitària Pere Virgili: 2011-2013

Principal Investigator: Ana Megía Colet

Associate investigators: Pilar Gil Lluis; Cristina Gutierrez Fornes; Silvia Naf Cortes

Private funds. Programme 2

Estudio de TWEAK/CD 163 como posibles biomarcadores de diabetes tipo (DT2) en la cohorte di@bet.es. Aspectos moleculares locales en el tejido adiposo

ISCIII, PI 11/00049,: 2012-2014

Principal Investigator: Matilde Rodriguez Chacón

Associate investigators: Elsa Maymó

National project. Programme 2

Estudio de los marcadores de tejido adiposo marrón y de los mecanismos de su diferenciación a partir de células madre mesenquimales del tejido adiposo blanco subcutáneo humano

ISCIII, PI 11/00085: 2012-2014

Principal Investigator: Joan Vendrell Ortega

Associate investigators: Joaquin Maldonado, Esther Solano, Miriam Campos, Xavier Escote, Olga Gisela Pachon, Vicente Vicente, Cristina Gutierrez. *National project. Programme 2*

Contratos de investigadores en el Sistema Nacional de Salud "Miguel Servet"

ISCIII, CP 10/00438: 2011-2013

Principal Investigator: Sonia Fernandez Veledo

Associate investigator: Kelly Roche

National project. Programme: 4

Scientific collaborations within Ciberdem

STEMOB: Adult adipose tissue-derived progenitor cells: the influence of the clinical phenotype and adipose depot origin on their biological properties

Coordinator: Joan J Vendrell

Ciberdem groups: Vendrell J, Zorzano A, Balsinde J, Gómez-Foix AM, Montanya E, Simó R, Vázquez-Carrera M

DIASOBS: Determinants of insulin resistance and glucose tolerance disorders, including diabetes, in severe obesity and their changes after bariatric surgery-induced weight loss

Coordinator: Héctor F Escobar Morreale

Ciberdem groups: Vendrell J, Correig X, Montanya E, Escobar-Morreale HF, Simó R

Di@bet.es Study: 1st epidemiological study of the prevalence of type 2 diabetes in Spain

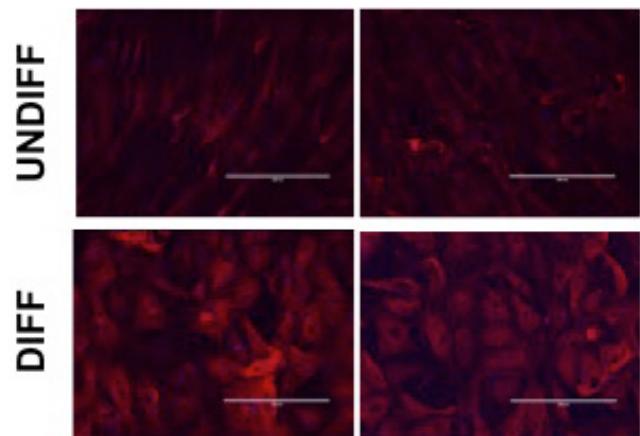
Coordinator: Federico Soriguer

Ciberdem groups: Vendrell J, Soriguer F, Carmena R, Castaño L, Gomis R, Serrano-Ríos M

Ciberdem Biobank

Coordinator: Anna Novials

Ciberdem Biobank nodes: Vendrell J, Gomis R, Novials A, Masana L, Castaño L, Serrano-Ríos M, Soriguer F, Carmena R, Blanco-Vaca F



Immunofluorescence location of AQP11 in human adipocytes.

Molecular characteristics and action of incretins, the physiopathology of glucose, lipids and bone metabolism

Fundación Jiménez Díaz, Madrid

www.fjd.es



Principal Investigator María Luisa Villanueva Peñacarrillo mlvillanueva@fjd.es **Associate researchers** Alicia Acitores, Isabel Valverde, Nieves González **PhD students** Irene Gutiérrez, Irene Ramos **Lab manager** María Moreno **Lab technicians** Estrella Martín-Crespo

Publications: 1 Research grants: 1 Awards: 1

Programmes

Programme 2. Mechanisms promoting the development of diabetes and its vascular complications. Associated disorders and co-morbidities. Strategies for prevention and treatment.

Keywords

Glucose transport. Incretins. Insulin sensitivity and resistance. Lipid metabolism. Islet amyloid polypeptide/amylin.

Main lines of research

- The effects and mechanisms in the action of GLP-1 action (glucagon-like-peptide 1), -an incretin with antidiabetic properties- and also that of GLP-1-homologue peptides, on glucose, lipids and bone metabolism.
- The mechanism of insulin secretion.
- The genetic characteristics, pharmacology and function of the human BRS-3 receptor, a possible target for the treatment of

diabetes and obesity.

-The effect of amylin on glucose and bone metabolism.

Publications

Normalizing action of exendin-4 and GLP-1 on the glucose metabolism of extrapancreatic tissues, in insulin resistant and type 2 diabetic states

Moreno P, Nuche-Berengue B, Gutierrez-Rojas I, Acitores A, Sancho V, González N, Valverde I, Villanueva-Peña Carrillo ML
J Mol Endocrinol, 48, 37-47 (2012)

[PMID: 22065862. Q2. IF 3.485. Programme 2](https://pubmed.ncbi.nlm.nih.gov/22065862/)

Research grants

A molecular characterization of GLP-1 receptor in extrapancreatic tissues

ISCIII, PS09/01185: 2010-2012

Principal Investigator: Nieves González Gómez

National project. Programme 2

Scientific collaborations within Ciberdem

ENDODIAB: Mechanisms of endothelial dysfunction in diabetes:

the role of amylin and circulating endothelial cells

Coordinator: Anna Novials

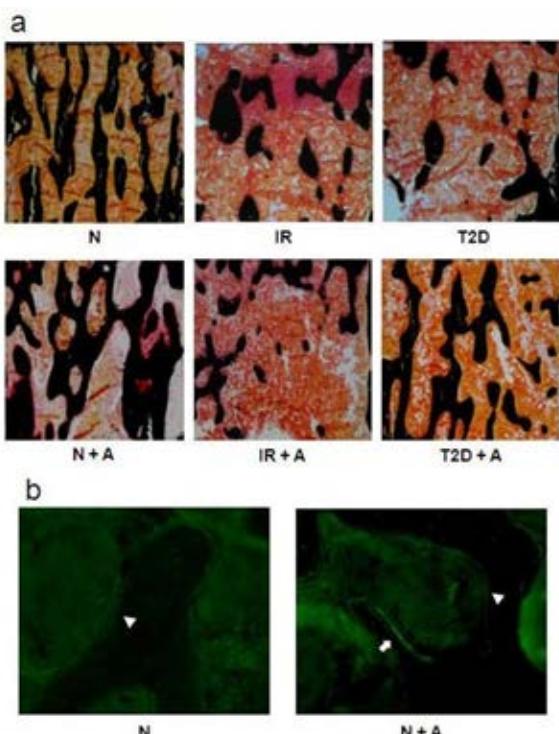
Ciberdem groups: Villanueva-Peña Carrillo ML, Gomis R,

Novials A

Awards

Honorary Member of the European Association for the Study of Diabetes (2012)

Awardee: Isabel Valverde Alonso



N: normal; IR: insulin-resistant; T2D: type 2 diabetic; A: amylin

Representative light microscopy images showing the trabecular structure using (a) Von Kossa's staining, and (b) single (arrowheads) and double (arrows) demeclocycline labels, in the femoral metaphysis of normal (N), insulin resistant (IR) and type 2 diabetic (T2D) rats, after saline (control) or amylin treatment. Original magnifications, x400.

Heterogenic and polygenic diseases. Genexartis

Institut de Recerca Biomèdica, Barcelona
www.irbbarcelona.org



Principal Investigator Antonio Zorzano antonio.zorzano@irbbarcelona.org **Associate researchers** Marta Camps, Anna Gumà, Manuela Sánchez Feutrie, Xavier Testar **Postdoctoral fellows** Maria Àngels Díaz, María Isabel Hernández, Saska Ivanova, Federica Lombardi, Juan Pablo Muñoz, Montserrat Romero, David Sebastián, Lucia Serrano **PhD students** Hilda Yuliana Enciso, Paula Martínez, Eduard Noguera, David Sala, Ana Sancho **MSc Students** Alba Sabaté **Lab Technicians** Ignacio Castrillón, Jorge Manuel Seco **Project Manager** Olga Bausà **Visiting scientist** Francesc Xavier Duran

Publications: 8 Research grants: 4

Programmes

Programme 4. Use of biomedical approach systems to develop personalized therapies for diabetes.

Keywords

Insulin action. Insulin sensitivity and resistance. Carbohydrate metabolism. Lipid metabolism. Oral pharmacological agents. Mitochondrial metabolism. Autophagy.

Main lines of research

Molecular mechanisms involved in the development of insulin resistance and the identification of novel targets for diabetes therapy:

a) analysis of the role of mitochondrial dynamics proteins in metabolic homeostasis, in the control of insulin signalling, and

in the response to cell stress,

b) a study of the role of DOR protein in insulin-resistant states,
c) analysis of the metabolism role of neuregulins.

Publications

Identification of novel type 2 diabetes candidate genes involved in the crosstalk between the mitochondrial and the insulin signaling systems

Mercader JM, Puiggros M, Segrè AV, Planet E, Sorianello E, Sebastian D, Rodriguez-Cuenca S, Ribas V, Bonàs-Guarch S, Draghici S, Yang C, Mora S, Vidal-Puig A, Dupuis J; DIAGRAM Consortium, Florez JC; MITIN Consortium, Zorzano A, Torrents D

PLoS Genet, 8, e1003046 (2012)

PMID 23236286. 1st decile. IF 8.694. With other international groups. Programme 4

DOA undergoes nucleo-cytoplasmic shuttling, which involves passage through the nucleolus

Mauvezin C, Sancho A, Ivanova S, Palacin M, Zorzano A
FEBS Lett, 586, 3179-3186 (2012)

PMID 22750142. Q2. IF 3.538. With other CIBERs: CIBERER. Programme 4

Cholesterol depletion in adipocytes causes caveolae collapse concomitant with proteosomal degradation of cavin-2 in a switch-like fashion

Breen MR, Camps M, Carvalho-Simoes F, Zorzano A, Pilch PF
PLoS One, 7, e34516 (2012)

PMID 22493697. Q1. IF 4.092. Programme 4

DOA/Tp53inp2 and Tp53inp1 constitute a metazoan gene family encoding dual regulators of autophagy and transcription
Sancho A, Duran J, García-España A, Mauvezin C, Alemu EA, Lamark T, Macias MJ, DeSalle R, Royo M, Sala D, Chicote JU, Palacín M, Johansen T, Zorzano A
PLoS One, 7, e34034 (2012)

PMID 22470510. Q1. IF 4.092. With other Ciberdem groups: Guinovart J. With other CIBERs: CIBERER. Programme 4

Loss of mitochondrial protease OMA1 alters processing of the GTPase OPA1 and causes obesity and defective thermogenesis in mice

Quirós PM, Ramsay AJ, Sala D, Fernández-Vizcaya E, Rodríguez F, Peinado JR, Fernández-García MS, Vega JA, Enríquez JA, Zorzano A, López-Otín C
EMBO J, 31, 2117-2133 (2012)

PMID 22433842. Q1. IF 9.205. Programme 4

The promoter activity of human Mfn2 depends on Sp1 in vascular smooth muscle cells

Sorianello E, Soriano FX, Fernández-Pascual S, Sancho A, Naon D, Vila-Caballer M, González-Navarro H, Portugal J, Andrés V, Palacín M, Zorzano A
Cardiovasc Res, 94, 38-47 (2012)

PMID 22253285. Q1. IF 6.064. With other CIBERs: CIBERER. Programme 4

Mitofusin 2 (Mfn2) links mitochondrial and endoplasmic reticulum function with insulin signaling and is essential for normal glucose homeostasis

Sebastián D, Hernández-Alvarez MI, Segalés J, Sorianello E, Muñoz JP, Sala D, Waget A, Liesa M, Paz JC, Gopalacharyulu P, Oresic M, Pich S, Burcelin R, Palacín M, Zorzano A
PNAS, 109, 5523-5528 (2012)

PMID 22427360. 1st decile. IF 9.681. With other CIBERs: CIBERER. Programme 4

Guidelines for the use and interpretation of assays for monitoring autophagy

Klionsky DJ, Abdalla FC, Abieliovich H, Abraham RT, Acevedo-Arozena A, Adeli K, Agholme L, Agnello M, Agostinis P, Aguirre-Ghiso JA et al.

Autophagy, 8, 445-544 (2012)

PMID 22966490. Q1. IF 7.453. Programme 4

Research grants

Transnational cooperation for technological innovation in the development of molecules for the treatment of obesity and diabetes

SUDOE (European Community Initiative INTERREG IV for Southwestern Europe) SOE1/P1/E178: 2009-2012

Principal Investigator: Antonio Zorzano

European project. Programme 4

Genetic determinants of the metabolic alterations in obesity and/or type 2 diabetes and their participation in insulin resistance
Ministerio de Ciencia e Innovación, SAF2008-03803: 2009-2013

Principal Investigator: Antonio Zorzano

National project. Programme 4

Caracterización de los efectos de las neuregulinas en modelos de resistencia a la insulina

Ministerio de Ciencia e Innovación, SAF2008-01723: 2009-2013

Principal Investigator: Antonio Zorzano

Coordinator: Anna Gumà

National project. Programme 4

Molecular basis of metabolic disorders

Departament d'Innovació, Universitats i Empresa, Generalitat de Catalunya, 2009SGR915: 2009-2013

Principal Investigator: Antonio Zorzano

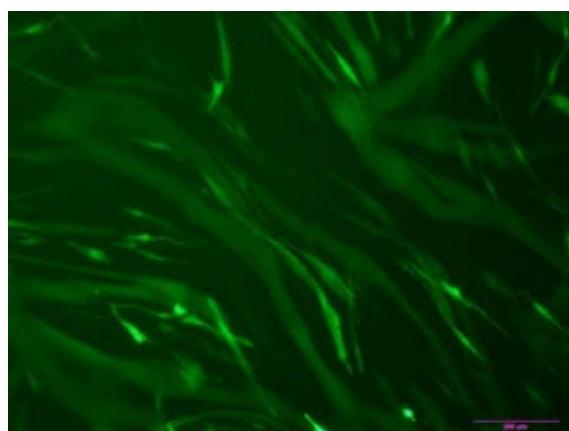
Autonomous Community project. Programme 4

Scientific collaborations within Ciberdem

STEMOB: Adult adipose-tissue-derived progenitor cells: the influence of the clinical phenotype and adipose depot origin on their biological properties

Coordinator: Joan J Vendrell

Ciberdem groups: Zorzano A, Vendrell J, Balsinde J, Gómez-Foix AM, Montanya E, Simó R, Vázquez-Carrera M



Day 4 myotubes. C2C12 myoblasts were infected with a control adenovirus that contains two miRNAs (they do not recognize any known mouse gene sequence) and EmGFP under the control of CMV promoter. Myoblasts were cultured with growth media and two days after the infection, growth media was removed and we added differentiation media until they differentiated into myotubes.

2012
ANNUAL REPORT

Epilogue

Principal Investigator index

Álvarez C	41
Balsinde J	43
Benito M	45
Blanco-Vaca F	47
Blázquez E	50
Bosch F	52
Burks D	55
Carmena R	57
Castaño L	61
Correig X	64
de Pablo F	67
Escobar-Morreale HF	69
Ferrer J	72
Gómez-Foix AM	74
Gomis R	76
Guinovart JJ	81
Ibáñez L	83
Martín F	86
Masana L	89
Montanya E	93
Nadal A	95
Novials A	98
Serrano-Ríos M	102
Simó R	105
Soriguer F	109
Vallejo M	113
Valverde AM	115
Vázquez-Carrera M	118
Vendrell J	120
Villanueva-Peña Carrillo ML	124
Zorzano A	126

Keyword index*

Autophagy	45, 137	Lipid metabolism	43, 47, 59, 79, 115, 119, 129, 135, 137
Beta-cell signal transduction	41, 45, 53, 57, 93, 103	Lipids	67
Bioinformatics	67	Lipid signalling	43
Biomarkers and imaging	51, 67, 73, 97	Lipoproteins	67
Carbohydrate metabolism	51, 79, 87, 137	Macrovascular disease	45, 47, 59, 97
Cardiac complications	71, 129	Metabolic syndrome	47, 59, 87, 89, 97, 111, 115, 119, 131
Clinical diabetes	47, 63, 81, 107, 111, 115, 119	Metabolomics	67
Cytokines	43, 89, 103, 125	Mitochondrial metabolism	137
Diabetic pregnancy	123	Monogenic diabetes	63, 77
Endothelium	45, 81, 97, 107	Nephropathy	125
Exercise	107	Nutrigenomics	97
Gastro-entero pancreatic factors	41, 101	Nutrition	47, 81, 93
Gene therapy	53	Obesity	45, 51, 57, 101, 111, 115, 131
Genetics type 1 diabetes	63	Oral pharmacological agents	63, 89, 137
Genetics type 2 diabetes	51, 77, 111	Paediatrics	89
Glucose transport	135	Phospholipases	43
Incretins	51, 135	Polycystic ovary síndrome	73
Insulin action	41, 51, 71, 123, 125, 137	PPAR	129
Insulin secretion	103	Prediction/prevention of type 1 diabetes	63
Insulin sensitivity and resistance	41, 45, 51, 53, 57, 59, 73, 79, 87, 89, 97, 103, 125, 129, 131, 135, 137	Prediction/prevention of type 2 diabetes	89, 111, 119, 131
Insulin síntesis	77, 123	Proinsulin	71
Insulin therapy	119	Proteomics	73
Islet amyloid polypeptide/amylin	93, 107, 135	Retinopathy	53, 57, 87, 115, 125
Islet degeneration and damage	41, 57, 77, 81, 87, 101, 107, 123	Sex	73
Islet development	71, 77, 81, 93, 101, 123	Sex hormones	73
Islet transplantation	77, 101	Stem cells	57

*Source: DIAMAP, Road Map for Diabetes Research in Europe.

Publications index*

A comparison of currently available GLP-1 receptor agonists for the treatment of type 2 diabetes

Montanya E

Expert Opin Pharmacother, 13, 1451-1467 (2012)

A genome-wide approach accounting for body mass index identifies genetic variants influencing fasting glycemic traits and insulin resistance

Manning AK, Hivert MF, Scott RA, Grimsby JL, Bouatia-Naji N, Chen H, Rybin D, et al.

Nat Genet, 44, 659-669 (2012)

A nontargeted proteomic approach to the study of visceral and subcutaneous adipose tissue in human obesity

Insenser M, Montes-Nieto R, Vilarrasa N, Lecube A, Simó R, Vendrell J, Escobar-Morreale HF

Mol Cell Endocrinol, 363, 10-19 (2012)

Abundance of circulating preadipocyte factor 1 in early life

de Zegher F, Díaz M, Sebastiani G, Martín-Ancel A, Sánchez-Infantes D, López-Bermejo A, Ibáñez L

Diabetes Care, 35, 848-849 (2012)

Acute Psychological Stress Accelerates Reverse Cholesterol Transport via Corticosterone-Dependent Inhibition of Intestinal Cholesterol Absorption

Silvennoinen R, Escola-Gil JC, Julve J, Rotllan N, Llaverias G, Metso J, Valledor AF, He J, Yu L, Jauhainen M, Blanco-Vaca F, Kovvanen PT, Lee-Rueckert M

Circ Res, 111, 1459-1469 (2012)

Adipose Tissue Overexpression of Vascular Endothelial Growth Factor Protects Against Diet-Induced Obesity and Insulin Resistance

Elias I, Franckhauser S, Ferré T, Vilà L, Tafuro S, Muñoz S, Roca C, Ramos D, Pujol A, Riu E, Ruberte J, Bosch F

Diabetes, 61, 1801-1813 (2012)

Alpha-tocopherol and BAY 11-7082 reduce vascular cell adhesion molecule in human aortic endothelial cells

Catalán U, Fernández-Castillejo S, Pons L, Heras M, Aragonés G, Anglès N, Morelló JR, Solà R

J Vasc Res, 49, 319-328 (2012)

Alterations in the common pathway of coagulation during weight loss induced by gastric bypass in severely obese patients

Pardina E, Ferrer R, Rivero J, Baena-Fustegueras JA, Lecube A, Fort JM, Vargas V, Catalán R, Peinado-Onsurbe

J Obesity, 20, 1048-1056 (2012)

Anti-diabetic and anti-obesity agent sodium tungstate enhances GCN pathway activation through Glc7p inhibition

Rodríguez-Hernandez CJ, Guinovart JJ, Murguia JR

FEBS Lett, 586, 270-276 (2012)

Anti-obesity sodium tungstate treatment triggers axonal and glial plasticity in hypothalamic feeding centers

Amigó-Correig M, Barceló-Batllo S, Soria G, Krezmon A, Benani A, Pénicaud L, Tudela R, Planas AM, Fernández E, Carmona Mdel C, Gomis R

PLoS One, 7, e39087 (2012)

*Only those published in 2012, with Ciberdem listed among the affiliations, which are related to Ciberdem's field of research and are located in the first or second quartile of their subject category are included.

APOA5 gene expression in the human intestinal tissue and its response to in vitro exposure to fatty acid and fibrate
Guardiola M, Alvaro A, Vallvé JC, Rosales R, Solà R, Girona J, Serra N, Duran P, Esteve E, Masana L, Ribalta J
Nutr Metab Cardiovasc Dis, 22, 756-762 (2012)

Apolipoprotein E gene mutations in subjects with mixed hyperlipidemia and a clinical diagnosis of familial combined hyperlipidemia
Solanas-Barca M, de Castro-Orós I, Mateo-Gallego R, Cofán M, Plana N, Puzo J, Burillo E, Martín-Fuentes P, Ros E, Masana L, Pocoví M, Civeira F, Cenarro A
Atherosclerosis, 222, 449-455 (2012)

Arterial stiffness is increased in patients with type 1 diabetes without cardiovascular disease: a potential role of low-grade inflammation
Llauradó G, Ceperuelo-Mallafré V, Vilardell C, Simó R, Freixenet N, Vendrell J, González-Clemente JM
Diabetes Care, 35, 1083-1089 (2012)

Assessment of compatibility between extraction methods for NMR- and LC/MS-based metabolomics
Beltran A, Suarez M, Rodriguez MA, Vinaixa M, Samino S, Arola L, Correig X, Yanes O
Anal Chem, 84, 5838-5844 (2012)

Associations between surrogate measures of insulin resistance and waist circumference, cardiovascular risk and the metabolic syndrome across Hispanic and non-Hispanic white populations
Martínez-Larrad MT, Lorenzo C, González-Villalpando C, Gabriel R, Haffner SM, Serrano-Ríos M
Diabet Med, 29, 1390-1394 (2012)

Autophagy plays a protective role in endoplasmic reticulum stress-mediated pancreatic β cell death
Bartolome A, Guillen C, Benito M
Autophagy, 8, 1-12 (2012)

Beneficial effects of fenofibrate in retinal pigment epithelium by the modulation of stress and survival signaling under diabetic conditions
Miranda S, González-Rodríguez Á, García-Ramírez M, Revuelta-Cervantes J, Hernández C, Simó R, Valverde ÁM
J Cell Physiol, 227, 2352-2362 (2012)

Bisphenol-A acts as a potent estrogen via non-classical estrogen triggered pathways
Alonso-Magdalena P, Ropero AB, Soriano S, García-Arévalo M, Ripoll C, Fuentes E, Quesada I, Nadal Á
Mol Cell Endocrinol, 355, 201-207 (2012)

Body composition and circulating high-molecular-weight adiponectin and IGF-I in infants born small for gestational age: breast- versus formula-feeding
de Zegher F, Sebastiani G, Diaz M, Sánchez-Infantes D, Lopez-Bermejo A, Ibáñez L
Diabetes 2012; 61:1969-1973

Brown fat lipotrophy and increased visceral adiposity through a concerted adipocytokines overexpression induces vascular insulin resistance and dysfunction
Gómez-Hernández A, Otero YF, de las Heras N, Escribano O, Cachofeiro V, Lahera V, Benito M
Endocrinology, 153, 1242-1255 (2012)

Can augmentation index substitute aortic pulse wave velocity in the assessment of central arterial stiffness in type 1 diabetes?
Llauradó G, Simó R, Villaplana M, Berlanga E, Vendrell J, González-Clemente JM
Acta Diabetol, 49, Suppl 1:253-257 (2012)

Carotid atherosclerosis and lipoprotein particle subclasses in familial hypercholesterolaemia and familial combined hyperlipidaemia
Jarauta E, Mateo-Gallego R, Gilabert R, Plana N, Junyent M, de Groot E, Cenarro A, Masana L, Ros E, Civeira F
Nutr Metab Cardiovasc Dis, 22, 591-597 (2012)

Carotid intima-media thickness at 7 years of age: relationship to C-reactive protein rather than adiposity
Osiniri I, Sitjar C, Soriano-Rodríguez P, Prats-Puig A, Casas-Satre C, Mayol L, de Zegher F, Ibáñez L, Bassols J, López-Bermejo A
J Pediatr, 160, 276-280 (2012)

Cholesterol depletion in adipocytes causes caveolae collapse concomitant with proteosomal degradation of cavin-2 in a switch-like fashion

Breen MR, Camps M, Carvalho-Simoes F, Zorzano A, Pilch PF
PLoS One, 7, e34516 (2012)

Cocoa, hazelnuts, sterols and soluble fiber cream reduces lipids and inflammation biomarkers in hypertensive patients: a randomized controlled trial
Solà R, Valls RM, Godàs G, Perez-Busquets G, Ribalta J, Girona J, Heras M, Cabré A, Castro A, Domenech G, Torres F, Masana L, Anglés N, Reguant J, Ramírez B, Barriach JM
PLoS One, 7 e31103 (2012)

Common variants in the sex hormone-binding globulin gene (SHBG) and polycystic ovary syndrome (PCOS) in Mediterranean women
Martínez-García MÁ, Gambineri A, Alpañés M, Sanchón R, Pasquali R, Escobar-Morreale HF
Hum Reprod, 27, 3569-3576 (2012)

Common variants of the liver fatty acid binding protein gene influence the risk of type 2 diabetes and insulin resistance in Spanish population
Mansego ML, Martínez F, Martínez-Larrad MT, Zabena C, Rojo G, Morcillo S, Soriguer F, Martín-Escudero JC, Serrano-Ríos M, Redon J, Chaves FJ
PLOS One, e31853 (2012)

Comparable early changes in gastrointestinal hormones after sleeve gastrectomy and Roux-En-Y gastric bypass surgery for morbidly obese type 2 diabetic subjects
Romero F, Nicolau J, Flores L, Casamitjana R, Ibarzabal A, Lacy A, Vidal J
Surg Endosc, 26, 2231-2239 (2012)

Comparison of liraglutide versus other incretin-related anti-hyperglycaemic agents
Blonde L, Montanya E
Diabetes Obes Metab, 14, 20-32 (2012)

Complement system and small HDL particles are associated with subclinical atherosclerosis in SLE patients
Parra S, Vives G, Ferré R, González M, Guardiola M, Ribalta J, Castro A
Atherosclerosis, 225, 224-230 (2012)

Consumption of cow's milk is associated with lower risk of type 2 diabetes mellitus. A cross-sectional study
Morcillo S, Atencia JA, Ortega A, Bilbao JR, Rubio-Martín E, Rojo-Martínez G, Esteva I, Valdes S, Oliveira G, Castano L
International Dairy Journal, 26, 162-165 (2012)

De novo lipogenesis in adipose tissue is associated with course of morbid obesity after bariatric surgery
Garrido-Sánchez L, Vendrell J, Fernández-García D, Ceperuelo-Mallafré V, Chacón MR, Ocaña-Wilhelmi L, Alcaide J, Tinahones FJ, García-Fuentes E
PLOS One, 7(2): e31280 (2012)

Deleterious effects of neuronal accumulation of glycogen in flies and mice
Duran J, Tevy MF, Garcia-Rocha M, Calbó J, Milán M, Guinovart JJ
EMBO Mol Med, 4, 719-729 (2012)

Development of a human extracellular matrix for applications related with stem cells and tissue engineering
Escobedo-Lucea C, Ayuso-Sacido A, Xiong C, Prado-López S, del Pino MS, Melguizo D, Bellver-Estellés C, Gonzalez-Granero S, Valero ML, Moreno R, Burks DJ, Stojkovic M
Stem Cell Rev, 8, 170-183 (2012)

Diabetes as a case study of chronic disease management with a personalized approach: The role of a structured feedback loop
Ceriello A, Barkai L, Christiansen JS, Czupryniak L, Gomis R, Harno K, Kulzer B, Ludvigsson J, Némethyová Z, Owens D, Schnell O, Tankova T, Taskinen MR, Vergès B, Weitgasser R, Wens J
Diabetes Res Clin Pract, 98, 5-10 (2012)

Diabetes is the main factor accounting for hypomagnesemia in obese subjects
Lecube A, Baena-Fustegueras JA, Fort JM, Pelegrí D, Hernández C, Simó R
PLoS One, 7, e30599 (2012)

Differential insulin receptor substrate-1 (IRS1)-related modulation of neuropeptide Y and proopiomelanocortin expression in nondiabetic and diabetic IRS2^{-/-} mice
Burgos-Ramos E, González-Rodríguez A, Canelles S, Baquedano E, Frago LM, Revuelta-Cervantes J, Gómez-Ambrosi J, Frühbeck G, Chowen JA, Argente J, Valverde AM, Barrios V
Endocrinology, 153, 1129-1140 (2012)

DOR/Tp53inp2 and Tp53inp1 constitute a metazoan gene family encoding dual regulators of autophagy and transcription
Sancho A, Duran J, García-España A, Mauvezin C, Alemu EA, Lamark T, Macias MJ, DeSalle R, Royo M, Sala D, Chicote JU, Palacín M, Johansen T, Zorzano A
PLoS One, 7, e34034 (2012)

DOR undergoes nucleo-cytoplasmic shuttling, which involves passage through the nucleolus
Mauvezin C, Sancho A, Ivanova S, Palacin M, Zorzano A
FEBS Lett, 586, 3179-3186 (2012)

Dynamics of arachidonic acid mobilization by inflammatory cells
Astudillo AM, Balgoma D, Balboa MA, Balsinde J
Biochim Biophys Acta, 1821, 249-256 (2012)

Early undernutrition induces glucagon resistance and insulin hypersensitivity in the liver of suckling rats
Lizárraga-Mollinedo E, Fernandez-Millan E, de Toro Martín J, Martínez-Hondurilla CJ, Escrivá F, Álvarez C
Am J Physiol Endocrinol Metab, 302, E1070-1077 (2012)

Effect of improving glycemic control in patients with type 2 diabetes mellitus on low-density lipoprotein size, electronegative low-density lipoprotein and lipoprotein-associated phospholipase A2 distribution
Sánchez-Quesada JL, Vinagre I, de Juan-Franco E, Sánchez-Hernández J, Blanco-Vaca F, Ordóñez-Llanos J, Pérez A
Am J Cardiol, 110, 67-71 (2012)

Effects of therapeutic lifestyle changes on peripheral artery tonometry in patients with abdominal obesity
Ferré R, Plana N, Merino J, Aragón G, Girona J, Heras M, Coll B, Cos R, Masana L
Nutr Metab Cardiovasc Dis, 22, 95-102 (2012)

Efficacy and safety of switching from the DPP-4 inhibitor sitagliptin to the human GLP-1 analog liraglutide after 52 weeks in metformin-treated patients with type 2 diabetes: a randomized, open-label trial
Pratley RE, Nauck MA, Bailey T, Montanya E, Filetti S, Garber AJ, Thomsen AB, Furber S, Davies M; for the 1860-LIRA-DPP-4 Study Group
Diabetes Care, 35, 1986-1993 (2012)

Epidemiology, diagnosis and management of hirsutism: a consensus statement by the Androgen Excess and Polycystic Ovary Syndrome Society
Escobar-Morreale HF, Carmina E, Dewailly D, Gambineri A, Kelestimur F, Moghetti P, Pugeat M, Qiao J, Wijeyaratne CN, Witchel SF, Norman RJ
Hum Reprod Update, 18, 146-170 (2012)

Essential role of protein tyrosine phosphatase 1B in obesity-induced inflammation and peripheral insulin resistance during aging
González-Rodríguez A, Más-Gutiérrez JA, Mirasierra M, Fernandez-Pérez A, Lee YJ, Ko HJ, Kim JK, Romanos E, Carrascosa JM, Ros M, Vallejo M, Rondinone CM, Valverde AM
Aging Cell, 11, 284-296 (2012)

Ethynodiol-cyproterone acetate versus low-dose pioglitazone-flutamide-metformin for adolescent girls with androgen excess: divergent effects on CD163, TWEAK receptor, ANGPTL4, and LEPTIN expression in subcutaneous adipose tissue
Díaz M, Chacón MR, López-Bermejo A, Maymó-Masip E, Salvador C, Vendrell J, de Zegher F, Ibáñez L
J Clin Endocrinol Metab, 97, 3630-8 (2012)

Evidence that hyperglycemia after recovery from hypoglycemia worsens endothelial function and increases oxidative stress and inflammation in healthy control subjects and subjects with type 1 diabetes
Ceriello A, Novials A, Ortega E, La Sala L, Pujadas G, Testa R, Bonfigli AR, Esposito K, Giugliano D
Diabetes, 61, 2993-2997 (2012)

Exenatide twice daily versus glimepiride for prevention of glycaemic deterioration in patients with type 2 diabetes with metformin

failure (EUREXA): an open-label, randomised controlled trial

Gallwitz B, Guzman J, Dotta F, Guerci B, Simó R, Basson BR, Festa A, Kiljański J, Sapin H, Trautmann M, Schernthaner G
Lancet, 379, 2270-2278 (2012)

Expression of TMEM16A and SLC4A4 in human pancreatic islets

Hanzu FA, Gasa R, Bulur N, Lybaert P, Gomis R, Malaisse WJ, Beauwens R, Sener A
Cell Physiol Biochem, 29, 61-64 (2012)

FABP4 dynamics in obesity: discrepancies in adipose tissue and liver expression regarding circulating plasma levels

Queipo-Ortuño MI, Escoté X, Ceperuelo-Mallafré V, Garrido-Sánchez L, Miranda M, Clemente-Postigo M, Pérez-Pérez R, Peral B, Cardona F, Fernández-Real JM, Tinahones FJ, Vendrell J
PLoS One, 7, e48605 (2012)

FABP4 predicts atherogenic dyslipidemia development. The PREDIMED study

Cabré A, Babio N, Lázaro I, Bulló M, García-Arellano A, Masana L, Salas-Salvadó J
Atherosclerosis, 222, 229-234 (2012)

Fatty acid-binding protein 4 impairs the insulin-dependent nitric oxide pathway in vascular endothelial cells

Aragonès G, Saavedra P, Heras M, Cabré A, Girona J, Masana L
Cardiovasc Diabetol, 18, 11-72 (2012)

Fenofibrate - a potential systemic treatment for diabetic retinopathy?

Wong TY, Simó R, Mitchell P
Am J Ophthalmol, 154, 6-12 (2012)

Functional and structural adaptations in the pancreatic α-cell and changes in glucagon signaling during protein malnutrition

Marroquí L, Batista TM, Gonzalez A, Vieira E, Rafacho A, Colletta SJ, Taboga SR, Boschero AC, Nadal A, Carneiro EM, Quesada I
Endocrinology, 153, 1663-1672 (2012)

Functional characterization of MODY2 mutations highlights the importance of the fine-tuning of glucokinase and its role in glucose sensing

García-Herrero CM, Rubio-Cabezas O, Azriel S, Gutierrez-Nogués A, Aragonés A, Vincent O, Campos-Barros A, Argente J, Navas MA
PLoS ONE, 7, e30518 (2012)

Functional characterization of TLR4 +3725 G/C polymorphism and association with protection against overweight

Penas-Steinhardt A, Barcos LS, Belforte FS, de Sereday M, Vilariño J, Gonzalez CD, Martínez-Larrad MT, Tellechea ML, Serrano-Ríos M, Poskus E, Frechtel GD, Leskow FC
PLoS One, 7, e50992 (2012)

GATA4 and GATA6 control mouse pancreas organogenesis

Carrasco M, Delgado I, Soria B, Martín F, Rojas A
J Clin Invest, 122, 3504-3515 (2012)

GATA believe it: new essential regulators of pancreas development

Rodríguez-Seguí S, Akerman I, Ferrer J
J Clin Invest, 122, 3469-3471 (2012)

GATA6 haploinsufficiency causes pancreatic agenesis in humans

Allen HL, Flanagan SE, Shaw-Smith C, De Franco E, Akerman I, Caswell R; the International Pancreatic Agenesis Consortium, Ferrer J, Hattersley AT, Ellard S
Nat Genet, 44, 20-22 (2012)

Gene expression dynamics after murine pancreatitis unveils novel roles for Hnf1α in acinar cell homeostasis

Molero X, Vaquero EC, Flández M, González AM, Ortiz MA, Cibrián-Uhalte E, Servitja JM, Merlos A, Juanpere N, Massumi M, Skoudy A, Macdonald R, Ferrer J, Real FX
Gut, 61, 1187-1196 (2012)

Glucagon-like peptide 1 (GLP-1) can reverse AMP-activated protein kinase (AMPK) and S6 kinase (P70S6K) activities induced by fluctuations in glucose levels in hypothalamic areas involved in feeding behaviour

Hurtado-Carneiro V, Sanz C, Roncero I, Vazquez P, Blazquez E, Alvarez E
Mol Neurobiol, 45, 348-361 (2012)

Glucagon-Like Peptide-2 (GLP-2) modulates the cGMP signalling pathway by regulating the expression of the soluble guanylyl cyclase receptor subunits in cultured rat astrocytes
Velázquez E, Blázquez E, Ruiz-Albusac JM
Mol Neurobiol, 46, 242-250 (2012)

Glucokinase (GCK) mutations and their characterization in MODY2 children of southern Italy
Capuano M, Garcia-Herrero CM, Tinto N, Carluccio C, Capobianco V, Coto I, Cola A, Iafusco D, Franzese A, Zagari A, Navas MA, Sacchetti L
PLoS ONE, 7, e38906 (2012)

GRK2 contribution to the regulation of energy expenditure and brown fat function
Vila-Bedmar R, Garcia-Guerra L, Nieto-Vazquez I, Mayor F Jr, Lorenzo M, Murga C, Fernández-Veledo S
FASEB J, 26, 3503-3514 (2012)

Guidelines for the use and interpretation of assays for monitoring autophagy
Klionsky DJ, Abdalla FC, Abieliovich H, Abraham RT, Acevedo-Arozena A, Adeli K, Agholme L, Agnello M, Agostinis P, Aguirre-Ghiso JA et al.
Autophagy, 8, 445-544 (2012)

HbA(1c) targets for type 2 diabetes: how many, ...how far!
Giugliano D, Ceriello A, Esposito K
Diabetes Res Clin Pract, 96, 414-415 (2012)

Health and fertility in World Health Organization group 2 anovulatory women
ESHRE Capri Workshop Group
Hum Reprod Update, 18, 586-599 (2012)

High fat intake leads to acute postprandial exposure to circulating endotoxin in type 2 diabetic subjects
Harte AL, Varma MC, Tripathi G, McGee KC, Al-Daghri NM, Al-Attas OS, Sabico S, O'Hare JP, Ceriello A, Saravanan P, Kumar S, McTernan PG
Diabetes Care, 35, 375-3782 (2012)

High resolution melting curve analysis of DNA samples isolated by different DNA extraction methods
Martín-Núñez GM, Gómez-Zumaquero JM, Soriguer F, Morcillo S
Clin Chim Acta, 413, 331-333 (2012)

(1)H-NMR-based metabolomic analysis of the effect of moderate wine consumption on subjects with cardiovascular risk factors
Vazquez-Fresno R, Llorach R, Alcaro F, Rodriguez MA, Vinaixa M, Chiva-Blanch G, Estruch R, Correig X, Andres-Lacueva C
Electrophoresis, 33, 2345-2354 (2012)

Human β Cell Transcriptome Analysis Uncovers lncRNAs That Are Tissue-Specific, Dynamically Regulated, and Abnormally Expressed in Type 2 Diabetes
Morán I, Akerman I, van de Bunt M, Xie R, Benazra M, Nammo T, Arnes L, Nakić N, García-Hurtado J, Rodríguez-Seguí S, Pasquali L, Sauty-Colace C, Beucher A, Scharfmann R, van Arensbergen J, Johnson PR, Berry A, Lee C, Harkins T, Gmyr V, Pattou F, Kerr-Conte J, Piemonti L, Berney T, Hanley N, Gloyn AL, Sussel L, Langman L, Brayman KL, Sander M, McCarthy MI, Ravassard P, Ferrer J
Cell Metab, 16, 435-448 (2012)

Identification of a novel mutation in the ANGPTL3 gene in two families diagnosed of familial hypobetalipoproteinemia without APOB mutation
Martín-Campos JM, Roig R, Mayoral C, Martínez S, Martí G, Arroyo JA, Julve J, Blanco-Vaca F
Clin Chim Acta, 413, 552-555 (2012)

Identification of novel type 2 diabetes candidate genes involved in the crosstalk between the mitochondrial and the insulin signaling systems
Mercader JM, Puiggros M, Segrè AV, Planet E, Soriano E, Sebastian D, Rodriguez-Cuenca S, Ribas V, Bonàs-Guarch S, Draghici

S, Yang C, Mora S, Vidal-Puig A, Dupuis J; DIAGRAM Consortium, Florez JC; MITIN Consortium, Zorzano A, Torrents D
PLoS Genet. 8, e1003046 (2012)

IL1 β down-regulation of sex hormone-binding globulin production by decreasing HNF-4 α via MEK-1/2 and JNK MAPK pathways
Simó R, Barbosa-Desongles A, Hernandez C, Selva DM
Mol Endocrinol, 26, 1917-1927 (2012)

Impact of olive oil phenolic concentration on human plasmatic phenolic metabolites
Rubió L, Valls RM, Macià A, Pedret A, Giralt M, Romero MP, de la Torre R, Covas MI, Solà R, Motilva MJ
Food Chem, 135, 2922-2929 (2012)

Incidence of lower limb amputations in individuals with and without diabetes mellitus in Andalusia (Spain) from 1998 to 2006
Almaraz MC, González-Romero S, Bravo M, Caballero FF, Palomo MJ, Vallejo R, Esteva I, Calleja F, Sorribes F
Diabetes Res Clin Pract, 95, 399-405 (2012)

Inhibition of the transcription factor c-Jun by the MAPK family, and not the NF- κ B pathway, suggests that peanut extract has anti-inflammatory properties
Catalán Ú, Fernández-Castillejo S, Anglès N, Morelló JR, Yebras M, Solà R
Mol Immunol, 52, 125-132 (2012)

Innovation: Metabolomics: the apogee of the omics trilogy
Patti GJ, Yanes O, Siuzdak G
Nat Rev Mol Cell Biol, 13, 263-269 (2012)

Insulin resistance, low-grade inflammation and type 1 diabetes mellitus
Llauradó G, Gallart L, Tirado R, Megía A, Simón I, Caixàs A, Giménez-Palop O, Berlanga E, Vendrell J, González-Clemente JM
Acta Diabetol, 49, 33-39 (2012)

Insulinotropic effect of the non-steroidal compound STX in pancreatic β -cells
Ropero AB, Alonso-Magdalena P, Soriano S, Juan-Picó P, Roepke TA, Kelly MJ, Nadal A
PLoS ONE, 7, e34650 (2012)

Iodine intake in the adult population. Di@bet.es study
Sorribes F, García-Fuentes E, Gutiérrez-Repiso C, Rojo-Martínez G, Velasco I, Goday A, Bosch-Comas A, Bordiu E, Calle A, Carmena R, Casamitjana R, Castaño L, Castell C, Català M, Delgado E, Franch J, Gaztambide S, Girbes J, Gomis R, Gutiérrez G, López-Alba A, Martínez-Larrad MT, Menéndez E, Mora-Peces I, Ortega E, Pascual-Manich G, Serrano-Ríos M, Valdés S, Vázquez JA, Vendrell J
Clin Nutr, 31, 882-888 (2012)

Iron metabolism and the polycystic ovary syndrome
Escobar-Morreale HF
Trends Endocrinol Metab, 23, 509-515 (2012)

IRS-2 deficiency impairs NMDA receptor-dependent long-term potentiation
Martin ED, Sanchez-Perez A, Trejo JL, Martin-Aldana JA, Cano M, Pons S, Acosta C, Menes L, White MF, Burks DJ
Cereb Cortex, 22, 1717-1727 (2012)

IRS-2 deficient mice show sensorineural hearing loss that is delayed by concomitant PTP1B loss of function
Murillo-Cuesta S, Camarero G, González-Rodríguez A, La Rosa LR, Burks DJ, Avendaño C, Valverde AM, Varela-Nieto I
Mol Med, 18, 260-269 (2012)

IRS2 signalling is required for the development of a subset of sensory spinal neurons
Chirivella L, Cano-Jáimez M, Pérez-Sánchez F, Herraez L, Carretero J, Fariñas I, Burks DJ, Kirstein M
Eur J Neurosci, 35, 341-352 (2012)

Leptin and adiponectin, but not IL18, are related with insulin resistance in treated HIV-1-infected patients with lipodystrophy
Veloso S, Escoté X, Ceperuelo-Mallafré V, López-Dupla M, Peraire J, Viladés C, Domingo P, Castro A, Olona M, Sirvent JJ, Leal M, Vendrell J, Richart C, Vidal F
Cytokine, 58, 253-260 (2012)

Lifestyle changes lower FABP4 plasma concentration in patients with cardiovascular risk
Lázaro I, Ferré R, Plana N, Aragonès G, Girona J, Merino J, Heras M, Cabré A, Masana L
Rev Esp Cardiol (Engl Ed), 65, 152-157 (2012)

Lipin-2 reduces proinflammatory signaling induced by saturated fatty acids in macrophages
Valdearcos M, Esquinas E, Meana C, Peña L, Gil-de-Gómez L, Balsinde J, Balboa MA
J BiolChem, 287, 10894-10904 (2012)

Long-term effects of sleeve gastrectomy and Roux-en-Y gastric bypass surgery on type 2 diabetes mellitus in morbidly obese subjects
Jiménez A, Casamitjana R, Flores L, Viaplana J, Corcelles R, Lacy A, Vidal J
Ann Surg, 256, 1023-1029 (2012)

Long-term retinal PEDF overexpression prevents neovascularization in a murine adult model of retinopathy
Haurigot V, Villacampa P, Ribera A, Bosch A, Ramos D, Ruberte J, Bosch F
PLOS One, e41511 (2012)

Long-term safety and efficacy of linagliptin as monotherapy or in combination with other oral glucose-lowering agents in 2121 subjects years exposure in 24-week phase III trials with type 2 diabetes: up to 2 followed by a 78-week open-label extension
Gomis R, Owens DR, Taskinen MR, Del Prato S, Patel S, Pivovarova A, Schlosser A, Woerle HJ
Int J Clin Pract, 66, 731-740 (2012)

Loss of mitochondrial protease OMA1 alters processing of the GTPase OPA1 and causes obesity and defective thermogenesis in mice
Quirós PM, Ramsay AJ, Sala D, Fernández-Vizarra E, Rodríguez F, Peinado JR, Fernández-García MS, Vega JA, Enríquez JA, Zorzano A, López-Otín C
EMBO J, 31, 2117-2133 (2012)

LRH-1-dependent glucose sensing determines intermediary metabolism in liver
Oosterveer MH, Mataki C, Yamamoto H, Harach T, Moullan N, van Dijk TH, Ayuso E, Bosch F, Postic C, Groen AK, Auwerx J, Schoonjans K
J Clin Invest, 122, 2817-2826 (2012)

Lyase activity of glycogen synthase: Is an elimination/addition mechanism a possible reaction pathway for retaining glycosyl transferases?
Díaz A, Díaz-Lobo M, Grados E, Guinovart JJ, Fita I, Ferrer JC
IUBMB Life, 64, 649-658 (2012)

Management of postmenopausal virilization
Alpañés M, González-Casbas JM, Sánchez J, Pián H, Escobar-Morreale HF
J Clin Endocrinol Metab, 97, 2584-2588 (2012)

Metabolic heterogeneity in polycystic ovary syndrome is determined by obesity: plasma metabolomic approach using GC-MS
Escobar-Morreale HF, Samino S, Insenser M, Vinaixa M, Luque-Ramírez M, Lasunción MA, Correig X
ClinChem, 58, 999-1009 (2012)

Metabolomic profiling in blood from umbilical cords of low birth weight newborns
Ivorra C, García-Vicent C, Chaves FJ, Monleón D, Morales JM, Lurbe E
J Transl Med, 10, 142 (2012)

Metabolomics approach for analyzing the effects of exercise in subjects with type 1 diabetes mellitus
Brugnara L, Vinaixa M, Murillo S, Samino S, Rodriguez MA, Beltran A, Lerin C, Davison G, Correig X, Novials A
PLoS ONE, 7, e40600 (2012)

Metabolomics implicates altered sphingolipids in chronic pain of neuropathic origin
Patti GJ, Yanes O, Shriver LP, Courade JP, Tautenhahn R, Manchester M, Siuzdak G
Nat Chem Biol, 8, 232-234 (2012)

Mitofusin 2 (Mfn2) links mitochondrial and endoplasmic reticulum function with insulin signaling and is essential for normal glucose homeostasis

Sebastián D, Hernández-Alvarez MI, Segalés J, Sorianello E, Muñoz JP, Sala D, Waget A, Liesa M, Paz JC, Gopalacharyulu P, Oresic M, Pich S, Burcelin R, Palacín M, Zorzano A
PNAS, 109, 5523-5528 (2012)

Model for glucagon secretion by pancreatic α -cells
González-Vélez V, Dupont G, Gil A, González A, Quesada I
PLoS One, 7, e32282 (2012)

Molecular Mechanism of TNF α -Induced Down-Regulation of SHBG Expression
Simó R, Barbosa-Desongles A, Sáez-Lopez C, Lecube A, Hernandez C, Selva DM
Mol Endocrinol, 26, 438-446 (2012)

Molecular signature of the immune and tissue response to non-coding plasmid DNA in skeletal muscle after electrotransfer
Mann CJ, Anguela XM, Montané J, Obach M, Roca C, Ruzo A, Otaegui P, Mir LM, Bosch F
Gene Ther, 19, 1177-1186 (2012)

Muscle fiber atrophy and regeneration coexist in collagen VI-deficient human muscle: role of calpain-3 and nuclear factor- κ B signaling
Paco S, Ferrer I, Jou C, Cusí V, Corbera J, Torner F, Gualandi F, Sabatelli P, Orozco A, Gómez-Foix AM, Colomer J, Nascimento A, Jimenez-Mallebrera C
J Neuropathol Exp Neurol, 71, 894-906 (2012)

Nanostructure Initiator Mass Spectrometry for tissue imaging in metabolomics: Future prospects and perspectives
Calavia R, Annanouch FE, Correig X, Yanes O
J Proteomics, 75, 5061-5068 (2012)

Neurodegeneration is an early event in diabetic retinopathy: therapeutic implications
Simó R, Hernández C; European Consortium for the Early Treatment of Diabetic Retinopathy (EUROCONDOR)
Br J Ophthalmol, 96, 1285-1290 (2012)

Neuroprotection in diabetic retinopathy
Hernández C, Simó R
Curr Diab Rep, 12, 329-337 (2012)

Normalizing action of exendin-4 and GLP-1 on the glucose metabolism of extrapancreatic tissues, in insulin resistant and type 2 diabetic states
Moreno P, Nuche-Berengue B, Gutierrez-Rojas I, Acitores A, Sancho V, González N, Valverde I, Villanueva-Peña Carrillo ML
J Mol Endocrinol, 48, 37-47 (2012)

Nurr1 protein is required for N-methyl-D-aspartic acid (NMDA) receptor-mediated neuronal survival
Barneda-Zahonero B, Servitja JM, Badiola N, Minano-Molina AJ, Fado R, Saura CA, Rodriguez-Alvarez J
J Biol Chem, 287, 11351-11362 (2012)

On the potential of metformin to prevent preterm delivery in women with polycystic ovary syndrome - an epi-analysis
Vanký E, de Zegher F, Díaz M, Ibáñez L, Carlsen SM
Acta Obstet Gynecol Scand, 91, 1460-1464 (2012)

Only C-reactive protein, but not TNF- α or IL6, reflects the improvement in inflammation after bariatric surgery
Pardina E, Ferrer R, Baena-Fustegueras JA, Rivero J, Lecube A, Fort JM, Vargas V, Catalán R, Peinado-Onsurbe J
Obes Surg, 22, 131-139 (2012)

Particle size measurement of lipoprotein fractions using diffusion-ordered NMR spectroscopy
Mallol R, Rodríguez MA, Heras M, Vinaixa M, Plana N, Masana L, Morris GA, Correig X
Anal Bioanal Chem, 402, 2407-2415 (2012)

Permanent neonatal diabetes caused by creation of an ectopic splice site within the INS gene
Garin I, Perez de Nanclares G, Gastaldo E, Harries LW, Rubio-Cabezas O, Castano L
N Engl J Med, 366, 433-434 (2012)

PGC-1 α induces mitochondrial and myokine transcriptional programs and lipid droplet and glycogen accumulation in cultured human skeletal muscle cells

Mormeneo E, Jimenez-Mallebrera C, Palomer X, De Nigris V, Vázquez-Carrera M, Orozco A, Nascimento A, Colomer J, Lerín C, Gómez-Foix AM
PLoS ONE, 7, e29985 (2012)

Phospholipid sources for adrenic acid mobilization in RAW 264.7 macrophages. Comparison with arachidonic acid
Guilas C, Astudillo AM, Gil-de-Gómez L, Rubio JM, Balboa MA, Balsinde J
Biochim Biophys Acta, 1821, 1386-1393 (2012)

Placental expression of peroxisome proliferator-activated receptor γ (PPAR γ): relation to placental and fetal growth
Díaz M, Bassols J, López-Bermejo A, Gómez-Roig MD, de Zegher F, Ibáñez L
J Clin Endocrinol Metab, 97, E1468-1472 (2012)

Plasma homocysteine levels are independently associated with the severity of peripheral polyneuropathy in type 2 diabetic subjects
González R, Pedro T, Martínez-Hervas S, Civera M, Priego MA, Catalá M, Chaves FJ, Ascaso JF, Carmena R, Real JT
J Peripher Nerv Syst, 17, 191-196 (2012)

Polymorphisms of the UCP2 gene are associated with body fat distribution and risk of abdominal obesity in Spanish population
Martínez-Hervas S, Mansego ML, de Marco G, Martínez F, Alonso MP, Morcillo S, Rojo-Martínez G, Real JT, Ascaso JF, Redon J, Martín Escudero JC, Sorribes F, Chaves FJ
Eur J Clin Invest, 42, 171-178 (2012)

Polyphenol-rich foods exhibit DNA antioxidative properties and protect the glutathione system in healthy subjects
Pedret A, Valls RM, Fernández-Castillejo S, Catalán Ú, Romeu M, Giralt M, Lamuela-Raventós RM, Medina-Remón A, Arija V, Aranda N, Espinol A, Delgado MA, Solà R
Mol Nutr Food Res, 56, 1025-1033 (2012)

Potential role of tumor necrosis factor- α in downregulating sex hormone-binding globulin
Simó R, Barbosa-Desongles A, Lecube A, Hernandez C, Selva DM
Diabetes, 61, 372-382 (2012)

Prediction of whole-body and segmental body composition by bioelectrical impedance in morbidly obese subjects.
Jiménez A, Omaña W, Flores L, Coves MJ, Bellido D, Perea V, Vidal J.
Obes Surg, 22, 587-593 (2012)

Predictive factors of excess body weight loss 1 year after laparoscopic bariatric surgery
Ortega E, Morínigo R, Flores L, Moize V, Rios M, Lacy AM, Vidal J
Surg Endosc, 26, 1744-1750 (2012)

Prevalence of diabetes mellitus and impaired glucose regulation in Spain: the Di@bet.es Study
Sorribes F, Goday A, Bosch-Comas A, Bordiu E, Calle-Pascual A, Carmena R, Casamitjana R, Castano L, Castell C, Catala M, Delgado E, Franch J, Gatzambide S, Girbes J, Gomis R, Gutierrez G, Lopez-Alba A, Martínez-Larrad MT, Menendez E, Mora-Peces I, Ortega E, Pascual-Manich G, Rojo-Martínez G, Serrano-Rios M, Valdes S, Vazquez JA, Vendrell J
Diabetologia, 55, 88-93 (2012)

Prevalence of functional disorders of androgen excess in unselected premenopausal women: a study in blood donors
Sánchez R, Gambineri A, Alpañés M, Martínez-García MÁ, Pasquali R, Escobar-Morreale HF
Hum Reprod, 27, 1209-1216 (2012)

Prevention of diabetes mellitus type 2
Sorribes F, Rubio-Martín E, Rojo-Martínez G
Med Clin (Barc), 139, 640-646 (2012)

Protein-tyrosine phosphatases are involved in interferon resistance associated with insulin resistance in HepG2 cells and obese mice
García-Ruiz I, Solís-Muñoz P, Gómez-Izquierdo E, Muñoz-Yagüe MT, Valverde AM, Solís-Herruzo JA
J Biol Chem, 287, 19564-19573 (2012)

Protein-tyrosine phosphatase 1B (PTP1B) deficiency confers resistance to transforming growth factor- β (TGF- β)-induced suppressor effects in hepatocytes
Ortiz C, Caja L, Bertran E, Gonzalez-Rodriguez Á, Valverde ÁM, Fabregat I, Sancho P
J Biol Chem, 287, 15263-15274 (2012)

Proteomic analysis of cerebrospinal fluid from obese women with idiopathic intracranial hypertension: a new approach for identifying new candidates in the pathogenesis of obesity

Lecube A, Poca MA, Colomé N, Bech-Serra JJ, Hernández C, García-Ramírez M, Gándara D, Canals F, Simó R
J Neuroendocrinol, 24, 944-952 (2012)

Pten positively regulates brown adipose function, energy expenditure, and longevity

Ortega-Molina A, Efeyan A, Lopez-Guadarrama E, Muñoz-Martin M, Gómez-López G, Cañamero M, Mulero F, Pastor J, Sonia Martínez S, Romanos E, Gonzalez-Barroso MM, Rial E, Valverde AM, Bischoff JR, Serrano M
Cell Metabolism, 15, 382-394 (2012)

Quality of healthcare in type 2 diabetes mellitus in Spain

Soriguer F, Ruiz de Adana MS
Med Clin (Barc), 138, 522-524 (2012)

Rapid insulinotropic action of low doses of bisphenol-A on mouse and human islets of Langerhans: role of estrogen receptor β

Soriano S, Alonso-Magdalena P, García-Arévalo M, Novials A, Muhammed SJ, Salehi A, Gustafsson JA, Quesada I, Nadal A
PLoS ONE, 7, e31109 (2012)

Relationship between the degree of glycemic control and diabetes characteristics and hyperglycemia treatment in type 2 diabetes.
DIABES Study

Pérez A, Franch J, Cases A, González Juanatey JR, Conthe P, Gimeno E, Matai A
Med Clin (Barc), 138, 505-511 (2012)

Relative hypoadiponectinemia, insulin resistance, and increased visceral fat in euthyroid prepubertal girls with low-normal serum free thyroxine

Prats-Puig A, Sitjar C, Ribot R, Calvo M, Clausell-Pomés N, Soler-Roca M, Soriano-Rodríguez P, Osiniri I, Ros-Miquel M, Bassols J, de Zegher F, Ibáñez L, López-Bermejo A
Obesity, 20, 1455-1461 (2012)

Role of ER β and GPR30 in the endocrine pancreas: A matter of estrogen dose

Ropero AB, Pang Y, Alonso-Magdalena P, Thomas P, Nadal A
Steroids, 77, 951-958 (2012)

Role of IGFBP-3 in the regulation of β -cell mass during obesity: adipose tissue/ β -cell cross talk

Palau N, Rebuffat SA, Altirriba J, Piquer S, Hanzu FA, Gomis R, Barbera A
Endocrinology, 153, 177-187 (2012)

Role of leptin in the pancreatic β -cell: effects and signaling pathways

Marroquín L, Gonzalez A, Ñeco P, Caballero-Garrido E, Vieira E, Ripoll C, Nadal A, Quesada I
J Mol Endocrinol, 49, R9-17 (2012)

Self-monitoring of blood glucose in type 2 diabetes: is the debate (finally) ending?

Ceriello A
Diabetes Res Clin Pract, 97, 1-2 (2012)

Serum levels of TWEAK and scavenger receptor CD163 in type 1 diabetes mellitus: relationship with cardiovascular risk factors. a case-control study

Llauradó G, González-Clemente JM, Maymó-Masip E, Subías D, Vendrell J, Chacón MR
PLoS One, 7, e43919 (2012)

Short-term treatment with bisphenol-A leads to metabolic abnormalities in adult male mice

Batista TM, Alonso-Magdalena P, Vieira E, Amaral MEC, Cederroth CR, Nef S, Quesada I, Carneiro EM, Nadal A
PLoS ONE, 7, e33814 (2012)

Simultaneous activation of p38 and JNK by arachidonic acid stimulates the cytosolic phospholipase A2-dependent synthesis of lipid droplets in human monocytes

Guilas C, Pérez-Chacón G, Astudillo AM, Rubio JM, Gil-de-Gómez L, Balboa MA, Balsinde J
J Lipid Res, 53, 2343-2354 (2012)

Small artery dilation and endothelial markers in cardiovascular risk patients

Aragonès G, Ferré R, Girona J, Plana N, Merino J, Heras M, Masana L

Soluble fatty acid synthase relates to bone biomarkers in prepubertal children

Prats-Puig A, Puig T, Sitjar C, Mas-Parareda M, Grau-Cabrera P, Soriano-Rodríguez P, Montesinos-Costa M, Diaz M, de Zegher F, Ibáñez L, Bassols J, López-Bermejo A

Osteoporos Int, 23, 2053-2058 (2012)

Structural damage in diabetic nephropathy is associated with TNF- α system activity

Fernández-Real JM, Vendrell J, García I, Ricart W, Vallès M

Acta Diabetol. 49, 301-305 (2012)

Studies of naturally occurring friedelane triterpenoids as insulin sensitizers in the treatment type 2 diabetes mellitus

Ardiles AE, González-Rodríguez A, Núñez MJ, Perestelo NR, Pardo V, Jiménez IA, Valverde AM, Bazzocchi IL

Phytochemistry, 84, 116-124 (2012)

Subclinical carotid atherosclerosis in patients with familial combined hyperlipidemia. Two years follow-up after treatment with high doses of atorvastatin

Martínez-Hervás S, Priego A, Lorente R, Molina M, Navarro-Hidalgo MI, Real JT, Ascaso JF

Med Clin (Barc), 138, 1-6 (2012)

Surgical management of metabolic dysfunction in PCOS

Escobar-Morreale HF

Steroids, 77, 312-316 (2012)

Targeting PPAR β/δ for the treatment of type 2 diabetes mellitus

Salvadó L, Serrano-Marco L, Barroso E, Palomer X, Vázquez-Carrera M

Expert Opin Ther Targets, 16, 209-223 (2012)

Telomerase gene therapy in adult and old mice delays aging and increases longevity without increasing cancer

Bernardes de Jesus B, Vera E, Schneeberger K, Tejera AM, Ayuso E, Bosch F, Blasco MA

EMBO Mol Med, 4, 691-704 (2012)

Testosterone, SHBG and risk of type 2 diabetes in the second evaluation of the Pizarra cohort study

Soriguer F, Rubio-Martín E, Fernández D, Valdés S, García-Escobar E, Martín-Núñez GM, Esteva I, Almaraz MC, Rojo-Martínez G

Eur J Clin Invest, 42, 79-85 (2012)

The clock gene rev-erb α regulates pancreatic β -cell function: modulation by leptin and high-fat diet

Vieira E, Marroquí L, Batista TM, Caballero-Garrido E, Carneiro EM, Boschero AC, Nadal A, Quesada I

Endocrinology, 153, 592-601 (2012)

The metabolome of induced pluripotent stem cells reveals metabolic changes occurring in somatic cell reprogramming

Panopoulos AD, Yanes O, Ruiz S, Kida YS, Diep D, Tautenhahn R, Herreras A, Batchelder EM, Plongthongkum N, Lutz M, Berggren WT, Zhang K, Evans RM, Siuzdak G, Izpisua Belmonte JC

Cell Res, 22, 168-177 (2012)

The peroxisome proliferator-activated receptor (PPAR) β/δ agonist GW501516 inhibits IL-6-induced signal transducer and activator of transcription 3 (STAT3) activation and insulin resistance in human liver cells

Serrano-Marco L, Barroso E, El Kochairi I, Palomer X, Michalik L, Wahli W, Vázquez-Carrera M

Diabetologia, 55, 743-751 (2012)

The promoter activity of human Mfn2 depends on Sp1 in vascular smooth muscle cells

Sorianello E, Soriano FX, Fernández-Pascual S, Sancho A, Naon D, Vila-Caballer M, González-Navarro H, Portugal J, Andrés V, Palacín M, Zorzano A

Cardiovasc Res, 94, 38-47 (2012)

The retinoic acid receptor-related orphan nuclear receptor $\gamma 1$ (ROR $\gamma 1$): a novel player determinant of insulin sensitivity in morbid obesity

Tinahones FJ, Moreno-Santos I, Vendrell J, Chacon MR, Garrido-Sánchez L, García-Fuentes E, Macias-González M

Obesity, 20, 488-497 (2012)

The role of Raf-1 kinase inhibitor protein in the regulation of pancreatic beta cell proliferation in mice
Pardo FN, Altirriba J, Pradas-Juni M, García A, Ahlgren U, Barberà A, Slebe JC, Yáñez AJ, Gomis R, Gasa R
Diabetologia, 55, 3331-3340 (2012)

The usefulness of HbA1c in postpartum reclassification of gestational diabetes
Megia A, Näf S, Herranz L, Serrat N, Yañez RE, Simón I, Vendrell J
BJOG, 119, 891-894 (2012)

TNF- α inhibits PPAR β/δ activity and SIRT1 expression through NF- κ B in human adipocytes
Serrano-Marco L, Chacón MR, Maymó-Masip E, Barroso E, Salvadó L, Wabistch M, Garrido-Sánchez L, Tinahones FJ, Palomer X, Vendrell J, Vázquez-Carrera M
Biochim Biophys Acta, 1821, 1177-1185 (2012)

Tungstate reduces the expression of gluconeogenic enzymes in STZ rats
Nocito L, Zafra D, Calbó J, Domínguez J, Guinovart JJ
PLoS One, 7, e42305 (2012)

Two variants in the fibulin2 gene are associated with lower systolic blood pressure and decreased risk of hypertension
Vallvé JC, Serra N, Zalba G, Fortuño A, Beloqui O, Ferre R, Ribalta J, Masana L
PLoS ONE, 7, e43051 (2012)

Update on cardiovascular safety of PPARgamma agonists and relevance to medicinal chemistry and clinical pharmacology
Ciudin A, Hernandez C, Simó R
Curr Top Med Chem, 12, 585-604 (2012)

Usefulness of the vitreous fluid analysis in the translational research of diabetic retinopathy
Simó-Servat O, Hernández C, Simó R
Mediators Inflamm, 2012, 872978 (2012)

Validation of the FINDRISC (FINNish Diabetes Risk Score) for prediction of the risk of type 2 diabetes in a population of southern Spain. Pizarra Study
Soriguer F, Valdés S, Tapia MJ, Esteva I, Ruiz de Adana MS, Almaraz MC, Morcillo S, García Fuentes E, Rodríguez F, Rojo-Martínez G
Med Clin (Barc), 138, 371-376 (2012)

Vascular Endothelial Growth Factor-Mediated Islet Hypervasculization and Inflammation Contribute to Progressive Reduction of β -Cell Mass
Agudo J, Ayuso E, Jimenez V, Casellas A, Mallol C, Salavert A, Tafuro S, Obach M, Ruzo A, Moya M, Pujol A, Bosch F
Diabetes, 61, 2851-2861 (2012)

Vitamin D and incidence of diabetes: A prospective cohort study
González-Molero I, Rojo-Martínez G, Morcillo S, Gutiérrez-Repiso C, Rubio-Martín E, Almaraz MC, Olveira G, Soriguer F
Clin Nutr, 31, 571-573 (2012)

Zinc-alpha 2-glycoprotein gene expression in adipose tissue is related with insulin resistance and lipolytic genes in morbidly obese patients.
Garrido-Sánchez L, García-Fuentes E, Fernández-García D, Escoté X, Alcaide J, Perez-Martinez P, Vendrell J, Tinahones FJ
Plos One, 7, e33264 (2012)

Zinc- α 2-glycoprotein is unrelated to gestational diabetes: anthropometric and metabolic determinants in pregnant women and their offspring
Näf S, Escote X, Yañez RE, Ballesteros M, Simón I, Gil P, Megia A, Vendrell J
PLoS One, 7, e47601 (2012)

CIBERDEM

Centro de Investigación Biomédica en Red de Diabetes y Enfermedades Metabólicas Asociadas
Spanish Biomedical Research Centre in Diabetes and Associated Metabolic Disorders

Scientific Director Luis Castaño

Adjunct Scientific Director Anna Novials

Steering Committee Luis Castaño, Anna Novials, Rafael Carmena, Manuel Benito, Antonio Zorzano, Fàtima Bosch

Management Office

Managing Director | Johanna Rivera

Executive Secretary | Tania Fernández

Project Management | Francesc Martí

Knowledge Management and Communication | Marta Vidal and Joana Balfegó

Human Resources | Libertad Montaño and Carme Bardia

Accounting and Purchase Agent | Antonio Santaliestra

Administrative Assistant | Maria Rosa Vázquez

Contact details | Bonanova 69, 6th floor, 08017 Barcelona, Spain, info@ciberdem.org

An initiative of **Instituto de Salud Carlos III**, Ministerio de Economía y Competitividad, Gobierno de España

Institutions of the Consortium

BIOEF (Fundación Vasca de Innovación e Investigación Sanitarias), CIPF (Fundación Centro de Investigación Príncipe Felipe), CSIC (Consejo Superior de Investigaciones Científicas), FIHCUV (Fundación Investigación Hospital Clínico Universitario de Valencia), FIR-HUVH (Fundació Institut de Recerca Hospital Universitari Vall d'Hebron), FJD (Fundación Jiménez Díaz), FSJD (Fundació Sant Joan de Déu), IDIBAPS (Institut d'Investigacions Biomèdiques August Pi i Sunyer), IDIBELL (Fundació Institut d'Investigació Biomèdica de Bellvitge), IISPV (Fundació Institut d'Investigació Sanitària Pere Virgili), IMABIS (Fundación Instituto Mediterráneo para el Avance de la Biotecnología y la Investigación Sanitaria), IRB (Fundació Institut de Recerca Biomèdica), IRHSCSP (Institut de Recerca Hospital de la Santa Creu i Sant Pau), SERMAS (Servicio Madrileño de Salud), UAB (Universitat Autònoma de Barcelona), UB (Universitat de Barcelona), UCM (Universidad Complutense de Madrid), UMH (Universidad Miguel Hernández), UPO (Universidad Pablo de Olavide)

2013

Edition | Ciberdem Management Office

Director | Luis Castaño

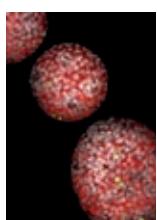
Editor | Joana Balfegó

Designer | Estudi Moliné

Language Consultant | Andrew Hastings

Texts | Ciberdem Research Groups and Ciberdem Management Office

Images and Graphics | Victoria Adam, Judith Agudo Cantero, Elvira Álvarez, M.A. Balboa, J. Balsinde, Enrique Blázquez, Sebastian Blesa, Manuel Carrasco, Hospital Universitario Cruces Diabetes Research Group, Irene Delgado, Diabetes and Cardiovascular Group/Facultad de Farmacia-Universidad Complutense de Madrid, Diabetes and Metabolic Associated Diseases Research Group/Hospital Universitari de Tarragona Joan XXIII-Institut d'Investigació Sanitària Pere Virgili, Diabetobé Group/Hospital Clínico San Carlos, H. F. Escobar-Morreale, Antonio Fernández, Mario García de Lacoba, Genomic Programming of Beta Cells Group/Institut d'Investigacions Biomèdiques August Pi i Sunyer, Águeda González-Rodríguez, Stella González Romero, Cristina Hernández, Verónica Hurtado, Laboratory of Molecular Endocrinology/Centro de Investigación Príncipe Felipe, Esther Lizárraga-Mollinedo, Iliana López-Soldado, Rita Malpique, Metabolic disease and cardiovascular risk group/Hospital de la Santa Creu i Sant Pau-Servei de Bioquímica i Endocrinologia i Institut de Recerca (IIB Sant Pau), Molecular characteristics and action of incretins, the physiopathology of glucose, lipids and bone metabolism/Fundación Jiménez Díaz, Marta Montori Grau, Alba Moreno-Asso, Eduard Noguera, Marcelina Párrizas, L. Peña, Prenatal growth restriction and subsequent risks for type 2 diabetes and cardiovascular disease group/Hospital Sant Joan de Déu-Universitat de Barcelona, Isabel Roncero, Roser Rosales, María del Carmen Sanz Miguel, Joan-Marc Servitja, Sergi Soriano, Noèlia Téllez, Juan de Toro-Martín, Mario Vallejo, Manuel Vázquez-Carrera, Oscar Yanes



Cover image | Alba Moreno-Asso, Marcelina Párrizas and Joan-Marc Servitja, Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS). Confocal micrograph of isolated mouse pancreatic islets cultured at a stimulatory glucose concentration. Insulin is stained in red, proliferating beta cells in green and nuclei in white. In this issue of Diabetologia (vol. 56).

Special thanks to all those individuals and institutions without whose cooperation and good will this book would not have been possible.



ciberdem
Centro de Investigación Biomédica en Red de
Diabetes y Enfermedades Metabólicas Asociadas