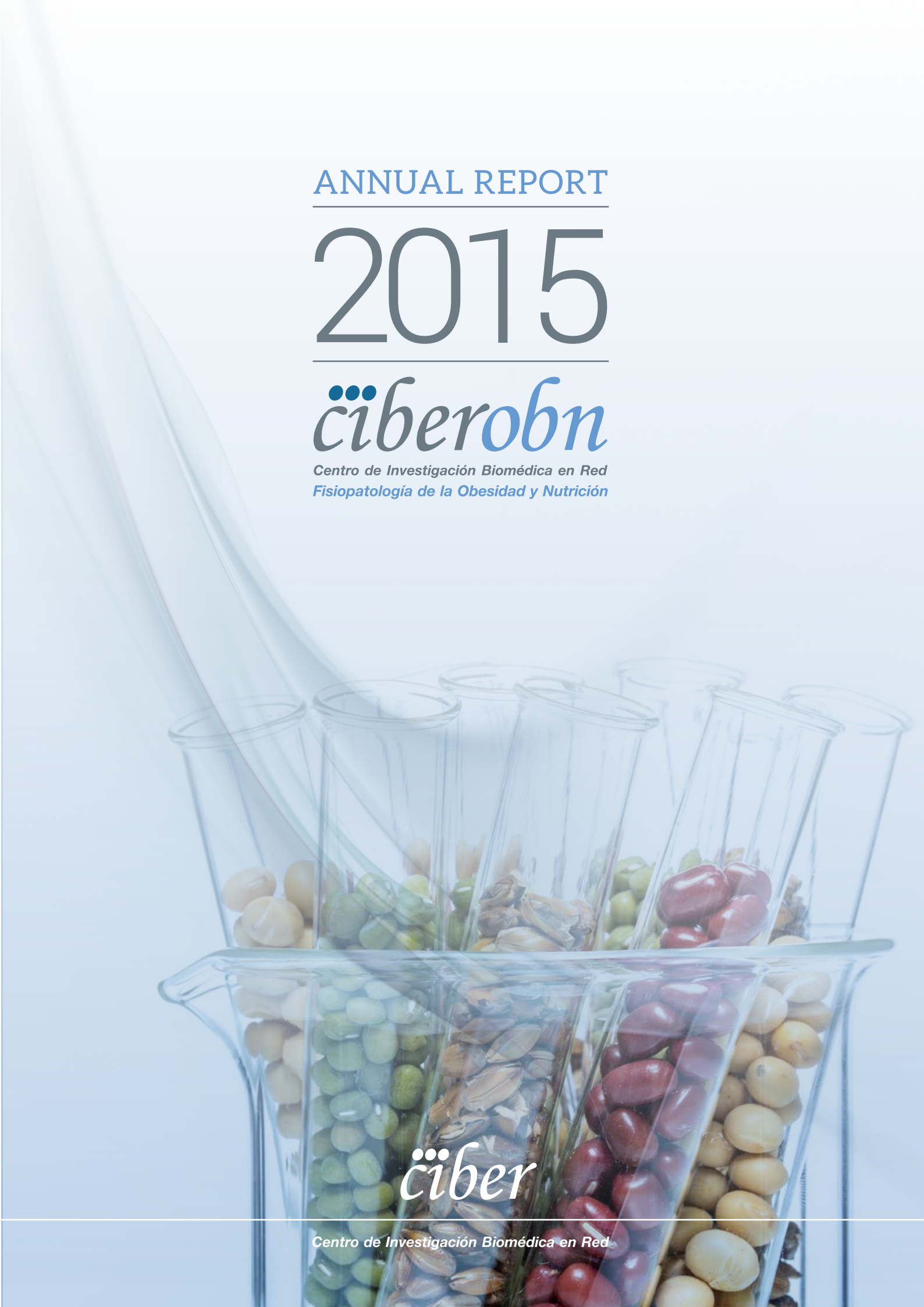
ANNUAL REPORT 2015

ciberobn

Centro de Investigación Biomédica en Red
Fisiopatología de la Obesidad y Nutrición



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Centro de Investigación Biomédica en Red

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Scientific Director's Presentation

It is a pleasure for me to be presenting for the first time this annual report on the work done by the CIBEROBN, in which the scientific activity in the areas of Obesity and Nutrition carried out by the CIBER public consortium is represented. The CIBEROBN was conceived with the aim of generating an environment for scientific management and translational research of proven quality in the national and international settings, intended for solving healthcare problems in the benefit of the National Health System (SNS) and for improving citizens' quality of life. At the present time, the CIBEROBN is structured around 6 research programmes along with a number of transversal areas (teaching) and common platforms (Fatbank, Metagenomics, Epigenomics).

The report now presented represents the work done by a total number of 31 Groups which will next year be joined by two new Groups, which were selected with the aim of strengthening the Childhood Obesity line.

The first valuation I should like to make is in respect of my predecessor in the post as Scientific Director, Dr Felipe Casanueva, who had been carrying out that role since the CIBEROBN was founded as a new instrument for cooperative research at the ISCIII. The challenge that he faced as founding Director was highly considerable, since not only did he have to get a new research Centre under way but this also had to be done without having any similar model to take inspiration from. Over these years he managed to define and develop different research programmes in the field of obesity and nutrition which in the great majority of cases imply the participation of a large number of groups with different types of structure. Common and complementary structures have also been defined and got under way to reinforce the work done in cooperation, stressing the FATBANK in this respect. Lastly, something that should also be stressed was having defined transparent criteria and continuous assessment objectives of the Groups in the CIBER. The success of the work done by the Scientific Management, Management Committee and researchers of the CIBEROBN is I believe reflected by data included in this report, which proves that the CIBEROBN has gained a position as an international benchmark in the field of obesity and nutrition. With regard to this aspect I should like to highlight one milestone of exceptional relevance in the biomedical research done in this country and connected with the PREDIMED study, which forms part of the CIBEROBN research programme. The publications stemming from the PREDIMED study carried out by CIBEROBN researchers are unquestionably going to have a resounding effect on the population's lifestyle habits and on their cardiovascular health. This is vouched for by the incorporation of the Mediterranean diet as a healthy pattern for preventing cardiovascular diseases in the Dietary guidelines for Americans 2015 by its Scientific Committee, basing its conclusions precisely on the PREDIMED. study. In fact the Health Department of the US Government makes express mention of the PREDIMED studies on up to 82 occasions in its 2015 nutritional guidelines.

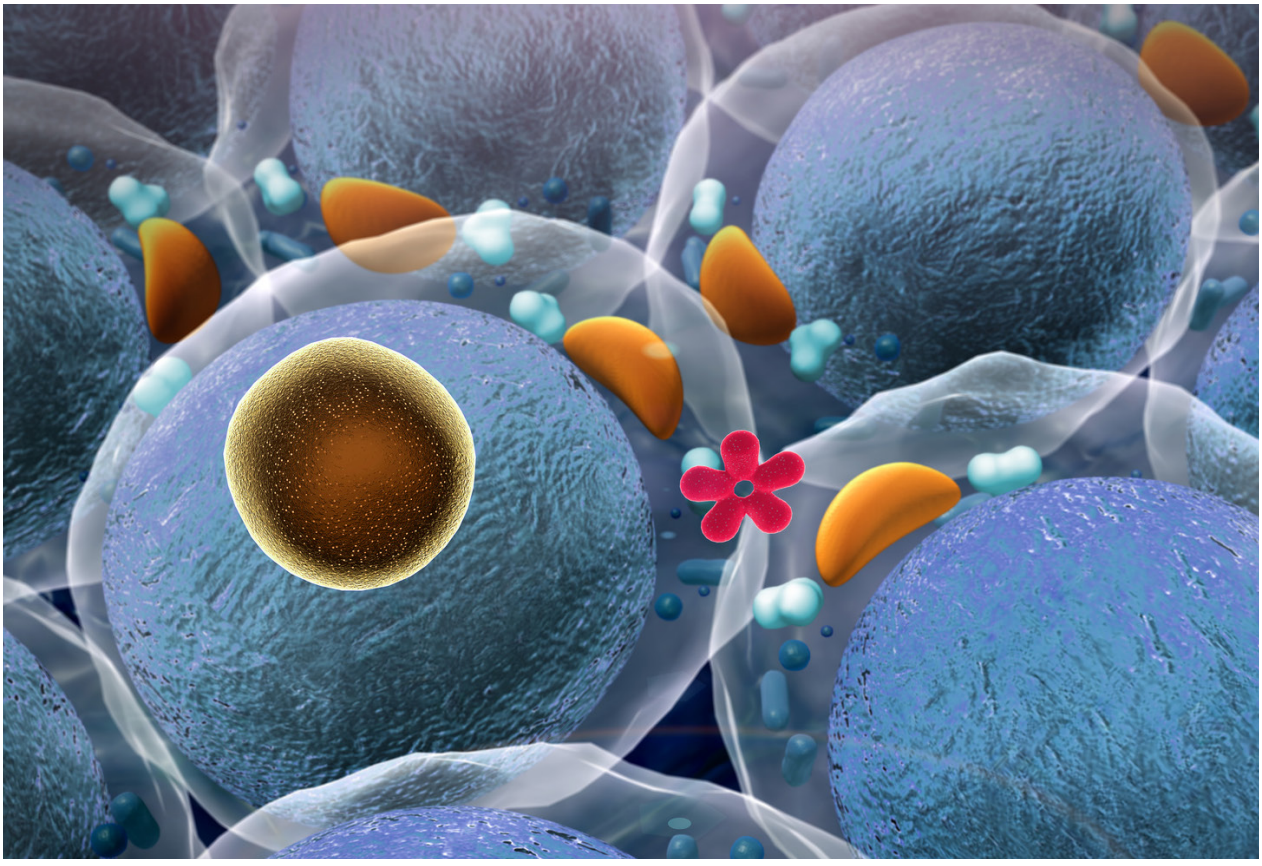
The fact that PREDIMED should form part of American Diet Guidelines is exceptionally relevant since this implies that the Mediterranean diet is starting to become prominent as one of the healthiest diet patterns based on the best scientific evidence for prevention of cardiovascular disease.

This worldwide standing of the CIBEROBN is a

reflection of the international-scale work done by its researchers. In this respect I would like to stress the participation of CIBEROBN researchers in a total number of 32 international/ European projects. These range from ERC projects of all kinds (Advanced, Consolidated and Starting Grants) to projects of the VII PM or Horizon 2020.

I believe that everything mentioned above and many other aspects contained in this report vouch for our having obtained our initial objective of "generating an environment for scientific management and translational research of proven quality in the national and international settings intended for solving healthcare problems in the benefit of the National Health System (SNS) and for improving citizens' quality of life". This should spur us on to attain an even higher level of excellence enabling us to become recognised agents in the field of research into Obesity and Nutrition.

Carlos Diéguez González
Scientific Director



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Organization

Organisational structure

The CIBEROBN is one of the eight thematic areas forming the Centro de Investigación Biomédica en Red (CIBER), a Spanish research consortium in the field of biomedical research with great scientific potential, under the Instituto de Salud Carlos III (ISCIII) – Ministry of the Economy and Competitiveness.

The Physiopathology of Obesity and Nutrition area is made up of 31 research groups, keeping its independence as regards scientific management. Its organisational structure is based on the research groups belonging to this and its activity revolves around the Research Programmes and Transversal Programmes, with a coordinator for each Programme belonging to the Steering Committee. Scientific decisions are made by the Scientific Director, advised by said Steering Committee and the External Scientific Committee.

The Steering Committee is presided over by the Scientific Director and made up of the coordinators of the programmes and Managing Director of the CIBER.

The External Scientific Committee is a body for scientific support and advice, made up of relevant personalities in the field of health sciences standing out for their professional or scientific careers in line with the objectives of the thematic area.

The senior administrative bodies of the CIBEROBN are the Governing Body and the Permanent Commission, common for all the CIBER research areas.

The Governing Body is made up of three representatives of the ISCIII and by an institutional representative of each of the centres in the consortium. It is presided over by the Director of the ISCIII and meets every six months.

The Permanent Commission is an executive committee made up of the ISCIII and 8 members of the Governing Body, who can be renewed on an annual basis.

Both the operation and the purposes of the governing, support and advisory bodies are established in the statutes of the CIBER.

Members of the Steering Advisory Committee of CIBEROBN

NAME	POST HELD
Carlos Diéguez	Scientific Director
Jordi Salas	Nutrition Programme
Dolores Corella	Nutrition Programme
Gema Frühbeck	Adipobiology Programme
Francisco Tinahones	Complications of Obesity and Childhood Obesity Programme
Fernando Fernández-Aranda	Neurocognition and Environmental-Biological Factors Programme
Andreu Palou	New Strategies and Biomarkers Programme
Francesc Villarroya	Body Weight Homeostasis Physiopathology Programme
José Manuel Fernández-Real	Scientific Platforms
Manuel Tena	Training Programme
Manuel Sánchez	CIBER Manager

Scientific Director Assistant : Leticia Álvarez

External Advisory Scientific Committee

This is body made up of scientists of particular international significance in the field of health sciences who have stood out for their professional or scientific careers in line with the Consortium's objectives.

Xavier Pi-Sunyer	Department of Medicine, St. Luke's/Roosevelt Hospital Center
Antonio Vidal-Puig	University of Cambridge Metabolic Research Laboratories, Institute of Metabolic Science
José C. Florez	Center for Human Genetic Research/Diabetes Unit Massachusetts General Hospital
José M. Ordovás	Professor Nutrition and Genetics JM-USDA-HNRCA at Tufts University
Lluis Fajas	Research Director Metabolism and Cancer Laboratory - Montpellier - France

Technical Unit

List of personnel: http://www.ciberobn.es/en/about-us/structure/head-office

Directory of Groups and Institutions

Group leader	Institution	Centre	Province
Argente Oliver, Jesús	Servicio Madrileño de Salud	Hospital Infantil Universitario Niño Jesús	Madrid
Arós Borau, Fernando	Fundación Vasca de Innovación e Investigación Sanitarias	Hospital Universitario de Álava-Sede Santiago	Álava
Botella Arbona, Cristina	Universitat Jaume I	Facultad de Ciencias de la Salud	Castellón
Casanueva Freijo, Felipe	Servicio Gallego de Salud	Complejo Hospitalario Universitario Santiago	A Coruña
Corella Piquer, Dolores	Universitat de València	Facultad de Medicina de Valencia	Valencia
Diéguez González, Carlos	Universidad de Santiago de Compostela	CIMUS	A Coruña
Estruch Riba, Ramón	Hospital Clínic de Barcelona	Hospital Clínic de Barcelona	Barcelona
Fernández-Aranda, Fernando	Fundación IDIBELL	Hospital Universitari de Bellvitge	Barcelona
Fernández-Real Lemos, José Manuel	Fundación Institut d'Investigació Biomèdica de Girona	Hospital Josep Trueta	Girona
Fiol Sala, Miguel	Universitat de les Illes Balears	Facultad de Ciencias de Mallorca	Illes Balears
Fitó Colomer, Montserrat	Consorci Mar Parc Salut de Barcelona	Consorci Mar Parc de Salut de Barcelona	Barcelona
Frühbeck Martínez, Gema	Universidad de Navarra	Clínica Universitaria de Navarra	Navarra
Lamuela-Raventos, Rosa María	Universitat de Barcelona	Facultad de Farmacia. Universitat de Barcelona	Barcelona
Lapetra-Peralta, José	Fundación Pública Andaluza para la Gestión de la Investigación en Salud de Sevilla	Distrito Sanitario Atención Primaria de Sevilla	Sevilla
Lasunción Ripa, Miguel Ángel	Servicio Madrileño de Salud	Hospital Ramón y Cajal	Madrid
López Miranda, José	Fundación para la Investigación Biomédica de Córdoba (FIBICO)	Hospital Universitario Reina Sofía	Córdoba
Lurbe Ferrer, Empar	Consorci Hospital General Universitari València	Hospital General Universitari València	Valencia
Martínez González, Miguel Ángel	Universidad de Navarra	Universidad de Navarra	Navarra
Martínez Hernández, José Alfredo	Universidad de Navarra	Universidad de Navarra	Navarra
Osada García, Jesús de la	Universidad de Zaragoza	Universidad de Zaragoza	Zaragoza
Palou Oliver, Andreu	Universitat de les Illes Balears	Facultad de Ciencias de Mallorca	Illes Balears

Group leader	Institution	Centre	Province
Pintó Sala, Xavier	Fundación IDIBELL	Hospital Universitari de Bellvitge	Barcelona
Portillo Baqueda, María del Puy	Universidad del País Vasco	Facultad de Farmacia	Álava
Remesar Betlloch, Xavier	Universitat de Barcelona	Facultad de Biología. Universitat de Barcelona	Barcelona
Ros Rahola, Emilio	Hospital Clínic de Barcelona	Hospital Clínic de Barcelona	Barcelona
Salas Salvadó, Jordi	Fundación Institut d'Investigació Sanitària Pere Virgili	Universitat Rovira i Virgili	Tarragona
Serra Majem, Lluis	Universidad de las Palmas de Gran Canaria	Universidad de Las Palmas de Gran Canaria	Las Palmas
Tena Sempere, Manuel	Universidad de Córdoba	Facultad de Medicina. Universidad de Córdoba	Córdoba
Tinahones Madueño, Francisco	Fundación Pública Andaluza para la Investigación de Málaga en Biomedicina y Salud (FIMABIS)	Hospital Universitario Carlos Haya	Málaga
Tur Mari, Josep Antoni	Universitat de les Illes Balears	Facultad de Ciencias de Mallorca	Illes Balears
Villaroya Gombau, Francesc	Universitat de Barcelona	Facultad de Biología. Universitat de Barcelona	Barcelona

Budget

INCOME	5.378.742,85
NOMINAL ISCIII GRANT	2.767.230,00
INCOME FROM NEW GROUPS	120.000,00
AGREEMENTS AND CONTRACTS	442.969,92
OWN FUNDS	2.048.542,93

EXPENDITURE	3.023.547,23
GROUP	2.247.341,87
RESEARCH PROGRAMMES	109.889,39
TRAINING	23.385,06
TECHNICAL OFFICE	155.000,00
SCIENTIFIC MANAGEMENT	38.265,70
FAT BANK PLATFORM	25.727,66
SCIENTIFIC SECRETARY	45.421,47
SCIENTIFIC CONFERENCE	58.480,74
PREDIMED	28.686,10
COMPETITIVE PROJECTS	291.349,24

Personnel

Personnel contracted during the year as of 31st December, separating by categories:

Category	Permanent	Temporary	Works & service	Post-doctoral	Main Total
Diploma holder	5	-	6	-	11
Doctor	4	-	6	5	15
Graduate	20	1	18	-	39
Technical	8	-	5	-	13
Total	**37**	**1**	**35**	**5**	**78**

Significant Activities

Projects

The projects active in 2015 were as follows:

NATIONAL PROJECTS

Financing Agency: Instituto de Salud Carlos III:

- Study of the possible role of iron in the physiology of human adipose tissue in association with obesity and resistance to insulin.
- Rio Hortega Contract.
- Miguel Servet Contract.
- Cell membrane changes induced by dietary long-chain omega-3 fatty acids and their link to chronic disease development.

Other financing agencies:

- TV3 Fundació la Marató: Lipotoxicity, liver steatosis and hepatocellular carcinoma: function of the armc10/armcx family of mitochondrial proteins.
- SEA/FEA: Effects of a walnut-enriched diet on circulating microRNAs related with the metabolism of cholesterol and lipoproteins

We should stress CIBEROBN's participation in two of the three interdisciplinary CIBER excellence projects financed by the AES: one of these, led by CIBERDEM, has the aim of identifying the mechanisms of the inflammatory processes which are detected on one hand in obese or type 2 diabetic patients and on the other in patients with Crohn's disease. Another of the projects in which CIBEROBN researchers are taking part is led by the CIBEREHD and seeks to find the common and differential molecular mechanisms of obesity, the metabolic syndrome, diabetes and fatty liver disease, identifying biomarkers for early diagnosis and sets out to find new therapeutic approaches.

INTERNATIONAL (EUROPEAN) PROJECTS

- *Long-term effects of an energy-restricted Mediterranean diet on mortality and cardiovascular disease: the PREDIMED PLUS Study".*
- *EhcoBUTLER.*

Transferencia de tecnología

One of the CIBER's main aims is the transfer of research results into clinical practice, and one of the best tools existing for this purpose is technology transfer.

The Unit managing this at the CIBER sets out to act as a bridge between our researchers and other agents in the Science and Technology System (companies, business associations, other research organisations, etc.) to make cooperation with these bodies more effective. This means that research results will be efficiently developed and can succeed in being applied. Work is done in several lines to this end:

- **Training in innovation management and continuous contact with our researchers to monitor their results.**

  In this respect, last year the first general event of the CIBER in training on technology transfer and innovation was held, on 26th February 2015 and where national experts took part sharing their knowledge in matters such as industrial property, business creation or publication in open access, etc.

- **Protection of their research results and management of cooperation with other agents, as vouched for by applications for patents and signing licensing contracts, amongst other agreements.**

  Hence, over 20 new patent applications were made and seven licensing agreements were signed at the CIBER in 2015.

- **The presentation of research results and technological capacities of our groups.**

  Among many other measures and only as an example, in 2015, several projects were presented at the II Foro de Innovación en Diagnóstico in Vitro – FENIN in Barcelona (December 2015).

- **Support for technology-based business creation stemming from CIBER groups.**

  The CIBER has since 2014 taken part in Epidisease (http://www.epidisease.com/es/) which it continued to support in 2015.

- **Other activities connected with innovation, public-private cooperation and industrial and intellectual property.**

  For example, the registration of the "community trademark" of the CIBER has been processed, or steps have been taken for registering intellectual property rights for audio-visual projects, amongst many others.

Dissemination activities

In 2015 CIBER's Communication Department carried out different measures for dissemination and disclosure in order to improve the Centre's visibility, as well as publicising the research work done by the groups in its eight thematic areas.

We now give details of some 2015 milestones in CIBEROBN communication:

THE CIBEROBN IN THE MEDIA:

During the 2015 period fifteen CIBER press releases were issued, seven of these from the CIBEROBN and four in cooperation between several CIBER areas.

Date	Thematic Area	Title
January	SEVERAL CIBER	El CIBER pone en marcha tres proyectos de excelencia interdisciplinares financiados con casi 2 millones de euros por la AES
February	SEVERAL CIBER	Investigadores del CIBER identifican diversos factores de riesgo de sufrir cáncer
November	SEVERAL CIBER	El CIBER acerca su investigación al público de la mano de la improvisación teatral en #ImproCiencia
December	SEVERAL CIBER	El CIBER incorpora 11 nuevos grupos en diversas áreas de investigación
February	CIBEROBN	El proyecto PREDIMED del CIBEROBN en las nuevas guías dietéticas americanas
March	CIBEROBN	Francesc Villarroya, del CIBEROBN, distinguido con el premio ICREA Academia de la Generalitat de Catalunya
April	CIBEROBN	Investigadores del CIBEROBN descubren que el déficit de Vitamina D está estrechamente relacionado con la Diabetes
April	CIBEROBN	Fernando Fernández-Aranda, del CIBEROBN, primer científico español que recibe el Premio Leadership Award on Research 2015
September	CIBEROBN	Un estudio de Recercaixa demuestra que una hormona presente en la leche materna es clave para regular el metabolismo de los neonatos
September	CIBEROBN	La Dieta Mediterránea puede reducir hasta en dos terceras partes el riesgo de sufrir cáncer de mama
September	CIBEROBN	La Dieta Mediterránea suplementada con Aceite de Oliva Virgen Extra reduce en un 44% el riesgo de desarrollar retinopatía diabética
September	CIBEROBN	El investigador del CIBEROBN, Rubén Nogueiras, premiado con el 'Rising Star' de la Fundación europea para el estudio de la diabetes
October	CIBEROBN	Se describe por primera vez la relación entre la Obesidad y la población de hongos del intestino humano
October	CIBEROBN	'Slim Cities', paso en firme del CIBEROBN en su lucha contra la obesidad
November	CIBEROBN	Miguel Ángel Martínez-González, catedrático de Medicina Preventiva y Salud Pública, primer premio Oliduero a la I+D+i
November	CIBEROBN	El CIBEROBN demuestra por primera vez la relación directa entre obesidad y cáncer de mama
November	CIBEROBN	El tipo y origen de la grasa que se consume determinan el riesgo de padecer enfermedades cardiovasculares

Date	Thematic Area	Title
December	CIBEROBN	Uroguanylina, la nueva diana antiobesidad descubierta por el CIBEROBN.
December	CIBEROBN	CIBEROBN, nuevo impulso a la investigación contra la obesidad infantil

2394 appearances in the media were registered over this period:

CIBEROBN	NEWS	AUDIENCE
Internet	2.046	235.911.200
Press	348	42.599.000
Total	**2.394**	**278.510.200**

NUEVA WEB DEL CIBER OBN:

In November 2015 the new web page of the CIBEROBN was launched in order to have a common structure, image and contents manager for all the CIBER areas. http://www.ciberobn.es/en

CIBER NEWSLETTER

Over this period five CIBER newsletters were issued, including relevant contents on both the CIBEROBN and the other thematic areas. The digital newsletters were sent to around 4000 subscribers.

http://www.ciberisciii.es/comunicacion/boletines

SOCIAL NETWORKS

Main indicators of CIBEROBN's presence on Twitter:

UPDATES		FOLLOWERS		FOLLOWING		KLOUT (influence, values between 1 and 100)	
JANUARY	DECEMBER	JANUARY	DECEMBER	JANUARY	DECEMBER	JANUARY	DECEMBER
230	392	238	509	179	230	44	47

CIBEROBN ANNUAL REPORT

The Communication area of the CIBER in cooperation with the CIBEROBN coordinated the content of the CIBEROBN report 2014 in Spanish/English, drawing up and disseminating 2 reports in interactive format (Flipbook) and PDF. These were distributed over the web page and Twitter account: http://www.ciberisciii.es/en/press/annual-report/annual-report-2015

CIBER #IMPROCIENCIA SCIENCE WEEK

The #ImproCiencia dissemination event, arranged by the CIBER in the framework of the Madrid Science Week 2015, took place on 3rd November at the Nave 73 rooms in Madrid. The event combined science and theatre improvisation to give a light-hearted explanation of the biomedical research done by the CIBER in its eight thematic areas. Games and improvisations were alternated with live connections with CIBER researchers during the event.

Scientific Production

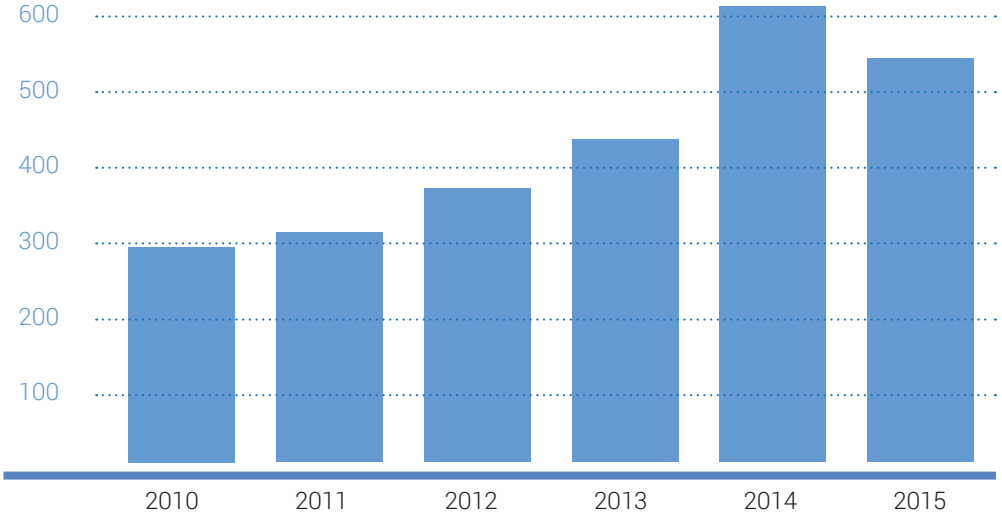
The evolution of CIBEROBN publications can be seen from the following graphs in which the data from 2010 to 2015 is analysed.

The publications are also detailed by group for this year, as well as the interCIBER and intraCIBER cooperation.

Publications:

No. of affiliated publications 2015	
Total publications	**535**
First quartile	298
First decile	88

EVOLUTION OF CIBEROBN PUBLICATIONS 2010-2015



MOST RELEVANT CIBEROBN PUBLICATIONS IN 2015 BY IMPACT FACTOR

Publication	Impact Factor
HONG S., MORENO-NAVARRETE J.M., WEI X., KIKUKAWA Y., TZAMELI I., PRASAD D., LEE Y., ASARA J.M., FERNANDEZ-REAL J.M., MARATOS-FLIER E., PISSIOS P. Nicotinamide N-methyltransferase regulates hepatic nutrient metabolism through Sirt1 protein stabilization. Nature Medicine	28,223
GOEDEKE L., ROTLLAN N., CANFRAN-DUQUE A., ARANDA J.F., RAMIREZ C.M., ARALDI E., LIN C.-S., ANDERSON N.N., WAGSCHAL A., DE CABO R., HORTON J.D., LASUNCION M.A., NAAR A.M., SUAREZ Y., FERNANDEZ-HERNANDO C. MicroRNA-148a regulates LDL receptor and ABCA1 expression to control circulating lipoprotein levels. Nature Medicine	28,223
MAHFOUD F., BOHM M., AZIZI M., PATHAK A., DURAND ZALESKI I., EWEN S., TSIOUFIS K., ANDERSSON B., BLANKESTIJN P.J., BURNIER M., CHATELLIER G., GAFOOR S., GRASSI G., JONER M., KJELDSEN S.E., LUSCHER T.F., LOBO M.D., LOTAN C., PARATI G., REDON J., RUILOPE L., SUDANO I., UKENA C., VAN LEEUWEN E., VOLPE M., WINDECKER S., WITKOWSKI A., WIJNS W., ZELLER T., SCHMIEDER R.E. Proceedings from the European clinical consensus conference for renal denervation: Considerations on future clinical trial design. European Heart Journal	15,203
FRUHBECK G. Bariatric and metabolic surgery: A shift in eligibility and success criteria. Nature Reviews Endocrinology	13,281

Publication	Impact Factor
VALLS-PEDRET C., SALA-VILA A., SERRA-MIR M., CORELLA D., DE LA TORRE R., MARTÍNEZ-GONZÁLEZ M.A., MARTINEZ-LAPISCINA E.H., FITO M., PÉREZ-HERAS A., SALAS-SALVADO J., ESTRUCH R., ROS E. Mediterranean diet and age-related cognitive decline: A randomized clinical trial. JAMA Internal Medicine.	13,116
TOLEDO E., SALAS-SALVADÓ J., DONAT-VARGAS C., BUIL-COSIALES P., ESTRUCH R., ROS E., CORELLA D., FITO M., HU F.B., AROS F., GÓMEZ-GRACIA E., ROMAGUERA D., ORTEGA-CALVO M., SERRA-MAJEM L., PINTO X., SCHRODER H., BASORA J., SORLI J.V., BULLO M., SERRA-MIR M., MARTINEZ-GONZALEZ M.A. Mediterranean diet and invasive breast cancer risk among women at high cardiovascular risk in the predimed trial a randomized clinical trial. JAMA Internal Medicine.	13,116
CRUJEIRAS AB, CASANUEVA FF. Obesity and the reproductive system disorders: epigenetics as a potential bridge. Human reproduction update.	10,165
LOPEZ M., TENA-SEMPERE M. Estrogens and the control of energy homeostasis: A brain perspective. Trends in Endocrinology and Metabolism	9,392
DÍAZ-LÓPEZ A, BABIO N, MARTÍNEZ-GONZÁLEZ MA, CORELLA D, AMOR AJ, FITÓ M, ESTRUCH R, ARÓS F, GÓMEZ-GRACIA E, FIOL M, LAPETRA J, SERRA-MAJEM L, BASORA J, BASTERRA-GORTARI FJ, ZANON-MORENO V, MUÑOZ MÁ, SALAS-SALVADÓ J, PREDIMED STUDY INVESTIGATORS, PORTILLO BAQUEDA MARÍA DEL PUY, ROS E. Mediterranean Diet, Retinopathy, Nephropathy, and Microvascular Diabetes Complications: A Post Hoc Analysis of a Randomized Trial. Diabetes care	8,42
FERNÁNDEZ-REAL JM, MCCLAIN D, MANCO M. Mechanisms Linking Glucose Homeostasis and Iron Metabolism Toward the Onset and Progression of Type 2 Diabetes.Diabetes care	8,42

CIBEROBN Publications per group 2015

Group	Publications	Q1	D1
Argente Oliver, Jesús	15	9	1
Arós Borau, Fernando	12	8	5
Botella Arbona, Cristina	20	10	1
Casanueva Freijo, Felipe	31	17	7
Corella Pique, Dolores	27	17	8
De La Osada, Jesús	7	1	0
Diéguez González, Carlos	34	23	9
Estruch Riba, Ramon	26	18	9
Fernández Aranda, Fernando	31	14	0
Fernández Real, José Manuel	30	24	5
Fiol Sala, Miquel	24	16	9
Fito Colomer, Monserrat	56	38	14
Frühbeck Martínez, Gema	20	14	5
Lamuela, Rosa Maria	22	14	1
Lapetra Peralta, José	12	9	5
Lasuncion Ripa, Miguel Ángel	9	6	2
López Miranda, José	22	14	7
Lurbe Ferrer, Empar	18	15	2
Martínez González, Miguel Ángel	41	27	11

Martínez Hernández, José Alfredo	58	29	10
Palou Oliver, Andreu	22	16	0
Pintó Salas, Xavier	12	6	3
Portillo Baquedano, María del Puy	10	5	1
Remesar Betlloch, Xavier	14	14	0
Ros Rahola, Emilio	21	14	6
Salas Salvadó, Jordi	34	21	10
Serra Majem, Lluis	32	14	8
Tena Sempere, Manuel	29	24	9
Tinahones Madueño, Francisco José	46	34	12
Tur Mari, Josep A	45	14	3
Villarroya Gombau, Francesc	14	11	3

COOPERATION:

No. of intraCIBER publications 2015: **113**

No. of interCIBER publications 2015: **99**

PATENTS:

PATENTS APPLIED FOR

- Compositions for treatment of obesity, metabolic syndrome and associated diseases. P201531946.
- Method of identifying individuals vulnerable to diabetes and other metabolic diseases. P201531945.

CLINICAL GUIDELINES

National	Recomendaciones del Grupo de Trabajo Diabetes y Enfermedad Cardiovascular de la Sociedad Española de Diabetes (SED, 2015). Clin Invest Arterioscl. 2015;27(4):181---192.
International	Food Consumption and its Impact on Cardiovascular Disease: Importance of Solutions Focused on the Globalized Food System: A Report From the Workshop Convened by the World Heart. Federation.
International	Biomarkers: background, classification and guidelines for applications in nutritional epidemiology.
National	Guía de Recomendación de la carne de cerdo de capa blanca. Documento de Consenso dirigido a profesionales de la salud.
National	Guías de práctica clínica de manejo de la dislipemia en diabéticos y otros grupos de riesgo.
National	Consensus document and conclusions. Methodology of dietary surveys, studies on nutrition, physical activity and other lifestyles.
National	Consenso sobre las grasas y aceites en la alimentación de la población española adulta; postura de la Federación Española de Sociedades de Alimentación, Nutrition y Dietética (FESNAD).
National	Position statement on the SEMI, SED, redGDPS, SEC, SEEDO, SEEN, SEMERGEN y SEMFYC.
International	2014 EASO Position Statement on the Use of Anti-Obesity Drugs.
National	Guía clínica para el manejo de la diabetes mellitus tipo 2.
International	Manual of Hypertension of the European Society of Hypertension.
International	Guide to substantiation of health claims for bioactive compounds and functional foods

3

Scientific Programmes

Nutrition

In 2015, the groups in the Nutrition Programme attained some important milestones. These are some of their achievements:

As regards the PREDIMED cooperative study, in which 11 CIBEROBN groups are taking part, over 40 scientific articles have been published in the best international journals (many of which are in the first quartile and first decile), This thus meets the different objectives set in the programme referring to the relationship between nutrition and chronic diseases including obesity, cardiovascular and neurodegenerative diseases, total mortality and cause-specific mortality and incidence of breast cancer. Several of these articles have had great scientific and media repercussions: we should stress for example the publication of the protective effects of the Mediterranean diet (particularly supplemented with virgin olive oil) in the prevention of breast cancer (JAMA Intl Med); also the publication on the prevention of microvascular complications of diabetes in patients suffering from this disease with a Mediterranean diet (Diabetes Care). Both studies were presented at a press conference at the Instituto Carlos III, with a great impact in the general and specialised press. The beneficial effects of the Mediterranean diet on cognitive deterioration have also been made known with a high level of scientific evidence (JAMA Int Med). This publication has been included among the 100 most relevant worldwide in 2015 in Altmetric. In 2015 the results of the PREDIMED study were incorporated in the general directives of several guides for diet recommendations, including the renowned American Dietary Guidelines.

2015 could be considered a key year for consolidation of the new PREDIMED-PLUS study which was started in 2014. This project, led by CIBEROBN, is currently being taken part in by 22 research centres, most of which belong to CIBEROBN but also to other CIBERs (Epidemiology and Public Health, Diabetes and Metabolic Diseases) or other institutions. In December 2016, 22 centres had joined the project randomising participants. This is a project which is proving to be of great interest for the international scientific community. At present over half (>3000) of the participants covered by the study (n=6000) have been randomised) and the interventions stipulated in the protocol are being carried out.

Another project to be stressed led by the researchers from this programme is the SUN, carried out on university students, in which researchers from Navarre University have described the association between diet patterns and the incidence of depression (BMC Med), amongst other recent findings published.

In parallel, the most basic research groups of the nutrition programme have continued to contribute new laboratory evidence on the possible mechanisms by means of which the Mediterranean diet or its components can provide protective action in different health phenotypes. These studies also included different OMICS analysis also including the analysis of the length of telomeres (CirCardGenet and AJCN). There has also been cooperation with other Programmes.

Several groups from the programme have published different clinical trials or nutritional intervention tests cooperating with companies. Large numbers of Doctoral theses have been read, and there has been great participation as speakers at relevant international congresses, all of which places our groups in a leading position in Europe.

Adipobiology

In keeping with the founding spirit of the CIBERs, as part of the research work done in the Adipobiology Programme, intra- and inter-CIBER cooperative work has been implemented, as well as working with groups of renowned international status. This has enabled taking on much more ambitious and extensive projects, which would not otherwise have been possible and has materialised in some very significant findings (Hong et al. Nature Medicine 2015; 21:887-94). Some relevant achievements to be stressed are having gone further into knowledge of the contribution of adipose tissue to the overall metabolic control modulating lipolysis, adipose expansion, insulin-resistance and inflammation (Michailidou et al. Diabetes 2015;64:733-45/Moreno-Navarrete et al. Lipopolysaccharide binding protein is an adipokine involved in the resilience of the mouse adipocyte to inflammation. Diabetologia 2015; 58:2424-34 / Marques-Rocha et al. FASEB J 2015; 29:3595-611), as well as its response to surgical and/or diet operations (FrüHbeck. Nature Rev Endocrinol 2015; 11:465-77 / Ortega et al. Surgery-induced weight loss is associated with the downregulation of genes targeted by mi- croRNAs in adipose tissue. J Clin Endocrinol Metab 2015; 100:E1467-76 / Yubero-serrano et al. Am J Clin Nutr 2015; 102:1509-17). It should be pointed out that cooperation between groups has extended ,to take on transversal projects between different CIBERs (Inter-CIBER Inflames Project), as well as between different programmes in the CIBEROBN. This is seen in the case of the study on the microbiota (Fernández-real et al. Gut microbiota interacts with brain microstructure and function. J Clin Endocrinol Metab 2015; 100:4505-13 / Mar Rodríguez et al. Obesity changes the human gut mycobiome. Sci Rep 2015; 5:14600) or betatrophin, which have been possible thanks to the added and synergic effect with the Neurocognition programme (Barja-Fernández et al. Circulating betatrophin levels are increased in anorexia and decreased in morbidly obese women. J Clin Endocrinol Metab 2015; 100:E1188-96).

Progress has also been made in the establishment of the two-way relationship existing between the metabolism of iron and glycemic control, an area in which the CIBEROBN group is a genuine pioneer and world leader (Fernández-real et al. Mechanisms linking glucose homeostasis and iron metabolism toward the onset and progression of type 2 diabetes. Diabetes Care 2015; 38:2169-76). A contribution has also been made to proving the dynamic endocrine function of adipose tissue, such as in the case of expression of the vitamin D receptor (Clemente-Postigo et al. Serum 25-hydroxyvitamin D and adipose tissue vitamin D receptor gene expression: relationship with obesity and type 2 diabetes. J Clin Endocrinol Metab 2015; 100:E591-5) or of the growth factors of fibroblasts (Gallego-Escuredo et al. Opposite alterations in FGF21 and FGF19 levels and disturbed expression of the receptor machinery for endocrine FGFs in obese patients. Int J Obes 2015; 39:121-9).

Other translation work should be added to this prolific and relevant publishing activity such as the preparation of clinical guidelines and positioning documents whose attention focusses on obesity in general and excess adiposity in particular. Similarly, the groups in Programme 2 have taken part in forming international consortiums (see participation in European projects) and pursued the development of patents.

Complications of Obesity and Childhood Obesity

As part of the programme on Complications of Obesity and Childhood Obesity we should stress the following as most important achievements. All of them are backed by documentary evidence of several scientific articles or patents.

- We have gone on furthering several lines of research thanks to the CordioPrev study. We have proven that insulin resistance phenotypes may partly determine the biological response to different types of diet. The results of the LIPGENE study have also shown that patients with resistance to insulin (highest HOMAIR) would be more vulnerable to the healthy substitution of saturated fat by monounsaturated or polyunsaturated fat.
- We have shown that a low-fat diet may be especially beneficial in homozygotes for the major allele of polymorphism rs4580704 of the CLOCK gene.
- In the ageing line, we are laying the scientific foundations for developing a technology platform enabling assessing the degree of ageing and establishing a pattern for personalised nutritional treatment based on the patient's clinical, biological and genetic profile.
- We have continued to provide data for the explanation of the discordant phenotypes of obesity-diabetes:

  -We have shown the importance in this discordance of molecules of the adipose tissue such as PTHrp, the vitamin D receptor, Zinc-α2-Glycoprotein along with ceramides and the degree of mono-unsaturation of fatty acids.

  -We have proven that the mesenchymal cells of the obese with metabolic syndrome are less capable of being differentiated into bone and adipose tissue.

  -We have shown that thin persons with metabolic illness have a high degree of inflammation in their subcutaneous adipose tissue.
- We have supplied information on the relationship of the microbiota with metabolic disease (two patents have been registered) as well as the changes taking place in this with hygiene-diet interventions and antibiotic treatment.
- We have established the relationship between microbiota and certain brain functions for the first time.
- The relationship between nutritional parameters such as ferritin and the lean mass with the thickness of the carotid intima media.

Obesity-Cancer Sub-programme

- **Analysis of the methylome in breast and colon cancer associated with obesity:** with the preparation of two titled manuscripts sent for publishing in first decile journals.

Childhood Obesity Sub-Programme

- **Importance of the GH/IGF-I axis in bodily growth and composition:** Last year we described the first mutation in metalloprotease PAPP-A2, which generates delay in postnatal growth and modifications in body composition (in the press and patent pending). This protease carries out its proteolytic effect on the transport proteins of IGFs number 3 (IGFBP-3) and 5 (IGFBP-5). These findings describe a new syndrome which helps to understand the physiology of the GH/IGF system.
- **Role of hypothalamic astrocytes in the physiology and physiopathology of metabolic control:** We have published the results of the effect of metabolic factors (ghrelin and leptin) and nutritional factors (fructose and fatty acids) on hypothalamic astrocytes in neuroendocrinal control of metabolism and development of resistance to leptin and insulin and results of the analysis of protective effects of sex hormones and resveratrol.
- **Long-term metabolic effects of diet modifications and early hormones:** Studies of the effects of nutrition, stress and hormonal changes (leptin and sexual steroids) in the uterus and/or during the neonatal stage.

Neurocognition and Environmental-Biological Factors in Extreme Weight conditions

Achievements of Sub-programme 1 (P4):

A.1) Extension and complete collection of clinical samples. Comparative analyses of data on psychopathological, emotional, neurocognitive, environmental and personality aspects in the Obese, similar food disorders and extreme weight situations. Phenotypic characterisation in relation with BMI.

A.2) The transversal sub-programme currently has a total sample of 502 women in extreme weight situations (113 AN, 20 low-weight controls, 119 normal weight controls, 16 overweight controls, 38 obese with nervous bulimia (BN) or binge eating disorder (BED), 51 obese with no eating disorder (ED) and 145 morbidly obese), either phenotypically characterised (neurocognition, smell-taste, clinically, activity-sleep) in respect of biological markers and Buffy-coat.

Over last year we went on performing and publishing studies analysing neurocognitive and sensorial parameters with the data from the programme:

- ISLAM, MA ET AL. (2015). *Olfaction in eating disorders and abnormal eating behavior: A Systematic Review.* Frontiers in Psychology, 6:1431.
- WOLZ I ET AL. (2015). *Emotion regulation in disordered eating: Psychometric properties of the Difficulties in Emotion Regulation Scale among Spanish adults and its interrelations with personality and clinical severity.* Front Psychol.; 6:907.

A.3). Analysis of data on the mood, activity and quality of life in extreme weight situation subjects.

- SAUCHELLI ET AL., (2016). *Orexin and sleep quality in anorexia nervosa: Clínical relevance and influence on treatment outcome. Psychoneuroendocrinology*. 65:102-108.

B.1) Characterisation of patients with extreme weight situations and with similar ED based on endocrine-metabolic-genetic parameters (opioid system, endogenous cannabinoids, endogens, hormones and cardiovascular markers) and integrating models.

- BARJA-FERNÁNDEZ ET AL. (2015). *Circulating betatrophin levels are increased in anorexia and decreased in morbid obese women.* J Clin Endocrinol Metab. 2015 Sep; 100 (9):E1188-96.
- PARDO ET AL. (2014). *Association of irisin with fat mass, resting energy expenditure, and daily activity in conditions of extreme body mass index.* Int J Endocrinol. 2014; 2014:857270.
- MAILLARD AM ET AL. (2015). 16p11.2 *Locus modulates response to satiety before the onset of obesity*. Int J Obes (Lond). 2015 Dec 1. doi: 10.1038/ijo.2015.247.

C.1) Analysis of the interaction between environmental-neurocognitive and biological factors (endocrinal-metabolic-genetic-environmental functional channels) and integrating models. Determination of endophenotypes and shared vulnerabilities in subjects with extreme weight conditions and patterns of anomalous ingestion.

- FERNÁNDEZ-ARANDA, F. ET AL. (2016) *Smell-taste dysfunctions in extreme weight/eating conditions: analysis of hormonal and psychological interaction*. Endocrine. 2016 Feb; 51(2):256-67.
- PASTOR ET AL. (2016) *A Lower Olfactory Capacity Is Related to Higher Circulating Concentrations of Endocannabinoid 2-Arachidonoylglycerol and Higher Body Mass Index in Women*. PLoS One. 2016 Feb 5; 11(2):e0148734.
- FAGUNDO, AB ET AL. (2015). *Modulation of Higher-order Olfaction Components on Executive Functions in Humans*. PLOS One 2015 Jun 17; 10(6):e0130319.
- FERNÁNDEZ-REAL JM, SERINO M, BLASCO G, PUIG J, DAUNIS-I-ESTADELLA J, RICART W, BURCELIN R, FERNÁNDEZ-ARANDA F, PORTERO-OTÍN M. (2015). *Gut microbiota interacts with brain microstructure and function*. J Clin Endocrinol Metab. Oct 7:jc20153076. [Epub ahead of print].

Achievements of Sub-programme 2 (P4):

A.1) Collection of data, assessment and comparative analysis of neurocognitive, olfactory-sensory and neurodevelopmental data in clinical samples, with extreme weight situations, throughout a treatment.

In the longitudinal sub-programme 121 women have already been assessed after the 6-month/1-year follow-up subsequent to an operation (43 AN, 55 controls and 23 obese after Bariatric Surgery).

B.1) Analysis of neurocognitive, metabolic and endocrine predictors in extreme weight situations (Anorexia nervosa and Obesity) after a treatment.

- AGÜERA, Z. (2015). *Changes in body composition in Anorexia nervosa: predictors of recovery and treatment outcome*. PLoS One. 23; 10(11):e0143012.
- AGÜERA Z, ET AL. (2015). *Psychological and Personality Predictors of Weight Loss and Comorbid Metabolic Changes After Bariatric Surgery*. Eur Eat Disord Rev. 23(6):509-16.
- SAUCHELI ET AL. (2015). *Physical activity in anorexia nervosa: how relevant is it to therapy response?* European Psychiatry, 30(8): 924-31.

C.1) Analysis of the effectiveness of a brain-training treatment in clinical samples with extreme weight/food situations, for modulation of neurocognitive parameters. Case studies - control.

- SAUVAGET A ET AL. (2015). *Transcranial direct current stimulation (tDCS) in behavioral and food addiction: a systematic review of efficacy, technical, and methodological issues*. Front Neurosci.; 9:349.
- FERNÁNDEZ-ARANDA F ET AL. (2015). *The Use of Videogames as Complementary Therapeutic Tool for Cognitive Behavioral Therapy in Bulimia Nervosa Patients*. Cyberpsychol Behav Soc Netw. 18(12):744-51.
- GINER-BARTOLOMÉ C ET AL. (2015). *Can an intervention based on a serious videogame prior to cognitive behavioral therapy be helpful in bulimia nervosa? A clinical case study*. Front Psychol.; 6:982.

Results of programme 4 have also been presented at papers at different national and international congresses and symposia: SEEDO 2015 (Malaga), ICBA-2015 Budapest, ECO 2015 (Prague), EDRS 2015 (Sicily), SEEN-2015 (Madrid).

New Strategies and Biomarkers in the Prevention and Treatment of Obesity and Eating Disorders

As part of the European BIOCLAIMS project, coordinated by the CIBER, a nutrigenomic marker in rodent blood cells has been described in this period as being indicative of predisposition to obesity (results protected in the form of a patent, PCT/ES2015/070216). Early molecular markers for predicting the expansion of adipose tissue associated with the ingestion of obesogenic diets, markers of metabolic recovery due to weight loss and markers of ingestion of diets with an unbalanced proportion of macronutrients reflecting metabolic damage have also been identified in rodent blood. In studies with human beings, molecular markers in the blood indicative of the intake of sugary and fatty diets with humans have been characterised in children (I.FAMILY project), and a method has been prepared for valuing the antioxidant status in plasma. All these markers prove of great utility for use in studies of obesity prevention and in studies for valuation of nutritional habits.

Progress has also been made in the study of bioactive compounds for treatment/prevention of obesity. We should stress the characterisation of the effects of retinoic acid, resveratrol and quercetin in the remodelling of white to brown adipose tissue (European project DIABAT). Other bioactive compounds of interest are pectins, which can prevent the loss of sensitivity to insulin/leptin with age and pterostilbene, which improves glycemic control associated with obesity. As regards the identification of new therapeutic targets, it has been shown that the ingestion of such compounds as conjugated linoleic acid, calcium or quercetin is associated with changes in the composition of gastrointestinal microflora which could be connected with weight loss in obesity; moreover that changes in the expression of microRNAs, which favour the browning of white adipose tissue, as well as methylation by nutrients of regions promoting key genes in lipid metabolism, could also be involved in the beneficial effect of some of the bioactive compounds analysed.

In order to implement the incorporation of this type of compounds in food, a guide for supporting the application for “health claims” in food has been published.

One of the key objectives in the programme is to use physical exercise for treating obesity and its complications. For this reason an assessment of the physical condition of obese children and teenagers has been registered as part of daily clinical practice. This includes a valuation of balance and cardio-respiratory physical condition, as well as the study of the activity profile by means of questionnaires and accelerometry. The evaluation of cardiovascular risk has been registered in these patients and a selection of individuals has been included in a protocol of physical exercise at home. The valuation of the impact of this protocol on physical condition and cardiometabolic risk is under way. In parallel, research has gone further into the identification of measurable parameters in the blood differing in the active population versus control population, and which could be used as biomarkers to monitor the performance of physical activity, as well as of the metabolic benefits of exercise (antioxidant protection).

Body Weight Homeostasis Physiopathology

In 2015, the Programme's development continued with excellent results, and some highly relevant contributions have been made based not only on the research work done by the groups involved, but especially as a result of cooperative work between CIBEROBN teams. In 2015 over 40 international publications of CIBEROBN teams connected with the objectives of the Programme can be identified. Some are mentioned below in view of their relevance and the cooperative basis of the Programme in their execution.

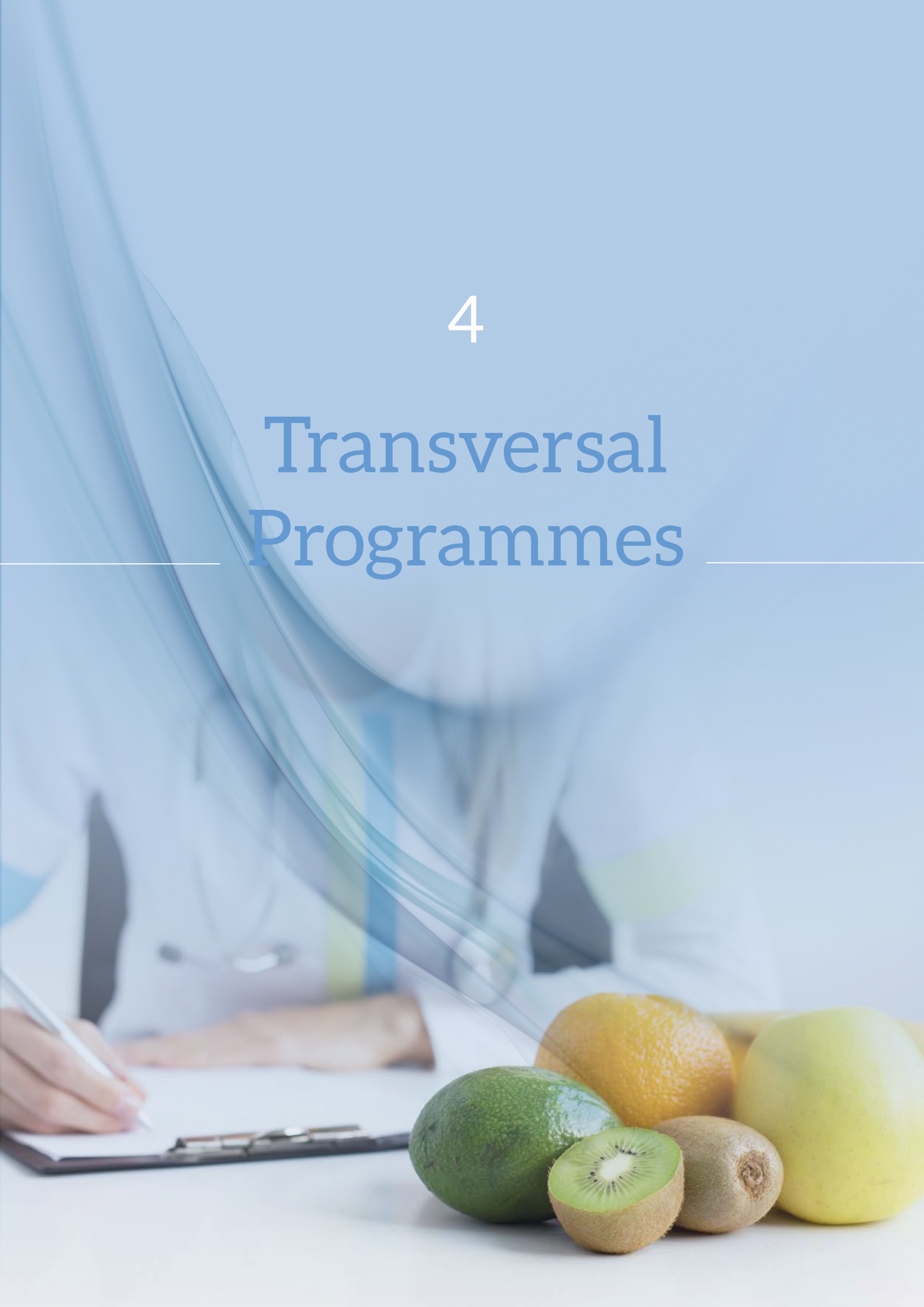
One of the Programme's essential lines of work is research into the effects of hormonal and nutritional alterations in early stages of development on obesity in the adult, and learning the molecular and physiological mechanisms involved. One highly relevant contribution in this field, which clarifies the role of the interaction between metabolic and gonadotropic determinants in the female was the publication: "Metabolic and Gonadotropic Impact of Sequential Obesogenic Insults in the Female: Influence of the Loss of Ovarian Secretion". Sánchez-Garrido MA,..., Diéguez C, Pinilla L, Tena-Sempere M. Endocrinology. 2015; 156:2984-98, as a result of the cooperation between two CIBEROBN teams (M. Tena-Sempere; C, Diéguez) in the Programme. Another example of collaborative study within these objectives of the programme was: "Moderate calorie restriction during gestation programs offspring for lower BAT thermogenic capacity driven by thyroid and sympathetic signaling". Palou M,...Remesar X, Palou A, Pico C. Int J Obes (Lond). 2015, 39:339-45, in which two CIBEROBN groups cooperated (X. Remesar and A. Palou).

Another field of the Programme's research involves finding out about the role played in obesity by certain emerging endocrine factors identified by means of preclinical studies in animal models. In this respect we should stress the publication concerned with new hormones FGF21 and FGF19 in obese patients, as a result of the cooperation between two CIBEROBN teams working in the programme (G. Frühbeck; F.Villarroya): "Opposite alterations in FGF21 and FGF19 levels and disturbed expression of the receptor machinery for endocrine FGFs in obese patients". Gallego-Escuredo JM,..., Frühbeck G, Villarroya F. Int J Obes (Lond). 2015, 39:121-9.

Along with the scientific achievements materialising in publications, the Programme continued to carry out its measures for invigorating and coordinating effectively in 2015. The internal database of animal models available is maintained, and support has been given to importing and transferring among groups of animal models, particularly mice with genetic modifications, relevant for the study of obesity. Annual coordination meetings and for scientific exchange have been held by combining the internal meetings of the Programme along with sessions in which international scientists take part, a highly productive setting, as was already seen in other yearly periods. In the present year the meeting "Emerging models in obesity research" was arranged (scheduled for December 2015 but, for logistics reasons, to be held in March 2016 in Barcelona), with the participation of international experts in the use of unconventional animal models in research into obesity.

4

Transversal Programmes



Training Programme

The CIBEROBN Training Programme is based on the premise that continuous training is a keystone on which research work is sustained. As in previous years, the main focus of the programme was on the younger members of its teams. Its aims were thus to promote the training of researchers (especially emerging and consolidating investigators) in the field of obesity and nutrition, to encourage their mobility and help to consolidate their professional career as independent researchers in this thematic area.

In keeping with the development of the programme, the main training activities were implemented by financing training stays of CIBEROBN members in other national and international benchmark research groups. To this end, the programme has had an open dynamic system of applications since it started. This enables it to award financial aid, after assessment by the scientific management and manager, for carrying out training stays at CIBEROBN groups (other than the ones located in the home town or city of the applying group), at other CIBER groups and groups not attached to the CIBER structure (both national and international). In our accumulated experience, these stays are extremely productive for developing programmes, since young researchers are trained in specific techniques which they later immediately apply to studies of their group in the CIBEROBN.

More specifically, in 2015 a total number of ten applications for training stays of CIBEROBN researchers were applied for, mostly lasting about three months (which is the longest time that a programme can be financed for per group and year). The overall financing granted in this programme in 2015 came to 23,625 EUR. This means a greater number of applicants (a 20% increase) and of funds used (an increase of around 40%). Some other positive aspects to be stressed are the high percentage of internationalisation (80% of the stays were at prestigious foreign centres) and a longer average stay, of special interest from the standpoint of gaining knowledge, establishing scientific relations and developing new techniques and cooperation schemes.

Apart from the mobility activities indicated, the programme has integrated other higher level training activities. One example of these is the annual international level CIBEROBN scientific meeting, which was held in El Escorial from 15th to 16th November this year. As well as members of different CIBEROBN groups, this meeting was attended by national speakers (belonging to the CIBEROBN, other CIBER areas and non-linked entities) and international participants (of a very high level). Likewise, and as a training element of greatest importance, we should point out in this field that in 2015 a total number of 65 Doctoral theses were written (8 of them international), which means the consolidation of a growing tendency in this important training activity, with a figure comfortably doubling the number of theses defended in 2011.

Looking at this in perspective, the CIBEROBN training and mobility programme can be considered to have reached consolidation. Its flexibility means it has become a valuable tool not only in researchers' professional development (especially for younger researchers) but also in reinforcing the international connections and cooperation of the groups belonging to our CIBER. In this setting, this programme has made a considerable contribution to boosting interest and synergies of a combination of universities and hospitals at the CIBER, with very good results in training research personnel. Similarly, and even without being stated in terms of financing, the training programme has hosted stays of post-doctoral researchers at the centres belonging to the consortium of our CIBEROBN, as well as doctorands who have been awarded grants by other countries for writing their doctoral theses at groups in the CIBEROBN.

5

Platforms

Platform FATBANK

In 2015 the main achievements of the platform were:

- A face-to-face meeting in Barcelona of all the PIs, the director of the Institut d'Investigació Biomèdica de Girona (IDIBGI) and the coordinator of the Biobanco IDIBGI, to consolidate the implication of all the nodes and establish cooperation agreements of the FATBANK platform at the IDIBGI Biobank.
- Incorporating the protocol for collecting stools, in order to obtain more data. At present the collection of stool samples has been added to the FATBANK collection, meaning that the samples currently collected from each donor are: serum, EDTA plasma, buffy coat, visceral and parietal adipose tissue and stools.
- Updating the version of FATBANK's informed consent, including the collection of stool samples: CI Fatbank Biobank IDIB- GI_V3. After being approved by the CEIC of IDIBGI Biobank this has been distributed to all the nodes in order to obtain the approval of their respective committees.
- Updating of Standardised Operating Procedures (SOPs):
  > obtaining serum
  > EDTA plasma
  > buffy coats
  > adipose tissue
  > stools
- Donors registered in 2015:
  > Girona node: 84 donors
  > Santiago de Compostela node: 28 donors
  > Navarre node: 46 donors
  > Cordoba node: 0 donors
  > Malaga node: 0 donors

THE NUMBER OF SAMPLES CURRENTLY AVAILABLE IS:

	Nº Donantes					Suero					Plasma EDTA				
Nodo	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
Girona	130	196	242	285	386	2.080	3.136	3.872	4.560	6.091	4.160	6.272	7.744	9.120	12.066
Málaga	142	200	230	230	166	2.272	3.200	3.680	3.680	?	4.544	6.400	7.360	7.360	?
Pamplona	36	74	107	138	202	288	1.184	1.712	2.208	450	576	2.368	3.424	4.416	1.543
Santiago	30	51	72	93	125	240	816	1.152	1.488	1.508	480	1.632	2.304	2.976	3.940
Córdoba	62	62	77	84	88	496	992	1.344	1.392	24	992	1.984	2.464	2.688	74
Tarragona	50	76	76	0	0	400	1.216	1.216	0	0	800	2.432	2.432	0	0
Total	450	659	804	830	967	5.776	10.544	12.864	13.328	8.073	11.552	21.088	25.728	26.560	17.623

			MUESTRAS 2015						
Nodo	Nº Donantes acumulados 2009-2015	DONANTES 2015	SUERO	PLASMA EDTA	BUFFY COAT	TA VISCERAL	TA PARIETAL	TA TIROIDAL	HECES
Girona	386	84	1338	2688	672	101	97	24	31
Málaga	166	0	0	0	0	0	0	0	0
Pamplona	202	46	144	566	51	58	12	0	0
Santiago	125	28	284	896	112	56	28	0	0
Córdoba	88	0	0	0	0	0	0	0	0
Total	967	158	1766	4150	835	215	137	24	31

6

Research Groups

Obesidad Infantil, Genética y Neuroendocrinología

Programme: Complications of Obesity / Physiopathology of the Homeostasis of Body Weight / Adipobiology / New Strategies and Biomarkers

Lead Researcher: Argente Oliver, Jesús

Group Members

STAFF MEMBERS: Canelles Ortiz, Sandra | Díaz González, Francisca.

ASSOCIATED MEMBERS: Argente Arizon, Pilar | Baquedano Caballero, Eva | Barrios Sabador, Vicente | Castro González, David | Chowen King, Julie Ann | Frago Fernández, Laura María | García Cáceres, Cristina | Granado García, Miriam | Martos Moreno, Gabriel Ángel | Muñoz Calvo, María Teresa | Pozo Román, Jesús.

Main lines of research

- Severe early onset childhood obesity: metabolic, hormonal, genetic, genomic and metabolomic aspects. Clinical follow-up and study of more than 1300 children with severe early onset obesity.
- Relationship genotype/phenotype in the development of secondary complications of obesity. Studies analyzing the impact of sex, ethnic group, etc., on the development of lipid, cardiac and carbohydrate metabolism disorders.
- Importance of the GH/IGF-I axis in growth and body composition. Description and study of the first patients with mutations in the metaloprotease PAPP-A2 and its effects on the GH/IGF-I axis. Studies analyzing the role of proteases (PAPP-A and PAPP-A2) specific for certain IGF binding proteins in controlling the balance of the GH/IGF-I system in obese children.
- The role of hypothalamic astrocytes in physiological and pathophysiological metabolic control. Analysis of the effect of metabolic factors (ghrelin and leptin) and nutritional factors (fructose and fatty acids) on hypothalamic astrocytes and how this affects the neuroendocrine control of metabolism and the possible development of leptin and insulin resistance. Determination of the protective effects of sex steroids and resveratrol on astrocytes.
- Long-term metabolic effects of early dietary and hormonal modifications. Studies involving the effects of maternal and/or neonatal nutrition, stress and modifications in hormones (leptin and sex steroids) on adult metabolism.
- Interaction of leptin and insulin signaling pathways in the development of obesity associated complications.

Most relevant scientific articles

ZHOU L., PARK S.-Y., XU L., XIA X., YE J., SU L. ET AL. Insulin resistance and white adipose tissue inflammation are uncoupled in energetically challenged Fsp27-deficient mice. Nature Communications. 2015;6.

LÓPEZ-VILLAR E., MARTOS-MORENO G.A., CHOWEN J.A., OKADA S., KOPCHICK J.J., ARGENTE J.. A proteomic approach to obesity and type 2 diabetes. Journal of Cellular and Molecular Medicine. 2015;19(7):1455-1470.

CASTRO-GONZÁLEZ D., FUENTE-MARTÍN E., SÁNCHEZ-GARRIDO M.A., ARGENTE-ARIZON P., TENA-SEMPERE M., BARRIOS V. ET AL. Increased prepubertal body weight enhances leptin sensitivity in proopiomelanocortin and neuropeptide y neurons before puberty onset in female rats. Endocrinology. 2015;156(4):1272-1282.

MELA V., DIAZ F., LÓPEZ-RODRÍGUEZ A.B., VÁZQUEZ M.J., GERTLER A., ARGENTE J. ET AL. Blockage of the neonatal leptin surge affects the gene expression of growth factors, glial proteins, and neuropeptides involved in the control of metabolism and reproduction in peripubertal male and female rats. Endocrinology. 2015;156(7):2571-2581.

BURGOS-RAMOS E., CANELLES S., RODRÍGUEZ A., GÓMEZ-AMBROSI J., FRAGO L.M., CHOWEN J.A. ET AL. Chronic central leptin infusion modulates the glycemia response to insulin administration in male rats through regulation of hepatic glucose metabolism. Molecular and Cellular Endocrinology. 2015;415:157-172.

Highlights

This past year we described the first human mutations in the metaloprotease PAPP-A2 that results in post-natal growth retardation and modifications in body composition (in press and patent pending). This protease specifically cleaves IGF binding protein (IGFBP) 3 and IGFBP5. These patients have extremely high circulating levels of the components that form the 150 kDA ternary complex: IGF-I, IGF.II, IGFBP-3, IGFBP-5 and the acid labile subunit (ALS), but very low levels of free/bioactive IGF-I. These findings not only describe a new syndrome, but help to advance our understanding of the physiology of the GH/IGF system. One of our current aims is to analyze how alterations in PAPP-A2 activity, as well as PAPPA activity, might explain the alterations of the GH/IGF axis in obese children.

The childhood obesity clinic continues to not only provide adequate clinical care and behavioral treatment, but we are also advancing in our understanding of how to identify those children that may be at higher risk of developing insulin resistance. Recent results from studies including metabolomics have helped to identify potential new biomarkers (in press).

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Prevención Cardiovascular y Estilo de Vida

Programme: Nutrition

Lead Researcher: Arós Borau, Fernando

Group Members

STAFF MEMBERS: Salaverria Lete, Itziar.

ASSOCIATED MEMBERS: Alonso Gómez, Ángel María | Bello Mora, María Concepción | de Loma-Osorio Montes, Ángel | Recondo Olaechea, Javier Gregorio.

Main lines of research

- Effect of Mediterranean Diet on primary preven-tion of cardiovascular disease.
- Secondary prevention of ischemic heart disease. Cardiac rehabilitation. Lifestyle.
- Exercise testing in stable coronary artery disease.
- Exercise phisiology in obese patients.
- Cardiac imaging in obesity.

Most relevant scientific articles

TOLEDO E., SALAS-SALVADO J., DONAT-VARGAS C., BUIL-COSIALES P., ESTRUCH R., ROS E. ET AL. Mediterranean diet and invasive breast cancer risk among women at high cardiovascular risk in the predimed trial a randomized clinical trial. JAMA Internal Medicine. 2015;175(11):1752-1760.

DÍAZ-LÓPEZ A, BABIO N, MARTÍNEZ-GONZÁLEZ MA, CORELLA D, AMOR AJ, FITÓ M ET AL. Mediterranean Diet, Retinopathy, Nephropathy, and Microvascular Diabetes Complications: A Post Hoc Analysis of a Randomized Trial.Diabetes care. 2015;38(11):2134-41.

GUASCH-FERRE M., BABIO N., MARTÍNEZ-GONZÁLEZ M.A., CORELLA D., ROS E., MARTIN-PELAEZ S. ET AL. Dietary fat intake and risk of cardiovascular disease and all-cause mortality in a population at high risk of cardiovascular disease. American Journal of Clínical Nutrition. 2015;102(6):1563-1573.

MERINO J., GUASCH-FERRE M., MARTÍNEZ-GONZÁLEZ M.A., CORELLA D., ESTRUCH R., FITO M. ET AL. Is complying with the recommendations of sodium intake beneficial for health in individuals at high cardiovascular risk? Findings from the PREDIMED study. American Journal of Clínical Nutrition. 2015;101(3):440-448.

JUANOLA-FALGARONA M., SALAS-SALVADO J., BUIL-COSIALES P., CORELLA D., ESTRUCH R., ROS E. ET AL. Dietary glycemic index and glycemic load are positively associated with risk of developing metabolic syndrome in middle-aged and elderly adults. Journal of the American Geriatrics Society. 2015;63(10):1991-2000.

Highlights

The activity of the group has been focused on the multicenter study PREDIMED PLUS in which other groups of the Ciber participate as well. This study is in the recruitment phase and therefore it had not been possible to carry out publications so far. In addition to the general study , our group performs a substudy on the changes observed in the ecocardiogram and in the ergoespirometry with the loss of weight.

The IP continues to coordinate the clinical events Committee of the PREDIMED study and of the PREDIMED PLUS, where is also involved one of the members of the Group (Dr. A. Alonso – Gómez).

Institution: Fundación Vasca de Innovación e Investigación Sanitarias · **Contact:** Hospital Universitario Araba. Sede Txagorritxu · c/ José Achótegi s/n. 01009 Vitoria (Álava) · E.mail: aborau@secardiologia.es

Bioingeniería y Tecnología Orientada al ser Humano (I3BH)

Programme: Neurocognition and Environmental-Biological Factors / Physiopathology of the Homeostasis of Body Weight
Lead Researcher: Botella Arbona, Cristina

Group Members

STAFF MEMBERS: Etchemendy, Ernestina | Rodríguez Berges, Sergio | Zaragoza Álvarez, Irene.

ASSOCIATED MEMBERS: Alcañiz Raya, Mariano | Andreu Mateu, Sabrina | Baños Rivera, Rosa María | Bretón López, Juana María | Castilla López, Diana Virginia | Cebolla Martí, Ausias Josep | García Palacios, Azucena | Guillén Botella, Verónica | Guixeres Provinciale, Jaime | Juan Lizandra, María de l Carmen | Miralles Tena, Ignacio | Moragrega Vergara, Inés | Oliver Gasch, Elia | Perpiña Tordera, Concepción | Quero Castellano, Soledad | Rey Solaz, Beatriz | Serrano Zarate, Berenice.

Main lines of research

- Virtual Reality.
- Augmented Reality.
- Internet and Web technologies.
- Mobile Devices.
- Serious Games.
- Psychological Treatments.
- Health Psychology.
- Physical activity, health and wellness.
- Positive Psychology.
- Emotional Regulation.
- Cognitive Ergonomics.

Most relevant scientific articles

BANOS R.M., MENSORIO M.S., CEBOLLA A., RODILLA E., PALOMAR G., LISON J.F. ET AL. An internet-based self-administered intervention for promoting healthy habits and weight loss in hypertensive people who are overweight or obese: A randomized controlled trial. BMC Cardiovascular Disorders. 2015;15(1).

BARJA-FERNÁNDEZ S., FOLGUEIRA C., SEOANE L.M., CASANUEVA F.F., DIEGUEZ C., CASTELAO C. ET AL. Circulating betatrophin levels are increased in anorexia and decreased in morbidly obese women. Journal of Clínical Endocrinology and Metabolism. 2015;100(9):E1188-E1196.

NAVARRO-HARO M.V., WESSMAN I., BOTELLA C., GARCÍA-PALACIOS A.. The role of emotion regulation strategies and dissociation in non-suicidal self-injury for women with borderline personality disorder and comorbid eating disorder. Comprehensive Psychiatry. 2015;63:123-130.

AGÜERA Z, ROMERO X, ARCELUS J, SÁNCHEZ I, RIESCO N, JIMÉNEZ-MURCIA S ET AL. Changes in Body Composition in Anorexia Nervosa: Predictors of Recovery and Treatment Outcome.PloS one. 2015;10(11):e0143012.

KARYOTAKI E., KLEIBOER A., SMIT F., TURNER D.T., PASTOR A.M., ANDERSSON G. ET AL. Predictors of treatment dropout in self-guided web-based interventions for depression: an 'individual patient data' meta-analysis. Psychological Medicine. 2015.

Highlights

The European project MEAL has successfully finished. We have created and tested a platform that helps teachers and nutritionists in nutrition education of children, with very good results.

Another European project, ehcoBUTLER has started, and we have designed and developed functional specifications of a platform that trains the elders in cognitive and emotional abilities, promoting a healthy and active ageing.

Within the Living Better project, we have successfully tested a self-applied program that promotes healthy lifestyles in hypertensive patients with obesity.

The 2.0 version of the E-TIOBE platform is being tested to treat childhood obesity. Right now there are two controlled studies in Murcia (Hospital Virgen de la Arrixaca) and México (Universidad Nacional Autónoma). The objective is to carry out the treatment with the support of E-TIOBE.

Within the framework of the PROMETEO project (Generalitat Valenciana) we have developed an online intervention program to promote physical activity to prevent depression. An App has been developed to provide data of the context where the users are, in real time.

Actiobe –project financed by the Spanish National Plan-, has developed several tests to analyze the role Virtual Reality has in the promotion of physical activity in children.

We keep on working with Dr Palou's Nutrigenomics and Obesity Group, Dr Lurbe's Pediatrics in Childhood Obesity Group, and with Dr Fernández-Aranda's group in the transversal projects of CIBERobn. We are collaborating with Dr De la Torre's research group, and have jointly applied for a project to the Koplowitz Foundation in order to adapt the E-TIOBE platform to children with Down syndrome, trying to improve their eating habits and increasing their physical activity. We continue actively working on PREDIMED-PLUS, and have designed the psychological intervention program the patients follow.

In 2015 three members of our group have finished their PhD, we have applied for 4 local/national projects, and 7 European ones.

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Endocrinología Molecular

Programme: Complications of Obesity
Lead Researcher: Casanueva Freijo, Felipe

Group Members

STAFF MEMBERS: Cabia Fernández, Begoña | Castelao Taboada, Cecilia | Castro País, Ana Isabel | Couselo Carreira, Marcos | Monteiro Andrade Sousa, Sara María.

ASSOCIATED MEMBERS: Amil Diz, María | Crujeiras Martínez, Ana Belén | Martínez Olmos, Miguel Ángel | Pardo Pérez, María | Pazos Randulfe, Yolanda | Peino García, Roberto | Peñalva Maqueda, Ángela | Pérez Camiña, Jesús | Seoane Camino, Luisa María.

Main lines of research

- Adipobiology.
- Obesity and Cancer.
- Nanotechnology applied to obesity.
- Development and validation of anti-obesity treatments.
- Influence of obesity in models of cerebral ischemia.
- Obesidomic: identification and characterization of new signals released by adipose and muscle tissue involved in the regulation of energy homeostasis: Proteomic Analysis of visceral and subcutaneous adipose tissue and its implications in the development and maintenance of obesity.
- Development and adaptation of proteomic technologies (quantitative proteomics: DIGE, CILAIR) study these secretome of muscle and adipose tissue.
- Analysis of skeletal muscle secretome for the identification of regulatory signals of energy homeostasis.
- Characterization of Fetuin-A and Musclin/Osteocrin as new peripheral signals involved in energy homeostasis.
- Study of the role of hormone irisin as a new target for the treatment of obesity and type 2 diabetes.
- Study of the physiological mechanisms responsible for the regulation of energy balance in the gastrointestinal tract. Role of ghrelin nesfatin a-1, gastricendogenous cannabinoid, signaling pathway activated by FNDC5 andmTOR/S6k1.
- Study of the effect of lactation on metabolism. Study of lipid metabolism in adipose tissue and gastrointestinal mechanisms.

Most relevant scientific articles

CRUJEIRAS A.B., ZULET M.A., ABETE I., AMIL M., CARREIRA M.C., MARTÍNEZ J.A. ET AL. Interplay of atherogenic factors, protein intake and betatrophin levels in obese–metabolic syndrome patients treated with hypocaloric diets. International Journal of Obesity. 2015.

CRUJEIRAS AB, CASANUEVA FF. Obesity and the reproductive system disorders: epigenetics as a potential bridge. Human reproduction update. 2015;21(2):249-261.

GURRIARAN-RODRÍGUEZ U., SANTOS-ZAS I., GONZÁLEZ-SÁNCHEZ J., BEIROA D., MORESI V., MOSTEIRO C.S. ET AL. Action of obestatin in skeletal muscle repair: Stem cell expansion, muscle growth, and microenvironment remodeling. Molecular Therapy. 2015;23(6):1003-1021.

TANRIVERDI F., SCHNEIDER H.J., AIMARETTI G., MASEL B.E., CASANUEVA F.F., KELESTIMUR F.. Pituitary dysfunction after traumatic brain injury: A clinical and pathophysiological approach. Endocrine Reviews. 2015;36(3):305-342.

BARJA-FERNÁNDEZ S., FOLGUEIRA C., SEOANE L.M., CASANUEVA F.F., DIEGUEZ C., CASTELAO C. ET AL. Circulating betatrophin levels are increased in anorexia and decreased in morbidly obese women. Journal of Clínical Endocrinology and Metabolism. 2015;100(9):E1188-E1196.

Highlights

In this year 2015, the group of Molecular Endocrinology has published 37 articles with a cumulative impact factor of 138,02 among which Nature Reviews, Human Reproduction Update, Endocrine Reviews y Lancet Diabetes Endocrinology. The group, during this period, has obtained a national project (ISCIII/AES PI14/01012) and have established agreements with various companies as well as 2 clinical trials. Noteworthy the process a project funded by FEDER-INNTERCONECTA from Consellería Innovation and Industry and Centro para el Desarrollo Tecnológico e Industrial (CDTI) – Ministerio de Economía. The aim is to find scientific evidence supporting the use of products derived from mushrooms and fish as healthy foods in patients with pre-diabetic metabolic syndrome. Moreover, it is noteworthy the implementation of epigenetic plataform for future projects on obesity and cancer.

Equally in this year 2015 the Group continues to develop the research focused on the search for new effective therapies against obesity based on oral treatments with antioxidants and the use of nanoparticles having obtained very encouraging preliminary results. There have also been significant advances in the project The Obesity Paradox in multiple prevalent diseases: a translational approach whose results will be published during 2016.

Within the CIBER, Endocrinology group actively participates in several scientific programs and the Fat Bank and during the last year they have obtained obvious progress.

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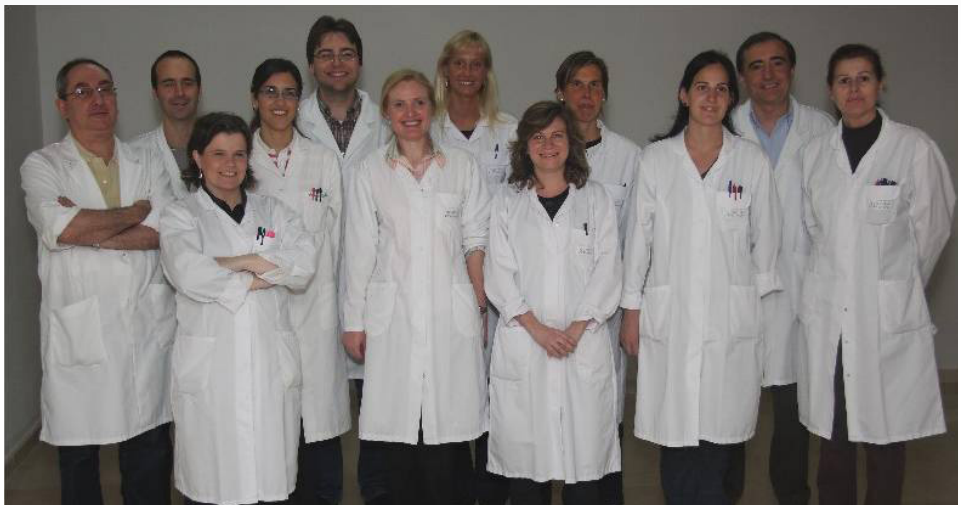
Epidemiología Genética de las Enfermedades Cardiovasculares y Obesidad-Nutrigenómica (EPIGEM-NUTRIGENIO)

Programme: Nutrition / New Strategies and Biomarkers
Lead Researcher: Corella Piquer, Dolores

Group Members



STAFF MEMBERS: Carrasco Espi, Paula | Fernández Carrion, Rebeca | Guillem Saiz, Patricia | Ortega Azorín, Carolina.

ASSOCIATED MEMBERS: Alfonso Sánchez, José Luis | Asensio Márquez, Eva María | Barragán Arnal, Rocío | Bautista Rentero, Daniel | Coltell Simon, Oscar | Frances Bozal, Francisco | Giménez Fernández, Francisco Javier | González Arráez, José Ignacio | Guillén Domínguez, María Luisa | Portoles Reparaz, Olga | Ruiz de la Fuente Tirado, Salvador | Sorli Guerola, José Vicente | Sotos Prieto, Mercedes | Zanón Moreno, Vicente.

Main lines of research

- Mediterranean diet and health.
- Genetic and Molecular Epigemiology of Obesity and Cardiovascular Diseases.
- Gene-environment interactions and Gene-Diet Interactions.
- Research Methods in Genomics and Epigenomics.
- Nutrigenomics of eye diseases.
- Bionformatics and Genomics.
- Computational Medicine.
- Taste and cardiovascular risk factors and obesity.
- MicroRNAs, methodology and association with cardiovascular diseases and obesity.
- Meta-analysis.
- Gene expresion and modulation by diet and physical activity.
- Healhty ageing.

Most relevant scientific articles

ZANON-MORENO V., ZANON-MORENO L., ORTEGA-AZORIN C., ASENSIO-MARQUEZ E.M., GARCÍA-MEDINA J.J., SANZ P. ET AL. Genetic polymorphism related to exfoliative glaucoma is also associated with primary open-angle glaucoma risk. Clínical and Experimental Ophthalmology. 2015;43(1):26-30.

GARCÍA-ALOY M., LLORACH R., URPI-SARDA M., JAUREGUI O., CORELLA D., RUIZ-CANELA M. ET AL. A metabolomics-driven approach to predict cocoa product consumption by designing a multimetabolite biomarker model in free-living subjects from the PREDIMED study. Molecular Nutrition and Food Research. 2015;59(2):212-220.

VÁZQUEZ-FRESNO R., LLORACH R., URPI-SARDA M., KHYMENETS O., BULLO M., CORELLA D. ET AL. An NMR metabolomics approach reveals a combined-biomarkers model in a wine interventional trial with validation in free-living individuals of the PREDIMED study. Metabolomics. 2015;11(4):797-806.

VALLS-PEDRET C., SALA-VILA A., SERRA-MIR M., CORELLA D., DE LA TORRE R., MARTÍNEZ-GONZÁLEZ M.A. ET AL. Mediterranean diet and age-related cognitive decline: A randomized clinical trial. JAMA Internal Medicine. 2015;175(7):1094-1103.

URPI-SARDA M., BOTO-ORDONEZ M., QUEIPO-ORTUNO M.I., TULIPANI S., CORELLA D., ESTRUCH R. ET AL. Phenolic and microbial-targeted metabolomics to discovering and evaluating wine intake biomarkers in human urine and plasma. Electrophoresis. 2015;36(18):2259-2268.

Highlights

Our research group has continued to deepen the study of serveral omics (genomics, transcriptomics, epigenomics, metabolomics) and its application in Nutrigenomics. Several members of the group have been visiting researchers in the United States to learn the main tools for the integration of omics data. In relation to this integration, our research group has applied in 2015 with Dr. Ordovás from the Human Nutrition Research Center in Boston to a NIH (USA) research grant on the integration of omics in PREDIMED participants focused on the incidence of Cardiovascular Disease Related Phenotypes. In parallel, we have continued conducting genetic analysis in the PREDIMED, ending the high density genotyping of the PREDIMED-Valencia Study and making the first GWAs thereof. We have also obtained funding for dense genotyping from Mapfre to carry out in GWAS in the PREDIMED PLUS-Valencia participants. We have initiated the dense methylation of DNA samples by Illumina arrays to carry out a EWAS in a pilot case-control sample of CVD cases from the PREDIMED-Valencia study to provide preliminary data on the application of the NIH grant. We have collaborated on several metabolomic studies in our urine PREDIMED samples with Cristina Andrés (UB). Overall, our group has has acquired a hugh potential in the iomics integration in the epidemiological studies. We have been invited to several international conferences related to omics, nutrigenomics and personalized medicine, among which we highlight the one held in November 2015 at the EMBL in Heidelberg (Germany) focused on Personalized Health in collaboration with the Stanford University. Unfortunately this year has not been good in publications, which will be materialized in 2016. We conducted clinical trials, clinical guidelines and PhD student dregrees.

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Obesómica Funcional y Metabolismo Molecular

Programme: Adipobiology / Complications of Obesity / Physiopathology of the Homeostasis of Body Weight

Lead Researcher: Diéguez González, Carlos

Group Members

STAFF MEMBERS: Álvarez Mangas, Leticia | Beiroa Tarrio, Daniel | Cuñarro Gómez, Juan | Suárez Fariña, Mª Carmen

ASSOCIATED MEMBERS: Abella Fernández, Mª del Sol | Almassadi Iglesias, Omar | Álvarez Crespo, Mayte | Blanco Martínez de Morentín, Pablo | Fernández Mayo, Diana | Gallego Gómez, Rosalía | García García, Mª del Carmen | González Diéguez, Carmen Ruth | Imbernón Piedra, Mónica | Jesús Martins, Luis Ricardo | López Pérez, Miguel Antonio | Martínez Sánchez, Noelia | Nogueiras Pozo, Rubén | Porteiro Couto, Begoña | Tovar Carro, Sulay | Tudurí López, Eva.

Main lines of research

- Identification of new drug targets at the CNS for Obesity and associated comorbilities.
- Search for new therapeutic agents against complicated obesity by reprofiling existing drugs.
- The Integrated Neurobiology of Food Intake and food reward.
- Central Control of peripheral lipid metabolism.
- Gender and energy homeostasis.
- Energy sensors and energy balance.
- Molecular Metabolism.

Most relevant scientific articles

TUDURI E., BEIROA D., PORTEIRO B., LÓPEZ M., DIEGUEZ C., NOGUEIRAS R. Acute but not chronic activation of brain glucagon-like peptide-1 receptors enhances glucose-stimulated insulin secretion in mice. Diabetes, Obesity and Metabolism. 2015;17(8):789-799.

CONTRERAS C., GONZÁLEZ F., FERNO J., DIEGUEZ C., RAHMOUNI K., NOGUEIRAS R. ET AL. The brain and brown fat. Annals of Medicine. 2015;47(2):150-168.

BARJA-FERNÁNDEZ S., FOLGUEIRA C., SEOANE L.M., CASANUEVA F.F., DIÉGUEZ C., CASTELAO C. ET AL. Circulating betatrophin levels are increased in anorexia and decreased in morbidly obese women. Journal of Clínical Endocrinology and Metabolism. 2015;100(9):E1188-E1196.

LEAR PV, GONZÁLEZ-TOUCEDA D, PORTEIRO COUTO B, VIAÑO P, GUYMER V, REMZOVA E ET AL. Absence of Intracellular Ion Channels TPC1 and TPC2 Leads to Mature-Onset Obesity in Male Mice, Due to Impaired Lipid Availability for Thermogenesis in Brown Adipose Tissue.Endocrinology. 2015;156(3):975-86.

PAZOS P., LIMA L., TOVAR S., GONZÁLEZ-TOUCEDA D., DIEGUEZ C., GARCÍA M.C. Divergent responses to thermogenic stimuli in BAT and subcutaneous adipose tissue from interleukin 18 and interleukin 18 receptor 1-deficient mice. Scientific Reports. 2015;5.

Highlights

The highlight, this year, our group has been obtaining a Ramón y Cajal contract by Sulay Tovar Ph.D. and the patent application, in October, : Methods of using up-regulators of the expression of p53 and / or down-regulators or inhibitors of the expression of p53 for the treatment of NAFLD (Non-alcoholic fatty liver disease) and / or NASH (Non-alcoholic steatohepatitis) .Application number: 300 059 223.

Institution: Universidad de Santiago de Compostela · **Contact:** CIMUS. Avda Barcelona 3
15706 Santiago de Compostela · Tel.: 981 563 100 · E.mail: carlos.dieguez@usc.es

Dieta Mediterránea y Enfermedad Cardiovascular

Programme: Nutrition

Lead Researcher: Estruch Riba, Ramon

Group Members

STAFF MEMBERS: Casas Rodríguez, Rosa María | Viñas Hernández, Concepción.

ASSOCIATED MEMBERS: Arranz Martínez, Sara | Bosch Aparici, Xavier | Boto Ordóñez, María | Coca Payeras, Antonio | Fernández Solá, Joaquín | López Soto, Alfonso | Masanes Torán, Ferran | Medina Remón, Alexander | Mena Jaramillo, Mari Pau | Nicolás Arfelis, José María | Rey Fernández, Olalla | Romero Mamani, Edwin Saul | Sacanella Meseguer, Emilio | Valderas Martínez, Palmira.

Main lines of research

- Effects of the Mediterranean diet on the prevention of cardiovascular disease, cancer and neurodegenerative diseases.
- Effects of the Mediterranean diet of classical and novel cardiovascular risk factors.
- Effects of olive oil, nuts, tomato and cocoa effects on lipid profile, oxidative stress and biomarkers related to atherosclerosis.
- Effects of chronic alcohol consumption on cardiovascular system, liver and nervous system.
- Mechanism of the effects on moderate consumption of wine or beer: effect on the expression and function of adhesion molecules and chemokines associated with the development of atherosclerosis.
- Effects of different types of alcoholic beverages on the immune system.

Most relevant scientific articles

TOLEDO E., SALAS-SALVADO J., DONAT-VARGAS C., BUIL-COSIALES P., ESTRUCH R., ROS E. ET AL. Mediterranean diet and invasive breast cancer risk among women at high cardiovascular risk in the predimed trial a randomized clinical trial. JAMA Internal Medicine. 2015;175(11):1752-1760.

GUASCH-FERRE M., BABIO N., MARTÍNEZ-GONZÁLEZ M.A., CORELLA D., ROS E., MARTIN-PELAEZ S. et al. Dietary fat intake and risk of cardiovascular disease and all-cause mortality in a population at high risk of cardiovascular disease. American Journal of Clínical Nutrition. 2015;102(6):1563-1573.

VALLS-PEDRET C., SALA-VILA A., SERRA-MIR M., CORELLA D., DE LA TORRE R., MARTÍNEZ-GONZÁLEZ M.A. ET AL. Mediterranean diet and age-related cognitive decline: A randomized clinical trial. JAMA Internal Medicine. 2015;175(7):1094-1103.

MERINO J., GUASCH-FERRE M., MARTÍNEZ-GONZÁLEZ M.A., CORELLA D., ESTRUCH R., FITO M. ET AL. Is complying with the recommendations of sodium intake beneficial for health in individuals at high cardiovascular risk? Findings from the PREDIMED study. American Journal of Clínical Nutrition. 2015;101(3):440-448.

MEDINA-REMON A., TRESSERRA-RIMBAU A., PONS A., TUR J.A., MARTORELL M., ROS E. ET AL. Effects of total dietary polyphenols on plasma nitric oxide and blood pressure in a high cardiovascular risk cohort. The PREDIMED randomized trial. Nutrition, Metabolism and Cardiovascular Diseases. 2015;25(1):60-67.

Highlights

Our group has published over 150 research papers in journals such as New England Journal of Medicine, Annals of Internal Medicine, JAMA, Archives of Medicine, Annals of Neurology and Archives of Neurology, American Journal of Clinical Nutrition and the Journal of Nutrition. Currently, we participate in the PREDIMED Plus study; it would assess the effect on adiposity, cardiovascular risk factors and quality of life of an intensive weight loss intervention based on a low calorie Mediterranean diet, physical activity and behavioral therapy, the effects of the Mediterranean diet on the primary prevention of cardiovascular disease, now framed in the CIBERobn. In parallel, we are carrying out a study to reduce body weight with a natural plant extracts, participate in the Interciber INFLAMES Project and designing a new randomized parallel group controlled intervention trial on the protective effects of moderate alcohol consumption on cardiovascular disease (MACH 14 trial) that will included 20 centers from USA, Europe, Africa, Australia and South America.

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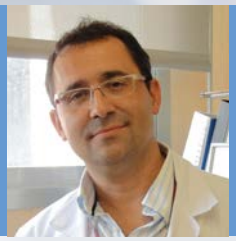
Grupo de Investigación Avanzada en Trastornos de la Conducta Alimentaria

Programme: Neurocognition and Environmental-Biological Factors / Nutrition / New Strategies and Biomarkers

Lead Researcher: Fernández-Aranda, Fernando



Group Members

STAFF MEMBERS: Aguera Imbernón, Zaida Palmira | Mallorquí Bagué, Nuria

ASSOCIATED MEMBERS: Giner Bartolomé, Cristina | Granero Pérez, Roser | Gunnard, Katarina | Jiménez Murcia, Susana | Sauchelli Toran, Sarah | Wolz, Inés

Main lines of research

- Environmental and genetic risk factors in Eating Disorders and Abnormal eating behaviors.
- Neurocognitive, sensorial, activity related factors and their interaction with biological correlates in Extreme weight conditions.
- New technologies and emotional regulation strategies in Eating disorders and Impulse control disorders: effectiveness and underlying brain-physiological correlates.
- fMRI studies in Obesity and related Eating Disorders when considering specific stimulus and emotional states.
- Treatment outcome and related clinical-cognitive-biological correlates in Obesity and related Eating Disorders.
- Food behavior and Addictive patterns in Eating Disorders, Obesity and non-substance related addicitions.

Most relevant scientific articles

SAUCHELLI S, ARCELUS J, SÁNCHEZ I, RIESCO N, JIMÉNEZ-MURCIA S, GRANERO R ET AL. Physical activity in anorexia nervosa: How relevant is it to therapy response?. European psychiatry : the journal of the Association of European Psychiatrists. 2015;30(8):924-31.

FERNÁNDEZ-REAL J.-M., SERINO M., BLASCO G., PUIG J., DAUNIS-I-ESTADELLA J., RICART W. ET AL. Gut microbiota interacts with brain microstructure and function. Journal of Clínical Endocrinology and Metabolism. 2015;100(12):4505-4513.

BARJA-FERNÁNDEZ S., FOLGUEIRA C., SEOANE L.M., CASANUEVA F.F., DIEGUEZ C., CASTELAO C. ET AL. Circulating betatrophin levels are increased in anorexia and decreased in morbidly obese women. Journal of Clínical Endocrinology and Metabolism. 2015;100(9):E1188-E1196.

AGÜERA Z, ROMERO X, ARCELUS J, SÁNCHEZ I, RIESCO N, JIMÉNEZ-MURCIA S ET AL. Changes in Body Composition in Anorexia Nervosa: Predictors of Recovery and Treatment Outcome.PloS one. 2015;10(11):e0143012.

ISLAM MA, FAGUNDO AB, ARCELUS J, AGÜERA Z, JIMÉNEZ-MURCIA S, FERNÁNDEZ-REAL JM ET AL. Olfaction in eating disorders and abnormal eating behavior: a systematic review.Frontiers in psychology. 2015;6:1431.

Highlights

- Neurocognitive functioning under extreme weight conditions (from Obesity to Anorexia nervosa): Detection of specific endophenotypes and their association with therapy response (PI11/ 210)- FIS/ ISCIII.
- Intensification Program for Research Activity of Clinical Specialists of the National Health Department SNS-ICS (Ref. INT12/270) Instituto de Salud Carlos III-Generalitat Cataluña (FFA).
- EU COST-Action: European Union- Biomedicine and Molecular Biosciences: GnRH deficiency: Elucidation of the neuroendocrine control of human reproduction (BM1105).
- Networking Research Grant (Agencia de Gestió d'Ajuts Universitaris i de Recerca) "Clinical-Biological Psychiatry and Psychology Group" (2014 SGR 1672).
- Neurocognition and emotional regulation in Extreme Weight Conditions: A study of Brain Activity and cognitive changes associated with serios video game intervention (PI14/ 290)- FIS-ISCIII.
- EchoBUTLER -ICT solutions for independent living with cognitive impairment (H2020-643566) H2020 Innovation Action/ PHC-20-2014.
- Excellence Research Networking Grant in Psychology – (PSI2014-56303-REDT)- PROMOSAM.
- TICs-Innovation and Technological implementation for the Treatment of the Impulsivity in Eating Disorders and Impulse Control Disorders, University Hospital of Bellvitge, Barcelona (Spain).
- Participation in the following international consortiums: Healthy Eating, Playmancer, GWAS: Genomewide Association Study of Anorexia nervosa; PGC: Psychiatric Genomics Consortium;
- International Guidelines: Based Treatment for Eating Disorders Children, Adolescents and Adults.

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Website: http://www.idibell.cat/modul/psiquiatria-i-salut-mental/ca

Nutrición, Eumetabolismo y Salud

Programme: Adipobiology / Complications of Obesity / Neurocognition and Environmental-Biological Factors

Lead Researcher: Fernández-Real Lemos, José Manuel

Group Members

STAFF MEMBERS: Alonso Ledesma, Isabel | Moreno Navarrete, José María | Ortega Delgado, Francisco José | Rovira Gómez, Óscar | Sabater Masdeu, Mónica

ASSOCIATED MEMBERS: Biarnes Costa, Josefina | Castillejo Navarro, Clotilde | Castro Guardiola, Antonio | Esteve Lafuente, Eduardo | Fernández Balsells, María de las Mercedes | Loshuertos Gil, Emilio | Martínez Merchán, Cristina | Pardo Albiñana, Gerard | Peral Fuentes, Belén | Planella Farrugia, Cristina | Recasens Sala, Mónica | Ricart Engel, Wifredo | Salleras Compte, Neus | Xifra Villarroya, Gemma.

Main lines of research

- Inflammation and insulin resistance.
- Iron metabolism and insulin resistance.
- Biomarkers of obesity, insulin resistance and type 2 diabetes.
- Bone as an endocrine organ.
- Vascular disease and inflammation.
- Proteomics in adipose tissue.
- Microbiota ,insulin resistance and NASH.

Most relevant scientific articles

HONG S., MORENO-NAVARRETE J.M., WEI X., KIKUKAWA Y., TZAMELI I., PRASAD D. ET AL. Nicotinamide N-methyltransferase regulates hepatic nutrient metabolism through Sirt1 protein stabilization. Nature Medicine. 2015;21(8):887-894.

FERNÁNDEZ-REAL JM, MCCLAIN D, MANCO M. Mechanisms Linking Glucose Homeostasis and Iron Metabolism Toward the Onset and Progression of Type 2 Diabetes. Diabetes care. 2015;38(11):2169-76.

SERRANO M, MORENO M, BASSOLS J, MORENO-NAVARRETE JM, ORTEGA F, RICART W ET AL. Coxsackie and adenovirus receptor is increased in adipose tissue of obese subjects: a role for adenovirus infection?. The Journal of clinical endocrinology and metabolism. 2015;100(3):1156-63.

MAR RODRÍGUEZ M., PÉREZ D., JAVIER CHAVES F., ESTEVE E., MARIN-GARCÍA P., XIFRA G. ET AL. Obesity changes the human gut mycobiome. Scientific Reports. 2015;5.

FERNÁNDEZ-REAL J.-M., SERINO M., BLASCO G., PUIG J., DAUNIS-I-ESTADELLA J., RICART W. ET AL. Gut microbiota interacts with brain microstructure and function. Journal of Clínical Endocrinology and Metabolism. 2015;100(12):4505-4513.

Highlights

The main results fall within the following research lines: Microbiota and obesity. Fungal microbiota has been described for the first time to be altered in obese subjects. A specific fungal microflora has also been characterized in metabolically healthy subjects, as opposed to the profile of mycobiota associated to arteriosclerosis of the carotid artery. We have also provided the first observation ever that demonstrates a relationship among the composition of the intestinal bacterial microbiota, brain microstructure and cognitive function in humans (JCEM). Adipobiology. In collaboration with the group of Dr Pissios at Harvard University, NNMT has been disclosed as an important factor regulating cholesterol metabolism in humans (Nat Medicine).Within the program of adipobiology, CAR has been investigated in human adipose tissue. CAR gene expression was more expressed in visceral adipose tissue compared with subcutaneous adipose tissue, and clearly increased in obese subjects (4) . This article has been highlighted as the best of 2015 in the best worldwide magazine of clinical endocrinology (Journal of Clinical Endocrinology and Metabolism), and the group was invited to present the work in the next meeting of the Endocrine Society in Boston. Iron and metabolism. Finally, we want to highlight the invited publication in Diabetes Care in collaboration with Dr. Melania Manco from Rome and Dr McClain from USA (5) in recognition of the research line of the group which focus on the interactions among body iron, obesity and insulin resistance.

Two doctoral theses:

- Eva López Navarro thesis, entitled: "Study of the expression of thyroid hormone receptors 03/27/2015.
- Gerard Solà Blasco thesis, entitled: "Study of carotid arterial stiffness," 05/22/2015.

A FIS project (277,000 euros) (2016-2018), an European project (PEPPER) (670,000 euros), and a new "Net" (ADIPOPLAST) have been granted.

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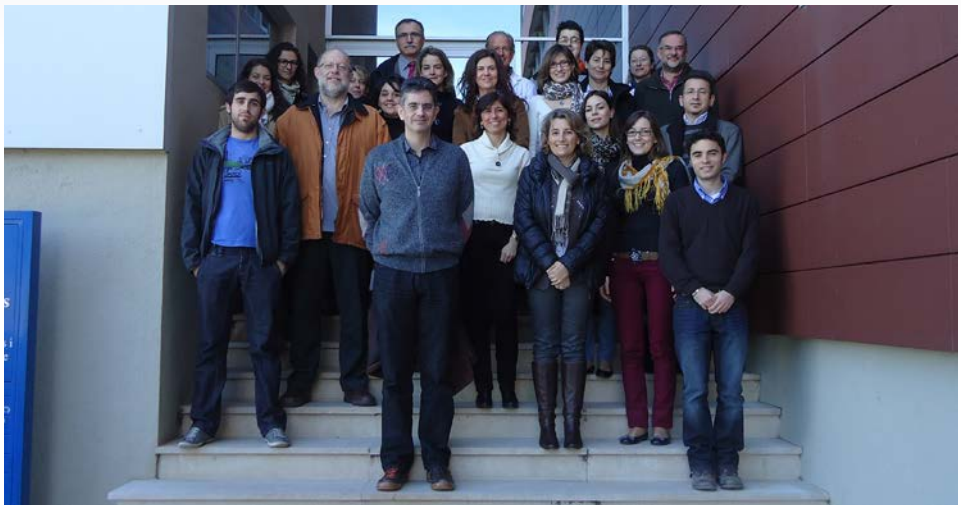
Website: http://www.idibgi.org

Fisiopatología Cardiovascular y Epidemiología Nutricional

Programme: Nutrition / Complications of Obesity / New Strategies and Biomarkers

Lead Researcher: Fiol Sala, Miguel

Group Members



STAFF MEMBERS: Colom Fernández, Antoni.

ASSOCIATED MEMBERS: Amezaga Menéndez, Rocío | Carrillo López, Andrés | Costa Bauza, Antonia | García Palmer, Francisco José | Gianotti Bauza, Magdalena | Grases Freixedas, Feliciano | Lladó Sampol, Isabel | Moñino Gómez, Manuel | Morey Servera, Margarita | Oliver Oliver, Jordi | Prieto Almirall, Rafael | Proenza Arenas, Ana María | Roca Salom, María del Pilar | Romaguera Bosch, María Adoración | Rosselló Ferrer, Ainhoa | Sastre Serra, Jorge | Valle Gómez, Adamo.

Main lines of research

Cardiovascular risk factors (nutrition, diabetes, obesity, high blood pressure, lipid levels, smoking, etc) affect cardiovascular disease incidence through several physio-pathological pathways.

Our group investigates some of these pathways in these research lines:

- The role of diet on intermediate markers of cardiovascular risk:

  - Evaluation of the effect of a Mediterranean diet on the primary prevention of cardiovascular disease (Predimed Study).

  - Phytate intake, coronary calcification and risk of cardiovascular disease.

  - Change in cardiovascular risk score and metabolic syndrome after an intervention based on the Mediterranean diet.

- Phatological implications of obesity:

  - Evaluation of an intensive lifestyle intervention based on a low calorie Mediterranean diet, physical activity and conductual treatment on weight loss and cardiovascular disease prevention (PrediMedPlus study).

  - Molecular basis of sexual dimorphism on the energy metabolism and mitocondrial function; pathological implications.

  - Nutritional and genetic determinants of the development of different obesity phenotypes; association of these phenotypes with diseases risk and mortality.

- Nutrition, diet and cancer:
  - Pro-oxidant and antioxidant nutritional factors and their influence on carcinogenesis: the role of estrogens.
  - Dietary patterns defined a priori and a posteriori and incidence and recurrence of cancer.

Most relevant scientific articles

DÍAZ-LÓPEZ A, BABIO N, MARTÍNEZ-GONZÁLEZ MA, CORELLA D, AMOR AJ, FITÓ M ET AL. Mediterranean Diet, Retinopathy, Nephropathy, and Microvascular Diabetes Complications: A Post Hoc Analysis of a Randomized Trial.Diabetes care. 2015;38(11):2134-41.

GUASCH-FERRE M., BABIO N., MARTÍNEZ-GONZÁLEZ M.A., CORELLA D., ROS E., MARTIN-PELAEZ S. ET AL. Dietary fat intake and risk of cardiovascular disease and all-cause mortality in a population at high risk of cardiovascular disease. American Journal of Clínical Nutrition. 2015;102(6):1563-1573.

TOLEDO E., SALAS-SALVADO J., DONAT-VARGAS C., BUIL-COSIALES P., ESTRUCH R., ROS E. ET AL. Mediterranean diet and invasive breast cancer risk among women at high cardiovascular risk in the predimed trial a randomized clinical trial. JAMA Internal Medicine. 2015;175(11):1752-1760.

MERINO J., GUASCH-FERRE M., MARTÍNEZ-GONZÁLEZ M.A., CORELLA D., ESTRUCH R., FITO M. ET AL. Is complying with the recommendations of sodium intake beneficial for health in individuals at high cardiovascular risk? Findings from the PREDIMED study. American Journal of Clínical Nutrition. 2015;101(3):440-448.

VALVI D., CASAS M., ROMAGUERA D., MONFORT N., VENTURA R., MARTÍNEZ D. ET AL. Prenatal phthalate exposure and childhood growth and blood pressure: Evidence from the spanish inma-sabadell birth cohort study. Environmental Health Perspectives. 2015;123(10):1022-1029.

Highlights

Our main efforts of the year 2015 have been centred on the field work of the study PREDIMED-PLUS. The objective of the study is to evaluate the effect of an intensive lifestyle intervention based on the promotion of a hypocaloric Mediterranean diet, physical activity and behavioural therapy on cardiovascular disease prevention. During 2015 we have randomized into the study around 200 participants. Our centres has been responsible in 2015 of coordinating, and continues to coordinate the ECG reading centre of the study PREDIMED-PLUS. We are also participating in the coordination of the sub-study of DEXA in PREDIMED-PLUS. We are also performing echocardiograms to our patients, along with other CIBER-OBN centres, and we together with researchers from the US have applied to a Project to the USA NIH to evaluate the effect of the intervention PREDIMED-PLUS on atrial fibrillation and its substrate. Last but not least, we should highlight that our group is developing a sub-study focused on the analysis of the origin of uric lithalsas in the patients of the PREDIMED-PLUS study, led by Dr. Rafael Prieto.

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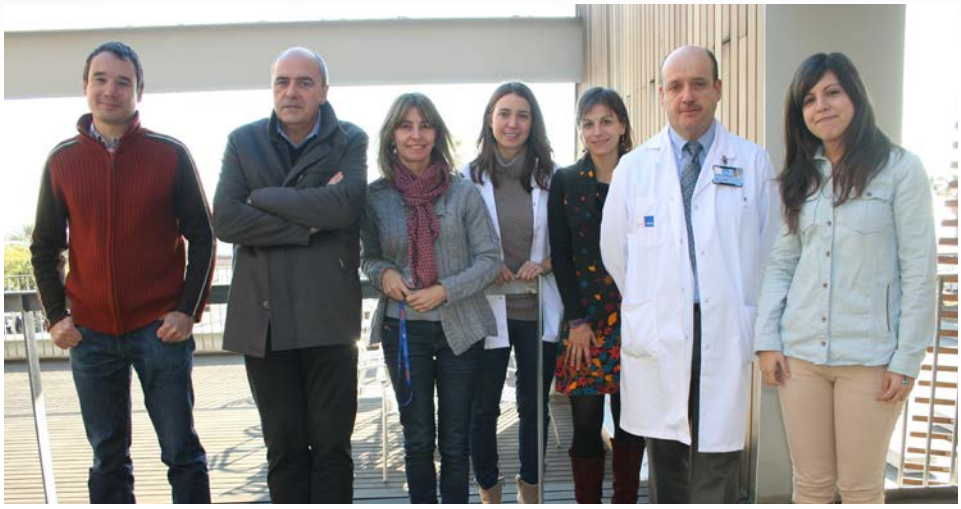
Riesgo Cardiovascular y Nutrición (CARIN)

Programme: Neurocognition and environmental-biological factors / Physiopathology of the Homeostasis of Body Weight / Nutrition / New Strategies and Biomarkers / Complications of Obesity

Lead Researcher: Fitó Colomer, Montserrat

Group Members



STAFF MEMBERS: Blasco Lapuente, Anna | Quifer Araujo, Mireia.

ASSOCIATED MEMBERS: Castañer Niño, Olga | Covas Planells, Maria Isabel | De la Torre Fornell, Rafael | Farras Mañé, Marta | Forcano Gamazo, Laura | Goday Arno, Alberto | Hernáez Camba, Álvaro | Martín Peláez, Sandra | Muñoz Aguayo, Daniel | Pastor Bosch, Antoni | Pujadas Bastardes, Maria Antònia | Rodríguez Morato, José | Tello Rovira, Susana.

Main lines of research

The Mediterranean diet, its foods and the interaction among different nutrients, has healthy effects on morbidity and mortality related to chronic degenerative diseases, such as cardiovascular and neurodegenerative. Into this context, the main objective of our research is to determine the benefit of a healthy diet pattern and some of characteristic food (olive oil and wine among others) on different cardiovascular risk factors, in healthy and in patients. To establish the cellular and molecular mechanisms that contribute to these benefits is also a key part of our research activity. Based on the knowledge of these underlying mechanisms of the benefit of the diet, progress is being achieved in research of the classical and emergent risk factors for cardiovascular and neurodegenerative diseases together with in the establishment of future risk biomarkers.

To achieve these goals, we are working at present in the following research lines:

- Nutrition intervention studies on the cardiovascular and neurodegenerative risk.
- Classical and emergent risk factors for cardiovascular and neurodegenerative diseases, including imaging biomarkers.
- Molecular and cellular mechanisms related with risk and protective factors for cardiovascular and neurodegenerative disease. Role of high density lipoproteins (HDLs) and low density (LDL), the interaction between diet and intestinal flora, and nutrigenomics.
- Nutritional Epidemiology and Epidemiology and Obesity and Diabetes management.

Most relevant scientific articles

HERNAEZ A., REMALEY A.T., FARRAS M., FERNÁNDEZ-CASTILLEJO S., SUBIRANA I., SCHRODER H. ET AL. Olive oil polyphenols decrease LDL concentrations and LDL atherogenicity in men in a randomized controlled trial. Journal of Nutrition. 2015;145(8):1692-1697.

FARRAS M., CASTANER O., MARTIN-PELAEZ S., HERNAEZ A., SCHRODER H., SUBIRANA I. ET AL. Complementary phenol-enriched olive oil improves HDL characteristics in hypercholesterolemic subjects. A randomized, double-blind, crossover, controlled trial. The VOHF study. Molecular Nutrition and Food Research. 2015;59(9):1758-1770.

HERNAEZ A., FARRAS M., FITO M.. Olive oil phenolic compounds and high-density lipoprotein function. Current Opinion in Lipidology. 2015.

VALLS R.-M., FARRAS M., SUAREZ M., FERNÁNDEZ-CASTILLEJO S., FITO M., KONSTANTINIDOU V. ET AL. Effects of functional olive oil enriched with its own phenolic compounds on endothelial function in hypertensive patients. A randomised controlled trial. Food Chemistry. 2015;167:30-35.

NAVARRO E., FUNTIKOVA A.N., FITO M., SCHRODER H.. Can metabolically healthy obesity be explained by diet, genetics, and inflammation?. Molecular Nutrition and Food Research. 2015;59(1):75-93.

Highlights

The highlight of 2015 was the granting of four national projects and European, the group leader is the main researcher in two of the national ones:

- FIS project "HDL funcionality for the prediction of cardiovascular events in a 5-year follow-up, in general population. Life-style as a modulatory factor" with the amount of 98,010 euros; PI: Montserrat Fitó.
- Project of the Marató de TV3 in Cataluña "Novel predictors of Coronary heart disease: endothelial Microparticles, HDL functionality, and fatty acid composition of cell membranes" of 133,907 euros; PI: Montserrat Fitó.
- European project (DG Justice Action Grants) "Predicting Risk of Emerging Drugs With in silico and Clinical Toxicology (PREDICT)" of 400,000 euros; PI: Rafael de la Torre.
- CDTI project "Biomolecules of the olive epidermis as adjuvant in the treatment of metabolic syndrome" of 50,400 euros; PI: Rafael de la Torre.
- Project of the Spanish Society of Internal Medicine "Cardiovascular morbidity and mortality, adherence to the Mediterranean diet and legacy effect on 1000 patients, 10 years after an intervention with Mediterranean diet" of 30,000 euros; PI: Emili Sacanella.

In addition to these gains to finance the work of the next few years, progress is being made in the recruitment and management of the PREDIMED-plus Study and two subprojects based on the improving of the neurocognitive status and functionality of HDL.

In 2015, a European project under the H2020-PHC-2014-2015 (H2020-PHC-2015-single-stage Proposal: 690,166-selfie) call was requested about the development of a recommender of a healthy lifestyle for patients who have suffered a stroke. Although the project was rejected, the creation of the consortium has promoted presenting again a new project this year.

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Adipobiología Traslacional

Programme: Adipobiology

Lead Researcher: Frühbeck Martínez, Gema

Group Members

STAFF MEMBERS: Becerril Mañas, Sara | Ibáñez Solano, Patricia.

ASSOCIATED MEMBERS: Álvarez Cienfuegos Suárez, Javier | Burrel Bustos, María Ángela | Catalán Goñi, Victoria | Escalada San Martin, Francisco Javier | Fernández González, Secundino | Gil Calvo, María Jesús | Gómez Ambrosi, Javier | Lancha Urtasun, Andoni | Méndez Giménez de los Galanes, Leire | Moncada Durruti, Rafael | Ramírez Solá, Beatriz | Rodríguez Murueta Goyena, Amaia | Rotellar Sastre, Fernando | Salvador Rodríguez, Francisco Javier | Silva Frojan, Camilo | Valenti Azcarate, Victor.

Main lines of research

- Study of the changes in energy balance and metabolism following bariatric surgery.
- Influence of adipokines, myokines, hepatokines and osteokines in the development of obesity and its comorbidities.
- Implication of aquaglyceroporins in energy homeostasis and metabolic control.
- Importance of adipose tissue extracellular matrix remodelling in obesity and its comorbidities.
- Influence of immune cells in the development of obesity-associated adipose tissue inflammation.
- Adipose tissue dysregulation and colon carcinogenesis promotion.

Most relevant scientific articles

GÓMEZ-AMBROSI J, CATALÁN V, RODRÍGUEZ A, SALVADOR J, FRÜHBECK G. Does body adiposity better predict obesity-associated cardiometabolic risk than body mass index?. Journal of the American College of Cardiology. 2015;65(6):632-3.

Fruhbeck G.. Bariatric and metabolic surgery: A shift in eligibility and success criteria. Nature Reviews Endocrinology. 2015;11(8):465-477.

RODRÍGUEZ A., MORENO N.R., BALAGUER I., MENDEZ-GIMÉNEZ L., BECERRIL S., CATALAN V. ET AL. Leptin administration restores the altered adipose and hepatic expression of aquaglyceroporins improving the non-alcoholic fatty liver of ob/ob mice. Scientific Reports. 2015;5.

RODRÍGUEZ A., BECERRIL S., MENDEZ-GIMÉNEZ L., RAMÍREZ B., SAINZ N., CATALAN V. ET AL. Leptin administration activates irisin-induced myogenesis via nitric oxide-dependent mechanisms, but reduces its effect on subcutaneous fat browning in mice. International Journal of Obesity. 2015;39(3):397-407.

MONCADA R., BECERRIL S., RODRÍGUEZ A., MENDEZ-GIMÉNEZ L., RAMÍREZ B., CATALAN V. ET AL. Sleeve Gastrectomy Reduces Body Weight and Improves Metabolic Profile also in Obesity-Prone Rats. Obesity Surgery. 2015.

Highlights

RESEARCH PROJECTS:

- Prospective study of the changes in energy expenditure after bariatric surgery. FIS_INTRASALUD-ISCIII_Frühbeck.
- Identification of novel modulators of chronic inflammation in prevalent diseases: unveiling divergent mechanisms of disease. FIS-ISCIII.
- Role of interleukin-32 in the regulation of macrophage polarization in adipose tissue. Involvement in the obesity-associated inflammation and comorbidities. FIS-ISCIII_Catalán.
- Implication of ghrelin isoforms in the development of steatosis and non-alcoholic steatohepatitis associated with obesity and insulin resistance. FIS-ISCIII_Rodríguez.
- Study of the implication of osteopontin in colon cancer development in the context of obesity. FIS-ISCIII_Gómez Ambrosi.
- Study of the regulation of aquagliceroporins in insulin-sensitive tissues in an obesity and insulin resistance context. Dept. Salud, GobNav_Rodríguez.
- Implication of obesity and type 2 diabetes mellitus in colon cancer development. Gene expression analysis involved in metilation, inflammation and tumoral growth in adipose tissue and peripheral blood. DeptoSalud, GobNav_Catalán.
- Study of the effect of adipose tissue dysfunction in the obesity-associated cardiometabolic alterations and its influence during aging. CAN_Gómez-Ambrosi.
- SPOTLIGHT – Sustainable Prevention of Obesity Through Integrated Strategies. EU-Commission_Brug.

CLINICAL GUIDELINES:

- 2014 EASO Position Statement on the Use of Anti-Obesity Drugs. Obes Facts. 2015;8(3):166-74.

COLLABORATIONS:

NATIONAL COLLABORATION:

Collaboration & publications with CIBEROBN groups of Drs. Casanueva, Fernández- Real, Fernández-Aranda, Diéguez, Tena-Sempere, Botella, Argente, Tinahones, Villaroya, Fitó-Colomer, López-Miranda.

INTERNATIONAL COLLABORATION:

Collaboration & publications with Drs. Calamita (Bari,Italy), Soveral (Lisboa, Portugal), Yumuk (Istanbul,-Turkey), Toplak (Graz,Austria), Woodward (European Association for the Study of Obesity), Halford (Liverpool,UK), Oppert (Paris,France).

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Antioxidantes Naturales

Programme: New Strategies and Biomarkers
Lead Researcher: Lamuela-Raventós, Rosa Maria

Group Members

STAFF MEMBERS: Tresserra Rimbau, Anna.

ASSOCIATED MEMBERS: Castellote Bargallo, Ana Isabel | Escribano Ferrer, Elvira | Izquierdo Pulido, María | López Sabater, María del Carmen | Martínez Huélamo, Miriam | Montes Goyanes, Rosa María | Quifer Rada, Paula | Vallverdú Queralt, Anna.

Main lines of research

A. Study of food bioactive compounds (polyphenols, carotenoids and vitamins).

- Polyphenols, carotenoids and vitamins in food, intrinsic and extrinsic factors that modify the presence therefore. Influence of cultural factors, technology, processing and storage in the levels of these compounds.
- The matrix effect on the bioavailability of such compounds.

B. Nutritional studies of bioactive compounds: clinical trials and epidemiological studies.

- The relationship between the consumption of bioactive compounds in the prevention and reduction of chronic diseases.
- Bioavailability and Bioaccessibility tests, effect of food matrix on the absorption and efficacy of such compounds.
- Studies of nutritional biomarkers.
- Nutrikinetics and pharmacokinetics analysis. Effect of consumption of polyphenols and other bioactive compounds in primary prevention and obesity (PREDIMED and PREDIMEDPLUS).

Most relevant scientific articles

ARRANZ S., MARTÍNEZ-HUELAMO M., VALLVERDU-QUERALT A., VALDERAS-MARTÍNEZ P., ILLAN M., SACANELLA E. ET AL. Influence of olive oil on carotenoid absorption from tomato juice and effects on postprandial lipemia. Food Chemistry. 2015;168:203-210.

MARTÍNEZ-HUELAMO M., TULIPANI S., ESTRUCH R., ESCRIBANO E., ILLAN M., CORELLA D. ET AL. The tomato sauce making process affects the bioaccessibility and bioavailability of tomato phenolics: A pharmacokinetic study. Food Chemistry. 2015;173:864-872.

VALLVERDU-QUERALT A., VERBAERE A., MEUDEC E., CHEYNIER V., SOMMERER N.. Straightforward method to quantify GSH, GSSG, GRP, and hydroxycinnamic acids in wines by UPLC-MRM-MS. Journal of Agricultural and Food Chemistry. 2015;63(1):142-149.

CHAVEZ-SERVIN J.L., DE LA TORRE CARBOT K., GARCÍA-GASCA T., CASTELLOTE A.I., LÓPEZ-SABATER M.C.. Content and evolution of potential furfural compounds in commercial milk-based infant formula powder after opening the packet. Food Chemistry. 2015;166:486-491.

VALLVERDU-QUERALT A., LAMUELA-RAVENTOS R.M.. Foodomics: A new tool to differentiate between organic and conventional foods. Electrophoresis. 2015.

Highlights

In the last year 2015 the Natural Antioxidant Group was involved in several projects:

- The group started working in the Project "Probiotics increase the presence of bioactive phenolic compounds in human body and reduce cardiovascular risk parameters" thanks to the grant of the Instituto Danone.
- Has continued working in the Project "Bioactive compounds of sofrito. Metabolomic study and mechanisms involved in the control of oxidative stress and inflammation." with a grant of the Ministerio de Economía y Competitividad.
- Dr. M. Carmen López Sabater has participated in the Project "Fatty acids role during the first life stage on the risk of obesity and neurodevelopmental of the child and Dr. Elvira Escribano Ferrer has continued collaborating with the Project "Self-assembly technologies of amphiphilic molecules for therapeutical applications", both projects are grants of the Ministerio de Economía y competitividad.
- The project "Risks and benefits of the ethanol and polyphenol content in beer: effects of moderate consumption on cardiovascular system" has been completed. Also the projects "Risks and benefits of moderate beer intake (with and without alcohol) on osteoporosis in postmenopausal women" and "Evaluation of moderate daily intake of beer in reducing menopausal symptoms. Estrogenic effect of hop prenylflavanoids" have been granted by the "European Research on Alcoholism Board – ERAB", they will start in 2016.

The clinical trial "Assessment of different doses of polyphenols from dealcoholized red wine and red wine on blood pressure and endothelial function in subjects with metabolic syndrome and high cardiovascular risk" has been done.

The group collaborated internationally with the University of California Davis analyzing biological samples and the New York Obesity Center of Columbia University thanks to the stay of Dr. Lamuela.

Also in the year 2015, the group was present in 6 national and international conferences on various topics within the field of nutrition.

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Nutrición y Prevención de Enfermedades en Atención Primaria

Programme: Nutrition
Lead Researcher: Lapetra-Peralta, José

Group Members

STAFF MEMBERS: Miro Moriano, Leticia.

ASSOCIATED MEMBERS: Espinaco Garrido, María Josefa | García de la Corte, Francisco José | Iglesias Bonilla, Pablo | Jiménez Jiménez, Luis Manuel | Lahera Robles, Laura | Lama Herrera, Carmen | Mayoral Sánchez, Eduardo | Ortega Calvo, Manuel | Ramos Molina, Marian | Román Torres, Pilar | San Juan Lozano, Pilar | Santos Lozano, José Manuel | Urbano Fernández, Víctor.

Main lines of research

- Diet, nutrition, and disease prevention.
- Cardiovascular epidemiology.
- Hypertension and ambulatory blood pressure monitoring.
- Health related quality of life.

Highlights

- Grant by Instituto de Salud Carlos III for Research Coordinated Project "PREDIMED-PLUS: Effect of Hypocaloric Mediterranean Diet and Physical Activity Promotion on the Primary Prevention of Cardiovascular Disease. Pilot Study on Intermediate Markers" (PI13/00673). Principal Investigator: José Lapetra. Coordinating Principal Investigator: Jordi Salas-Salvadó. Duration: 3 years: 2014 to 2016.
- Grant by Andalusian Healh Service (Spain) for Research Project "Validity of glycemic hour after the oral glucose load in diagnosis of impaired glucose tolerance and hidden diabetes in patients with impaired fasting glucose" (PI-0112-2013). Investigator: Manuel Santos. Duration: 3 years: 2014 to 2016.
- Designation as "Affiliated Group" at the Institute of Biomedicine of Seville (IBIS).

Institution: Fundación Pública Andaluza para la Gestión de la Investigación en Salud de Sevilla
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Colesterol, Nutrición y Obesidad

Programme: Nutrition / Physiopathology of the Homeostasis of Body Weight / New Strategies and Biomarkers / Complications of Obesity

Lead Researcher: Lasunción Ripa, Miguel Ángel

Group Members

STAFF MEMBERS: Casado Cerdeño, María Emilia.

ASSOCIATED MEMBERS: Arrieta Blanco, Francisco Jesús | Balsa Barro, José Antonio | Botella Carretero, José Ignacio | Busto Durán, Rebeca | Cerrato Fernández, Francisca | Crespo Toro, Lorena | Gómez Coronado Cáceres, Diego | Martín Hidalgo, Antonia | Martínez Botas Mateo, Javier | Prieto Moreno, Ana | Ramírez Ortiz, María Mercedes | Vázquez Martínez, Clotilde.

Main lines of research

- Alterations of intracellular cholesterol homeostasis.
- Role of cholesterol in cell proliferation and differentiation.
- Effects of nutrients and foods on lipid, hydrocarbon and oxidative metabolisms.
- Metabolic effects of bariatric surgery in morbidly obese patients.
- Gene polymorphisms and gene expression in the obese patient and their relation with cardiometabolic affectation.
- Role of lipids in male infertility associated to metabolic disorders. Study of the mechanisms and prevention by diet.

Most relevant scientific articles

LOBO M.V.T., ARENAS M.I., HUERTA L., SACRISTÁN S., PÉREZ-CRESPO M., GUTIERREZ-ADAN A. ET AL. Liver growth factor induces testicular regeneration in EDS-treated rats and increases protein levels of class B scavenger receptors. American Journal of Physiology - Endocrinology and Metabolism. 2015;308(2):E111-E121.

CERRATO F., FERNÁNDEZ-SUAREZ M.E., ALONSO R., ALONSO M., VÁZQUEZ C., PASTOR O. ET AL. Clínically used selective oestrogen receptor modulators increase LDL receptor activity in primary human lymphocytes. British Journal of Pharmacology. 2015;172(5):1379-1394.

MARTÍNEZ-BOTAS J., RODRÍGUEZ-ÁLVAREZ M., CERECEDO I., VLAICU C., DIEGUEZ M.C., GÓMEZ-CORONADO D. ET AL. Identification of novel peptide biomarkers to predict safety and efficacy of cow's milk oral immunotherapy by peptide microarray. Clínical and Experimental Allergy. 2015;45(6):1071-1084.

MARTÍN SÁNCHEZ C., PÉREZ MARTÍN J.M., JIN J.-S., DAVALOS A., ZHANG W., DE LA PENA G. ET AL. Disruption of the mevalonate pathway induces dNTP depletion and DNA damage. Biochimica et Biophysica Acta - Molecular and Cell Biology of Lipids. 2015;1851(9):1240-1253.

CANFRAN-DUQUE A., PASTOR O., REINA M., LERMA M., CRUZ-JENTOFT A.J., LASUNCION M.A. ET AL. Curcumin mitigates the intracellular lipid deposit induced by antipsychotics in vitro. PLoS ONE. 2015;10(10).

Highlights

During 2015, the CNO group has made many progresses in the development of various lines of research on cholesterol metabolism, the actions and effects of certain micronutrients and complications of obesity, such as diabetes and infertility. As for the results, we have shown that alterations in the biosynthesis of cholesterol can lead to replication stress and DNA damage, with consequences in genomic stability, being the first time a connection between the cholesterol metabolism and the intracellular deoxyribonucleotide pool is established. Furthermore, it has been shown that firs and second generation antipsychotics as well as selective estrogen receptor modulators (SERMs), which are amines with amphiphilic nature, alter the intracellular cholesterol traffic and produce lipidosis. This alteration can be alleviated by dietary polyphenols that stimulate the formation and secretion of exosomes. It has been also delineated the mechanism by which SERMs stimulate LDL receptor expression and activity. This explains the cholesterol lowering effect of SERMs. Regarding infertility, we have shown that HSL, 3β-HSD and SR-BI receptor, which are all involved in the metabolism of lipids, also play an important role in spermatogenesis. In the field of biomarkers, we have identified two groups of peptides bound to IgE-binding proteins that can be used as novel biomarkers to predict the safety and efficacy of CM-OIT before starting treatment. In addition, a MALDI-TOP-based method has been developed for the quantitative lipidomic analysis of plasma and plasma lipoproteins. Various collaborative studies have been performed for the identification and characterization of microRNAs involved in the regulation of lipid metabolism.

Several AES projects remain active, from both ISCI-II and MINECO, as well as from private fundations. Finally, this group is involved in the consortium ALIBIRD-CM entitled "Functional Foods and effective nutritional strategies for the prevention and treatment of chronic diseases".

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Nutrigenómica y Síndrome Metabólico

Programme: Nutrition / Physiopathology of the Homeostasis of Body Weight / Adipobiology

Lead Researcher: López Miranda, José

Group Members

STAFF MEMBERS: Gómez Arcas, Pilar | Gómez Luna, Purificación | Rangel Zúñiga, Oriol Alberto.

ASSOCIATED MEMBERS: Alcala Díaz, Juan Francisco | Almaden Peña, Yolanda | Blanco Rojo, Ruth | Camargo García, Antonio | Criado García, Juan | Cruz Teno, Cristina | Delgado Casado, Nieves | Delgado Lista, Francisco Javier | Fernández de La Puebla Giménez, Rafael Ángel | Fuentes Jiménez, Francisco José | García Ríos, Antonio | López Segura, Fernando | Marín Hinojosa, Carmen | Paniagua González, Juan Antonio | Pérez Jiménez, Francisco | Pérez Martínez, Pablo | Yubero Serrano, María Elena.

Main lines of research

- Nutrition and disease.
- Gene-environment interaction.

Most relevant scientific articles

YUBERO-SERRANO E.M., DELGADO-LISTA J., TIERNEY A.C., PÉREZ-MARTÍNEZ P., GARCÍA-RIOS A., ALCALA-DIAZ J.F. ET AL. Insulin resistance determines a differential response to changes in dietary fat modification on metabolic syndrome risk factors: The LIPGENE study. American Journal of Clínical Nutrition. 2015;102(6):1509-1517.

GONZÁLEZ-GUARDIA L, YUBERO-SERRANO EM, DELGADO-LISTA J, PÉREZ-MARTÍNEZ P, GARCÍA-RIOS A, MARIN C ET AL. Effects of the Mediterranean diet supplemented with coenzyme q10 on metabolomic profiles in elderly men and women.The journals of gerontology. Series A, Biological sciences and medical sciences. 2015;70(1):78-84.

FINUCANE O.M., LYONS C.L., MURPHY A.M., REYNOLDS C.M., KLINGER R., HEALY N.P. ET AL. Monounsaturated fatty acid-enriched high-fat diets impede adipose NLRP3 inflammasome-mediated IL-1β secretion and insulin resistance despite obesity. Diabetes. 2015;64(6):2116-2128.

GÓMEZ-DELGADO F., GARCÍA-RIOS A., ALCALA-DIAZ J.F., RANGEL-ZUNIGA O., DELGADO-LISTA J., YUBERO-SERRANO E.M. ET AL. Chronic consumption of a low-fat diet improves cardiometabolic risk factors according to the CLOCK gene in patients with coronary heart disease. Molecular Nutrition and Food Research. 2015;59(12):2556-2564.

RANGEL-ZUNIGA O.A., CAMARGO A., MARIN C., PENA-ORIHUELA P., PÉREZ-MARTÍNEZ P., DELGADO-LISTA J. ET AL. Proteome from patients with metabolic syndrome is regulated by quantity and quality of dietary lipids. BMC Genomics. 2015;16(1).

Highlights

During the year 2015 our group has maintained the high level of excellence, accredited in the past. This fact is supported by the following milestones:

We have published 29 articles (JCR), with a high percentage of leadership in these publications, and an index of more than 122 points cumulative impact. In addition, during the year of 2015, we have developed a total of 13 research projects of national competitive calls, and a European project, and we have obtained the financing of a new European project (Power2DM). Within the catchment of the Group's resources, it should be noted the participation in 18 clinical trials. From the point of view of mobility, we have been receiving several visiting researchers and a researcher of our group has made a stay at the HNRC Tufts University, Boston, (USA). In relation to the human resources we currently enjoy a contract Rio-Hortega, PFIS, FPI, Sara Borrell, Juan de la Cierva, two Miguel Servet, NicolásMonarde, contract medicine internal to enhance the research work of the UGC, and it is defended one PhD these with the highest rating, which means the quality of the formation of our group. Following the creation of a technological spin-off in 2012, our group participates in several projects for generation of electronic based platforms and other e-health devices. Through this initiative, we finished in 2015 an electronic platform for the management of research projects. It has resulted in the generation of a patent application owned partially by CIBER "Virtual platform for the management and exploitation of research projects, with application to nutritional intervention studies (Pad-CRD)", with copyright registration code RPI201599902441360 (Spain). This tool is added to the preliminary patents of previous years, which are still on.

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Pediatría, Innovación, Traslación y Tecnología en la Obesidad Infantil

Programme: Complications of Obesity / New strategies and Biomarkers

Lead Researcher: Lurbe Ferrer, Empar

Group Members

STAFF MEMBERS: Calaforra Juan, Óscar | Dix, Rachael Ann | Ponce Zanón, Francisco José | Redon Lurbe, Pau.

ASSOCIATED MEMBERS: Aguilar Bacallado, Francisco | Álvarez Pitti, Julio Carlos | Pascual Izuel, José María | Redon i Mas, Josep | Torro Domènech, Maria Isabel.

Main lines of research

The group has established a number of research areas that focus on various aspects of childhood obesity and the study of cardiometabolic and renal complications both in children and in adults.

In the area of childhood obesity:

- Study of risk factors for development of obesity, focusing on the impact of intrauterine life, postnatal growth and environmental factors (tobacco, metals).
- Identification of molecular mechanisms involved in cardiometabolic risk to better understand its mechanisms and search for biomarkers.
- Study of the association of metabolic factors, dyslipidemia, insulin resistance and hyperuricemia and hemodynamic, arterial pressure.
- Comprehensive prevention and treatment focused on physical exercise with the implementation of new technologies for personalized treatment leading to the creation of PEDITEC (JOINT RESEARCH UNIT FOR TECHNOLOGICAL INNOVATION IN PEDIATRICS -PEDITEC- FACING CHILD WELFARE) together with the Polytechnic University of Valencia (VLCCampus).
- Technology transfer, with the creation of integrated software for cardiorespiratory fitness and autonomic activity for personalizing exercise.

In the study area of cardiometabolic and renal complications:

- Study of biomarkers of cardiometabolic risk.
- Study of the mechanisms of podocyte damage as the origin of renal damage in obesity.
- Study of genetic markers in the risk of developing obesity and its complications.

Most relevant scientific articles

PICHLER G., MARTÍNEZ F., VICENTE A., SOLAZ E., CALAFORRA O., LURBE E. ET AL. Influence of obesity in central blood pressure. Journal of Hypertension. 2015;33(2):308-313.

IVORRA C., FRAGA M.F., BAYON G.F., FERNÁNDEZ A.F., GARCÍA-VICENT C., CHAVES F.J. ET AL. DNA methylation patterns in newborns exposed to tobacco in utero. Journal of Translational Medicine. 2015;13(1).

BERMUDEZ L., GARCÍA-VICENT C., LÓPEZ J., TORRO M.I., LURBE E.. Assessment of ten trace elements in umbilical cord blood and maternal blood: Association with birth weight. Journal of Translational Medicine. 2015;13(1).

LISON J.F., CEBOLLA A., GUIXERES J., ÁLVAREZ-PITTI J., ESCOBAR P., BRUNO A. ET AL. Competitive active video games: Physiological and psychological responses in children and adolescents. Paediatrics and Child Health (Canada). 2015;20(7):373-376.

REDON J, LURBE E. The kidney in obesity.Current hypertension reports. 2015;17(6):555.

Highlights

- Research Unit ***Unidad de investigación conjunta para la innovacion tecnológica en pediatría -PEDITEC- orientada al bienestar del niño*** with the Polytechnic University of Valencia, uses both health along with engineers who develop software for capturing signals via mobile devices. The study of physiological parameters that allow for therapeutic individualization has been a priority during the year 2015 has advanced in clinical practice in obese pediatric patients in Unit Against Obesity and Cardiovascular Risk in Children and Adolescents. The project financed by FIPSE of the Health Institute Carlos III entitled "Development of a plan for the transfer of a prototype analysis of cardiorespiratory fitness and its application in the prevention and treatment of childhood obesity" is being carried out and is practically complete with relevant results.
- The PAIDO program continues its activities in Unit Against Cardiovascular Risk in Children and Adolescents of the Hospital General Universitario de Valencia, coordinated by the group of Dr. Lurbe. The Programme of Personalised Integrated Care for Childhood Obesity (PAIDO) extends to the dinvolvement of the family, educators, nutritionists, physical education teachers and other actors of various kinds. Thus, the treatment of this pathology goes beyond the hospital space and also involves the environment and the child's own individual sphere. This has also been supported by the introduction of modern technologies of artificial intelligence. The results of the effectiveness of the program are now being analysed.
- Development of the FIS Project: Prospective study from birth of children who have reached 10 years of age. With over 200 children. The study combines information and umbilical cord material with epigenetic studies and metabolomics, and the follow-up of clinical parameters and cardiometabolic phenotype.
- Currently, Dr. Lurbe is the coordinator of the new document of the European Guidelines on Hypertension in Children and Adolescents.

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Epidemiología Nutricional

Programme: Nutrition

Lead Researcher: Martínez González, Miguel Ángel

Group Members

STAFF MEMBERS: Goñi Ochandorena, Estíbaliz | Sánchez Tainta, Ana

ASSOCIATED MEMBERS: Alonso Gutiérrez, Álvaro | Bes Rastrollo, Maira | Buil Cosiales, Pilar | de Irala Estévez, Jokin | De La Fuente Arrillaga, Carmen | Díez Espino, Javier | García Arellano, Ana | Gea Sánchez, Alfredo | Guillén Grima, Francisco | López de Burgo, Cristina | Martín Calvo, Nerea | Razquín Burillo, Cristina | Rodríguez Alemany, Susana | Ruiz-Canela López, Miguel | San Julián, Beatriz | Serrano Martínez, Manuel | Toledo Atucha, Estefanía A. | Vázquez Ruiz, Zenaida | Zazpe García, Itziar

COLABORADORES: Sánchez Adan, David

Main lines of research

- Mediterranean diet and cardiovascular disease.
- Mediterranean diet and other chronic diseases.
- Lifestyles and obesity.
- Lifestyles and chronic diseases.
- Metabolic profile and cardiovascular disease.
- Dietary patterns, quality of life and depression.
- Lifestyles, genetics and cognitive decline.

Most relevant scientific articles

ANAND S.S., HAWKES C., DE SOUZA R.J., MENTE A., DEHGHAN M., NUGENT R. ET AL. Food Consumption and its Impact on Cardiovascular Disease: Importance of Solutions Focused on the Globalized Food System A Report from the Workshop Convened by the World Heart Federation. Journal of the American College of Cardiology. 2015;66(14):1590-1614.

TOLEDO E., SALAS-SALVADO J., DONAT-VARGAS C., BUIL-COSIALES P., ESTRUCH R., ROS E. ET AL. Mediterranean diet and invasive breast cancer risk among women at high cardiovascular risk in the predimed trial a randomized clinical trial. JAMA Internal Medicine. 2015;175(11):1752-1760.

SÁNCHEZ-VILLEGAS A., HENRIQUEZ-SÁNCHEZ P., RUIZ-CANELA M., LAHORTIGA F., MOLERO P., TOLEDO E. ET AL. A longitudinal analysis of diet quality scores and the risk of incident depression in the SUN Project. BMC Medicine. 2015;13(1).

PÉREZ-CORNAGO A., MARTÍNEZ-GONZÁLEZ M.A., RUIZ-CANELA M., JAURRIETA I., CARLOS S., SAYON-OREA C. ET AL. Prebiotic consumption and the incidence of overweight in a Mediterranean cohort: The Seguimiento Universidad de Navarra Project. American Journal of Clínical Nutrition. 2015;102(6):1554-1562.

DONAT-VARGAS C., GEA A., SAYON-OREA C., DE LA FUENTE-ARRILLAGA C., MARTÍNEZ-GONZÁLEZ M.A., BES-RASTROLLO M.. Association between dietary intake of polychlorinated biphenyls and the incidence of hypertension in a Spanish Cohort: The Seguimiento Universidad de Navarra project. Hypertension. 2015;65(4):714-721.

Highlights

Our research group has organized in 2015 at the University of Navarra, two important meetings of high scientific relevance: 1) "Symposium on nutrition, metabolism and cardiometabolic prevention: omics, epigenetics and system epidemiology" where world-known scientists in each cited area participated, including Frank B. Hu, Antonia Trichopoulou and Olle Melander, among others; 2) Data Safeting & Monitoring Board of the predimed-plus trial meeting, formed by Meir Stampfer, Xavier Pi-Sunyer, Francisco Fernández-Avilés and Joan Sabaté. This committee evaluates the protocol, ethics and methods of the predimed-plus trial to ensure the correct compliance and the rights and well-being of participants.

Furthermore, Miguel A. Martinez-González was one of the 2 European invited speakers to a unique consensus conference called "Finding Common Ground" in Boston, about the Dietary Guidelines for Americans'2015. It comprised worldwide experts at the highest scientific level including Dariush Mozaffarian, Walter Willett, Meir Stampfer, David Jenkis, Eric Rimm or Dean Ornish.

Currently the most important project we are working on is the predimed-plus trial. By December 2015 we were the first center reaching the goal of 300 recruited subjects that was the final objective of the recruitment period in July 2016.

On September 14, 2015, a press conference was organized at the Instituto de Salud Carlos III in Madrid to disclose one of the most relevant results of the predimed trial: the substantial reduction in breast cancer risk associated with the intervention with Mediterranean diet in a study leaded by our group.

In that month, we also published the book entitled "Predimed, date el gusto de comer sano", written by Miguel A. Martinez-Gonzalez, Ana Sanchez Tainta and Beatriz San Julián.

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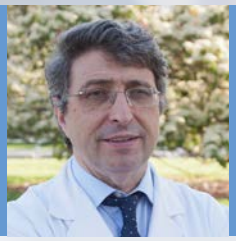
Nutrición, Obesidad y Salud

Programme: Nutrition

Lead Researcher: Martínez Hernández, José Alfredo



Group Members

STAFF MEMBERS: Abete Goñi, Itziar | González Muniesa, Pedro | Martí del Moral, Amelia | Milagro Yoldi, Fermín Ignacio | Moreno Aliaga, María Jesús | Navas Carretero, Santiago | Zulet Alzorriz, Mª Ángeles.

COLABORADORES: Jimeno Moreno, Beatriz.

Main lines of research

- Obesity and inflammation
- Personalized nutrition and diet therapy in metabolic syndrome
- Mechanisms involved in energy homeostasis
- Metabolic biomarkers in obesity
- bioactive compounds.

Most relevant scientific articles

LÓPEZ-YOLDI M., FERNÁNDEZ-GALILEA M., LAIGLESIA L.M., LAREQUI E., PRIETO J., MARTÍNEZ J.A. ET AL. Cardiotrophin-1 stimulates lipolysis through the regulation of main adipose tissue lipases. Journal of Lipid Research. 2015;55(12):2634-2643.

FERNÁNDEZ-GALILEA M., PÉREZ-MATUTE P., PRIETO-HONTORIA P.L., HOUSSIER M., BURRELL M.A., LANGIN D. ET AL. α-Lipoic acid treatment increases mitochondrial biogenesis and promotes beige adipose features in subcutaneous adipocytes from overweight/obese subjects. Biochimica et Biophysica Acta - Molecular and Cell Biology of Lipids. 2015;1851(3):273-281.

MARTÍNEZ J.A., MILAGRO F.I.. Genetics of weight loss: A basis for personalized obesity management. Trends in Food Science and Technology. 2015.

GARCÍA-CALZON S., MOLERES A., MARTÍNEZ-GONZÁLEZ M.A., MARTÍNEZ J.A., ZALBA G., MARTI A. ET AL. Dietary total antioxidant capacity is associated with leukocyte telomere length in a children and adolescent population. Clínical Nutrition. 2015;34(4):694-699.

IBERO-BARAIBAR I., NAVAS-CARRETERO S., ABETE I., MARTÍNEZ J.A., ZULET M.A.. Increases in plasma 25(OH)D levels are related to improvements in body composition and blood pressure in middle-aged subjects after a weight loss intervention: Longitudinal study. Clínical Nutrition. 2015;34(5):1010-1017.

Highlights

The group has participated in this period in the following projects:

- Nutrigenomics and personalized nutrition and biomarkers of inflammation associated with diet and obesity. Role of nutrients, adiposity and age.
- PREVIEW - Prevention of diabetes alifestyle intervention and population studies in Europe and aroud the World.
- Bioactive lipid mediators derived from omega-3 fatty acids: potential application in obesity, inflammation and insulin resistance.
- Personalised nutrition: An integrated analysis of Opportunities and challenges. Food4Me.
- Project related study supplementation of a lyophilized fruit.
- Development and validation of satiating foods by integrating the signals and pre postingestivas.
- PREDIMED + DM: Effect of a low calorie Mediterranean diet and promoting physical activity in the prevention of type 2 diabetes in people with metabolic syndrome.
- NAFLD in obese population of Navarra: Multidisciplinary / nutritional approach from the standpoint of clinical and scientific.
- Development of a test nutrigenetic for custom prescription weight loss diets.
- Study or function and therapeutic potential pro-operative lipid mediators of inflammation in obesity, insulin resistance, intestinal function and neurocognitive disorders.

The number of theses supervised by members of the group in this period was 7, while the number of interventions at international congresses was 12. This group participates in editorial boards of 7 international journals included in Web of Science and impact factor and received 3 research awards.

The results appeared in 57 publications related to inflammation, energy metabolism with emphasis on lipids and carbohydrates, along with studies metabolomics and nutrigenomics, transcriptomics, epigenetics, etc. involving in animal cells, nutrition interventions in humans and epidemiologic studies. Also It has been developed a guide CLAIMS.

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Efectos Metabolico-Nutricionales del Aceite de Oliva Virgen y sus Componentes

Programme: Nutrition / Physiopathology of the Homeostasis of Body Weight / Complications of Obesity

Lead Researcher: Osada García, Jesús de la

Group Members

STAFF MEMBERS: Barranquero Cortes, Cristina | Gascón Mesa, Sonia | Martínez Beamonte, Roberto

ASSOCIATED MEMBERS: Arbones Mainar, José Miguel | Arnal Atares, Carmen | Lou Bonafonte, José Manuel | Marca Andres, María del Carmen | Martínez Gracia, María Victoria | Muniesa Lorda, Pedro | Navarro Ferrando, María Ángeles | Rodríguez Yoldi, María Jesús | Surra Muñoz, Joaquín Carlos.

Main lines of research

- Olive oil and fatty liver.
- Olive oil and intestinal physiopathology.
- Nuts and atherosclerosis.
- Expandability of adipose tissue.

Most relevant scientific articles

RODRÍGUEZ-YOLDI M.J., GASCON S., BARRANQUERO C., GARCÍA-BARRIOS A., OSADA J.. Involvement of intracellular signaling in the IL-1β inhibitory effect on fructose intestinal absorption. Journal of Cellular Physiology. 2015;230(4):896-902.

TORRES-PÉREZ E., VALERO M., GARCÍA-RODRÍGUEZ B., GONZÁLEZ-IRAZABAL Y., CALMARZA P., CALVO-RUATA L. ET AL. The FAT expandability (FATe) Project: Biomarkers to determine the limit of expansion and the complications of obesity. Cardiovascular Diabetology. 2015;14(1).

SANCHO-KNAPIK S., GUILLEN N., OSADA J.. Cloning and expression of hepatic synaptotagmin 1 in mouse. Gene. 2015;562(2):236-243.

LOU-BONAFONTE J.M., GABAS-RIVERA C., NAVARRO M.A., OSADA J.. PON1 and mediterranean diet. Nutrients. 2015;7(6):4068-4092.

GAMUNDI-SEGURA S., SERNA J., OEHNINGER S., HORCAJADAS J.A., ARBONES-MAINAR J.M.. Effects of adipocyte-secreted factors on decidualized endometrial cells: modulation of endometrial receptivity in vitro. Journal of Physiology and Biochemistry. 2015;71(3):537-546.

Highlights

RESEACH GRANTS

- Virgin olive oil terpenic compounds in atherosclerosis and fatty liver development. Funding body: Ministerio de Economía y Competitividad. SAF 2013-41651-R. Period 2014-2016. Principal investigator : Jesus de la Osada Garcia.
- Effect of nut dietary supplementation on atherosclerosis development in apolipoprotein E deficient mice. A search for new biomarkers in humans. Funding body: Fiss PI13/02600. Period: 2014-2016. Principal investigator: María Angeles Navarro Ferrando.
- Expandability of adipose tissue. A search for non-invasive biomarkers to evaluate its expansion limit and obesity complications. Funding body: Fiss PI14/00508. Period: 2015-2017. Principal investigator: Jose Miguel Arbonés Mainar.

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Nutrigenómica y Obesidad

Programme: New Strategies and Biomarkers / Adipobiology / Complications of Obesity

Lead Researcher: Palou Oliver, Andreu

Group Members

STAFF MEMBERS: Ceresi, Enzo | Pons Vives, Pere Josep | Reynés Miralles, Bàrbara.

ASSOCIATED MEMBERS: Asnani Kishnani, Madhu | Bonet Piña, María Luisa | Chaplin, Alice | Cifre Calafat, Margalida | Dianov Petrov, Petar | García Carrizo, Francisco José | García Ruiz, Estefanía | Konieczna, Jadwiga | Laraichi, Sarah | Llopis Corro, Marina | López Sanfot, Nora | Nozhenko, Yuriy | Oliver Vara, Paula | Palou March, Andreu | Palou March, Mariona | Parra Moya, Pilar | Pico Segura, Catalina | Pomar Oliver, Catalina Amadora | Ribot Riutort, Joan | Rodríguez Guerrero, Ana María | Sánchez Roig, Juana | Serra Vich, Francisca | Szostaczuk, Nara | Torrens García, Juana Mª.

Main lines of research

- Nutrition, genes and pathologies. Obesity and diabetes.
- Nutrigenomics and personalized nutrition.
- Biomarkers of health.
- Functional foods. Health claims.
- Food security and quality.

Most relevant scientific articles

KONIECZNA J., SÁNCHEZ J., PALOU M., PICÓ C., PALOU A.. Blood cell transcriptomic-based early biomarkers of adverse programming effects of gestational calorie restriction and their reversibility by leptin supplementation. Scientific Reports. 2015;5.

PRIEGO T., SÁNCHEZ J., PICÓ C., AHRENS W., DE HENAUW S., KOURIDES Y. ET AL. TAS1R3 and UCN2 transcript levels in blood cells are associated with sugary and fatty food consumption in children. Journal of Clínical Endocrinology and Metabolism. 2015;100(9):3556-3564.

KONIECZNA J., PALOU M., SÁNCHEZ J., PICÓ C., PALOU A.. Leptin intake in suckling rats restores altered T3 levels and markers of adipose tissue sympathetic drive and function caused by gestational calorie restriction. International Journal of Obesity. 2015;39(6):959-966.

GARCÍA-RUIZ E., REYNÉS B., DÍAZ-RUA R., CERESI E., OLIVER P., PALOU A.. The intake of high-fat diets induces the acquisition of brown adipocyte gene expression features in white adipose tissue. International Journal of Obesity. 2015;39(11):1619-1629.

CASTRO H., POMAR C.A., PICÓ C., SÁNCHEZ J., PALOU A.. Cafeteria diet overfeeding in young male rats impairs the adaptive response to fed/fasted conditions and increases adiposity independent of body weight. International Journal of Obesity. 2015;39(3):430-437.

Highlights

During the year 2015, the group headed by Prof. Andreu Palou has participated in three European projects (BIOCLAIMS, I.FAMILY and DIABAT), in one project of the National Plan (EPIMILK, AGL2012-33692) and in 6 projects of private entities: a project of the Fundación Ramón Areces, other of Biosearch, and three of Alimentómica S.L., as well as in two research networks (MARCASALUD and IBERCAROT). It is worth noting the European project BIOCLAIMS ("BIOmarkers of Robustness of Metabolic Homeostasis for Nutrigenomics-derived Health CLAIMS Made on Food", FP7-244995, contract n. 244885), headed by Palou. As a remarkable result obtained in this project, the group has identified a nutrigenomic biomarker, in blood, able to predict since early ages predisposition to develop obesity (these results have been patented, PCT/ES2015/070216). In relation to the search of biomarkers of obesity and nutrition, the group has also participated in the project I.FAMILY ("Determinants of eating behaviour in European children, adolescents and their parents", Ref. 266044); among the most outstanding results obtained in 2015, blood biomarkers related to sugary and fatty food consumption in children have been described. Besides, as a result of the participation in the European project DIABAT ("Recruitment and activation of brown adipocytes as preventive and curative theraphy for type 2 diabetes", HEALTH-F2-2011-278373), the group has contributed to go in depth in the understanding of the effect of diet and food compounds on brown adipose tissue activation and in the remodeling of white to brown adipose tissue, which is of therapeutic interest to increase energy expenditure and combat obesity. Furthermore, the group has described the utility of gene expression analysis in blood cells as a tool to perform thermogenic studies with minimum invasiveness.

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Dieta mediterránea, Esteatosis y Riesgo Vascular

Programme: Nutrition / Neurocognition & environmental-biological factors

Lead Researcher: Pintó Sala, Xavier

Group Members

STAFF MEMBERS: de la Cruz Ballester, Elsa | Galera Cusí, Ana

ASSOCIATED MEMBERS: Corbella Inglés, Emili | Pujol Farriols, Ramon | Solanich Moreno, Xavier | Soler Sancho, Yolanda.

Main lines of research

- Clinical studies about the diagnosis and treatment of disorders of lipoprotein metabolism, including the degree of control of dyslipidemia and the related factors.
- Effect of an intensive intervention on lifestyle with a hipocaloric Mediterranean diet, physical activity and behavior therapy for the primary prevention of cardiovascular disease in patients with obesity and high cardiovascular risk.
- Influence of diet and the changes in body weight on changes in hepatic fat (steatosis) assessed by nuclear magnetic resonance (NMR) and biochemical parameters of liver inflammation (Esteatohepatitis). Assessing the relationship between changes in biomarkers of oxidative stress and inflammation, and changes in hepatic fat content and in the biochemical signs of hepatitis.
- Study of the relationship between changes in body weight and the variations in the parameters of platelet aggregation.
- Study variants of genes of lipid metabolism that may be related with the etiology of family and polygenic hypercholesterolemia and with severe hypertriglyceridemia.
- Study of the relationship between cardiovascular risk factors of Arterial and Venous Vascular Disease.
- Study the relationship between cardiovascular risk factors, diet and drug treatments on erectile function.
- Relationship between nutritional factors and lifestyle with plasma homocysteine concentrations.

Most relevant scientific articles

TOLEDO E., SALAS-SALVADO J., DONAT-VARGAS C., BUIL-COSIALES P., ESTRUCH R., ROS E. ET AL. Mediterranean diet and invasive breast cancer risk among women at high cardiovascular risk in the predimed trial a randomized clinical trial. JAMA Internal Medicine. 2015;175(11):1752-1760.

MERINO J., GUASCH-FERRE M., MARTÍNEZ-GONZÁLEZ M.A., CORELLA D., ESTRUCH R., FITO M. ET AL. Is complying with the recommendations of sodium intake beneficial for health in individuals at high cardiovascular risk? Findings from the PREDIMED study. American Journal of Clínical Nutrition. 2015;101(3):440-448.

JUANOLA-FALGARONA M., SALAS-SALVADO J., BUIL-COSIALES P., CORELLA D., ESTRUCH R., ROS E. ET AL. Dietary glycemic index and glycemic load are positively associated with risk of developing metabolic syndrome in middle-aged and elderly adults. Journal of the American Geriatrics Society. 2015;63(10):1991-2000.

VERSMISSEN J., OOSTERVEER D.M., YAZDANPANAH M., DEHGHAN A., HOLM H., ERDMAN J. ET AL. Identifying genetic risk variants for coronary heart disease in familial hypercholesterolemia: An extreme genetics approach. European Journal of Human Genetics. 2015;23(3):381-387.

DE LA SIERRA A., PINTO X., GUIJARRO C., MIRANDA J.L., CALLEJO D., CUERVO J. ET AL. Prevalence, Treatment, and Control of Hypercholesterolemia in High Cardiovascular Risk Patients: Evidences from a Systematic Literature Review in Spain. Advances in Therapy. 2015;32(10):944-961.

Highlights

About the research group on diet / nutrition and cardiovascular prevention, the more important results are:

- Analysis of data from the PREDIMED study: effects of Mediterranean diet on liver fat (steatosis) assessed by NMR. Study of the relationship involvement of oxidation and inflammation in the protective mechanisms of diet (manuscript in preparation); in cooperation with the group of IMIM we are preparing a manuscript in which the effect of the intervention on lipid metabolism and the role of lipid parameters on the incidence of events is analyzed. With the group of Dr. Fernández-Aranda from the Hospital de Bellvitge we are preparing a protocol to test the effect of statins on neurocognitive aspects (within the program of neurocognitive CIBER).
- Within the study PREDIMED plus, we are leading the project about hepatic fat content (steatosis) evaluated by MRI at baseline and after one year of follow-up in both treatment arms. In this sub-project it is planned to reach a sample of 60 patients and we already have included 57 patients.
- We have developed a clinical practice guideline on the treatment of disorders of lipid metabolism in diabetic patients that has been published in 2015 in the Spanish Journal of Cardiology. Our group has organized the13 Clinical Course lipidology and Cardiovascular Risk Factors in which more than 300 people attended. We have also coordinated two seminars on advanced lipidology and participated as an organizing committee in the XI symposium on hypertriglyceridemia on behalf of the Spanish Society of Arteriosclerosis.

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Nutrición y obesidad

Programme: Nutrition / Adipobiology / New Strategies and Biomarkers
Lead Researcher: Portillo Baqueda, María del Puy

Group Members

STAFF MEMBERS: Aguirre López, Leixuri.

ASSOCIATED MEMBERS: Arias Rueda, Noemi | Churruca Ortega, Itziar | Eseberri Barrace, Itziar | Fernández Quintela, Alfredo | Gómez Zorita, Saioa | Lasa Elgezua, Arrate | Macarulla Arenaza, María Teresa | Miranda Gómez, Jonatan | Rodríguez Rivera, Víctor Manuel | Simón Magro, Edurne.

Main lines of research

- Functional foods and obesity.
- Fuctional food and diabetes.
- Mediterranean diet and health.
- Childhood obesity.
- Epigenetic: obesity markers.
- Assessment of dietary habits and nutritional state of population.
- Design and validation of nutritional education programs.
- Assessment of gluten in food. Accredited laboratory.

Most relevant scientific articles

ETXEBERRIA U., ARIAS N., BOQUE N., MACARULLA M.T., PORTILLO M.P., MARTÍNEZ J.A. ET AL. Reshaping faecal gut microbiota composition by the intake of trans-resveratrol and quercetin in high-fat sucrose diet-fed rats. Journal of Nutritional Biochemistry. 2015;26(6):651-660.

GÓMEZ-ZORITA S., FERNÁNDEZ-QUINTELA A., AGUIRRE L., MACARULLA M.T., RIMANDO A.M., PORTILLO M.P.. Pterostilbene improves glycaemic control in rats fed an obesogenic diet: Involvement of skeletal muscle and liver. Food and Function. 2015;6(6):1968-1976.

ETXEBERRIA U., ARIAS N., BOQUE N., ROMO-HUALDE A., MACARULLA M.T., PORTILLO M.P. ET AL. Metabolic faecal fingerprinting of trans-resveratrol and quercetin following a high-fat sucrose dietary model using liquid chromatography coupled to high-resolution mass spectrometry. Food and Function. 2015;6(8):2758-2767.

ESEBERRI I., MIRANDA J., LASA A., CHURRUCA I., PORTILLO M.P.. Doses of quercetin in the range of serum concentrations exert delipidating effects in 3t3-l1 preadipocytes by acting on different stages of adipogenesis, but not in mature adipocytes. Oxidative Medicine and Cellular Longevity. 2015.

MIRANDA J, LASA A, AGUIRRE L, FERNÁNDEZ-QUINTELA A, MILTON I, PORTILLO MP. Potential application of non-flavonoid phenolics in diabetes: antiinflammatory effects. Curr Med Chem. 2015;22(1):112-31. Review.

Highlights

The main research line of our group "Nutrition and Obesity" is a preclinical one devoted to study the health benefits of biomolecules present in foodstuffs, which is supported by Plan Nacional and Basque Government grants. In 2015 we have worked in a project aimed to improving resveratrol effectiveness as an anti-obesity molecule, by means of its combination with quercetin, another polyphenol which reduces resveratrol metabolism, and thus increases its bioavailability. In this Project we have worked in collaboration with the team lead by Dr. Alfredo Martinez, which belongs to CIBER, in very up-dated topics such as, microbiota and metabolomics.

Also working in this research line, we have demonstrated that pterostilbene, a structural analogue of resveratrol which shows higher bioavailability, improves glycaemic control in animals fed an obesogenic diet. This study has been carried out in collaboration with USDA in USA.

In another international collaboration between Spanish groups (some of them belonging to CIBER) and French groups, we have found several beneficial effects of piceatannol, a resveratrol derivative. The results will be published in 2016.

Our group also performs activities for knowledge transference to society. We continue implementing a program devoted to increase fruit and vegetable consumption among child population by collaborating with the City Hall. It has been applied in Vitoria-Gasteiz in the frame of the City Nutritional Observatory.

Other remarkable transference activity is the publication of a Practical Guide for the management of type 2 Diabetes, written in collaboration with Infanta Luisa Hospital (Sevilla) and edited by the University of the Basque Country.

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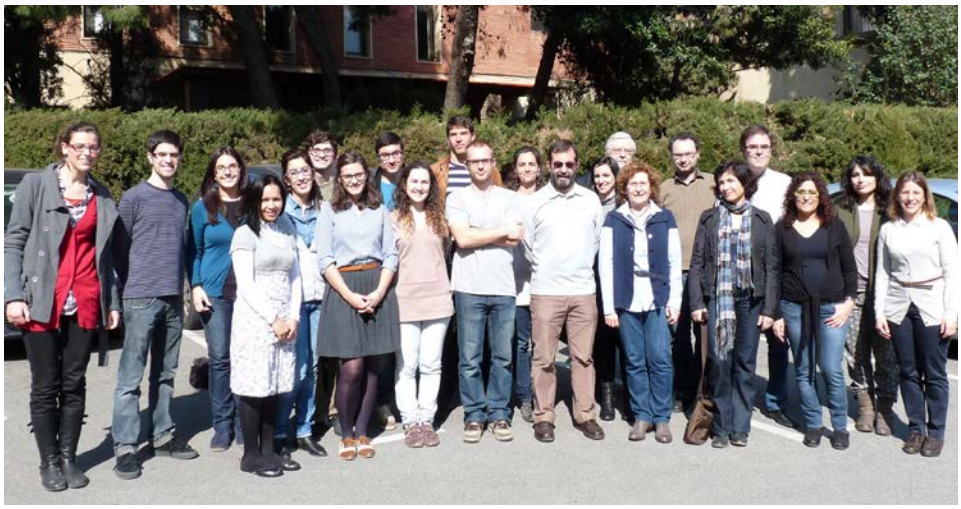
Regulación del Metabolismo en la Obesidad

Programme: Physiopathology of the Homeostasis of Body Weight
Lead Researcher: Remesar Betlloch, Xavier

Group Members



STAFF MEMBERS: Calderón Domínguez, María | Romero Romero, María Mar.

ASSOCIATED MEMBERS: Alemany Lamana, Mariano | Ariza Piquer, Javier | Calvo Márquez, Merce | Casals Farré, Nuria | Esteve Ráfols, Monserrat | Fernández López, José Antonio | García Gómez, Jorge | Grasa Martínez, Mar | Herrero Rodríguez, Laura | Ramírez Flores, Sara | Serra Cucurull, Dolores.

Main lines of research

- Determine how the excess fat in the diet influences the catabolism of amino acids and their role in inflammation. Analysis of urea cycle function i diferent tissues. Effects of high-energy diets.
- Role of protein binding corticosterone (CBG) in the first stage of inflammation to evaluate the mechanism by which hormone fit into the tissue and how can modulate the inflammatory response.
- Role of CPTI in the development of obesity-induced insulin resistance and type 2 diabetes. We study that enhancing fatty acid oxidation in liver, in white and brown adipose tissue can be new therapies against obesity.
- Study of the effect of overexpression of CPT1 in animal models prone to obesity prevention and treatment of obesity, it has been observed that in mice in which obesity is induced by fat diet and which has the CPT1A overexpressed exhibit a reversal of hyperinsulinemia, hyperglycemia and an almost complete reversal of hepatic steatosis accompanied by a slight decrease in weight of the animals.
- We study of the role of CPT1A and CPT1C in the hypothalamus in the control of food intake and energy expenditure.
- We study of C75 derivatives as potential drugs against obesity by their interaction with CPT1 at the hypothalamus.

Most relevant scientific articles

DEL MAR ROMERO M., SABATER D., FERNÁNDEZ-LÓPEZ J.A., REMESAR X., ALEMANY M.. Glycerol production from glucose and fructose by 3T3-L1 Cells: A mechanism of Adipocyte defense from excess substrate. PLoS ONE. 2015;10(10).

FADO R., SOTO D., MINANO-MOLINA A.J., POZO M., CARRASCO P., YEFIMENKO N. ET AL. Novel regulation of the synthesis of α-Amino-3-hydroxy-5-methyl-4-isoxazolepropionic Acid (ampa) receptor subunit glua1 by carnitine palmitoyltransferase 1C (CPT1C) in the Hippocampus. Journal of Biological Chemistry. 2015;290(42):25548-25560.

ARRIARAN S., AGNELLI S., REMESAR X., FERNÁNDEZ-LÓPEZ J.-A., ALEMANY M.. The urea cycle of rat white adipose tissue. RSC Advances. 2015;5(113):93403-93414.

HERRERO L., VALCARCEL L., DA SILVA C.A., ALBERT N., DIEZ-NOGUERA A., CAMBRAS T. ET AL. Altered circadian rhythm and metabolic gene profile in rats subjected to advanced light phase shifts. PLoS ONE. 2015;10(4).

PARDINA E., BAENA-FUSTEGUERAS J.A., FORT J.M., FERRER R., ROSSELL J., ESTEVE M. ET AL. Hepatic and visceral adipose tissue 11βHSD1 expressions are markers of body weight loss after bariatric surgery. Obesity. 2015;23(9):1856-1863.

Highlights

WE HAVE OBTAINED THESE PROJECTS:

- SAF2014-52223-C2-1-R: "Study of carnitine palmitoylltransferases in hypothalamus as potential targets for the control of food intake and obesity treatment. Funding 160.000 €. institution: Ministerio de Economia y Competitividad (2015-2017). PI: Dolors Serra.
- SAF2014-52223-C2-2-R "The role of carnitine palmitoyltranferase 1C as an acyl-CoA hypothalamic sensor and modulator of peripheral lipid metabolism. Funding: 125.000 € Institutiondad: Ministerio de Economia y Competitividad (2015-2017) . PI: Núria Casals.
- La Marató de TV3 (343/U/2014) "Searching new biomarkers and therapeutic targets related to cognitive deficits in early stages of Alzheimer's disease: role of AKAP79/150, CPT1C and SSAO/VAP-1 in ab-mediated AMPAR dysfunction". Funding:197.000 € (march 2015-march 2018). PI: José Rodríguez (UAB)/Nuria Casals.

Institution: Universitat de Barcelona · **Contact:** Facultad de Biología. Universitat de Barcelona
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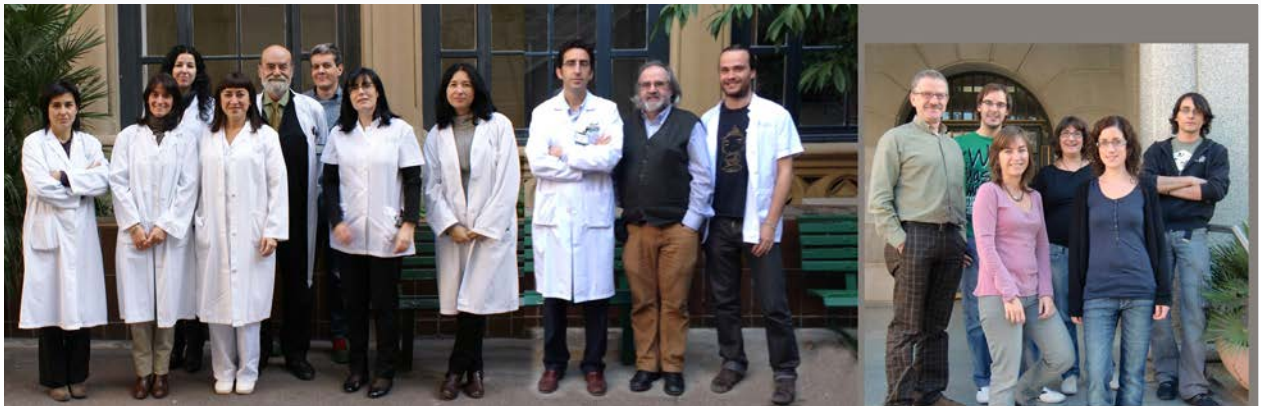
Grupo de Nutrition, Lípidos y Riesgo Cardiovascular

Programme: Nutrition

Lead Researcher: Ros Rahola, Emilio

Group Members



STAFF MEMBERS: Cofan Pujol, Monserrat | Sala Vila, Aleix.

ASSOCIATED MEMBERS: Alegret Jordà, Marta | Laguna Egea, Juan Carlos | Merlos Roca, Manuel | Núñez Lucas, Isabel | Ortega Martínez de Victoria, Emilio | Pérez Heras, Ana Mª | Roglans Ribas, Nuria | Sánchez Peñarroya, Rosa Mª.

Main lines of research

- Study of variants in genes of lipid metabolism that might illustrate the etiology of familial and polygenic hypercholesterolemia and severe hypertriglyceridemia.
- Carotid and femoral ultrasound examination, in particular. a) examination of the associations between preclinical atherosclerosis and classical and emergent risk factors and dietary biomarkers, such as polyunsaturated fatty acids in plasma lipid fractions and circulating phytosterols; b) preclinical atherosclerosis in the pre-diabetic stage compared with a matched control population, and its temporal evolution.
- Functionality of whole foods and dietary patterns: effects on the serum lipoprotein profile, blood pressure as assessed by 24-h ambulatory monitoring, insulin resistance, markers of cholesterol absorption and synthesis and vascular risk, and dietary biomarkers (blood polyunsaturated fatty acids, plasma carotenes and vitamin E, and urinary polyphenols).
- Specific projects within the PREDIMED study, for which the Group directed the nutritional intervention. The main projects deal with the effects of PREDIMED diets on: a) age-related cognitive decline alter intervention for 4 y in a subgroup of 450 participants; b) 5-y incidence of dementia in the whole cohort; c) consumption of alpha-linolenic acid and mortality in the whole cohort; d) fructose intake and mortality in the whole cohort; e) changes in carotid plaque by ultrasound and MRI after intervention for 2 y in an subgroup of 150 participants.
- Randomized controlled trial WAHA (WAlnuts for Healthy Aging): effects of a diet enriched with walnuts (15% of energy) for 2 y in comparison with a control diet on age-related cognitive decline and macular degeneration in 700 older persons. Other outcomes are 2-y changes in: brain structure and function by MRI, carotid atherosclerosis, body composition corporal, bone mineral density, 24-h ambulatory blood pressure, lipid profile and circulating inflammation markers, leukocyte telomere length, and miRNAs related to lipid metabolism.
- Cognitive function evaluated by neuropsychological tests and functional brain MRI in familial hypercholesterolemia compared to moderate hypercholesterolemia and normolipidemia.
- Cholesterol absorption and synthesis as assessed by determination of plasma non-cholesterol sterols by gas chromatography: quantification, genetic determi-

nants, effect on cardiovascular risk, and associations with lipid responses to plant sterols, statins, and ezetimibe.
- Influence of long-chain polyunsaturated fatty acids (n-3 from plant and marine sources) on carotid atherosclerosis assessed by ultrasound and MRI.
- Associations of fatty acids profiles in total blood, total plasma and phospholipid fractions with cardiometabolic risk factors and non-alcoholic fatty liver; genetic determinants of the blood omega-3 index; and fatty acid composition of lipid rafts and intracellular signal transduction.
- Investigation of receptors heterodimeric with RXR (PPAR, FXR, LXR, etc.) and other nuclear receptors participating in energy metabolism in liver, adipose, and skeletal muscle tissues and in macrophages.
- Experimental models of metabolic syndrome in fructose-fed rats and rodent models of senescence. Molecular characterization.

Most relevant scientific articles

KOOPAL C., RETTERSTOL K., SJOUKE B., HOVINGH G.K., ROS E., DE GRAAF J. ET AL. Vascular risk factors, vascular disease, lipids and lipid targets in patients with familial dysbetalipoproteinemia: A European cross-sectional study. Atherosclerosis. 2015;240(1):90-97.

SALA-VILA A., ESTRUCH R., ROS E.. New Insights into the Role of Nutrition in CVD Prevention. Current Cardiology Reports. 2015;17(5).

VALLS-PEDRET C., SALA-VILA A., SERRA-MIR M., CORELLA D., DE LA TORRE R., MARTÍNEZ-GONZÁLEZ M.A. ET AL. Mediterranean diet and age-related cognitive decline: A randomized clinical trial. JAMA Internal Medicine. 2015;175(7):1094-1103.

ROS E., LÓPEZ-MIRANDA J., PICO C., RUBIO M.A., BABIO N., SALA-VILA A. ET AL. Consensus on fats and oils in the diet of spanish adults; position paper of the Spanish Federation of Food, nutrition and dietetics societies. Nutrition Hospitalaria. 2015;32(2):435-477.

GUASCH-FERRE M., BABIO N., MARTÍNEZ-GONZÁLEZ M.A., CORELLA D., ROS E., MARTIN-PELAEZ S. ET AL. Dietary fat intake and risk of cardiovascular disease and all-cause mortality in a population at high risk of cardiovascular disease. American Journal of Clínical Nutrition. 2015;102(6):1563-1573.

Highlights

- Mining of PREDIMED data: effects of intervention on neurocognition (published 2015) and incidence of dementia (in preparation); preventive role of vegetable and marine n-3 fatty acids (published 2016); role of simple sugars on cancer incidence and mortality and total mortality (in preparation); and effects of the intervention on carotid plaques by MRI at 2 years (working report).
- The WAHA randomized clinical trial, a dual center study (Hospital Clínic Barcelona and Loma Linda University, California) assesses the 2-y effects of a diet supplemented with walnuts at 15% of energy vs. a control diet on age-related cognitive decline and macular degeneration in 700 volunteers aged 63 to 79 y. The recruitment and 2-year follow-up of 350 participants from our center was completed in December 2015. Results of specific projects are being elaborated.
- On the benefits of membrane enrichment in n-3 fatty acids: Cardiovascular - predictive value in progression of subclinical atherosclerosis and on 6-mo post-ischemic recovery of the myocardium in patients surviving an acute coronary syndrome (paper submitted). Neurodegenerative diseases – changes in brain and circulating lipids in relation to progression of Alzheimer's disease (elaboration of results). AIDS - effects of n-3 fatty acid incorporation into cultured lymphocytes on membrane raft organization and ensuing changes of HIV-1 infectivity (results in elaboration).
- Editing of novel clinical guidelines on fats and oils in the Spanish diet.
- Implementation and supervision of the PREDIMED-PLUS study.
- Incorporation to writing group for clinical guidelines on laboratory medicine of lipids of the European Atherosclerosis Society.
- Data sharing on dysbetalipoproteinemia (published 2015).

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Unidad de Nutrition Humana y Obesidad

Programme: Nutrition

Lead Researcher: Salas Salvadó, Jordi

Group Members

STAFF MEMBERS: Ferreira Pego, Cintia Sofía | Mestres Pedret, Gloria.

ASSOCIATED MEMBERS: Babio Sánchez, Nancy Elvira | Balanza Roure, Rafael | Basora Gallisa, Josep | Becerra Tomás, Nerea | Bullo Bonet, Mónica | Cavallé Busquets, Pere | Díaz López, Andrés | Fernández Ballart, Joan Domènech | García Minguillan del Campo, Carlos Jesús | Guasch Ferre, Marta | Hernández Alonso, Pablo | Ibarrola Jurado, Nuria | Juanola Falgarona, Martí | Munné i Cuevas, Carles | Murphy, Michelle | Quílez Grau, Joan.

Main lines of research

- Mediterranean diet and cardiovascular disease.
- Public health and epidemiology in relation to nutrition and nutrition related diseases.
- Clinical trials to assess the effect of diet and diet components on health or disease and its mechanisms.
- Evaluation of the relation between obesity, inflammation and co morbidities associated to obesity.
- Effect of the interactions of genetics and nutrition on health.
- Influence of the nutritional status on fertility and the effect on pregnancy on the pregnant and its offspring.
- Metabolic and biochemical biomarkers of diabetes and cardiovascular disease.

Most relevant scientific articles

MERINO J., GUASCH-FERRE M., MARTÍNEZ-GONZÁLEZ M.A., CORELLA D., ESTRUCH R., FITO M. ET AL. Is complying with the recommendations of sodium intake beneficial for health in individuals at high cardiovascular risk? Findings from the PREDIMED study. American Journal of Clínical Nutrition. 2015;101(3):440-448.

VALLS-PEDRET C., SALA-VILA A., SERRA-MIR M., CORELLA D., DE LA TORRE R., MARTÍNEZ-GONZÁLEZ M.A. ET AL. Mediterranean diet and age-related cognitive decline: A randomized clinical trial. JAMA Internal Medicine. 2015;175(7):1094-1103.

JUANOLA-FALGARONA M., SALAS-SALVADO J., BUIL-COSIALES P., CORELLA D., ESTRUCH R., ROS E. ET AL. Dietary glycemic index and glycemic load are positively associated with risk of developing metabolic syndrome in middle-aged and elderly adults. Journal of the American Geriatrics Society. 2015;63(10):1991-2000.

GUASCH-FERRE M., BABIO N., MARTÍNEZ-GONZÁLEZ M.A., CORELLA D., ROS E., MARTIN-PELAEZ S. ET AL. Dietary fat intake and risk of cardiovascular disease and all-cause mortality in a population at high risk of cardiovascular disease. American Journal of Clínical Nutrition. 2015;102(6):1563-1573.

DÍAZ-LÓPEZ A, BABIO N, MARTÍNEZ-GONZÁLEZ MA, CORELLA D, AMOR AJ, FITÓ M ET AL. Mediterranean Diet, Retinopathy, Nephropathy, and Microvascular Diabetes Complications: A Post Hoc Analysis of a Randomized Trial.Diabetes care. 2015;38(11):2134-41.

Highlights

Over the year 2015, the research group has focused in coordinating and conducting the PREDIMED PLUS study. We have randomized 270 participants, of which 130 have been already followed for one year after randomization. Also, several aspects have been coordinated in relation to the study intervention and the clinical data collection, while leading a national fund proposal destined to all PREDIMED PLUS groups. Regarding the NIH project for Diabetes Predictors, all the selected samples were identified in order to initiate the biochemical determinations at the beginning of 2016.

Similarly, the group has made ready the whole methodological frame necessary to initiate the European study SATIN in January 2016, of which the short-term urinary metabolites have been also analyzed.

With the PREDIMED study we demonstrated the relationship between dietary fats and cardiovascular risk, glycemic index and metabolic syndrome, and dairy consumption and type 2 diabetes risk, among others. Moreover, the results of the effects of a Mediterranean diet on the prevention of microvascular complications in diabetes was successfully published with a high media impact.

Recently, a collaborative project founded by Fundació La Marató from TV3-channel was obtained by our research group. This project aims at describing new predictors for coronary heart disease and its modulation through the diet, within the frame of the PREDIMED study. Furthermore, the International Nut and Dried Fruit Foundation have founded a new clinical trial that evaluates the effect of nuts consumption on fertility. The practical work in this study started in November 2015 with the inclusion of the first 10 participants.

Institution: Fundación Institut d'Investigació Sanitària Pere Virgili · **Contact:** Universitat Rovira i Virgili
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Nutrition y Toxicología

Programme: Nutrition / Complications of Obesity / Neurocognición y Factores Ambientales-Biológicos

Lead Researcher: Serra Majem, Lluis

Group Members

STAFF MEMBERS: Álvarez Pérez, Jacqueline | Díaz Benítez, Elena María.

ASSOCIATED MEMBERS: Álvarez León, Eva Elisa | Aranceta Bartrina, Javier | Bautista Castaño, Inmaculada | Domínguez Boada, Luis Mª | Henríquez Sánchez, Patricia | Nissensohn, Mariela | Peña Quintana, Luis | Pérez Luzardo, Octavio Luis | Ribas Barba, Mª Lourdes | Román Viñas, Blanca | Ruano Rodríguez, Cristina | Sánchez Villegas, Almudena.

Main lines of research

- Assessment of nutritional status in different populations in the context of Public Health Nutrition. Nutritional adequacy methodology in populations and individuals and its repercussions on health.
- Epidemiology and obesity determinants in different populations: children, adolescents and pregnant women.
- Mediterranean diet, chronic diseases and mental disorder. SUN and PREDIMED studies. Effect of an intensive lifestyle intervention with an energy-restricted Mediterranean diet, increased physical activity, and behavioural treatment on the primary prevention of cardiovascular diseases: the PREDIMED-PLUS randomized clinical trial.
- PLANT food supplements: Levels of Intake, Benefit and Risk Assessment: PLANTLIBRA
- Role of Zinc in neurodevelopment and growth. EURRECA.
- European Network of Excellence developing methodologies to standardise the process of setting micronutrient recommendations. EURRECA NoE
- Incentives and new technologies in the promotion of Mediterranean Diet and physical activity (Credits4Health).
- Interaction of the genetic load with the metabolism of selected micronutrients and with the load of POPs (Persistent Organic Pollutants),and the development of the obesity and other chronic diseases.
- Body composition estimated by bioelectrical impedance and Mediterranean diet.
- Study of the dietary glycaemic index and dietary glycaemic load in the Mediterranean Diet.
- Quality of life and Mediterranean diet.
- Effect of the Mediterranean diet on the development of pregnancy and intrauterine growth.
- Hydration and health in Europe: validation of questionnaires for beverage intake.

Most relevant scientific articles

HENRIQUEZ-SÁNCHEZ P., SÁNCHEZ-VILLEGAS A., RUANO-RODRÍGUEZ C., GEA A., LAMUELA-RAVENTOS R.M., ESTRUCH R. ET AL. Dietary total antioxidant capacity and mortality in the PREDIMED study. European Journal of Nutrition. 2015.

SERRA-MAJEM L., BAUTISTA-CASTANO I.. Relationship between bread and obesity. British Journal of Nutrition. 2015;113(S2):S29-S35.

RUANO-RODRÍGUEZ C., SERRA-MAJEM L., DUBOIS D.. Assessing the impact of dietary habits on health-related quality of life requires contextual measurement tools. Frontiers in Pharmacology. 2015;6(MAY).

SÁNCHEZ-VILLEGAS A., HENRIQUEZ-SÁNCHEZ P., RUIZ-CANELA M., LAHORTIGA F., MOLERO P., TOLEDO E. ET AL. A longitudinal analysis of diet quality scores and the risk of incident depression in the SUN Project. BMC Medicine. 2015;13(1).

TOLEDO E., SALAS-SALVADO J., DONAT-VARGAS C., BUIL-COSIALES P., ESTRUCH R., ROS E. ET AL. Mediterranean diet and invasive breast cancer risk among women at high cardiovascular risk in the predimed trial a randomized clinical trial. JAMA Internal Medicine. 2015;175(11):1752-1760.

Highlights

During 2015 a total of 55 indexed articles with a cumulated impact factor of 216 were published and five Doctoral Thesis has been defended.

In 2014 the PREDIMED PLUS study was launched in the Canary Island node, PI13 / 00272. During 2015 we have conducted the recruitment period. We have captured a total of 279 participants of which there are 150 randomized patients at the end of 2015. In addition, our node is leading with Reus the validation of a beverage and water consumption questionnaire in a subsample of 120 participants.

At the European level we lead the project ""Beverage intake among Healthy adults in Europe", financed by the European Hydration Institute with the participation of Italy, France, Greece and Spain in order to assess the total water consumption at a European level and its relationship with caloric intake. We also were partners in the CREDITS4HEALT Project: "Credits-based, people-centric approach for the adoption of healthy life-styles and balance Mediterranean Diet in the frame of social participation and innovation for health promotion" funding by the European Comission: Fp7. The project started with the aim to find and validate an effective system that encourages people to adopt a healthy lifestyle. Our contribution in the project was defining and coordinating the nutrition and physical activity intervention guidelines.

Finally, the Nutrition research group is a member of Research Institute of Biomedical and Health Sciences (IUIBS) at the University of Las Palmas, which director is Lluis Serra-Majem.In 2015 a budget of 1.5 million euros has been executed in infrastructure provision for the Institute UNLP10-3E -2187 (PI Lluis Serra).

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Obesidad, Neuroendocrinología y Función Reproductora (UCO)

Programme: Physiopathology of the Homeostasis of Body Weight / Complications of Obesity / Adipobiology

Lead Researcher: Tena Sempere, Manuel

Group Members

STAFF MEMBERS: Barroso Romero, María Alexia | Molero Murillo, Laura | Rivero Cortés, Esther | Rodríguez Sánchez, Ana Belén

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Main lines of research

Our group implements integral analyses of various aspects of the pathophysiology of obesity and its complications, by the use of state-of-the-art techniques and cellular and animal models, as well as human samples. Our major research lines are:

- **Adipobiology.** We conduct proteomic analyses directed to the identification of novel molecular targets that are altered in the adipose tissue in obesity, with special interest in the characterization of the differential proteomic profile of the various fat depots and their different components (mature adipocytes vs. stromal-vascular fraction). These studies aim also at the identification of novel molecular markers of adipocyte differentiation and insulin resistance.
- **Adipose hormone signaling.** We aim to characterize the receptors and signaling cascades of key adipokines, with special attention to the characterization of the receptors and intracellular signaling of adiponectin.
- **Neuroendocrinology of metabolic alterations.** We aim to characterize the endocrine and metabolic alterations of suitable preclinical models of deregulated energy balance, with special attention to the analysis of the contribution of somatostatin/cortistatin, ghrelin, GH/IGF-1, insulin, their receptors and related molecules, involved in the neuro-hormonal mechanisms responsible for the control of food intake, glucose homeostasis and metabolism.

- **Puberty, reproduction and obesity.** We aim to characterize the alterations of puberty and reproductive function in conditions of energy imbalance, with special attention to the impact of obesity on puberty onset, gonadotropic function and fertility. Our interest is also covering the pathophysiology of early onset obesity and its link with pubertal disorders, addressed by the use of suitable preclinical models.
- **Gonadal factors and obesity.** We study the metabolic alterations associated to gonadal and reproductive dysfunction, with special attention to the analysis of the influence of nutritional and gonadal factors in the generation of obesity, as studies by the use of preclinical models of sequential obesogenic insults.
- **Obesity and cancer.** We aim to evaluate the alterations induced by obesity in the generation and progression of hormone-dependent cancers, such as breast, ovarian and prostate cancers, using both human samples and suitable animal models, with special attention to the analysis of neuroendocrine metabolic and inflammatory markers.

Most relevant scientific articles

DIAZ-RUIZ A., GUZMAN-RUIZ R., MORENO N.R., GARCÍA-RIOS A., DELGADO-CASADO N., MEMBRIVES A. ET AL. Proteasome Dysfunction Associated to Oxidative Stress and Proteotoxicity in Adipocytes Compromises Insulin Sensitivity in Human Obesity. Antioxidants and Redox Signaling. 2015;23(7):597-612.

LUQUE R.M., SAMPEDRO-NUNEZ M., GAHETE M.D., RAMOS-LEVI A., IBANEZ-COSTA A., RIVERO-CORTES E. ET AL. In1-ghrelin, a splice variant of ghrelin gene, is associated with the evolution and aggressiveness of human neuroendocrine tumors: Evidence from clinical, cellular and molecular parameters. Oncotarget. 2015;6(23):19619-19633.

IBANEZ-COSTA A., GAHETE M.D., RIVERO-CORTES E., RINCON-FERNÁNDEZ D., NELSON R., BELTRAN M. ET AL. In1-ghrelin splicing variant is overexpressed in pituitary adenomas and increases their aggressive features. Scientific Reports. 2015;5.

SÁNCHEZ-GARRIDO M.A., RUIZ-PINO F., MANFREDI-LOZANO M., LEON S., HERAS V., CASTELLANO J.M. ET AL. Metabolic and gonadotropic impact of sequential obesogenic insults in the female: Influence of the loss of ovarian secretion. Endocrinology. 2015;156(8):2984-2998.

LÓPEZ M., TENA-SEMPERE M.. Estrogens and the control of energy homeostasis: A brain perspective. Trends in Endocrinology and Metabolism. 2015;26(8):411-421.

Highlights

Our activities are centered in the scientific programs of Adipobiology, Complications of Obesity & Child Obesity, and Pathophysiology of Body Weight Homeostasis. In this context, our contributions have included, among others, the characterization of adipocyte dysfunction in obesity, an area in which we have provided new data about proteasome deregulation in the adipose tissue linked to insulin resistance in obese individuals. Our group has also made substantial contributions in the area of obesity and cancer, with special attention to the definition of the prognostic and pathophysiological value of variants of the metabolic hormone, ghrelin (in detail, In1-Ghrelin) in neuroendocrine tumors, where this variant can predict evolution and aggressiveness. In addition, data from our group in preclinical models of obesity have contributed to decipher the central mechanisms of the state of hypogonadism linked to obesity, by the identification of the putative role of the neuropeptide system, Kiss1/kisspeptin, in this phenomenon. On the other hand, as reflection of the important contributions of our group in the characterization of the interplay between energy homeostasis, metabolism and gonadal factors, we have contributed an authoritative review on the central mechanisms whereby estrogens control body weight (in collaboration with M. Lopez, USC) and have participated in a very recent work delineating novel epigenetic mechanisms for the central control of puberty, which might help to define the molecular basis for deregulation of puberty in conditions such as obesity.

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Investigación y Desarrollo en Obesidad y Enfermedades Asociadas

Programme: Complications of Obesity

Lead Researcher: Tinahones Madueño, Francisco

Group Members

STAFF MEMBERS: Clemente Postigo, Mª Mercedes | Coin Aránguez, Leticia | Martín Núñez, Gracia Mª | Morcillo Espina, Sonsoles | Oliva Olivera, Wilfredo | Picón César, Inmaculada Concepción

ASSOCIATED MEMBERS: Alcaide Torres, Juan | Barbarroja Puerto, Nuria | Bernal López, Mª Rosa | Cardona Díaz, Fernando | Castellano Castillo, Daniel | El Bekay, Rajaa | Fernández García, Diego | Fernández García, José Carlos | García Almeida, José Manuel | García Fuentes, Eduardo | Garrido Sánchez, Lourdes | Gómez Huelgas, Ricardo | López Siguero, Juan Pedro | Macías González, Manuel | Manchas Doblas, Isabel | Moreno Indias, Isabel | Queipo Ortuño, Mª Isabel | Roca Rodríguez, Mª del Mar

Main lines of research

- **Obesity and related diseases.** Our group is studying the relationship between obesity and its related metabolic diseases. We try to elucidate the mechanisms that protect some particular obese individuals who do not develop metabolic diseases or do it lately. Within these related diseases, we are focused on diabetes, postprandial lipidemia and cancer.
- **Adipose tissue biology.** Our group is studying the expansion capacity of the adipose tissue and its relationship with insulin resistance. Thus, we are studying the neogenic capacity of the mesenchymal cells from adipose tissue, the necrosis predisposition, autophagy and apoptosis as well as the pro-fibrotic capacity of the tissue, relating these factors to metabolic pathologies. Moreover, the group is studying lipogenic and angiogenic capacities of the different factors that modulate the expansion capacity of the adipose tissue and its relationship with the metabolic diseases.
- **Study of the gut microbiota and related diseases**. We are studying the bacterial profiles of the gut microflora within different pathologic situations in order to establish its role in their origins and developments. Moreover, we are also studying the microbiota changes that interventions with polyphenols cause and the changes produced by the radiotherapy in oncologic patients.
- **Study of the epigenetic profiles according to their relationships with obesity-diabetes and cancer-obesity.** We are studying the epigenetic modifications of the genes implicated in the molecular mechanisms of expression repression and of the transcription factors implicated in obe-

sity and insulin resistance, associated to the development of tumors in humans.

- **PREDIMED+ Study.** In this line we are focused on the study of a Mediterranean diet intervention with olive oil and nuts (pistachios and almonds), in order to prevent the cardiovascular disease in overweight/obese metabolic syndrome patients.

Most relevant scientific articles

ROCA-RODRÍGUEZ M.M., BEKAY R.E., GARRIDO-SÁNCHEZ L., GÓMEZ-SERRANO M., COIN-ARAGUEZ L., OLIVA-OLIVERA W. ET AL. Parathyroid hormone-related protein, human adipose-derived stem cells adipogenic capacity and healthy obesity. Journal of Clínical Endocrinology and Metabolism. 2015;100(6):E826-E835.

CLEMENTE-POSTIGO M., ROCA-RODRÍGUEZ M.D.M., CAMARGO A., OCANA-WILHELMI L., CARDONA F., TINAHONES F.J.. Lipopolysaccharide and lipopolysaccharide-binding protein levels and their relationship to early metabolic improvement after bariatric surgery. Surgery for Obesity and Related Diseases. 2015;11(4):933-939.

BARBARROJA N, RODRÍGUEZ-CUENCA S, NYGREN H, CAMARGO A, PIRRACO A, RELAT J ET AL. Increased dihydroceramide/ceramide ratio mediated by defective expression of degs1 impairs adipocyte differentiation and function.Diabetes. 2015;.

MORENO-INDIAS I, TORRES M, MONTSERRAT JM, SÁNCHEZ-ALCOHOLADO L, CARDONA F, TINAHONES FJ ET AL. Intermittent hypoxia alters gut microbiota diversity in a mouse model of sleep apnoea.The European respiratory journal. 2015.

OLIVA-OLIVERA W., GEA A.L., LHAMYANI S., COIN-ARAGUEZ L., TORRES J.A., BERNAL-LÓPEZ M.R. ET AL. Differences in the osteogenic differentiation capacity of omental adipose-derived stem cells in obese patients with and without metabolic syndrome. Endocrinology. 2015;156(12):4492-4501.

Highlights

In this year (2015), we have been granted with three new national public grants entitled: "Epigenetic modifications and microbiota in the genesis of adipose tissue dysfunction and insulin resistance (PI15/01114)", "Influence of gut microbiota in the toxicity and response to the radio-chemotherapy pre-surgery in locally advanced rectal cancer patients (PI15/00256)" and "Epigenetic changes in the evolution of the metabolically healthy obese patients. Searching for new biomarkers. Prospective and interventional studies (PI15/01350)", together with the other 15 grants of previous calls (one European, 9 nationals and 5 regionals grants).

We have applied for two new patents "Identification method of individuals prone to suffer diabetes and other metabolic diseases" (P201531945) and "Compositions for the treatment of obesity, metabolic syndrome and related diseases" (P201531946).

We have participated in the consensus guide entitled "Diagnosis and treatment of iron deficiency, with or without anemia, before and after bariatric surgery", published in the journal of the Spanish Society of Endocrinology.

On the other hand, we are developing 25 clinical trials in phase II and phase III. In some of which we are included in the Steering Committee of their development.

We are participating in two European actions of Horizon 2020: Associate member in the project titled: "Health and Nutrition Biomarkers, JPI-HDHL-BioNH (EU-FOODBALL)" and Member of working group in the COST Action FA 1403, POSITIVe: "Interindividual variation in response to consumption of plant food bioactives and determinants involved".

As the most important results, we highlight the discovery of new molecules that regulate the adipose tissue function and the acquisition of solid data about the effect of the gut microbiota in the metabolic disease. These results have been published in high profile journals and hold a high number of citations. Moreover, many of these works have been the result of collaborative studies.

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Grupo de Nutrition, Ejercicio, Riesgo Cardiovascular, Obesidad y Estrés oxidativo (NUTECOX)

Programme: Nutrition / New Strategies and Biomarkers
Lead Researcher: Tur Marí, Josep Antoni

Group Members

STAFF MEMBERS: Bibiloni Esteva, Maria del Mar

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Main lines of research

- Characterization and monitoring of the dietary pattern of the population, the prevalence of obesity and its comorbidities.
- Longitudinal intervention study of the effect of the Mediterranean diet on cardiovascular health (PREDIMED).
- Evaluation of the effect of physical activity on health and quality of life.
- Search of strategies to enhance antioxidant defenses.
- Functional food and sports performance.

Most relevant scientific articles

HERRANZ-LÓPEZ M., BARRAJON-CATALAN E., SEGURA-CARRETERO A., MENENDEZ J.A., JOVEN J., MICOL V.. Lemon verbena (Lippia citriodora) polyphenols alleviate obesity-related disturbances in hypertrophic adipocytes through AMPK-dependent mechanisms. Phytomedicine. 2015;22(6):605-614.

JIMÉNEZ-MONREAL A.M., ANTONIA MURCIA M., GÓMEZ-MURCIA V., DEL MAR BIBILONI M., PONS A., TUR J.A. ET AL. Anthropometric and quality-of-life parameters in acute intermittent porphyria patients. Medicine (United States). 2015;94(30).

DEL MAR BIBILONI M., TUR J.A., MORANDI A., TOMMASI M., TOMASSELLI F., MAFFEIS C.. Protein intake as a risk factor of overweight/obesity in 8-to 12-year-old children. Medicine (United States). 2015;94(52).

BIBILONI M.D.M., SALAS R., NOVELO H.I., VILLARREAL J.Z., SUREDA A., TUR J.A.. Serum lipid levels and dyslipidaemia prevalence among 2-10 year-old northern mexican children. PLoS ONE. 2015;10(3).

BORRÁS-LINARES I, PÉREZ-SÁNCHEZ A, LOZANO-SÁNCHEZ J, BARRAJÓN-CATALÁN E, ARRÁEZ-ROMÁN D, CIFUENTES A ET AL. A bioguided identification of the active compounds that contribute to the antiproliferative/cytotoxic effects of rosemary extract on colon cancer cells.Food and chemical toxicology : an international journal published for the British Industrial Biological Research Association. 2015;80:215-22.

Highlights

The research project no. PI11/01791 has ended this year and preliminary results have been described: (1) physical activity =1100 MET/min/wk in men and =350 MET/min/wk in women is the cut-off for defining active subjects; (2) active subjects showed higher levels of creatinine, index urea/creatinine, HDL-cholesterol, potassium, free T4 and serum folic acid and lower levels of triglycerides, VLDL-cholesterol, iron and TSH and lower WBC and neutrophils; (3) the liquid intake was higher in the active group, but decreased with age; (4) active women showed higher accumulated levels of calcium, chromium, iron and zinc, but lower mercury than inactive peers. The research project no. PI14/00636 (PREDIMED+DM) has started: a longitudinal intervention study of the effect of the Mediterranean diet on cardiovascular health (PREDIMED PLUS) and evaluation of the effect of physical activity on physical performance. Collaborating with the University of Verona (Italy) we have described a positive relationship between energy intake from proteins and overweight/obesity status in children (8-12 years old). Collaborating with the Autonomous University of Nuevo Leon we have described the prevalence of dyslipidaemia and its components in children aged 2-10 years in Northern Mexico. The experimental work for a patent has also been performed along 2015 (date of application: January 2016). Dr. Josep A. Tur was also appointed to the Scientific Committee of the Spanish Agency for the Consumer Affairs, Food Safety and Nutrition (AECOSAN), collaborating in 7 technical reports in 2015.

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Biología Molecular y Regulación Génica del Tejido Adiposo y sus Patologías

Programme: Physiopathology of the Homeostasis of Body Weight / Adipobiology / Complications of Obesity

Lead Researcher: Villarroya Gombau, Francesc

Group Members

STAFF MEMBERS: Cereijo Téllez, Rubén | Gavalda Navarro, Aleix | Villarroya Terrade, Joan.

ASSOCIATED MEMBERS: Amat Ferrer, Ramon | Cairo Calzada, Monserrat | Giralt Coll, Albert | Giralt Oms, Marta | Iglesias Coll, María del Rosario | Mampel Astals, Teresa | Navarro Reglero, Isis | Planavila Porta, Ana | Redondo Angulo, Ibon | Ribas Aulinas, Francesc | Viñas Folch, Octavio.

Main lines of research

Our research group specializes in the study of the molecular and physiological basis that controls energy metabolism, and how this relates to human pathologies. We study the molecular mechanisms of adipocyte gene control, muscle and hepatic differentiation in relation to metabolism as well as fat functionality. Also, new metabolic and endocrine functions of cells, tissues and organs, and its control by hormones and nutrients are characterized. This involves the development of models at the sub-cellular, cellular and animal levels, and the study of biological material from patients with obesity and other metabolic diseases.

Most relevant scientific articles

GAVALDA-NAVARRO A., HONDARES E., GIRALT M., MAMPEL T., IGLESIAS R., VILLARROYA F.. Fibroblast growth factor 21 in breast milk controls neonatal intestine function. Scientific Reports. 2015;5.

GALLEGO-ESCUREDO J.M., GÓMEZ-AMBROSI J., CATALAN V., DOMINGO P., GIRALT M., FRUHBECK G. ET AL. Opposite alterations in FGF21 and FGF19 levels and disturbed expression of the receptor machinery for endocrine FGFs in obese patients. International Journal of Obesity. 2015;39(1):121-129.

VILLARROYA F., GIRALT M.. The beneficial effects of brown fat transplantation: Further evidence of an endocrine role of brown adipose tissue. Endocrinology. 2015;156(7):2368-2370.

SÁNCHEZ-INFANTES D, GALLEGO-ESCUREDO JM, DÍAZ M, ARAGONÉS G, SEBASTIANI G, LÓPEZ-BERMEJO A ET AL. Circulating FGF19 and FGF21 surge in early infancy from infra- to supra-adult concentrations.International journal of obesity (2005). 2015.

GIRALT M., GAVALDA-NAVARRO A., VILLARROYA F.. Fibroblast growth factor-21, energy balance and obesity. Molecular and Cellular Endocrinology. 2015;418:66-73.

Highlights

In 2015 the group has obtained several research projects funded via competitive calls from national agencies (Biomedicine MINECO; FIS-ISCIII) as well as transfer projects with private companies (Lucta, Lilly Portugal) ifor research on CIBERobn subjects. A. Planavila,a researcher in our group, has obtained a project from the prestigious Marató TV3 agency. The PI of group presented research results at various national and international conferences to which he has been invited (Keystone Meeting USA; European Congress on Obesity in Prague, Congress SEEDO in Malaga, European Congress of Pediatric Endocrinology, Barcelona). Training (PhD) and dissemination (contributions to various media and television) tasks have been developed. All this is available on the group's website www.ub.edu/tam. The PI of our grroup has received in 2015 the prestigious ICREA Academy Award by Generalitat de Catalunya for the preferential dedication to research.

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