

A blue-tinted photograph of a microscope in a laboratory setting. The microscope is the central focus, with its objective lenses and eyepiece visible. The background is slightly blurred, showing other laboratory equipment. A large, semi-transparent dark grey circle is overlaid on the left side of the image, containing the text 'Annual Report 2013'.

Annual Report 2013



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1

Organization

Introduction

The fundamental goal of the Centro de Investigación Biomédica en Red-Fisiopatología de la Obesidad y Nutrición (CIBERObn) is to find answers and solutions that allow controlling obesity and associated pathologies and improving people's quality of life through nutrition study.

The Centre collaborates with basic and clinical research groups, and the challenge to its activity is to find the causes and mechanisms that condition the development of obesity and other eating behaviour disorders. The purpose is to detect and deal with the main therapeutic targets that allow controlling and containing diseases derived from being overweight, a condition that is considered today as the epidemic of the 21st century.

Another goal of the Centre is to prevent widespread diseases through suitable diet and lifestyle changes.

Interaction with healthcare professionals, the food and pharmaceutical industry and patients is key in carrying out this clearly translational research for scientific progress to reach the parties involved as well as to gather their proposals and know their needs.

In recent years, obesity has stopped being an exclusively aesthetic problem and has crossed the health barrier, as it is now an authentic worldwide epidemic requiring enormous human, technical and financial resources to control it. Despite the institution of a preventive and therapeutic strategy by the administrative medical-scientific authorities, far from curbing the problem, obesity is dangerously on the rise. Its proliferation in society has reached a point where specialists are now calling it "globesity", a kind of overweight globalization, regardless of being a developed or underdeveloped country. Obesity in Spain affects between 23 and 28% of the adult population.

Recent epidemiological studies show that a high percentage of people have some type of pathology associated with excess weight, reaching figures exceeding 500 million people around the world. This figure is even more alarming when dealing with childhood obesity data. These nutritional disorders lead to a series of ailments associated with excess weight, some of which are chronic, such as type 2 diabetes, heart diseases, arterial hypertension and even some types of cancer.

Obesity has also considerably affected children as shown in studies conducted in developed countries such as the United States and some European countries. The number of obese children has multiplied primarily due to changes in eating habits, especially in relation to fat consumption, and a considerable drop in physical activity.

Anti-obesity treatments continue to offer unsatisfactory results due occasionally to mistaken strategies and the poor use of therapeutic resources that are available and on hand.

According to World Health Organization (WHO) estimates, 41 of the 64 million people who will die in 2015 will die from chronic diseases. Pathologies associated with obesity, such as diabetes, hypertension, cardiovascular diseases or metabolic syndrome will take up 80% of all healthcare expenditure in the next 10 years.

As a result and due to the extremely high economic costs of the number of pathologies associated with obesity for the Public Health Systems, the problem must be stopped in order to control its side effects. An inter- and multi-disciplinary global networking structure of professionals who help fight this worldwide epidemic is needed. The team would have to consist of specialists from different fields, ranging from primary care physicians, endocrinologists, nutritionists, psychologists, physical education teachers or political leaders.

Obesity is an individual and public chronic health issue that affects a considerable number of people worldwide. It is the responsibility of all the social agents involved to stop its expansion and to promote and maintain healthy life habits in order to reverse the situation

Besides genetic factors, food-related cultural and environmental factors are highly relevant in the development of obesity. In fact, a change in conventional eating patterns can be seen today in Spain moving away from the Mediterranean diet, which has a well-known beneficial effect on the prevention of cardiovascular disease, to a diet with a higher animal fat intake. This is causing an increase in cholesterol and cardiovascular risk levels at an increasingly younger age. Another factor determining obesity is changes in life habits and sedentary lifestyle, including physical exercise.

This is why it is so important to study nutrition and the changes to the advantages of the local "Mediterranean diet" as a key factor in cardiovascular prevention and in being healthy.

One of our groups published PREDIMED study results in the New England Journal of Medicine, the most widespread journal in the medical field, and generated a considerable scientific and social impact. The publication is the first documented evidence that components of the Mediterranean diet, such as olive oil or dried fruits and nuts, reduce cardiovascular mortality. Curiously, and despite the few months that have passed since publication, the paper was the most read and most mentioned in the journal from among about 9000 published papers.

Therefore, CIBER- Obesity and Nutritional Physiopathology will conduct research (basic, clinical, epidemiological and health services research) and technological development activities, in relation to the following:

- **Obesity, nutrition and physical activity.**
- **Genetics of obesity.**
- **Body weight homeostasis regulating factors.**
- **Intracellular signaling in obesity.**
- **Mediterranean diet and prevention of metabolic disorders.**
- **Physiopathological factors in nutrition. Epidemiology of obesity.**
- **Childhood obesity and effect of gender on obesity.**

Mission

CIBERObn's mission is to promote the understanding of mechanisms contributing to the development of obesity in order to reduce its occurrence and prevalence as well as its complications, in addition to nutrition-related diseases.

Through leadership in translational biomedical research, CIBERObn integrates basic, clinical, epidemiological and public health research, provides medical care and promotes public awareness about obesity and nutrition. It has therefore become a reference research centre that has the competitive potential of being internationalised and providing R&D&I consulting services to pharmaceutical companies, food companies and the nation's health authorities.



CIBERobn Research Groups and Consortium Institutions

ISCCIIP	Name	Institution
CB12/03/30019	Valentina Ruíz Gutiérrez	A. E. Consejo Superior de Investigaciones Científicas
CB06/03/0028	Montserrat Fitó Colomer	Consorci Mar Parc Salut de Barcelona
CB06/03/0039	Empar Lurbe Ferrer	Consorcio Hospital General Universitario Valencia
CB06/03/0034	Fernando Fernández Aranda	Fundación Idibell
CB12/03/30012	Xavier Pinto Sala	Fundación Idibell
CB06/03/0010	José M. Fernández-Real Lemos	Fund. Inst. de Investigación Biomédica de Girona
CB07/03/2004	Jordi Salas Salvadó	Fund. Inst. de Investigación Sanitaria Pere Virgili
CB06/03/0047	José López Miranda	Fundación para la Investigación Biomédica de Córdoba (FIBICO)
CB06/05/0087	José Lapetra Peralta	Fundación Pública Andaluza para la Gestion de la Investigación en Salud en Sevilla
CB12/03/30037	Fernando Arós Borau	Fund. Vasca de Innovación e Invest. Sanitarias
CB06/03/0019	Ramon Estruch Riba	Hospital Clínico y Provincial de Barcelona
CB06/03/0017	Emilio Ros Rahola	Hospital Clínico y Provincial de Barcelona
CB06/03/0003	Felipe Casanueva Freijo	Servicio Gallego de Salud
CB06/03/0022	Jesús Argente Oliver	Servicio Madrileño de Salud
CB06/03/0021	Miguel Ángel Lasunción Ripa	Servicio Madrileño de Salud
CB12/03/30020	Rosa María Lamuela Raventós	Universidad de Barcelona
CB06/03/0001	Xavier Remesar Betloch	Universidad de Barcelona
CB06/03/0025	Francesc Villarroya Gombau	Universidad de Barcelona
CB06/03/0020	Manuel Tena Sempere	Universidad de Córdoba
CB06/03/0060	Andreu Palou Oliver	Universidad de las Islas Baleares
CB06/03/0043	Miguel Fiol Sala	Universidad de las Islas Baleares
CB12/03/30038	Josep Antoni Tur Marí	Universidad de las Islas Baleares
CB12/03/30022	Lluís Serra Majem	Universidad de Las Palmas de Gran Canaria
CB06/03/0018	Francisco Tinahones Madueño	Fundación Pública Andaluza para la Investigación de Málaga en Biomedicina y Salud (Fimabis)
CB12/03/30025	Enrique Gómez Gracia	Universidad de Málaga
CB06/03/1014	Gema Frühbeck Martínez	Universidad de Navarra
CB12/03/30017	Miguel A. Martínez González	Universidad de Navarra
CB12/03/30002	José A. Martínez Hernández	Universidad de Navarra
CB06/03/0023	Carlos Diéguez González	Universidad de Santiago de Compostela
CB06/03/0035	Dolores Corella Piquer	Universidad de Valencia
CB12/03/30016	Guillermo Saez Tormo	Universidad de Valencia
CB06/03/1012	Jesús de La Osada García	Universidad de Zaragoza
CB12/03/30007	Mª del Puy Portillo Baquedano	Universidad del País Vasco
CB06/03/0052	Cristina Botella Arbona	Universidad Jaume I



Ciber Organizational Structure And Technical Office

Structure and Objectives

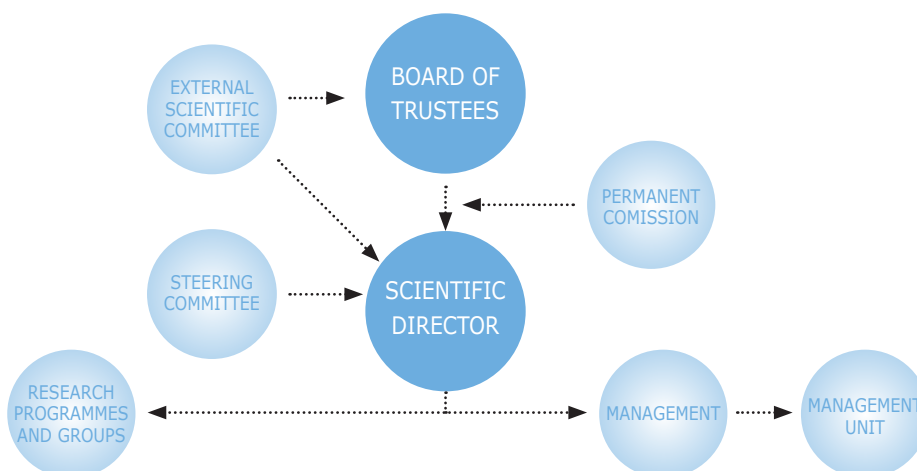
The CIBERObn is a networking cooperative structure consisting of 35 groups located in some of the most important research centres in Spain. These groups are divided into eight Research Programmes in which projects are carried out. Through multidisciplinary work, we are able to pool our efforts, optimize resources and take maximum advantage of generated knowledge to transfer it to clinical practice and, ultimately, to offer it to patients and to society as a whole.

Specific goals of CIBERObn consist of:

- **Conducting** joint research, development and innovation programmes in obesity and nutrition
- **Contributing** to solving healthcare issues relating to this field
- **Promoting** participation in national research activities, especially those included in the European Framework Programmes for R&D&I
- **Favoring** the transfer of the results of research processes to society in general and to the productive sector in particular
- **Fomenting** the dissemination of activities and training of researchers in the field of Obesity and Nutrition Physiopathology

Organization

As defined in the Articles of Association, governance and administration of CIBERObn shall be the responsibility of the following authorities: the Board of Trustees and its Permanent Commission and the management authorities represented by the Steering Committee, the Scientific Director and General Management.



Board of Trustees

The Board consists of three representatives of the Instituto de Salud Carlos III and one for each of the consortium institutions. The President of the Board of Trustees is the Director of the Instituto de Salud Carlos III, and the Consortium Manager acts as Secretary of the Board.

Mr. Antonio Luis Andreu Periz

Director of ISCIII

Ms. Margarita Blázquez Herranz

General Deputy Director of Cooperative Research Networks and Centres. (ISCIII)

Ms. Patricia Flores Cerdán

Servicio Madrileño de Salud

Mr. Vicent Climent Llorda

Universidad Jaume I

Ms. Rocío Mosquera Álvarez

Servicio Galego de Saúde

Ms. Ana M^a Cortes Herreros

Universidad de Valencia

Ms. Olga Pané Mena

Consorcio Mar Parc de Salut de Barcelona

Mr. Luis Rosel Ondé

Instituto Aragonés de Ciencias de la Salud (IACS)

Mr. Juan Carlos Casares Long

Universidad de Santiago de Compostela

Mr. Elías Campo Guerri

Hospital Clínico y Provincial de Barcelona

Mr. Emilá Pola Robles

Fundación IDIBELL

Mr. Albert Barberá

Fundación Instituto de Investigación Biomédica de Girona

Mr. Jaume Carot

Universidad Islas Baleares

Mr. Francisco Javier Mata

Rodríguez

Universidad de Navarra

Ms. Sandra Leal González

Fund. Pública Andaluza para la Gestión de la Investigación en Salud de Sevilla

Mr. José Manuel Irazo Miguélez

Consorcio Hospital General Universitario de Valencia

Mr. José Miguel Guzmán de Damas

Fundación para la Investigación Biomédica de Córdoba

Mr. Xavier Meneses

Universidad de Barcelona

Mr. Oriol Solà-Morales

Fundación Institut de Investigació Sanitaria Pere Virgili

Mr. Justo P. Castaño Fuentes

Universidad de Córdoba

Ms. Iciar Lourdes Ochotorena Zubizarreta

Fundación Pública Andaluza para la investigación de Málaga en Biomedicina y Salud

Mr. José Regidor García

Universidad de las Palmas de Gran Canaria

Ms. Carmen Garaizar Axpe

Fundación Vasca de Innovación e Investigación Sanitarias

Mr. José Ignacio Largo Gil

Universidad del País Vasco

D^a. Dolores González Pacanowska

Consejo Superior de Investigaciones Científicas

Ms. María Valpuesta Fernández

Universidad de Málaga

Ms. María José Neira Alfonsí

State General Legal Service

Mr. Felipe Casanueva Freijo

Scientific Director of CIBERobn

Secretary: Mr. Manuel Sánchez Delgado

Manager of CIBERobn

Permanent Commission

The Permanent Commission consists of the President of the Board of Trustees, or the person appointed by him/her, the Scientific Director of the Consortium, the Manager of the Consortium, who will act as Secretary, and four members representing consortium institutions.

Ms. Margarita Blázquez Herranz
 General Deputy Director of Cooperative Research Networks and Centres. (ISCIII)

Mr. Albert Barberá
 Fundación Instituto de Investigación Dr. Josep Trueta

Mr. José Miguel Guzmán de Damas
 Fundación Investigación Biomédica de Córdoba (FIBICO)

Mr. Javier Mata Rodríguez
 Universidad de Navarra

Mr. Luis Rosel Onde
 Instituto Aragonés de Ciencias de la Salud

Mr. Felipe Casanueva Freijo
 Scientific Director of CIBERobn

Secretario: Mr. Manuel Sánchez Delgado
 Manager of CIBERobn

External Scientific Advisory Committee

This body provides general scientific support and counseling for the Board of Trustees. It consists of important international scientists from the health sciences field who stand out given their professional or scientific trajectory consistent with Consortium's objectives.

The Committee comprises a President, who is appointed by the President of the Board of Trustees, approved by the mentioned Board of Trustees, and at least four members, appointed by the Board of Trustees. The President will have a renewable 4-year term. The remaining members will have an initial 2-year term that can later be renewed for variable time periods. Members of the External Scientific Advisory Committee shall appoint, among themselves, a Vice President and Secretary.

The members of the External Scientific Advisory Committee are:

Dr. Xavier Pi-Sunyer
 Department of Medicine, St. Luke's/ Roosevelt Hospital Centre

Dr. Antonio Vidal-Puig
 University of Cambridge Metabolic Research Laboratories, Institute of Metabolic Science

Dr. José C. Florez
 Centre for Human Genetic Research/ Diabetes Unit Massachusetts General Hospital

Dr. José M. Ordovás
 Professor of Nutrition and Genetics JM-USDA-HNRCA at Tufts University

Dr. Lluís Fajas
 Research Director, Metabolism and Cancer Laboratory - Montpellier - France

Steering Committee

The CIBERobn Steering Committee is responsible for handling management tasks. It is a professional body that must assure that the CIBER is managed taking into account group needs and strategic group objectives.

Mr. Felipe Casanueva Freijo
 Scientific Director of CIBERobn

Mr. Manuel Sánchez Delgado
 Manager of CIBERobn

Mr. José A. Fernández Formoso
 Deputy Scientific Management Director of CIBERobn

Mr. Ramón Estruch
 Nutrition Programme

Ms. Gema Frühbeck

Adipobiology Programme

Mr. Francisco TinahonesProgramme in Complications
in Obesity**Mr. Fernando Fernández Aranda**Programme in Neurocognition and
Environmental-Biological Factors**Mr. Jesús Argente Oliver**Programme in Obesity
and Childhood-Adolescence**Mr. Andreu Palou**Programme in New Strategies
and Biomarkers**Mr. Francesc Villarroya**Programme in Physiopathology of Body
Weight Homeostasis**Mr. José Manuel Fernández-Real**

Platforms - Fat-Bank

Mr. Manuel Tena Sempere

Training Programme

**Consortium
Institutions**

Members of the CIBERObn Consortium:

Instituto de Salud Carlos III
Servicio Madrileño de Salud
Universidad Jaume I
Servicio Galego de Saúde
Universidad de Valencia
Consorcio Mar Parc de Salut de Barcelona
Instituto Aragonés de Ciencias de la Salud (IACS)
Universidad de Santiago de Compostela
Hospital Clínico y Provincial de Barcelona
Fundación IDIBELL
Fundación Instituto de Investigación Biomédica de Girona
Universidad de las Islas Baleares
Universidad de Navarra
Fundación Pública Andaluza para la Gestión de la Investigación en Salud de Sevilla
Consorcio Hospital General Universitario de Valencia
Fundación para la Investigación Biomédica de Córdoba
Universidad de Barcelona
Fundación Institut de Investigació Sanitaria Pere Virgili
Universidad de Córdoba
Fundación Pública Andaluza para la investigación de Málaga en Biomedicina y Salud
Universidad de las Palmas de Gran Canaria
Fundación Vasca de Innovación e Investigación Sanitarias
Universidad del País Vasco
Consejo Superior de Investigaciones Científicas
Universidad de Málaga

Technical Unit

In 2013, the CIBERObn Administration team was headquartered at Hospital Clínico Universitario of Santiago de Compostela, C/ Choupana, sn, 1ª planta - Edificio D. Its goal is to suitably manage personnel, supplier payments, asset management, administrative hiring, collective bargaining and, in summary, to act as an intermediary between the geographically spread out research groups and the administrative bodies of CIBERObn.

Felipe Casanueva Freijo

Scientific Director
Email: endocrine@usc.es

Manuel Sánchez Delgado

Manager
Tel: +34 981 951 195
Email: gerencia@ciberobn.es

José Antonio Fernández Formoso

Deputy Scientific Management Director
Tel +34 981 951 193
Email: joseaff@yahoo.es

Leticia Álvarez Mangas

Human Resources and Hiring
Tel: +34 981 951 628
Email: leticia.alvarez.mangas@sergas.es

María Codesido Montoiro

Economic Management
Tel: +34 981 955 076
Email: maria.codesido.montoiro@sergas.es

Rocío Torres Fungueiro

IT Services
Tel: +34 981 951 193
Email: rtorres@ciberobn.es



Budget 2013

BUDGETS	2012	2013
Pluriannual Projects	684.081,38	600.000,00
Fully Authorised Groups	1.704.019,17	1.704.019,17
Associated Groups	10.000,00	0,00
Training	24.000,00	24.000,00
Programmes	160.000,00	140.000,00
Fat Bank	23.000,00	23.000,00
Structural	246.441,84	230.000,00
Technical U.	271.000,00	250.000,00
Total expenses	3.122.542,36	2.971.019,17
Private Projects	56.026,04	60.000,00
TOTAL EXPENSES	3.178.568,40	3.031.019,17

ITEMISED BUDGET	
Staff	1.900.000,00
Fungibles	350.000,00
Inventoriable	61.000,00
Services	720.019,17
TOTAL	3.031.019,17



2013 CIBERobn Staff

Average number of employees during the fiscal year as of December 31, including civil servants and non-civil servant staff, classified by category and gender.

The entire staff is non-civil servant staff

CATEGORY	MEN 2013	WOMEN 2013	MEN 2012	WOMEN 2012
Senior Executives	2	0	2	0
Executives, Technicians and the like	18	58	17	53
Administrative Officers and Administrative Assistants	0	4	0	5
Total	20	62	19	58

This is the average staff from the year 2013 up to 12/13/2013, considering a ratio of 1 full day worked to 1 worker based on 365 days.

CATEGORY	MEN 2013	WOMEN 2013	MEN 2012	WOMEN 2012
Doctor	5	7.79	4.5	7.69
Bachelor's Degree	9.9	24.34	9.98	25.63
Associate's Degree	1	11.67	2	10.39
Vocational Training, Level II	1.33	10.12	1	12.25

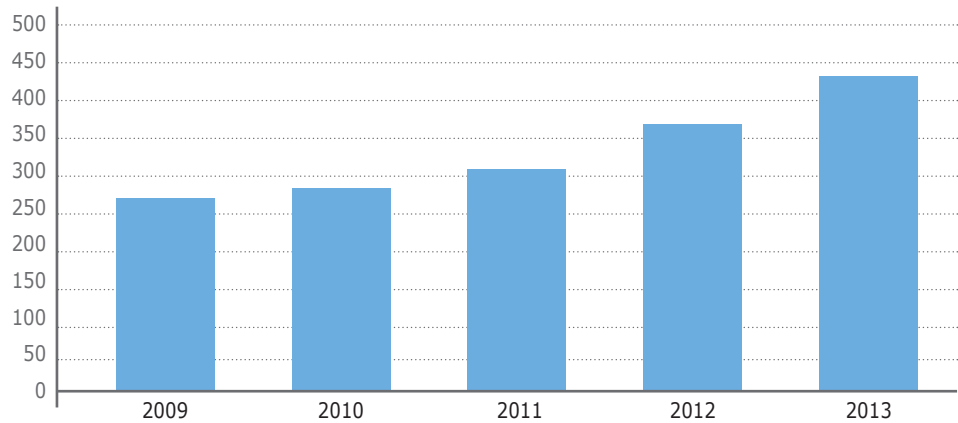


Scientific Production

Number Of Publications Per Year

It can be seen that the number of publications increase year after year. There were a total of 431 publications in 2013, which was up by 95 publications with respect to 2012.

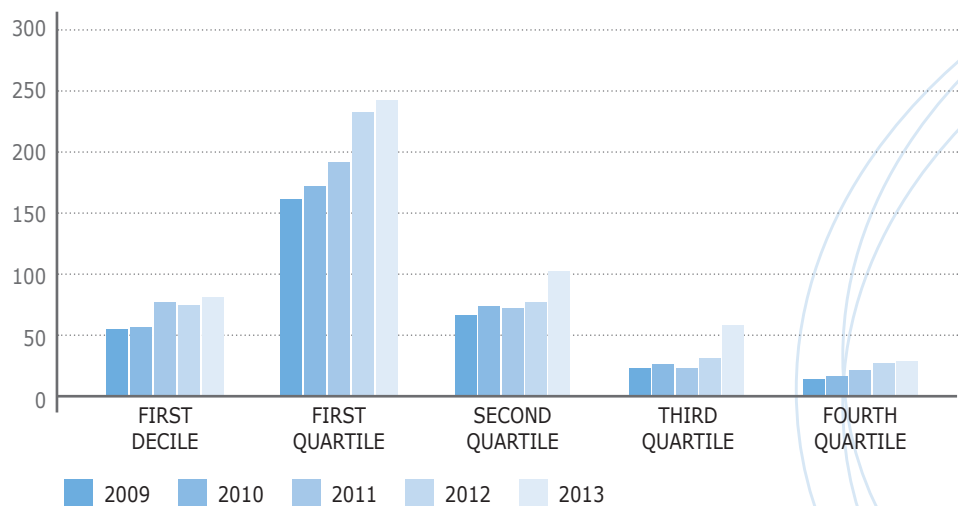
Number Of Publications Per Year



Number Of Publications Per Quartiles

The quality of scientific publications is associated with the quality of the journals in which they are published. The pursuit of excellence has led to better publications, i.e., publications in first decile or first quartile journals.

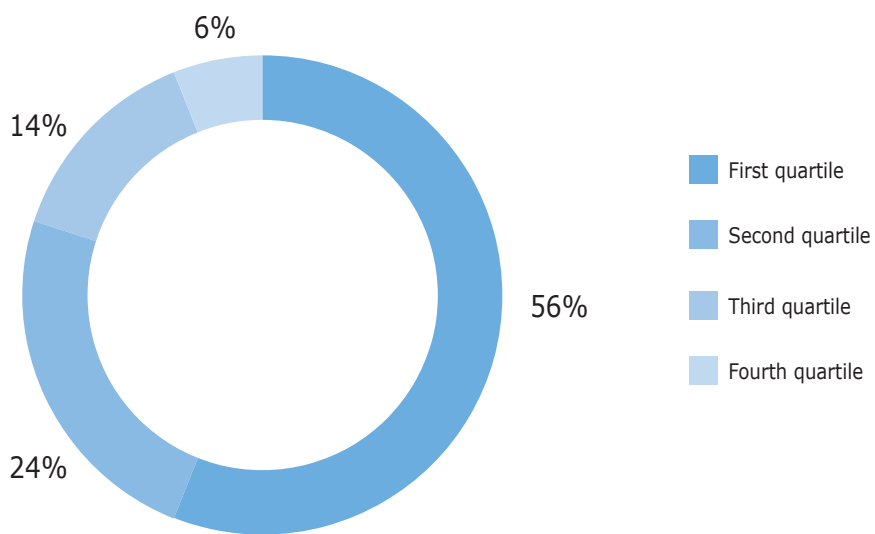
Number of publications per quartiles and first decile



Number of publications by quartiles and first decile in the 2009-2013 period

	Year 2009		Year 2010		Year 2011		Year 2012		Year 2013		Increase 2009-2013	
	Publ.	%Total	Publ.	%Total	Publ.	%Total	Publ.	%Total	Publ.	%Total	Publ.	Total
First quartile	163	61,51	172	59,93	192	62,75	232	63,56	243	56,38	80	48,19
Second quartile	66	24,91	73	25,44	71	23,20	76	20,82	102	23,67	36	21,69
Third quartile	23	8,68	27	9,41	23	7,52	32	8,77	59	13,69	36	21,69
Fourth quartile	13	4,91	15	5,23	20	6,54	25	6,85	27	6,26	14	8,43
Total	265	100,00	287	100,00	306	100,00	365	100,00	431	100,00	166	100,00

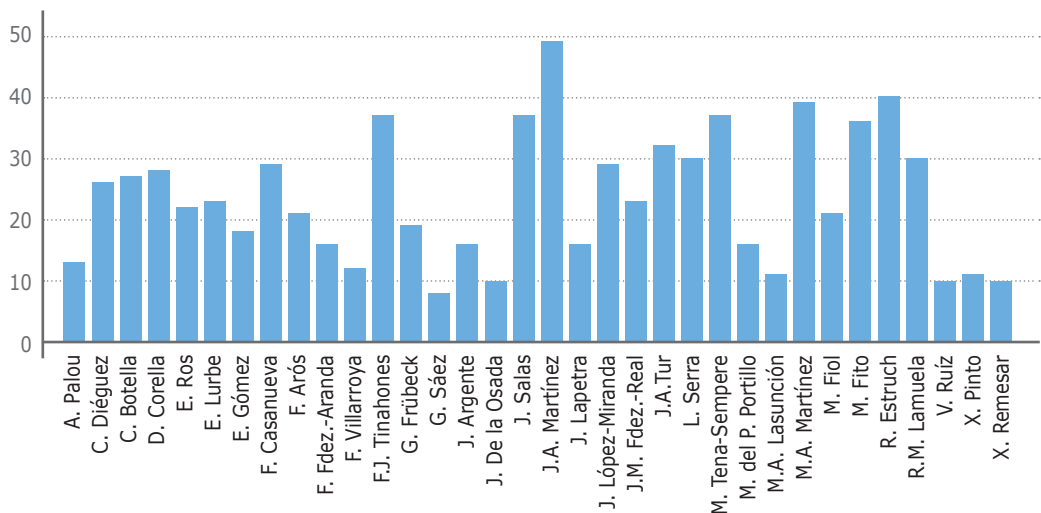
Percentage of publications per quartiles



Excellence is one of CIBERobn's main goals. 56% of CIBERobn publications belong to the first quartile, and the figure of the total number of papers published in the first and second quartile increases up to 80%.

Number of Publications Per Group

CIBERobn consists of clinical, basic and mixed (basic-clinical) groups, which explains the difference in the number of publications per group.

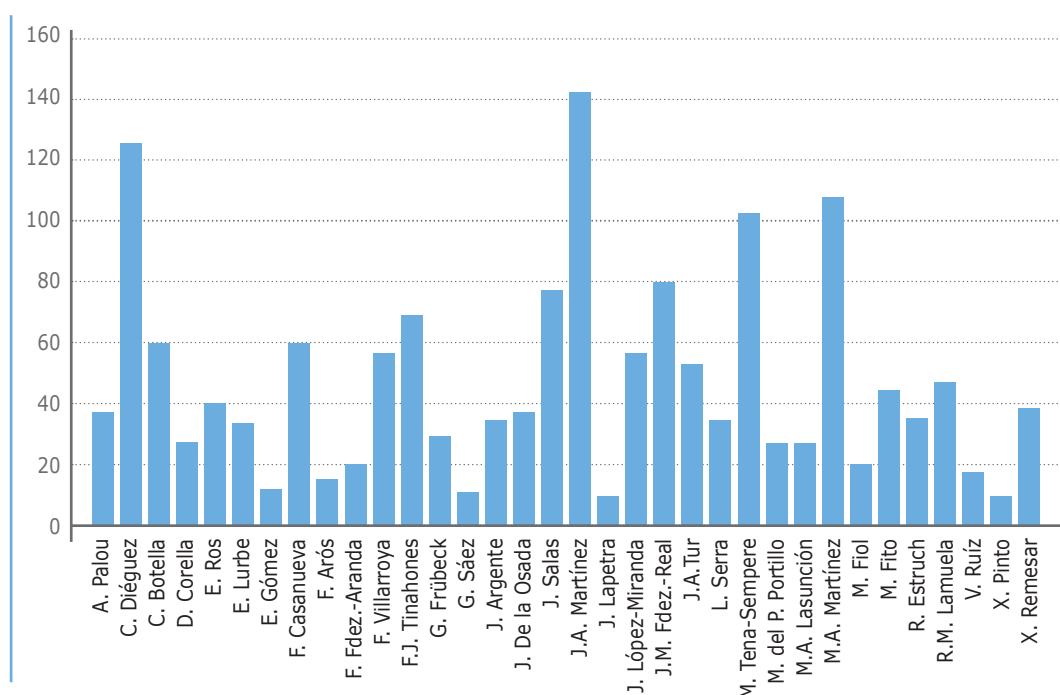


Impact factor

	Impact factor
2013	1564
2012	1532
2011	1273
2010	1215
2009	1082

Impact factor per group

The Impact Factor is 1564 because only publications in which the researchers are responsible for such publication have been taken into account. If all the publications of the different groups were added up separately, there would be 3808 publications since there is a considerable amount of collaboration between said groups



Joint CIBERobn publications

In dealing with concepts such as quality, excellence, public responsibility, transparency and efficacy in research processes, CIBERobn has always promoted IntraCIBER collaboration (collaboration between different groups of the network), extraCIBER collaboration (collaboration with other national groups and institutions that do not belong to the network) and international collaborations (which have been defined differently over the years by CIBERobn, including up to 2012 only collaborations with international consortiums and currently, following the Innovation Union Scoreboard-2014 criterion, also including collaborations co-authored with researchers from foreign entities).

In 2013 there was a considerable increase in intraCIBER publications, corroborating the usefulness of working through the programme structure. Collaboration within the Nutrition Programme, which for the most part consists of groups from the PRED-IMED Network, is a clear example. There are a considerable number of publications belonging to this programme which have over 15 authors. ExtraCIBER collaboration has increased considerably with 119 publications

In turn, the internationalisation process fostering international scientific-technological collaboration to enhance knowledge is of maximum importance. CIBERObn has increased its international collaborations, participating as authors in publications with over 100 authors from different countries and institutions, working together to transfer advancements in the scientific knowledge that is generated to the National Health Systems in different countries and to society in general, in an increasingly more globalised and international society.

Journals

These are the journals with the most publications in 2013. It must be borne in mind that this year the CIBERObn has publications in journals with a very high impact factor, such as the New England Journal of Medicine, with an impact factor of 53.48 and a publication in Lancet with an impact factor of 39.06.

Number of
publications per
journal

Journ	Public.	Impact factor
PloS one	36	4,092
Nutrición hospitalaria	21	1,120
Endocrinology	13	4,459
Anales de pediatría	12	0,770
The Journal of clinical endocrinology and metabolism	11	5,967
Molecular nutrition & food research	10	4,301
The British journal of nutrition	9	3,072
Journal of agricultural and food chemistry	9	2,823
The Journal of nutritional biochemistry	8	4,538
Nutrition, metabolism, and cardiovascular diseases	8	3,438
BMC medicine	7	6,035
Clinical nutrition	7	3,298
Food chemistry	6	3,458
Journal of hypertension	6	4,021
International journal of molecular sciences	6	2,464
Pituitary	6	2,667
Current vascular pharmacology	5	2,821
Hormone and metabolic research	5	2,145
The American journal of clinical nutrition	5	6,504
BMC psychiatry	4	2,891
Clinical endocrinology	4	3,168
The journals of gerontology.	4	4,598
Diabetología	4	6,814
International journal of obesity	4	4,691
Chronobiology international	4	4,350
Journal of physiology and biochemistry	4	1,654
Diabetes	3	8,889
Diabetes care	3	8,087
Circulation	3	14,739
Cell metabolism	3	14,619
The New England journal of medicine	1	53,486
Lancet	1	39,060

International publications

Publications with at least one international author have been increasing year after year. CIBERObn therefore has greater international relevance.

Year	International publications
2013	147
2012	121
2011	100
2010	102
2009	88

Training programme visits

There were 10 training visits, 9 of which were international, and 1 was with other networking structures

PI and Source Centre	Applicant Data	PI and Destination Centre	Duration of
Francisco Tinahones / Málaga	Nuria Barbarroja Puerto	Dr. Vidal Puig Universidad Cambridge Uk	January 8 - February 3
Manuel Tena Sempere / Córdoba	David García Galiano	Dr. Carol F. Elias. Universidad De Michigan	February 15 - April 15
Andreu Palou / Universidad Palma de Mallorca	Francisco Javier García Carizo	Dr. Barbara Cannon Universidad E Estocolmo	April 4 - July 3
Jordi Salas / Universidad Rovira i Virgili	Marti Juanola Falgarona	Dr. Anne Raben Universidad de Copenhague	Agost 1 - 2014 January 31
Maribel Covas / (IMIM)	Marta Farras Mañe	Dr. Ian Rowland Univerdidad de Reading UK	Agost 15 - November 15
Empar Lurbe / Hospital Univ. de Valencia	Carmen Ivorra Ivorra	Dr. Mario Fdez Instituto Universitario de Oncología Iuopa- Asturias	Agost 26 - September 27
Andreu Palou / Universidad Palma de Mallorca	Estefania García	Dr. Stefhann Herzig. German Cancer Research Center	September 16 - December 16
Josep M ^a Tur Marí / Palma de Mallorca	Maria del Mar Bibiloni	Dr. Rogelio Salas. Nuevo Mexico Universidad de Nuevo Leon	October 26 - December 07
Fernando Fdez-Aranda / Hospital Univ. de Belvitge	Ana Beatriz Fagundo	Dr. Kate Tchanturia. King`S College, London	November 1 - December 31
Francisco Tinahones / Málaga	María Mercedes Clemente Postigo	Dr. Geesje M Dallinga-Thie. Academic Medical Centre, Amsterdam	December 2 - March 2

Patents

It must be pointed out that in the year 2010, patents belonged only to consortium institutions. In 2013, only those patents held by CIBERObn are taken into account.

	Year 2010	Year 2011	Year 2012	Year 2013
National, filed	3	4	2	2
National, granted	1	0	0	0
International, filed	2	0	1	0
International, granted	1	0	0	0

**Only those patents co-own by CIBERObn and not by the groups have been taken into account.*

Platform Programme Results

The participating nodes incorporating samples to the "FAT-BANK" are shown below. Malaga and Girona are the most active as regards donor incorporation. In 2013, the Tarragona node left the project, so it did not provide new donors

No. of donors				
Node	2010	2011	2012	2013
Girona	70	130	196	250
Málaga	119	142	200	212
Pamplona	12	36	74	120
Santiago	14	30	51	96
Córdoba	27	62	62	65
Tarragona	11	50	76	0
Total	253	450	659	743

Serum				
Node	2010	2011	2012	2013
Girona	1120	2080	3136	4000
Málaga	1904	2272	3200	3392
Pamplona	192	288	1184	1920
Santiago	224	240	816	1221
Córdoba	432	496	992	1040
Tarragona	176	400	1216	0
Total	4048	5776	10544	11573

EDTA Plasma				
Nodo	2010	2011	2012	2013
Girona	2240	4160	6272	8000
Málaga	3808	4544	6400	6784
Pamplona	384	576	2368	3840
Santiago	248	480	1632	2972
Córdoba	864	992	1984	1990
Tarragona	352	800	2432	0
Total	8096	11552	21088	23586



2

Scientific Programmes

throughout its trajectory, CIBERobn has undergone successive structural and organizational changes all aiming to improve the scientific work efficacy and excellence levels.

These structural and organizational changes correspond to successive indications handed down from the governing bodies of Instituto de Salud Carlos III (ISCIII), as well as suggestions and critiques handed down by the ISCIII Quality Unit. The successive suggestions and contributions made by research groups forming the CIBER were fundamental in this organization.

The External Scientific Advisory Committee (CACEX) evaluates the activity of this consortium annually, suggesting changes that must be made and particularly the new aspects that must be covered by the scientific research. These evaluations have consequences, i.e., they introduce relevant changes in the operating organizational chart. In summary, CIBERobn has undergone a significant structural change to optimize financial and human resources by creating synergies in different groups which favor eliminating scientific redundancies and exponentially enhancing knowledge.

The incorporation of basic and clinical researchers who share common lines of research favors traslational research from clinical research to basic research, or vice versa, improving the National Health System, because patients can immediately benefit from scientific advancements in prevention, diagnosis and treatment.

The current structure is a set of scientific and structural programmes developed by a conglomeration of different research groups that share common lines and objectives. Therefore, two fundamental types of programmes can be distinguished in the CIBER's activity:

1. Scientific Programmes

2. Structural Programmes

Different research groups can participate in each scientific programme, and participation in one programme does not exclude participation in different programmes.

A programme coordinator who will assume the responsibilities of coordinating and representing the programme is appointed from the participating research groups.

The scientific programmes are:



P1. Nutrition

Description

CIBERobn is the only structure that has been able to prove for the first time worldwide through the PREDIMED Study that when the Mediterranean diet is used as an intervention agent, it has components that are capable of reducing cardiovascular risk factors. The term "cardiovascular risk factors" does not refer to indirect or surrogate markers, but rather to cardiovascular morbi-mortality giving more weight to the results. The first part of this paper was finished in the New England Journal of Medicine in 2013 with considerable scientific repercussion and media coverage.

Obesity and diabetes mellitus are closely related metabolic diseases that have reached epidemic proportions in the 21st century.

It is therefore not unusual for pathologies associated with obesity, such as cardiovascular diseases and cancer, to be the most common causes of death in the Western world. In this context, it should be pointed out that the first step both in prevention and in treatment of these diseases is to maintain a lifestyle healthy based on an optimal diet and suitable physical activity.

For this reason, any hygienic and/or dietary measures employed to achieve a healthy diet and lifestyle must always be a key ingredient to any prevention and the first step in any treatment.

Preventive efforts made in Primary Care usually consist of "preventive" treatments based on drugs (hypolipidemic agents, antihypertensives, etc.) instead of giving priority to education to modify lifestyles.

Though the efficacy of such drugs is undeniable, the delay in primary prevention is unfortunate because in addition to greatly increasing the pharmaceutical expense, the desired effectiveness is not attained because such prevention is usually too late in coming.

Eating habits play a crucial role in maintaining health both in individuals and in society as a whole. Currently, the Mediterranean diet is considered the healthiest eating model.

Findings of a number of European studies, EPIC cohort follow-up in Spain, Greece and the Netherlands, the SUN study in a university population, the HALE study in an elderly population and the Swedish study, as well as those observed in other studies conducted in the United States (the NIH-AARP Diet and Health Study and the Nurses' Health Study) or Australia (Melbourne Collaborative Cohort Study) suggest that strictly following the conventional Mediterranean diet is associated with lower overall mortality and lower mortality due to coronary heart disease.

Until now, only one randomised clinical trial with a modified Mediterranean diet model (enriched with alpha-linolenic acid and little olive oil) versus a control diet, the Lyon Diet Heart Study, has been conducted. In this trial, it was concluded

that the Mediterranean diet is associated with a significant reduction in cardiovascular mortality and in the occurrence of cardiovascular complications in patients who have already had a myocardial infarction. However, no randomised clinical trial assessing if the effects of the Mediterranean diet exceed those of a low-fat diet, which is currently recommended in primary prevention of coronary heart disease, had previously been conducted.

Likewise, the physical activity profile combined with the Mediterranean diet must be explored.

General Objective

To demonstrate the effects of foods and nutrients on disease prevention and treatment, as well as the mechanisms responsible for their effects on health to make recommendations to society in general, and to investigate the strategies that allow getting people to follow said recommendations. Study of the Mediterranean diet associated with an increase in physical activity.

P2. Adipobiology

Description

In the past few decades, obesity has become one of the main causes of death and disability, therefore threatening many of the achievements that have been obtained in the health field in the past 100 years. It must be pointed out that obesity is defined as an excess of fat, not an excess of body weight.

In the past, adipocytes, a component of the adipose tissue, were considered an inert isolating or damping organ. The scientific data generated in the past few decades, consisting of fundamental contributions from CIBERObn groups, have revolutionised this concept, demonstrating that adipose tissue is a powerful endocrine organ capable of secreting hormones regulating body homeostasis and the appetite, as well as various regulating signals such as adipokine and inflammatory markers. Determining how this endocrine activity of adipose tissue is regulated and how this tissue responds to regulating signals is a fundamental activity of CIBERObn.

There are fundamentally two types of adipose tissue, white adipose tissue and brown adipose tissue. The two adipose tissues differ in cellular origin and primary location, as well as in their molecular characteristics, functional characteristics and physiopathological implications. While brown adipose tissue primarily participates in thermogenesis, white adipose tissue is the most abundant in adults, forming the body's largest reservoir of energy. The profile of the so-called "beige" adipose tissue has yet to be characterised.

Most of the activity in this subject focuses on understanding the mechanisms of transdifferentiation which turn white adipose tissue into brown or beige adipose tissue and vice versa.

General Objective

Adipose tissue is considered to be an extraordinarily active endocrine organ. Therefore, understanding the underlying molecular mechanisms in regulating adipose mass and metabolism is key to being able to dig deeper into its operation and control, identifying possible therapeutic targets and preventing obesity.



P3. Complications of Obesity and Childhood Obesity

Description

Obesity is the fundamental risk factor and also an etiological factor of a series of pathologies, diseases or risk factors of considerable importance. Suffice it to say that obesity is the number one factor for the onset of type II diabetes mellitus, dyslipidemia, arterial hypertension, cardiovascular morbidity and stroke. Furthermore, though most people are unaware of this fact, data generated on an international level and especially by CIBERobn indicates with unquestionable epidemiological support that obesity is the number one factor in the onset of some types of cancer, such as breast cancer, endometrial cancer, prostate cancer, pancreatic cancer and a growing list of other types of cancers.

Though it has been a rather well-hidden concept up until now, CIBERobn has contributed data indicating that obesity is a fundamental cause of the risk for degenerative diseases such as Alzheimer's disease, and it is a fundamental factor in accelerating aging processes, reducing the life expectancy by between two and seven years.

A crucial aspect in complications arising from obesity is when this problem affects children. The aforementioned complications require temporal combination, i.e., degree of obesity multiplied by time of exposure to the aggression. Obviously when dealing with childhood obesity the time of exposure to the aggression will increase very significantly, perhaps even causing unprecedented medical problems such as dyslipidemia, arterial hypertension and type 2 diabetes in children and teenagers.

General Objective

To study diseases associated with obesity that cause significant morbi-mortality in obese subjects and to establish clinical practice guidelines for handling these patients.

Conducting clinical and basic research on childhood obesity, including auxological, body composition, biochemical, hormonal, metabolic, pubertal, reproductive function and genetic aspects. Studies of serum proteome and adipose tissue, as well as basic studies, analysing neuroendocrine metabolism control, at the start of and throughout puberty, are fundamental for proper development.

Special emphasis is dedicated to the association of obesity with neurodegeneration, cancer and aging.



P4. Neurocognition and Environmental-Biological Factors

Description

Studies conducted on an international level by CIBERObn groups indicate that there is a continuous aspect of neurocognitive pathology between body weight extremes, i.e., between extreme conditions of malnutrition due to a deficiency associated with symptoms of anorexia nervosa and extreme conditions due to an excess associated with obesity, there is a continuum of problems such as those suggested by genetic and psychiatric co-morbidity studies.

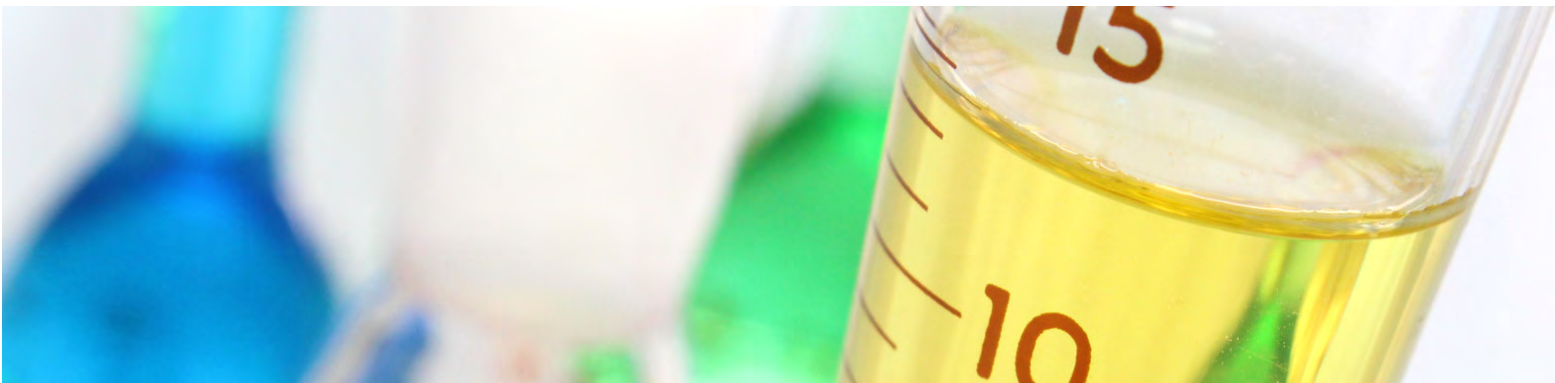
These neurocognitive processes regulating the emotional process of attraction to or rejection of foods and processes relating to pleasure and reward in relation to foods, being aware of them and possibly controlling them are a fundamental objective of current research.

Up until now, even though common aspects have been found between obesity and Eating Disorders (EDs) on a phenotypic level (overeating, excessive preoccupation with controlling weight) and with respect to environmental risk factors (low self-esteem, external locus of control, weight-related criticism) and biological-genetic factors (BDNF, MC4R, FTO, ghrelin), there are few studies analysing these aspects in detail from a multidimensional angle (environmental, neuropsychological and biological factors), which allow identifying common endophenotypes and/or analysing interactions between environmental and biological aspects.

This project seeks to combine, from a multidisciplinary point of view, aspects that are characteristic to biology, the neurosciences and psychology in extreme weight conditions based on a number of functional and integrating postulates.

General Objective

To identify shared and non-shared environmental factors associated with neurocognitive operation, as well as interactions with specific biological factors (endocrine and genetic factors) in extreme weight conditions.



P5. New Strategies and Biomarkers in the Prevention and Treatment of Obesity and Eating Disorders

Description

The constant increase in obesity in developed countries shows that conventional dietary-nutritional, pharmacological and behavioural approaches that have been applied for decades have failed and are particularly ineffective in maintaining weight loss and in preventing obesity. Most people who lose weight gain it back a few years later, and while patients were frequently blamed (for having little will power and discipline), what is in fact true is that there is a great deal of evidence concerning the biological mechanisms contributing to controlling body weight.

These mechanisms include those which favor the development of excess weight and certain forms of obesity and related complications. They also include the key issue of the hypothesis at hand, i.e., factors determining different responses, including individualised responses, which may or may not indicate imbalances in the physiological system for controlling body weight, knowledge of which in turn leads to consider not obesity but rather obesities and the number of related eating disorders, with specific factors that characterise them, most of which are still unresolved.

The CIBERObn groups involved are developing advanced lines of research with various models and approaches, both in humans and in experimental animals, which help to dig further into the knowledge and application of new early biomarkers in the control of obesity and associated disorders and in the identification of new keys to the use of physical activity in controlling obesity by applying new e-therapy strategies and technologies.

The intention is to include and therefore exploit potential synergies both in the European context and in the national context.

It is important to work with the food and drug industries through the development of activities and agreements for the transfer/translation of generated knowledge. It is also important to be involved in legal developments on food and health claims that are changing the paradigms of economic development of food-health binomial in Europe.

To identify new nutrigenomic biomarkers, to develop e-smart systems and nutritional therapy, exercise therapy and other behaviour therapies for the prevention and reversal of obesity and similar disorders.

General Objective



P6. Physiopathology of Body Weight Homeostasis

Description

As a continuation of its work from the previous two-year period, this programme seeks to implement multidisciplinary studies in various preclinical and clinical models of energy homeostasis disorder as a basis for generating physiological knowledge (about the mechanisms of energy balance control and related body functions) and pathological knowledge (relating to disorders in overweight conditions) that can be translated into clinical practice for treating obesity and its associated comorbidities.

The activities will allow implementing studies that aims at identifying new etiopathogenic mechanisms and therapeutic targets with traslational potential in the field of obesity and its complications, essentially by means of studying pre-clinical models.

It should be pointed out that the nutritional and pharmacological armamentarium available for treating obesity is very scarce, and at present could be classified as preoccupying. The potential of different inter- and intracellular signaling systems determining energy homeostasis will be investigated and studied as a therapeutic target against obesity. For this purpose, a strategy that contemplates the identification of new signals involved in controlling intake and energy expenditure, acting both on a central level and on particularly relevant peripheral tissues on a metabolic level, such as the liver, muscle and adipose tissues.

In turn, emphasis is placed on establishing by means of pre-clinical experimental models, the interactions of the mechanisms of control of body weight and their dysfunction with determining biological factors (gender, reproductive processes).

The identification of new agonists/antagonists of different adipokines and/or hormonal signals affecting body weight homeostasis, inflammation, lipid metabolism or cardiovascular and hepatic disorders associated with obesity can lead to a real improvement in the health prospects of obese patients.

General Objective

To establish the biological factors and the intra- and intercellular signaling that controls body weight homeostasis, as well as disorders in these processes occurring in obesity.

Group	P1 R. Estruch, R. Lamuela	P2 G. Frühbeck	P3 F. Tinahones	P4 F. Fdez. Aranda	P5 A. Palou	P6 F. Villarroya
Argente Oliver	10		80		10	
Arós Borau	100					
Botella Arbona				50		50
Casanueva Freijo		30	40	10		20
Corella Piquer	80		20			
De La Osada García	80					20
Diéguez González		60	10			30
Estruch Riba	100					
Fernández Aranda	10			80	10	
Fernández-Real Lemos		30	30	30	10	
Fiol Sala	50		50			
Fito Colomer	50			50		
Frühbeck Martínez		80	10	10		
Gómez Gracia	100					
Lamuela Raventós	100					
Lapetra	70		30			
Lasunción Ripa	30	30				40
Lurbe Ferrer			50		50	
Martínez González	100					
Martínez Hernández	100					
López-Miranda	40	30	30			
Palou Oliver			20		70	10
Pinto Sala	100					
Portillo Baquedano	100					
Remesar Betlloch				10	20	70
Ros Rahola	80		20			
Ruíz Gutiérrez	100					
Saez Tormo	100					
Salas Salvadó	70		30			
Serra Majem	100					
Tena Sempere		30	40			30
Tinahones Madueño	10	10	60	10	10	
Tur Marí	100					
Villarroya Gombau		40				60

List of Coordinators and Group Participation in the Programmes



3

Structural
Programmes



CIBERobn Training Programme

The CIBERobn Training Programme stemmed from the need to establish a structured schedule with learning activities and other related activities which:

- Allow improving the degree of knowledge and skills of CIBER group members, particularly the younger members.
- Integrate a vision of research from various points of view: clinical, basic, population, and knowledge transfer.
- Improve professional competence, which allows adapting to future needs of the investigative work of the CIBER.
- Enable adding young talent to the biomedical research, health sciences or health technology assessment fields.

A Training plan of this type must contemplate:

- Training needs analysis.
- Purpose of the training activities and target population.
- Proper organization and prioritisation of the various training activities.
- Traceability defined by annual compliance and progression indicators.

Furthermore, the Training Programme must fit the actual needs and circumstances of CIBER staff, the lines of research and priorities, and of course the pace and demands of medical practitioners in the health system. In turn, in addition to these general adjustments, the Programme must take into account the peculiarities that are characteristic of the field of obesity and nutrition.

The CIBERobn Training Programme targets all the members of its groups given that the need for continuous training is universal. However, the fundamental purpose of the Programme logically targets the younger team members. The reason is to promote obesity and nutrition researcher training and to help consolidate the staff's professional career as independent researchers in this subject.

Given the nature of this programme, the members of the groups forming CIBERobn could request funding under this budget item for funding only those training activities that facilitate research (basic, clinical, epidemiological and health services) relating to the lines of research of the subjects comprised in CIBERobn

Purpose of the training activities and target population

Justification

Although it is understood that the activities described above have allowed covering part of the CIBERobn's training mission in the fields of obesity and nutrition, consistent with the basis of its formation as a Networking Research Centre, it is also time to further promote this idea (as indicated in the CIBERobn evaluation), allowing the implementation of a Training Programme per se which on one hand is an offer for more comprehensive training for CIBERobn members and on the other hand serves as a tool for turning this centre into a national and eventually international example, in relation to training activities in the field of obesity and nutrition applied to health.

General Structure of the Training Programme

The CIBERobn Training Programme comprises the following programmes:

- **Programme to promote interest in obesity and nutrition physiopathology research.**
 - >> Training young/up-and-coming researchers
 - >> Doctoral dissertations in obesity and nutrition
 - >> Internships in CIBERobn laboratories
 - >> Exposure and orientation for young CIBERobn researchers
- **CIBERobn Research Initiation and Continuation Scholarship Programme.**
 - >> CIBERobn research initiation aid
 - >> CIBERobn research continuation aid
 - >> Strengthening of healthcare professional specialists
- **CIBERobn Mobility Programme**
 - >> IntraCIBER Mobility
 - >> ExtraCIBER Mobility
 - >> CIBERobn-Enterprise Mobility
- **CIBERobn Higher Learning Activities Programme**
 - >> Post-grad training activities
 - >> Training in New Frontiers of Obesity and Nutrition
 - >> Support for related specialized courses
- **CIBERobn Technical and Management Training Programme**
 - >> Training of technical staff and others
 - >> Training of administrative and research management staff

The Plan also includes a CIBERobn Training Activity Quality Assessment and Follow-up Programme.



Platforms

Having a large number of biological samples such as tissues, serum, plasma, DNA, proteins, etc., is extremely important today for the advancement and development of biomedical research.

Storing such a large amount of samples from different origins and the increasingly closer collaboration between laboratories mean that samples must be sent often, and this requires strict control.

The so-called biobanks were created for this purpose. They are public or private, non-profit establishments that store a collection of biological samples that has been designed for diagnostic or biomedical research purposes and organised as a technical unit with quality criteria, and that is orderly and intended to serve society in general and the scientific community in particular.

Biobanks will undoubtedly become a basic tool in biomedical research in no time. For that reason it is necessary to establish certain rules that must assure their efficacy.

The objective for which a biobank is created must first be defined, regardless of whether it is non-specialised, population-based biobank or a biobank specialising in a particular pathology, because each objective requires a different strategy.

Any biobank needs to meet the following 5 criteria:

- It must have the required Informed Consents for Biomedical Research and it must comply with the Law for the Protection of Personal Data, as well as those laws regulating biobanks
- Procedures and protocols must be standardised, assuring quality in obtaining, processing, preserving and storing the samples. Correctly completing the questionnaires will assure quality of the clinical information associated with the samples.
- Sample traceability must be assured, so the infrastructure required for that purpose must be acquired and unique coding methods used.
- The biobank and its samples must be effectively managed using computer applications created for such purpose.
- The biobank must employ specialised staff dedicated to the biobank and knowledgeable about same.

Once the initial effort of starting up and maintaining a biobank has been made, multiple benefits are obtained which help the research work, the diagnosis and treatment of diseases in patients, and finally society in general by preventing diseases, identifying risk factors and creating wealth and knowledge.

Given the lack of a biobank in Spain that specialises in collecting adipose tissue, associated samples and their clinical data for studying such widespread diseases that are constantly on the rise in the population, such as obesity, diabetes and diseases associated with them, there is a need to have a biobank to continue performing the daily activity in a strict manner and to have samples assuring reliable, quality results.



Communication

Communication is a key element that provides exposure to an entity that is not exclusively limited to informing, but rather hopes to establish its identity as a feature that distinguishes it in its field of operation and against competition. This comprises two aspects: external communication, which defines a company's relationship with the outside world; and internal communication, which refers to the information circulating within the enterprise. Informing, i.e., the simple transmission of messages to a receiver, was traditionally differentiated from communication. Communication is understood as the two-way exchange of messages between transmitter-receiver.

That is why the entity must first define its hallmark. Each entity must find relevant elements that characterise it specifically and distinguish it from others. Once these are defined, the entity will disclose them following the strategy defined in the communication plan prepared ad hoc for that purpose.

It must be taken into account that everything stemming from the organization, ranging from material elements to the attitude of the parties involved, form its identity and create its image. The challenge is to homogenize this variety of signs and combine them in a single unit, the organization's identity.

Once the features of its personality are identified, the next step will be to design the most appropriate strategy to give expression to such features. This is where the Communication Plan comes into play. This plan is the approach to problems, wants or needs of an entity/organization, with possible solutions. It also includes all the data needed to implement said solutions.

The current situation of the entity, in this case CIBERObn, the objectives to be met, the public to be taken into account (who are affected, who can help us meet our objectives, who must be addressed, etc.), the strategies and techniques that will define the actions to be followed, the planning of said actions, the budget to be invested, assessment of the plan and, finally, the end results obtained, must be defined.

To meet the established objectives, CIBERObn must have communication instruments that allow it to show its intentions. These instruments include printed media (announcements and information published by the press), direct contacts with journalists and directors of the press (professional and personal), and those disclosing actions which transfer CIBERObn technical-scientific activity to society as a whole.

Although an enterprise's external communication is usually more visible, an entity can never ignore its internal communication as it is a fundamental element to the success of a communication policy. In addition to the verticality and horizontality which must be assured, internal communication must also work in two other directions: information is distributed to the entire team (downwards) and opinions are heard (upwards) to achieve an integrated team. To that end, the entity has resort

to satisfaction surveys, corporate newsletters or journals, Intranet, internal meetings or activation of a network of facilitators which is responsible for communicating to General Management any issues of concern to their peers so that they can be discussed and dealt with at different times, while at the same time distributing information from General Management to colleagues.

The general objectives of the communication programme are:

- To make CIBERObn capable of transmitting to its internal and external spokesperson the abilities which define its identity and purpose.
- To position a public, internal and external image that generates the ideas of power, innovation, efficacy, efficiency, competence and quality all used to perform research.
- To enhance public visibility and awareness through communication, dissemination and disclosure of the research studies being conducted.



4
Other
activities



CIBERobn is the news

Research must have an effect on society to create a scientific culture and social awareness of the problem of obesity and associated chronic diseases. In 2013, CIBERobn organised and participated in a number of activities. The purpose of this Report is to include the most noteworthy news that the centre has been part of, such as the events in which the consortium participated or organised.

This task of dissemination and communication is possible as a result of the work performed by the professionals working at CIBERobn, promoting the participation of both the society in general as well as the scientific community in the activity that is conducted in the centre.

Selection of the most important news 2013

EL PAÍS
EL PERIÓDICO GLOBAL EN ESPAÑOL

www.elpais.com

EL PAÍS, lunes 11 de marzo de 2013

LA CUARTA PÁGINA

OPINIÓN

En España también se hacen las cosas bien

El estudio PREDIMED sobre nutrición basada en la dieta mediterránea, de enorme impacto en la prensa internacional, es fruto del trabajo de 19 centros de investigación de varias CC AA durante 10 años

Por **EMILIO ROS**

¿Qué pasaría si le contasen que los gestores de una institución pública depositaron en una tacha una parte del dinero de su presupuesto durante la época de las vacas gordas y, usando con discreción estos ahorros, pudieron mantener la mayor parte de su programa cuando llegaron las flacas? Seguramente creería que le hablan de un país con una Administración ejemplar, tal vez Suecia. Pues no, estamos hablando de España, donde también hay instituciones que funcionan. Parece una tontería alabar a alguien por hacer aquello que se supone debe hacer. Sin embargo, vista la desolación de los españoles por el impacto de la crisis y la pérdida de confianza en las instituciones del Estado, no hay que desperdiciar la oportunidad de contar que la marca España es valiosa más allá del fútbol, el tenis o las carreras de fórmula uno.

Estos gestores ilustrados pertenecen al Instituto de Salud Carlos III, actualmente englobado en el Ministerio de Economía y Competitividad. La función de este Instituto es "canalizar" el dinero público destinado a la investigación biomédica en España. Es bien sabido que los presupuestos destinados a este fin siempre han estado por debajo de otros países de la Unión Europea. Hace 10 años el Instituto de Salud Carlos III tuvo una iniciativa aplaudida por la comunidad científica: creó las redes temáticas de investigación cooperativa (RETIC), consorcios de varios investigadores de centros públicos, en general hospitales y universidades, con una línea específica de investigación para trabajar en equipo. Las RETIC se dotaron con unos presupuestos que permitían por fin contratar personal, siendo evaluadas anualmente mediante pruebas objetivas de rendimiento científico, como publicaciones y patentes. Ante el éxito de las RETIC, en 2006 se creó una nueva modalidad: los centros de investigación biomédica en red (CIBER), que se diferenciaban por tener personalidad jurídica propia y una gestión mejorada, englobar más grupos de investigación y promover la investigación tradicional.

Las RETIC y los CIBER trabajan en red, es decir, carecen de una sede física, con el consiguiente ahorro de infraestructuras, por lo que el coste es menor y los recursos se dirigen a los investigadores. Este uso dirigido del dinero público para la investigación biomédica ha sido una iniciativa pionera y única en el mundo, que algunos países desarrollados están tratando de imitar.

Se les asignó al azar a una de las tres dietas diferentes. Dos de ellas eran mediterráneas, ricas en grasa vegetal, una suplementada con aceite de oliva virgen extra y otra con frutos secos. El tercer grupo fue asignado a la dieta convencional recomendada para la prevención cardiovascular, una dieta baja en todo tipo de grasas.

Los resultados principales del estudio PREDIMED se hicieron públicos en sendos actos en el Instituto de Salud Carlos III y en un congreso de nutrición en California, coincidiendo con su publicación. Confiéndonos en que el riesgo de desarrollar un infarto de miocardio o un ictus, o de morir por estas enfermedades (muerte cardiovascular), se reduce un 30% en los dos grupos de dieta mediterránea. Estos resultados demuestran que nuestra dieta tradicional es superior a una dieta baja en todo tipo de grasas para la prevención de las enfermedades cardiovasculares, que son la principal causa de muerte en el mundo. Además, previene estas enfermedades con la misma eficacia que un tratamiento a largo plazo con medicamentos para el colesterol o la presión arterial, reduciendo significativamente el gasto sanitario. Dada la edad media de los participantes, se deduce que nunca es tarde para cambiar los hábitos alimentarios y mejorar la salud. También se ha demostrado que aumentar la grasa de origen vegetal en la dieta no adelgaza pero tampoco engorda, lo cual no es poco.

El estudio ha tenido un alto impacto en la prensa de Estados Unidos, con reseñas eclogicas en primeras páginas de diarios como The New York Times, que además han recabado la opinión de prestigiosos cardiólogos y nutricionistas. Sin embargo, aquí el impacto ha sido escaso. Estamos tan acostumbrados en las corrupeadas, cuentas suizas y desverguradas reales que parece no existir nada más... ¡O es que lo bueno que se hace en España no sucede!

El coste total del PREDIMED ha sido de unos 5,5 millones de euros. Expertos en salud pública y nutrición de Estados Unidos reconocen que en su país costaría 10 veces más! El estudio no se habría llevado a cabo si varias empresas alimentarias no hubiesen donado toneladas de aceite de oliva y frutos secos. Un buen ejemplo de colaboración público-privada para potenciar la ciencia y mejorar la competitividad de las empresas: si después del PREDIMED no venden más, ¡mejor que cambien de director de marketing!

Los resultados del PREDIMED tendrán un impacto en la práctica clínica dirigida a la prevención de las enfermedades cardiovasculares. El diseño del ensayo, su convergencia y los métodos utilizados tienen un alto potencial de traslación y hacen que se trate de una aportación extraordinariamente valiosa de la investigación española en salud a la comunidad médica mundial. El Instituto de Salud Carlos III

EFE: FUTURO

Descubren que una hormona que controla la obesidad tiene efecto cardioprotector

Un equipo de científicos de la Universidad de Barcelona (UB) ha descubierto que la hormona FGF21, clave en el control de la obesidad, también tiene efectos cardioprotectores en ratones de laboratorio.



La investigación, que publica hoy la revista científica "Nature Communications", ha sido dirigida por el catedrático de Bioquímica y Biología Molecular y director del [Instituto de Biomedicina de la UB \(IBUB\)](#), Francesc Villarroya.

El equipo del doctor Villarroya descubrió en 2010 que la hormona de crecimiento de fibroblastos 21 (FGF21), liberada por el hígado en respuesta a los lípidos de la dieta, era un factor endocrino con un papel clave en el metabolismo energético como agente antiobesidad y antiobesidad y activaba la termogénesis del metabolismo del tejido adiposo marrón, responsable de la generación de calor en el organismo.

Villarroya, que también es miembro del Centro de Investigación Biomédica de la Red de Fisiopatología de la Obesidad y la Nutrición (CIBERObn), ha explicado que "una de las principales contribuciones del nuevo trabajo es describir que la FGF21 tiene una función protectora contra la hipertrofia cardíaca en ratones de laboratorio".

JANO.es

MEDICINA Y HUMANIDADES

Descubren un biomarcador capaz de identificar en niños obesos el riesgo de anomalías metabólicas

El hallazgo convierte a los microRNAs circulantes en plasma, estructuras muy estables que hacen relativamente fácil su determinación, en potenciales objetivos terapéuticos.

Miembros del Centro de Investigación Biomédica en Red-Fisiopatología de la Obesidad y la Nutrición (CIBERObn), han podido demostrar, por primera vez, que algunas de las estructuras moleculares implicadas en la regulación de la expresión génica, denominadas microRNAs, aparecen desregularizadas en los niños obesos, lo que les convierte en un biomarcador capaz de identificar quienes sufrirán anomalías metabólicas de adultos.

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Según un estudio del CIBERObn

La inflamación es un factor principal de la muerte de células adiposas, lo que abre nuevas vías contra la obesidad

Un estudio llevado a cabo por especialistas del Centro de Investigación Biomédica en Red-Fisiopatología de la Obesidad y la Nutrición (CIBERObn), dirigidos por el investigador del Hospital Virgen de la Victoria de Málaga Francisco Tinahones, ha revelado que la inflamación es una de las principales causas de la muerte celular por apoptosis en el tejido adiposo. Con ello, se abre nuevas vías de actuación en la lucha contra la obesidad, al 'destapar' posibles dianas terapéuticas para prevenir las enfermedades metabólicas.

5 TELECINCO.es informativostelecinco.com

La flora intestinal de niños con diabetes tipo 1 es diferente a la de niños sanos

Científicos del Centro de Investigación Biomédica en Red-Fisiopatología de la Obesidad y la Nutrición (CIBERObn) han descubierto que la microbiota intestinal en niños con diabetes tipo 1 es diferente a la de los niños sanos, lo que abre la puerta al desarrollo de estrategias para controlar el avance de la enfermedad mediante la modificación de la flora intestinal.

El estudio, publicado en la revista 'BMC Medicine', ha sido dirigido desde el Hospital Virgen de la Victoria de Málaga por el doctor Francisco J Tinahones quien han descubierto también que algunas bacterias intestinales tienen relación con el grado de control glucémico de los pacientes.

DIARIO MEDICO.COM

Mediante un mayor gasto energético

Un hallazgo abre puertas al diseño de terapias antiobesidad más efectivas

Combinar la estimulación de los agonistas beta-3 adrenérgicos con oleiletanolamida podría ser útil para remodelar el tejido adiposo.

El Centro de Investigación Biomédica en Red-Fisiopatología de la Obesidad y la Nutrición (CIBERObn) ha demostrado que la oleiletanolamida es capaz de intensificar la acción de termogénesis de los antagonistas beta-3 adrenérgicos, transformando el tejido adiposo blanco en marrón. El hallazgo abre puertas al diseño de terapias antiobesidad más efectivas.

El estudio ha permitido demostrar que los agonistas beta-3 adrenérgicos y la oleiletanolamida potencian la reducción de la ingesta de alimentos y la ganancia de peso corporal mediante un mayor gasto energético.

DIARIO MEDICO.COM

Confirman sus beneficios protectores

La dieta mediterránea reduce un 30% el riesgo CV

La dieta mediterránea suplementada con aceite de oliva o frutos secos reduce un 30 por ciento la incidencia de eventos cardiovasculares (CV) mayores -ictus, infarto y muerte por causa cardiovascular-, según los resultados de Predimed (Prevención Primaria de la Enfermedad Cardiovascular con Dieta Mediterránea), un estudio español, cuyos resultados se publican en *The New England Journal of Medicine*.

Isabel Gallardo Ponce | igallardo@diariomedico.com | 25/02/2013 17:02



Ramón Estruch, coordinador de Predimed; Joaquín Arenas, director general del Instituto de Salud Carlos III; Carmen Vela, secretaria de Estado de Investigación, Desarrollo e Innovación; Felipe Casanueva, director del Ciberobn, y Estefanía Toledo, investigadora del RTIC-Predimed. (DM)

La dieta mediterránea suplementada con aceite de oliva o frutos secos reduce un 30 por ciento la incidencia de eventos cardiovasculares (CV) mayores -ictus, infarto y muerte por causa cardiovascular-, según los resultados de Predimed (Prevención Primaria de la Enfermedad Cardiovascular con Dieta Mediterránea), un estudio español, cuyos resultados se publican en *The New England Journal of Medicine*. El trabajo, que confirma los beneficios protectores de la dieta mediterránea, ha sido liderado por el Instituto de Salud Carlos III, se ha financiado a través del Ciber de Fisiopatología de la Obesidad y la Nutrición y la red Predimed, con una inversión de más de 6,8 millones de euros. 19 grupos de científicos de Andalucía, Baleares, Canarias, Cataluña, Navarra, País Vasco y Valencia, han puesto en marcha la investigación, que ha contado con la participación de 7.447 personas asintomáticas con alto riesgo cardiovascular, que no hubieran desarrollado la patología cuando se les reclutó.

El estudio, diseñado en 2002, quería "valorar la dieta mediterránea suplementada con aceite de oliva virgen extra sobre la incidencia de complicaciones cardiovasculares mayores", además de evaluar el efecto si se suplementaba la dieta con frutos secos sobre las mismas patologías, y el papel del consumo moderado de vino, explicó Ramón Estruch, coordinador de Predimed, en la presentación del trabajo en Madrid.

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Los centros de investigación biomédica en red del Carlos III organizan talleres para la Semana de la Ciencia

LA PRÓXIMA SEMANA EN MADRID

Los nueve Centros de Investigación Biomédica en Red (CIBER) dependientes del Instituto de Salud Carlos III del Ministerio de Economía y Competitividad organizarán la próxima semana una serie de microtalleres interactivos para exponer a la ciudadanía ejemplos del trabajo que realizan, con motivo de la XIII Semana de la Ciencia de Madrid 2013.



Más información: www.alexsa.com/saferno/Actasanitaria.com

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Los CIBER exponen ocho casos prácticos de investigación en red al servicio de los pacientes

En una mesa redonda enmarcada en la "Setmana de la Ciència" en Barcelona, los Centros de Investigación Biomédica en Red, CIBER, han expuesto ocho casos prácticos de investigación traslacional de excelencia en red.

Entre otros apartados, se han tratado los avances en el diagnóstico de tumores cerebrales, terapia celular en diabetes, prevención del cáncer colorrectal y Medicina Fetal.

En el encuentro, los investigadores de los diferentes CIBER han abordado temas como el diagnóstico de tumores cerebrales, terapia celular en diabetes, prevención del cáncer colorrectal, medicina fetal, diagnóstico de cáncer de pulmón, desigualdades en salud, la alimentación como prevención y los trastornos mentales.



CIBERObn cuenta ya con 31 grupos de excelencia

El Centro de Investigación Biomédica en Red-Fisiopatología de la Obesidad y la Nutrición (CIBERObn) ha ampliado su estructura de 24 a 31 grupos de excelencia. Muchos de los nuevos miembros provienen del estudio Prevención con Dieta Mediterránea (PREDIMED).

El Centro de Investigación Biomédica en Red-Fisiopatología de la Obesidad y la Nutrición (CIBERObn) ha ampliado su estructura de 24 a 31 grupos de excelencia. Muchos de los nuevos miembros provienen del estudio Prevención con Dieta Mediterránea (PREDIMED).

Para revisar las líneas de estudio de cada programa y valorar los resultados obtenidos, la red consorciada ha celebrado este viernes su V Simposio Científico.

Se trata de un encuentro de seguimiento que permite a los coordinadores de cada programa informar del estado de sus investigaciones.

Durante el simposio, se avanzó también de la puesta en marcha del PREDIMED II tras el éxito del primero. Se trata del mayor ensayo clínico aleatorizado realizado en España, hasta el momento, y uno de los principales en el mundo, para estudiar, a largo plazo, la intervención nutricional con dieta mediterránea para poder evaluar su eficacia en la prevención primaria de enfermedades cardiovasculares.

El Instituto Danone premia al profesor Emili Ros en su 20 aniversario

Los lácteos protegen contra la diabetes, explicó el experto José María Ordovás

elEconomista MADRID

"Los lácteos se pueden asociar con protección contra la diabetes, uno de los mayores problemas de nuestra sociedad", explicó ayer José María Ordovás, de la University de Boston y una autoridad en nutrición. "Además, su consumo suele acompañarse de un patrón dietético más sano". El profesor destacó estos aspectos en la lección magistral que impartió en el vigésimo aniversario del Instituto Danone.

En el mismo acto, Emili Ros, jefe clínico de la Unidad de Lípidos del Hospital Clínic de Barcelona, recibió el Premio Instituto Danone-Marti Henneberg a la trayectoria científica investigadora.

Ordovás indicó que el estudio de los efectos de los alimentos debe hacerse desde la óptica de las nuevas *ómicas*, como la genómica. Gracias a esta nueva manera de hacer ciencia "estamos empezando a descubrir que los *villanos* tradicionales, como las grasas saturadas, no son tan malos como se había dicho".

Foto: M. J. S. / Contraste / Contraste / Contraste



Emili Ros recibe el Premio Instituto Danone-C.M. Henneberg de manos de Luis Moreno, presidente del Instituto Danone.

El doctor Casanueva, honoris causa por la universidad más prestigiosa de Turquía

El catedrático de la USC recibe el galardón por su investigación a escala mundial en Endocrinología



Doctor Felipe Casanueva

Santiago. El profesor Felipe Casanueva Freijo, catedrático de la USC y jefe del servicio de Endocrinología y Nutrición del hospital Clínico Universitario de Santiago, acaba de ser investido doctor Honoris Causa por la universidad más prestigiosa de Turquía, la Erciyes de Kayseri, en una ceremonia que se celebró este martes en la ciudad turca.

Casanueva es también director

científico del Centro de Investigación Biomédica en Red-Fisiopatología de la Obesidad y la Nutrición (CiberObn) y presidente de la Sociedad Española para el Estudio de la Obesidad (Seedo).

Felipe Casanueva recibe este galardón, según destaca CIBERObn, "por su decidida contribución al desarrollo de la investigación en endocrinología a escala mundial", así como por su cooperación con la labor investigadora de la Facultad de Medicina de la citada universidad turca.

Para el doctor Casanueva esta distinción supone "una muestra más de reconocimiento" a toda una carrera médica, académica y científica de más de 35 años, "proyectada hacia la mejora de la salud pública" desde todas sus áreas de actividad, tanto en el ámbito autonómico, nacional como internacional.

La Universidad de Erciyes cuenta con 3.200 profesionales y tiene un campus con 13 facultades, 6 universidades y 7 escuelas de formación profesional.

En cuanto al CiberObn, este grupo de trabajo en red que dirige el doctor Casanueva desde Santiago cuenta con 35 grupos de investigación de máximo nivel en obesidad y nutrición. **REDACCIÓN**

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Una científica salmantina obtiene una de las Becas Loreal-Unesco de investigación valorada en 15.000 euros

La investigadora salmantina Laura Herrero Rodríguez ha sido premiada este jueves con una de las becas L'Oréal-Unesco 'For Women in Science' valorada en 15.000 euros por sus avances en el tratamiento de la obesidad y la diabetes tipo 2.

Herrero Rodríguez, de 36 años, nació en Salamanca y ha desarrollado su carrera en Barcelona, es licenciada en Química por la Universidad de Barcelona (UB). Además, cuenta también con un doctorado en Bioquímica y Biología molecular por la misma universidad, donde actualmente es Profesor Lector (Ayudante Doctor) en su Instituto de Biomedicina.

VIERNES
29 DE NOVIEMBRE DE 2013 EL CORREO GALLEGO

Un sillón en la Real Academia de Medicina para Casanueva

La obesidad como epidemia del siglo XXI centrará el discurso que pronunciará esta tarde el jefe de Endocrinología del CHUS

LUISA GONZÁLEZ
Santiago

Al doctor Felipe Casanueva ya deben de quedarle pocos huecos en las estanterías de su despacho. A las distinciones que ha ido acumulando a lo largo de su prolífica carrera, se suma hoy el reconocimiento por antonomasia: el de académico numerario de la Real Academia de Medicina y Cirugía de Galicia. Pasará a ocupar el sillón de endocrinología a partir de la ceremonia que esta tarde (19.30 horas) se celebrará en la sede de la entidad en A Coruña.

Director científico del Centro de Investigación Biomédica en Red-Fisiopatología de la Obesidad y la Nutrición (CIBERObn), presidente de la Sociedad Española para el Estudio de la Obesidad (SEEDO) y catedrático de Medicina en la Universidade de Santiago, Casanueva asume también la jefatura del servicio de Endocrinología y Nutrición del Complejo



El doctor Casanueva ingresa esta tarde en la Real Academia de Medicina de Galicia. Foto: AGN



5 Research Groups



PROGRAMME:

**P3. Complications of obesity
and childhood obesity**

Childhood obesity, genetics and neuroendocrinology

Group Members

STAFF MEMBERS

Canelles Ortiz, Sandra
Díaz González, Francisca
Freire Fdez.-Regatillo, Alejandra

ASSOCIATED MEMBERS

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

Lead Researcher

Argente Oliver, Jesús



Contact:

Servicio Endocrinología
Hospital Infantil Universitario Niño Jesús
Avenida Menéndez Pelayo, 65 · 28009 Madrid
Phone: (+34) 91 503 5936 · E.mail: argentefen@terra.com

Main lines of research

- Severe early onset childhood obesity: metabolic, hormonal, genetic, genomic and metabolomic aspects.
- Relationship genotype/phenotype in the development of secondary complications of obesity.
- The role of hypothalamic astrocytes in physiological and pathophysiological metabolic control.
- Long-term metabolic effects of early dietary and hormonal modifications.
- Interaction of leptin and insulin signaling pathways in the development of obesity associated complications.

Most relevant scientific articles

- FUENTE-MARTÍN E, GARCÍA-CÁCERES C, DÍAZ F, ARGENTE-ARIZÓN P, GRANADO M, BARRIOS V ET AL.. Hypothalamic inflammation without astrogliosis in response to high sucrose intake is modulated by neonatal nutrition in male rats. *Endocrinology*. 2013 Jul;154(7):2318-30.
- CHOWEN JA, ARGENTE J, HORVATH TL. Uncovering novel roles of nonneuronal cells in body weight homeostasis and obesity. *Endocrinology*. 2013 Sep;154(9):3001-7.
- MARTOS-MORENO GÁ, BARRIOS V, CHOWEN JA, ARGENTE J. Adipokines in childhood obesity. *Vitam Horm*. 2013;91:107-42.
- GRANADO M, FERNÁNDEZ N, MONGE L, FIGUERAS JC, CARREÑO-TARRAGONA G, AMOR S ET AL.. Effects of coronary ischemia-reperfusion in a rat model of early overnutrition. Role of Angiotensin receptors. *PLoS One*. 2013;8(2):e54984.
- PERIANES-CACHERO A, BURGOS-RAMOS E, PUEBLA-JIMÉNEZ L, CANELLES S, FRAGO LM, HERVÁS-AGUILAR A ET AL.. Acute up-regulation of the rat brain somatostatin receptor-effector system by leptin is related to activation of insulin signaling and may counteract central leptin actions. *Neuroscience*. 2013 Aug 23;252C:289-301.

Highlights

- There are now over 1200 obese children being followed and treated in our obesity clinic. Genetic/genomic, epigenetic, metabolic, hormonal, and metabolomic studies are being carried-out with several new genes being identified as possible causes of their condition. Metabolomic analyses, focusing on identification of possible markers for susceptibility for the development of insulin resistance, are underway and promising. Funding from the Fondo de Investigación Sanitario was renewed this year to continue these studies.
- A new addition of the "Clinical practice guide for the prevention and treatment of childhood obesity", commissioned by the Ministry of Health, was produced this past year.
- The identification of a new cause for isolated growth hormone deficiency, which courses with obesity, was identified and accepted for publication in *EMBO Molecular Medicine*. This gene, *RNPC3*, codes for a minor spliceosome protein required for U11/U12 small nuclear ribonucleoprotein formation and splicing of U12-type introns. This is the first demonstration of a mutation of a protein of the minor spliceosome resulting in a specific disease.
- Our studies on the role of glial cells in metabolic control have received increasing attention during the past year. The involvement of hypothalamic inflammation and gliosis in the production of obesity-related complications has been an active area of investigation and we have demonstrated that these processes are directly related to the underlying cause of the weight gain or obesity.



PROGRAMME:
P1. Nutrition

Prevención Cardiovascular y Estilo de Vida

Group Members

STAFF MEMBERS

Salaverria Lete, Itziar

ASSOCIATED MEMBERS

Alonso Gómez, Ángel María
Bello Mora, María Concepción
De Loma-Orsorio Montes, Ángel
Recondo Olaechea, Javier Gregorio

Lead Researcher

Arós Borau, Fernando



Contact:

Hospital Universitario Araba
José Achotegui, S/N. 01009 Vitoria-Gasteiz, Álava
E-mail: aborau@secardiologia.es

Main lines of research

- Effect of Mediterranean Diet on primary prevention of cardiovascular disease
- Prevención secundaria de cardiopatía isquémica. Rehabilitación cardiaca. Estilo de vida
- Respuesta al ejercicio en sujetos con cardiopatía isquémica crónica
- Respuesta al ejercicio en obesos
- Estudios de imagen cardiaca en la obesidad

Most relevant scientific articles

- ESTRUCH R, ROS E, SALAS-SALVADÓ J, COVAS MI, D PHARM, CORELLA D ET AL.. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. *N Engl J Med*. 2013 Feb 25;.
- CORELLA D, CARRASCO P, SORLÍ JV, ESTRUCH R, RICO-SANZ J, MARTÍNEZ-GONZÁLEZ MA ET AL.. Mediterranean Diet Reduces the Adverse Effect of the TCF7L2-rs7903146 Polymorphism on Cardiovascular Risk Factors and Stroke Incidence: A randomized controlled trial in a high-cardiovascular-risk population. *Diabetes Care*. 2013 Aug 13;.
- SÁNCHEZ-VILLEGAS A, MARTÍNEZ-GONZÁLEZ MA, ESTRUCH R, SALAS-SALVADÓ J, CORELLA D, COVAS MI ET AL.. Mediterranean dietary pattern and depression: the PREDIMED randomized trial. *BMC Med*. 2013 Sep 20;11:208.
- ARÓS F, ESTRUCH R. Mediterranean Diet and Cardiovascular Prevention. *Rev Esp Cardiol*. 2013 Jul 30;.
- TOLEDO E, HU FB, ESTRUCH R, BUIL-COSIALES P, CORELLA D, SALAS-SALVADÓ J ET AL.. Effect of the Mediterranean diet on blood pressure in the PREDIMED trial: results from a randomized controlled trial. *BMC Med*. 2013 Sep 19;11:207.

Highlights

The most significant activity in 2013 was the start of the PREDIMED PLUS study: Effect of an intensive lifestyle intervention with an energy-restricted Mediterranean diet, increased physical activity, and behavioral treatment on the primary prevention of cardiovascular diseases: The PREDIMED-PLUS randomized clinical trial. The pilot study on intermediate markers obtained a grant from the Instituto Carlos III (PI 13/01056) for three years.

In addition the group has contributed in more than 20 peer-reviewed publications with impact factor, one of which are comments of a working group on the European Society of Cardiology guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation.



PROGRAMME:

P4. Neurocognition and Environmental-Biological Factors
P6. Physiopathology of body weight homeostasis

Bioingeniería y Tecnología Orientada al Ser Humano (I3BH)

Group Members

STAFF MEMBERS

Etchemendy, Ernestina
 Zaragoza Alvarez, Irene

ASSOCIATED MEMBERS

Alcañiz Raya, Mariano
 Baños Rivera, Rosa María
 Breton López, Juana María
 Castilla López, Diana Virginia
 Cebolla Marti, Ausias Josep
 García Palacios, Azucena
 Guillen Botella, Verónica
 Guixeres Provinciale, Jaime
 Miralles Tena, Ignacio
 Oliver Gasch, Elia
 Perpiña Tordera, Conxa
 Quero Castellano, Soledad
 Rey Solaz, Beatriz
 Serrano Zarate, Berenice

Lead Researcher

Botella Arbona, Cristina



Contact:

Labpsitec Laboratorio de Psicología y Tecnología
 Dpto. Psicología Básica Clínica y Psicobiología
 Facultad de Ciencias de la Salud
 Avenida Sos Baynat, s/n. 12071 Castellón · Phone: (+34) 96 438 7639
 E.mail: botella@uji.es · Websites: www.labpsitec.es · www.labhuman.com

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

- VAN STRIEN T, CEBOLLA A, ETCHEMENDY E, GUTIÉRREZ-MALDONADO J, FERRER-GARCÍA M, BOTELLA C ET AL.. Emotional eating and food intake after sadness and joy. *Appetite*. 2013 Jul;66:20-5.
- MARCO JH, PERPIÑÁ C, BOTELLA C. Effectiveness of cognitive behavioral therapy supported by virtual reality in the treatment of body image in eating disorders: one year follow-up. *Psychiatry Res*. 2013 Oct 30;209(3):619-25.
- FAYED N, LÓPEZ DEL HOYO Y, ANDRES E, SERRANO-BLANCO A, BELLÓN J, AGUILAR K ET AL.. Brain changes in long-term zen meditators using proton magnetic resonance spectroscopy and diffusion tensor imaging: a controlled study. *PLoS One*. 2013;8(3):e58476.
- BAÑOS RM, ESPINOZA M, GARCÍA-PALACIOS A, CERVERA JM, ESQUERDO G, BARRAJÓN E ET AL.. A positive psychological intervention using virtual reality for patients with advanced cancer in a hospital setting: a pilot study to assess feasibility. *Support Care Cancer*. 2013 Jan;21(1):263-70.

Highlights

During the year 2013 the group has obtained several important projects focused on the specific activity of the CIBERObn team: a project supported by *Fundación Mapfre* to develop videogames as allies in the promotion of physical activity; the *Cátedra Real Madrid* also financed the *Exergaming platform* as a clinical tool for the treatment of childhood obesity; a project funded by the Spanish Ministry focused on the use of the ICTs to promote physical activity in children; a new excellence *Prometeo* project funded by the local government (*Generalitat Valenciana*) where to test the effects of physical activity in psychological health and wellness. As for European projects, we have been granted with the European project Education for Care (EDUCARE) where new strategies are tested in order to reach a better learning; the project *Modifying Eating Attitudes and Actions through Learning* (MEAL) has also started, where new ways to modify the behaviors towards food and eating patterns are being studied.

Regarding the progress in ICTs, a videogame (MOVE-IT) for the promotion of the physical activity in obese children has been developed and validated; we have obtained 1 year follow-up data using the ETIOBE platform for the treatment of children obesity. A new web application for the promotion of physical activity in adults has also been developed. A new authoring protocol for the creation of *Ecological Momentary Assessment* (EMAs) and *Ecological Momentary Interventions* (EMIs) has been developed, which allows structuring in a personalized way all interventions, both for children and adults. Regarding specific results, it has been proven the influence of inducing positive emotions in the degree of arousal and the wish to take part in physical activities in the case of children; also, the influence emotions have on emotional eating patterns in adults.



PROGRAMME:

P3. Complications of obesity and childhood obesity

Endocrinología Molecular

Group Members

STAFF MEMBERS

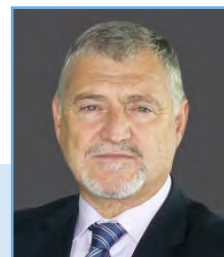
Álvarez Mangas, Leticia
 Castelao Taboada, Cecilia
 Castro País, Ana Isabel
 Couselo Carreira, Marcos
 Rendo Caneda, María Isabel

ASSOCIATED MEMBERS

Amil Diz, María
 Crujeiras Martínez, Ana Belén
 Gurriarran Rodríguez, Uxia
 Lage Varela, Mary Carmen
 Lodeiro Pose, María
 Martínez Olmos, Miguel Ángel
 Pardo Pérez, María
 Pazos Randulfe, Yolanda
 Peino García, Roberto
 Peñalva Maqueda, Ángela
 Pérez Camiña, Jesús
 Seoane Camino, Luisa María

Lead Researcher

Casanueva Freijo, Felipe



Contact:

Laboratorio Endocrinología Molecular
 Complejo Hospitalario Universitario Santiago
 C/ Chopuana S/N. 15706 Santiago de Compostela · Phone: (+34) 981 955 069
 E.mail: endocrine@usc.es · Website: www.ciberobn.es

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 cretome of muscle and adipose tissue.
- Analysis of skeletal muscle secretome for the identification of regulatory signals of energy homeostasis.

Most relevant scientific articles

- 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 , gastrin-dogenous cannabinoid, signaling pathway activated by FNDC5 and mTOR/S6k1.
 - Study of the effect of lactation on metabolism. Study of lipid metabolism in adipose tissue and gastrointestinal mechanisms.
- SENIN LL, AL-MASSADI O, FOLGUEIRA C, CASTELAO C, PARDO M, BARJA-FERNÁNDEZ S ET AL.. The Gastric CB1 Receptor Modulates Ghrelin Production through the mTOR Pathway to Regulate Food Intake. *PLoS One*. 2013 Nov 26;8(11):e80339.
 - ANDRADE S, PINHO F, RIBEIRO AM, CARREIRA M, CASANUEVA FF, ROY P ET AL.. Immunization against active ghrelin using virus-like particles for obesity treatment. *Curr Pharm Des*. 2013;19(36):6551-8.
 - ROCA-RIVADA A, CASTELAO C, SENIN LL, LANDROVE MO, BALTAR J, BELÉN CRUJEIRAS A ET AL.. FNDC5/irisin is not only a myokine but also an adipokine. *PLoS One*. 2013;8(4):e60563.
 - SANTOS-ZAS I, LODEIRO M, GURRIARÁN-RODRÍGUEZ U, BOUZO-LORENZO M, MOSTEIRO CS, CASANUEVA FF ET AL.. β -Arrestin signal complex plays a critical role in adipose differentiation. *Int J Biochem Cell Biol*. 2013 Jul;45(7):1281-92.
 - CRUJEIRAS AB, DÍAZ-LAGARES A, CARREIRA MC, AMIL M, CASANUEVA FF. Oxidative stress associated to dysfunctional adipose tissue: a potential link between obesity, type 2 diabetes mellitus and breast cancer. *Free Radic Res*. 2013 Apr;47(4):243-56.

Highlights

During 2013, the Molecular Endocrinology group has focused its efforts on developing new lines of work in order to strengthen its research on new aspects of obesity from basic character and, especially, applied to increase their capacity and methodological resources. In this regard, two novel approaches for therapeutic treatment of obesity based on nutritional supplements, and in the field of nanotechnology applied to metabolic control are remarkable.

Molecular Endocrinology group has developed an extensive research activity that has as one of its central themes, the study of the newly discovered irisin and its relationship with obesity resulting in identify in got as an adipokine and numerous articles published in 2013 or will be published shortly.

Also it has obtained new research projects among which is remarkable the call for Proyectos Integrados de Excelencia en los Institutos de Investigación Acreditados del ISCIII.



PROGRAMME:
P1. Nutrition

Epidemiología Genética de las enfermedades cardiovasculares y Obesidad-Nutrigenómica (EPIGEM-NUTRIGENIO)

Group Members

STAFF MEMBERS

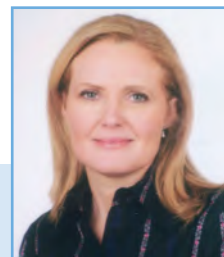
Asensio Márquez, Eva María
 Barragán Arnal, Rocío
 Guillem Saiz, Patricia
 Ortega Azorín, Carolina
 Osma Santiago, Rosana

ASSOCIATED MEMBERS

Alfonso Sánchez, José Luis
 Bautista Rentero, Daniel
 Coltell Simón, Óscar
 Frances Bozal, Francesc
 Giménez Fernández, Francisco J.
 González Arráez, José Ignacio
 Ruíz de la Fuente Tirado, Salvador
 Sorli Guerola, José Vicente
 Sotos Prieto, Mercedes
 Zanón Moreno, Vicente

Lead Researcher

Corella Piquer, Dolores



Contact:

Departamento de Medicina Preventiva
 Facultad de Medicina de Valencia
 Avda. Vicente Blasco Ibáñez, 13. 46010 Valencia
 E.mail: dolores.corella@uv.es

Main lines of research

- Mediterranean diet and health
- Genetic and Molecular Epigeniology 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
- Healthy ageing

Most relevant scientific articles

- ESTRUCH R, ROS E, SALAS-SALVADÓ J, COVAS MI, D PHARM, CORELLA D ET AL.. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. *N Engl J Med*. 2013 Feb 25;.
- CORELLA D, CARRASCO P, SORLÍ JV, ESTRUCH R, RICO-SANZ J, MARTÍNEZ-GONZÁLEZ MA ET AL.. Mediterranean Diet Reduces the Adverse Effect of the TCF7L2-rs7903146 Polymorphism on Cardiovascular Risk Factors and Stroke Incidence: A randomized controlled trial in a high-cardiovascular-risk population. *Diabetes Care*. 2013 Aug 13;.
- SOTOS-PRIETO M, GUILLÉN M, VICENTE SORLI J, PORTOLÉS O, GUILLEM-SAIZ P, IGNACIO GONZÁLEZ J ET AL.. Relevant associations of the glucokinase regulatory protein/glucokinase gene variation with TAG concentrations in a high-cardiovascular risk population: modulation by the Mediterranean diet. *Br J Nutr*. 2013 Jan 28;109(2):193-201.
- SOTOS-PRIETO M, GUILLÉN M, PORTOLÉS O, SORLÍ JV, GONZÁLEZ JI, ASENSIO EM ET AL.. Association between the rs6950982 polymorphism near the SERPINE1 gene and blood pressure and lipid parameters in a high-cardiovascular-risk population: interaction with Mediterranean diet. *Genes Nutr*. 2013 Jul;8(4):401-9.
- SMITH CE, TUCKER KL, ARNETT DK, NOEL SE, CORELLA D, BORECKI IB ET AL.. Apolipoprotein A2 polymorphism interacts with intakes of dairy foods to influence body weight in 2 U.S. populations. *J Nutr*. 2013 Dec;143(12):1865-71.

Highlights

Our research group has participated since 2003 in the recruitment and follow-up of participants in the PREDIMED study. It has been the group that have recruited the highest number of patients (n = 1094) and our work has been crucial for the success of the PREDIMED study. So, in 2013 we highlight as the most important publication, that carried out in the NEJM, that showed the protective effects of the Mediterranean diet in the Prevention of Cardiovascular Diseases.

In parallel, our group is a pioneer group in the study of gene-diet interactions in the genomic epidemiology of obesity and cardiovascular diseases. During 2013 we have continued to achieve interesting results on gene-diet interactions in both the Spanish population and U.S. populations in collaboration with Dr. JM . Ordovás, Boston . We also note that in the PREDIMED population we have published the first gene-diet interaction (Corella et al, *Diabetes Care* 2013) in which, using a randomized dietary intervention, we have demonstrated that the Mediterranean diet counteracts the increased risk of cerebrovascular disease conferred by a genetic polymorphism in the TCF7L2 gene. This study is very relevant in nutrigenetics, as it is the first time in the world that it has been demonstrated that a dietary intervention may modulate the risk of cardiovascular disease in genetically susceptible individuals and undoubtedly contribute to the advancement of personalized nutrition.

Our group has been involved in several guidelines, conducting clinical trials and Theses and has had a significant presence in both media as digital and print media programs as well as a TV (RTVE) magazine.



PROGRAMME:
P1. Nutrition

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

Group Members

STAFF MEMBERS

Barranquero Cortés, Cristina
 Gabas Rivera, Clara
 Gascón Mesa, Sonia
 Martínez Beamonte, Roberto

ASSOCIATED MEMBERS

Acin Martínez, Sergio
 Arbones Mainar, José Miguel
 Arnal Atares, Carmen
 Lou Bonafonte, José Manuel
 Marca Andrés, María del Carmen
 Martínez Gracia, María Victoria
 Muniesa Lorda, Pedro
 Navarro Ferrando, María Ángeles
 Rodríguez Yoldi, María Jesús
 Surra Muñoz, Joaquín Carlos

Lead Researcher

De la Osada García, Jesús



Contact:

Dpto. de Bioquímica y Biología Molecular y Celular
 Facultad de Veterinaria de Zaragoza
 C/ Miguel Servet, 117. 50013 Zaragoza
 Phone: (+34) 976 761 644 · E.mail: Josada@unizar.es
http://www.unizar.es/departamentos/bioquimica_biologia/investigacion/osada/index.html

Main lines of research

- Olive oil and fatty liver
- Olive oil and intestinal physiopathology
- Nuts and atherosclerosis

Most relevant scientific articles

- RODRÍGUEZ-CALVO R, GUADALL A, CALVAYRAC O, NAVARRO MA, ALONSO J, FERRÁN B ET AL.. Over-expression of neuron-derived orphan receptor-1 (NOR-1) exacerbates neointimal hyperplasia after vascular injury. *Hum Mol Genet.* 2013 May 15;22(10):1949-59.
- GABÁS-RIVERA C, MARTÍNEZ-BEAMONTE R, RÍOS JL, NAVARRO MA, SURRA JC, ARNAL C ET AL.. Dietary oleanolic acid mediates circadian clock gene expression in liver independently of diet and animal model but requires apolipoprotein A1. *J Nutr Biochem.* 2013 Dec;24(12):2100-9.
- JULVE J, ESCOLÀ-GIL JC, RODRÍGUEZ-MILLÁN E, MARTÍN-CAMPOS JM, JAUHAINEN M, QUESADA H ET AL.. Methionine-induced hyperhomocysteinemia impairs the antioxidant ability of high-density lipoproteins without reducing in vivo macrophage-specific reverse cholesterol transport. *Mol Nutr Food Res.* 2013 Oct;57(10):1814-24.
- SURRA JC, BARRANQUERO C, TORCAL MP, ORMAN I, SEGOVIA JC, GUILLÉN N ET AL.. In comparison with palm oil, dietary nut supplementation delays the progression of atherosclerotic lesions in female apoE-deficient mice. *Br J Nutr.* 2013 Jan 28;109(2):202-9.
- BARRENETXE J, SÁNCHEZ O, BARBER A, GASCÓN S, RODRÍGUEZ-YOLDI MJ, LOSTAÑO MP. TNF α regulates sugar transporters in the human intestinal epithelial cell line Caco-2. *Cytokine.* 2013 Oct;64(1):181-7.

Highlights

RESEARCH PROYECTS

- Title: Molecular basis of atherosclerosis · Funding organization: Gobierno de Aragón. Consolidated group · IP: Jesús de la Osada García · Duration: 2013
- Title: Intestinal transport · Funding organization: Gobierno de Aragón. Consolidated group · IP: María Jesús Rodríguez Yoldi · Duration: 2013
- Title: Effect of terpenic compounds from Virgin Olive oil on the development of atherosclerosis and fatty liver · Funding organization: CICYT SAF2010-14958. Ministerio de Ciencia e Innovación · IP: Jesús de la Osada García · Duration: 2011-2014
- Title: Effect of dietary nut supplements on atherosclerosis, a search for new biomarkers in humans · Funding organization: FISS PI13/02600 · IP: María Angeles Navarro Ferrando · Duration: 2014-2016
- Title: Apolipoprotein E in the Metabolic Syndrome · Funding organization: FP7-PEOPLE-2011-CIG · IP: Jose Miguel Arbonés Mainar · Duration: 2012-2015



PROGRAMME:

P2. Adipobiology; P3. Complications of obesity and childhood obesity; P6. Physiopathology of body weight homeostasis

Obesómica Funcional y Metabolismo Molecular

Group Members

STAFF MEMBERS

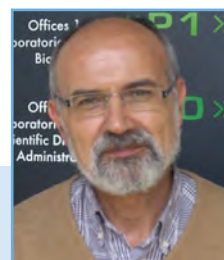
Garrido Novelle, Marta
 Imbernon Piedra, Mónica
 Pazos Mendoza, Patricia
 Pérez Sieira, Sonia
 Romero Picó, Amparo

ASSOCIATED MEMBERS

Abella Fernández, María del Sol
 Álvarez Crespo, Mayte
 Beiroa Tarrío, Daniel
 Blanco Martínez, Pablo
 Fernández Mayo, Diana
 Gallego Rómeiz, Rosalía
 García García, M^a del Carmen
 González Diéguez, Carmen Ruth
 Jesús Martins, Luis Ricardo
 López Pérez, Miguel A.
 Martínez Sánchez, Noelia
 Nogueiras Pozo, Rubén
 Tovar Carro, Sulay
 Velásquez Raimundo, Douglas A.
 Vigo Ramos, Eva

Lead Researcher

Diéguez González, Carlos



Contact:

CIMUS
 Avda Barcelona 3. 15782 Santiago de Compostela
 Phone: (+34) 981 563 100 · E.mail: carlos.dieguez@usc.es

Main lines of research

- Identification of new drug targets at the CNS for Obesity and associated comorbidities.
- 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.

Most relevant scientific articles

- ROMERO-PICÓ A, VÁZQUEZ MJ, GONZÁLEZ-TOUCEDA D, FOLGUEIRA C, SKIBICKA KP, ALVAREZ-CRESPO M ET AL.. Hypothalamic κ -Opioid Receptor Modulates the Orexigenic Effect of Ghrelin. *Neuropsychopharmacology*. 2013 Jan 24;.
- IMBERNON M, BEIROA D, VÁZQUEZ MJ, MORGAN DA, VEYRAT-DUREBEX C, PORTEIRO B ET AL.. Central Melanin-Concentrating Hormone Influences Liver and Adipose Metabolism Via Specific Hypothalamic Nuclei and Efferent Autonomic/JNK1 Pathways. *Gastroenterology*. 2013 Mar;144(3):636-649.e6.
- MENACHO-MÁRQUEZ M, NOGUEIRAS R, FABBIANO S, SAUZEAU V, AL-MASSADI O, DIÉGUEZ C ET AL.. Chronic sympathoexcitation through loss of Vav3, a Rac1 activator, results in divergent effects on metabolic syndrome and obesity depending on diet. *Cell Metab*. 2013 Aug 6;18(2):199-211.
- LÓPEZ M, ALVAREZ CV, NOGUEIRAS R, DIÉGUEZ C. Energy balance regulation by thyroid hormones at central level. *Trends Mol Med*. 2013 Jul;19(7):418-27.
- ÁLVAREZ-CRESPO M, MARTÍNEZ-SÁNCHEZ N, RUÍZ-PINO F, GARCÍA-LAVANDEIRA M, ALVAREZ CV, TENA-SEMPERE M ET AL.. The orexigenic effect of orexin-A revisited: dependence of an intact growth hormone axis. *Endocrinology*. 2013 Oct;154(10):3589-98.

Highlights

The major focus of its research is trying to uncover new mechanisms involved in weight gain in order to develop new drug targets for obesity. In addition new preclinical animal models , including GMA, are being set up.

The grupo is structured in different research áreas led by different PIs. Noteworthy some of them are being funded by the ERC through its Startin Grants (R.Nogueiras) and Consolidated Grants (M.Lopez) programmes. In addition we are currently part of two projects founded by the VII PM of the EU. Over the last 4 years the group have generated 4 patents and published more tan 100 papers in journals scuh as Cell, Nat Medicine, Cell Metabolism, *Physiol Rev*, *Diabetes* etc. Over the last three years 10 members of the group presented their Ph.D and over the last few years scientists from 8 different countries undertook their training in our group.



PROGRAMME:
P1. Nutrition

Dieta Mediterránea y Enfermedad Cardiovascular

Group Members

STAFF MEMBERS

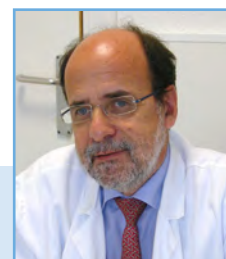
Casas Rodríguez, Rosa María
 Viñas Hernández, Concepción

ASSOCIATED MEMBERS

Arranz Martínez, Sara
 Boch Aparici, Xavier
 Boto Ordoñez, María
 Chiva Blanch, Gemma
 Coca Payeras, Antonio
 Fernández Sola, Joaquín
 López Soto, Alfonso
 Masanes Toran, Ferran
 Mena Jaramillo, Maria Pau
 Nicolás Arfelis, José María
 Rey Fernández, Olalla
 Romero Mama, Edwin Saul
 Sacanella Meseguer, Emilio
 Valderas Martínez, Palmira

Lead Researcher

Estruch Riba, Ramón



Contact:

Hospital Clínico y Provincial de Barcelona
 C/ Villarroel, 170. 08036 Barcelona
 Phone: (+34) 93 227 54 00 · E.mail: restruch@clinic.ub.es
http://www.ciberobn.es/index.php?option=com_content&view=article&catid=12:grupos&id=214&Itemid=13

Main lines of research

- 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 the cardiovascular system, liver and nervous system.
- Effects of Mediterranean diet on health and cardiovascular disease, cancer and neurodegenerative disease.
- Mechanism of the effects of moderate consumption of wine and beer: effects 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

- ESTRUCH R, ROS E, SALAS-SALVADÓ J, COVAS MI, D PHARM, CORELLA D ET AL.. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. *N Engl J Med*. 2013 Feb 25;.
- CORELLA D, CARRASCO P, SORLÍ JV, ESTRUCH R, RICO-SANZ J, MARTÍNEZ-GONZÁLEZ MA ET AL.. Mediterranean Diet Reduces the Adverse Effect of the TCF7L2-rs7903146 Polymorphism on Cardiovascular Risk Factors and Stroke Incidence: A randomized controlled trial in a high-cardiovascular-risk population. *Diabetes Care*. 2013 Aug 13;.
- ARRANZ S, VALDERAS-MARTÍNEZ P, CHIVA-BLANCH G, CASAS R, URPI-SARDA M, LAMUELA-RAVENTÓS RM ET AL.. Cardioprotective effects of cocoa: clinical evidence from randomized clinical intervention trials in humans. *Mol Nutr Food Res*. 2013 Jun;57(6):936-47.
- CHIVA-BLANCH G, ARRANZ S, LAMUELA-RAVENTÓS RM, ESTRUCH R. Effects of wine, alcohol and polyphenols on cardiovascular disease risk factors: evidences from human studies. *Alcohol Alcohol*. 2013 May-Jun;48(3):270-7.
- ESTRUCH R, SALAS-SALVADÓ J. "Towards an even healthier Mediterranean diet". *Nutr Metab Cardiovasc Dis*. 2013 Dec;23(12):1163-6.

Highlights

In the last years, this group has received grants from the National Institute of Health (NIH) from USA, CICYT, *Instituto Nacional de Investigación Agroalimentaria* (INIA) del *Ministerio de Economía y Competitividad*, and *Fondo de Investigación Sanitaria* (FIS)

In 1985, we started to study the toxic effect of alcohol on cardiovascular (*N Engl J Med* 1989, *Ann Intern Med* 1994; *JAMA* 1995, *Arch Intern Med* 1995) and central nervous systems (*Arch Neurol*.1995; *Ann Neurol*.1997). At 1994, a new research program on effects of key foods on atherosclerosis started. First, we analyzed the effects of alcoholic beverages on adhesion molecules related with the development of atherosclerosis (*Alcohol Clin Exp Res* 1998 and 1999; *Thromb Haemost* 2002) and the effects of wine and beer on inflammatory markers related to atherosclerosis (*Atherosclerosis* 2004 and 2014, *Am J Clin Nutr* 2004) and oxidative stress parameters (*Nutr Metab Cardiovasc Dis*. 2010). Finally, two new biomarkers of wine and beer intake have been developed (*Br J Nutr*. 2014 and *J Nutr*. 2014).

In addition, Prof. Estruch is the leader of the Thematic Network "Mediterranean Diet and Cardiovascular Disease" from the ISCIII (Spain). In 2003, we started an ambitious study (PREDIMED) to evaluate the effects of Mediterranean Diet and its main components on the primary prevention of cardiovascular disease in high-risk patients, which have enrolled near 7.500 patients. The study finished at the end of 2011 and their main results have been published in top journals, including *N Engl J Med* (2013), *JAMA* (2014), *Ann Intern Med* (2006 and 2014), *Arch Intern Med* (2007 and 2008), *Am J Clin Nutr* (2009), *J Nutr* (2010), *Diabetes Care* (2011), *PloS One* (2012), *Eur J Heart Fail* (2014), *Int J Cardiol* (2014) and *Arterioscler Thromb Vasc Biol* (2014). The group has published more than 250 manuscripts in peer-review Journals.



PROGRAMME:
**P4. Neurocognition and
 Environmental-Biological Factors**

Grupo de Investigación Avanzada en Trastornos de la Conducta Alimentaria

Group Members

STAFF MEMBERS

Aguera Imbernon, Zaida Palmira
 Forcano Gamazo, Laura
 Islam, Mohammed Anisul

ASSOCIATED MEMBERS

Fagundo Morales, Ana Beatriz
 Granero Pérez, Roser
 Jiménez Murcia, Susana

Lead Researcher

Fernández Aranda, Fernando



Contact:

Unidad de Trastornos de Alimentación
 Hospital Universitario de Bellvitge
 C/ Freixa Larga s/n. 08907 Hospitalet de Llobregat, Barcelona
 Phone: (+34) 93 260 72 27 · E.mail: ffernandez@bellvitgehospital.cat
 Website: <http://www.idibell.cat/modul/psiquiatria-i-salut-mental/ca>

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
- 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 addictions.

Most relevant scientific articles

- FAGUNDO AB, DE LA TORRE R, JIMÉNEZ-MURCIA S, AGÜERA Z, PASTOR A, CASANUEVA FF ET AL.. Modulation of the Endocannabinoids N-Arachidonylethanolamine (AEA) and 2-Arachidonoylglycerol (2-AG) on Executive Functions in Humans. *PLoS One*. 2013;8(6):e66387.
- TERRA X, AUGUET T, AGÜERA Z, QUESADA IM, ORELLANA-GAVALDÀ JM, AGUILAR C ET AL.. Adipocytokine levels in women with anorexia nervosa. Relationship with weight restoration and disease duration. *Int J Eat Disord*. 2013 Dec;46(8):855-61.
- AGÜERA Z, RIESCO N, JIMÉNEZ-MURCIA S, ISLAM MA, GRANERO R, VICENTE E ET AL.. Cognitive behaviour therapy response and dropout rate across purging and nonpurging bulimia nervosa and binge eating disorder: DSM-5 implications. *BMC Psychiatry*. 2013 Nov 7;13:285.
- FAGUNDO AB, SANTAMARÍA JJ, FORCANO L, GINER-BARTOLOMÉ C, JIMÉNEZ-MURCIA S, SÁNCHEZ I ET AL.. Video game therapy for emotional regulation and impulsivity control in a series of treated cases with bulimia nervosa. *Eur Eat Disord Rev*. 2013 Nov;21(6):493-9.
- JIMÉNEZ-MURCIA S, STEIGER H, ISRAËL M, GRANERO R, PRAT R, SANTAMARÍA JJ ET AL.. Pathological gambling in eating disorders: prevalence and clinical implications. *Compr Psychiatry*. 2013 Oct;54(7):1053-60.

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 (IP F. Fernández Aranda)
- Intensification Program for Research Activity of Clinical Specialists of the National Health Department SNS-ICS (Ref. INT12/270) Instituto de Salud Carlos III- Generalitat Catalunya (FFA)
- EU COST-Action: European Union- Biomedicine and Molecular Biosciences: GnRH deficiency: Elucidation of the neuroendocrine control of human reproduction (BM1105)
- Reliability, Validity and Classification Accuracy of the Proposed DSM-V Diagnostic Criteria for Pathological Gambling- Institute for Research in Gambling Disorders- IRGD-Ontario (IP Susana Jimenez-Murcia)
- Analysis of Gambling Behavior in Adolescents and Young Individuals: From Social issues to Pathology (PSI2011-28349)- I+D Plan Nacional (IP Susana Jiménez Murcia)
- 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.



PROGRAMME:

P2. Adipobiology;

P3. Complications of obesity and childhood obesity; P4. Neurocognition and Environmental-Biological Factors

Nutrición, Eumetabolismo y Salud

Group Members

STAFF MEMBERS

Alonso Ledesma, Isabel
 Moreno Navarrete, José María
 Moreno Rodríguez, María
 Ortega Delgado, Francisco José
 Rodríguez Llagostera, Roser
 Rovira Gómez, Óscar

ASSOCIATED MEMBERS

Biarnes Costa, Josefina
 Castillejo Navarro, Clotilde
 Castro Guardiola, Antonio
 Esteve Lafuente, Eduardo
 Fdez. Balsells, M. de las Mercedes
 Loshuertos Gil, Emilio
 Martínez Merchán, Cristina
 Pardo Albiñana, Gerard
 Peral Fuentes, Belén
 Planella Farrugia, Cristina
 Recasens Sala, Mónica
 Ricart Engel, Wifredo
 Sabater Masdeu, Mónica
 Salleras Compte, Neus
 Serrano Muñoz, Marta

CONTRIBUTORS

Millán, Olga

Lead Researcher

Fdez.-Real Lemos, José Manuel



Contact:

Fundación Instituto de Investigación Josep Trueta
 Hospital Josep Trueta 9ª Planta
 Ctra de Francia s/n. 17007 Girona · Phone: (+34) 972 940 200
 E.mail: jmfreal@idibigi.org · Website: www.idibigi.org

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

- ORTEGA FJ, MERCADER JM, CATALÁN V, MORENO-NAVARRETE JM, PUEYO N, SABATER M ET AL.. Targeting the circulating microRNA signature of obesity. *Clin Chem*. 2013 May;59(5):781-92.
- MORENO-NAVARRETE JM, ORTEGA F, SERRANO M, GUERRA E, PARDO G, TINAHONES F ET AL.. Irisin is expressed and produced by human muscle and adipose tissue in association with obesity and insulin resistance. *J Clin Endocrinol Metab*. 2013 Apr;98(4):E769-78.
- MORENO-NAVARRETE JM, PETROV P, SERRANO M, ORTEGA F, GARCÍA-RUIZ E, OLIVER P ET AL.. Decreased RB1 mRNA, Protein, and Activity Reflect Obesity-Induced Altered Adipogenic Capacity in Human Adipose Tissue. *Diabetes*. 2013 Jan 11;.
- PRATS-PUIG A, ORTEGA FJ, MERCADER JM, MORENO-NAVARRETE JM, MORENO M, BONET N ET AL.. Changes in circulating microRNAs are associated with childhood obesity. *J Clin Endocrinol Metab*. 2013 Oct;98(10):E1655-60.
- MORENO-NAVARRETE JM, ESCOTÉ X, ORTEGA F, SERINO M, CAMPBELL M, MICHALSKI MC ET AL.. A role for adipocyte-derived lipopolysaccharide-binding protein in inflammation- and obesity-associated adipose tissue dysfunction. *Diabetologia*. 2013 Nov;56(11):2524-2537.

Highlights

RECENT FUNDED PROJECTS:

- Title: The role of intestinal microflora in non-alcoholic fatty liver disease (FLORINASH) · Fundings: Séptimo Programa Marco de la Unión Europea · Since: 2010 to: 2014 · Funding: 520,000 euros · Principal investigator: José Manuel Fernández-Real.
- Title: MicroRNA circulantes y en el tejido adiposo como biomarcadores metabólicos (FIS 2011) · Fundings: Instituto de Salud Carlos III · Since: 2010 to: 2015 · Funding: 510.620 Euros · Principal investigator: José Manuel Fernández-Real
- Title: Estudio del posible rol del hierro en la fisiología del tejido adiposo humano en asociación con obesidad y resistencia a la insulina (FIS 2012) · Fundings: Instituto de Salud Carlos III · Since: 2012 to: 2015 · Funding: 147.015 Euros · Principal investigator: José Maria Moreno Navarrete.
- Title: Circulating microRNAs in prepubertal children as biomarkers of metabolic diseases as type 2 diabetes · Fundings: European Association for the Study of Diabetes · Since: 2013 to: 2014 · Funding: 50,000 Euros · Principal investigator: Francisco Jose Ortega Delgado.
- Title: Estudio de la metformina y microflora intestinal (FIS 2011) · Fundings: Instituto de Salud Carlos III · Since: 2010 to: 2012 · Principal investigator: Wifredo Ricart.

PATENT:

- AUTHORS: Francisco José Ortega Delgado, José Manuel Fernández-Real, Gemma Frühbeck, Josep Maria Mercader · TITLE: MÉTODO PARA EL DIAGNÓSTICO Y/O PRONÓSTICO DE OBESIDAD MÓRBIDA · REGISTRY NUMBER: ES2654.4 · TITULAR ENTITY: CIBERobn, IDIBGI, Clínica Universidad de Navarra, Barcelona Supercomputing Center · YEAR: 2012 COUNTRIES: Spain.
- AUTHORS: José Maria Moreno Navarrete, José Manuel Fernández-Real, Francesc Villarroya, Gemma Frühbeck · TÍTULO: MOLÉCULAS ÚTILES PARA EL TRATAMIENTO Y/O PREVENCIÓN DE TRASTORNOS METABÓLICOS ASOCIADOS A OBESIDAD Y RESISTENCIA A INSULINA · REGISTRY NUMBER: P201330998 · TITULAR ENTITY: CIBERobn, IDIBGI, Clínica Universidad de Navarra, University Central de Barcelona · YEAR: 2013 COUNTRIES: Spain.

CLINICAL GUIDELINES:

care path of type II diabetes. Girona Health Region

PRIZE:

Projecte EFSD / Lilly Fellowship of the European Association for the Study of Diabetes managed by Dr. Francisco Ortega.



PROGRAMME:

P1. Nutrition; P3. Complications of obesity and childhood obesity; P5. New Strategies and Biomarkers in the Prevention and Treatment of Obesity and Eating Disorders

Fisiopatología Cardiovascular y Epidemiología Nutricional

Group Members

STAFF MEMBERS

García Valdueza, Marta

ASSOCIATED MEMBERS

Alcolea Delgado, M^a Del Pilar
 Amengual Cladera, Emilia
 Amezaga Menéndez, Rocío
 Carrillo López, Andres
 Costa Bauzá, Antonia
 García Palmer, Francisco José
 Gianotti Bauzá, Magdalena
 Gómez Pérez, Yolanda
 Grases Freixedas, Feliciano
 Guevara De Bonis, Rocío
 Lladó Sampol, Isabel
 Moñino Gómez, Manuel
 Morey Servera, Margarita
 Nadal Casellas, Antonia
 Oliver Oliver, Jordi
 Prieto Almirall, Rafael
 Proenza Arenas, Ana María
 Prohens Rogo, Lara
 Roca Salom, María del Pilar
 Romaguera Bosch, M. Adoración
 Rosello Ferrer, Ainhoa
 Santandreu Jaume, Francisca M.
 Sastre Serra, Jorge
 Valle Gómez, Adamo
 Vila Vidal, Magdalena

Lead Researcher

Fiol Sala, Miguel



Contact:

IUNICS. Universidad de las Islas Baleares
 Edificio Científico Técnico, Campus Universitario (UIB)
 Ctra. de Valldemossa km 7.5 · 07122 Palma de Mallorca · Islas Baleares
 Phone: (+34) 971 172 070 · E.mail: miguel.fiol@ssib.es

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.
- Pathological 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 mitochondrial 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

- ESTRUCH R, ROS E, SALAS-SALVADÓ J, COVAS MI, D PHARM, CORELLA D ET AL.. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. *N Engl J Med*. 2013 Feb 25;.
- InterAct consortium. Consumption of sweet beverages and type 2 diabetes incidence in European adults: results from EPIC-InterAct. *Diabetología*. 2013 Jul;56(7):1520-30.
- GUASCH-FERRÉ M, BULLÓ M, MARTÍNEZ-GONZÁLEZ MA, ROS E, CORELLA D, ESTRUCH R ET AL.. Frequency of nut consumption and mortality risk in the PREDIMED nutrition intervention trial. *BMC Med*. 2013 Jul 16;11:164.
- TOLEDO E, HU FB, ESTRUCH R, BUIL-COSIALES P, CORELLA D, SALAS-SALVADÓ J ET AL.. Effect of the Mediterranean diet on blood pressure in the PREDIMED trial: results from a randomized controlled trial. *BMC Med*. 2013 Sep 19;11:207.
- BLANQUER-ROSSELLÓ MM, OLIVER J, VALLE A, ROCA P. Effect of xanthohumol and 8-prenylningenin on MCF-7 breast cancer cells oxidative stress and mitochondrial complexes expression. *J Cell Biochem*. 2013 Dec;114(12):2785-94.

Highlights

- We have participated on the PREDIMED study from its beginnings with the recruitment of 650 volunteers (www.predimed.org). We are currently implementing the study PREDIMED PLUS (www.predimedplus.com).
- We are also creating a database to correlate electrocardiographic alterations with diet and coronary events.



PROGRAMME:

**P1. Nutrition; P2. Adipobiology;
 P6. Physiopathology of body
 weight homeostasis**

Riesgo Cardiovascular y Nutrición (CARIN)

Group Members

STAFF MEMBERS

Blasco Lapuente, Anna
 Castañer Niño, Olga

ASSOCIATED MEMBERS

Covas Planells, María Isabel
 De la Torre Fornell, Rafael
 Farràs Mañé, Marta
 Goday Arno, Alberto
 Pastor Bosch, Antoni
 Pujadas Bastardes, María Antonia
 Tello Rovira, Susana
 Cladellas Capdevila, Mercè

Lead Researcher

Fitó Colomer, Monserrat



Contact:

IMIM-Institut Hospital del Mar d'Investigacions Mèdiques
 Hospital del Mar, P^o Marítim, 25-29. 08003 Barcelona
 E.mail: mfito@imim.es · Website: www.imim.es

Main lines of research

The Mediterranean diet, its foods and the interaction of nutrients, has healthy effects on morbidity and mortality related to cardiovascular diseases that have been widely described and scientifically proven. In this context, the main objective of our research is to determine the effect of diet on cardiovascular risk factors and cardiovascular diseases, as well as to establish the cellular and molecular mechanisms that contribute to these beneficial effects. To achieve these goals, we are working at present in the following research lines:

- Nutrition Studies and Cardiovascular Risk
- Molecular and cellular mechanisms related with risk and protective factors for cardiovascular disease
 - Role of high density lipoproteins (HDLs)
 - Nutrigenomics
 - Interaction between diet and intestinal flora
 - Emergent and cardiovascular risk factors
- Nutritional Epidemiology and Childhood Obesity
- Nutrition and Neurocognition
- Obesity and diabetes epidemiology and management

Most relevant scientific articles

- CASTAÑER O, CORELLA D, COVAS MI, SORLÍ JV, SUBIRANA I, FLORES-MATEO G ET AL.. In vivo transcriptomic profile after a Mediterranean diet in high-cardiovascular risk patients: a randomized controlled trial. *Am J Clin Nutr.* 2013 Sep;98(3):845-53.
- FARRÀS M, VALLS RM, FERNÁNDEZ-CASTILLEJO S, GIRALT M, SOLÀ R, SUBIRANA I ET AL.. Olive oil polyphenols enhance the expression of cholesterol efflux related genes in vivo in humans. A randomized controlled trial. *J Nutr Biochem.* 2013 Jul;24(7):1334-9.
- MARTÍN-PELÁEZ S, COVAS MI, FITÓ M, KUŠAR A, PRAVST I. Health effects of olive oil polyphenols: recent advances and possibilities for the use of health claims. *Mol Nutr Food Res.* 2013 May;57(5):760-71.
- KONSTANTINIDOU V, COVAS MI, SOLA R, FITÓ M. Up-to date knowledge on the in vivo transcriptomic effect of the Mediterranean diet in humans. *Mol Nutr Food Res.* 2013 May;57(5):772-83.
- YUBERO-LAHOZ S, ROBLEDO P, FARRÉ M, DE LA TORRE R. Platelet SERT as a peripheral biomarker of serotonergic neurotransmission in the central nervous system. *Curr Med Chem.* 2013;20(11):1382-96.

Highlights

Recently The PREDIMED trial showed that long-term adherence to energy unrestricted Mediterranean diet supplemented with extra-virgin olive oil or mixed nuts reduced incident cardiovascular disease in older subjects at high risk (Estruch et al. *NEJM* 2013). At present we are involved in the PREDIMED-plus Study, which is a randomized clinical trial for the primary prevention of cardiovascular disease with an energy-restricted Mediterranean diet and intensive lifestyle intervention directed to lose weight in older subjects with overweight or obesity and metabolic syndrome (FIS 2013- PI13/00233).

In addition the group is working in randomized trials with functional olive oils which are enriched in bioactive compounds (Plan Nacional 2013- AGL2012-40144-C03-01), such as the VOHF Study, a randomized trial with 33 volunteers with dyslipidemia. The volunteers consumed 3 different types of virgin olive oil: one enriched with phenol compounds derived from olive oil, one enriched with compounds derived from thyme, and virgin olive oil, used as a control. The study of the bioavailability and bioactivity of these compounds is also under our scientific scope (Kotronoulas A et al. *Pharmacol Res* 2013).

We have described an improvement of the expression of key genes related to cholesterol efflux after a virgin olive oil intervention (Farràs M et al. *J Nutr Biochem* 2013;). Also, the in vivo transcriptomic effect of the Mediterranean diet in humans has been described in high-cardiovascular risk patients (Castañer O et al. *AJCN* 2013, Konstantinidou V. *Mol Nutr Food Res* 2013).

A very new research line focuses on changes in microbiotic intestinal flora produced by a nutritional intervention has been standardized and developed (Martín-Peláez S et al. *Mol Nutr Food Res* 2013).

Finally, epigallocatechin-3-gallate, has been described to rescue cognitive deficits in Down syndrome in mouse models and in humans (De la Torre R et al. *Mol Nutr Food Res.* 2014).



PROGRAMME:
P2. Adipobiology

Adipobiología Traslacional

Group Members

STAFF MEMBERS

Becerril Mañas, Sara
 Ibáñez Solano, Patricia
 Romero Sánchez, Sonia

ASSOCIATED MEMBERS

Álvarez-Cienfuegos Suárez, Javier
 Burrel Bustos, María Ángela
 Catalán Goñi, Victoria
 Escalada Martín, Francisco Javier
 Fernández González, Secundino
 Gil Calvo, María Jesús
 Gómez Ambrosi, Javier
 Lancha Urtasun, Andoni
 Ramírez Sola, Beatriz
 Rodríguez Murueta-Goyena, Amaia
 Rotellar Sastre, Fernando
 Sainz Amillo, Neira
 Salvador Rodríguez, Fco. Javier
 Silva Froján, Camilo
 Valenti Azcarate, Víctor

Lead Researcher

Frühbeck Martínez, Gema



Contact:

Clínica Universitaria de Navarra
 Ava Pío XII, 36. 31008 Pamplona, Navarra
 Phone: (+34) 948 255 400 · E.mail: gfruhbeck@unav.es
http://www.ciberobn.es/index.php?option=com_content&view=article&catid=12:grupos&id=118&Itemid=13

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

- RODRÍGUEZ A, GENA P, MÉNDEZ-GIMÉNEZ L, ROSITO A, VALENTÍ V, ROTELLAR F ET AL.. Reduced hepatic aquaporin-9 and glycerol permeability are related to insulin resistance in non-alcoholic fatty liver disease. *Int J Obes (Lond)*. 2013 Dec 13;.
- NAUKKARINEN J, HEINONEN S, HAKKARAINEN A, LUNDBOM J, VUOLTEENAHO K, SAARINEN L ET AL.. Characterising metabolically healthy obesity in weight-discordant monozygotic twins. *Diabetología*. 2013 Oct 8;.
- ORTEGA FJ, MERCADER JM, CATALÁN V, MORENO-NAVARRETE JM, PUEYO N, SABATER M ET AL.. Targeting the circulating microRNA signature of obesity. *Clin Chem*. 2013 May;59(5):781-92.
- CATALÁN V, GÓMEZ-AMBROSI J, RODRÍGUEZ A, RAMÍREZ B, ROTELLAR F, VALENTÍ V ET AL.. Increased levels of chemerin and its receptor, chemokine-like receptor-1, in obesity are related to inflammation: tumor necrosis factor- α stimulates mRNA levels of chemerin in visceral adipocytes from obese patients. *Surg Obes Relat Dis*. 2013 Mar-Apr;9(2):306-14.
- MORENO-NAVARRETE JM, ESCOTÉ X, ORTEGA F, SERINO M, CAMPBELL M, MICHALSKI MC ET AL.. A role for adipocyte-derived lipopolysaccharide-binding protein in inflammation- and obesity-associated adipose tissue dysfunction. *Diabetología*. 2013 Nov;56(11):2524-2537.

Highlights

PROJECTS

- Prospective study of the changes in energy balance after bariatric surgery. ISC III. Ministerio Economía y Competitividad FIS-INTRASALUD. IP Gema Frühbeck.
- Study of the implication of extracellular matrix remodeling of the adipose tissue and liver in the onset of obesity and its comorbidities. ISC III. Ministerio Economía y Competitividad FIS. IP. Javier Gómez-Ambrosi.
- Impact of ghrelin isoforms in the development of obesity-related hypertension. ISC III. Ministerio Economía y Competitividad FIS. IP Amaia Rodríguez.
- DORIAN - Developmental Origins of Healthy and Unhealthy Ageing. The role of Maternal Obesity. EU Commission, 7th Framework Programme. IP Patricia Iozzo.
- SPOTLIGHT - Sustainable Prevention of Obesity Through Integrated Strategies. EU 7th Framework Programme IP Johannes Brug.

PATENT

- Co-inventor of the patent entitled "Useful molecules for the treatment and/or prevention of metabolic alterations associated to obesity and insulin resistance" (nº P201330998).

LIDERAZGO EN ELABORACIÓN DE GUÍAS CLÍNICAS

- Interdisciplinary European Guidelines on metabolic and bariatric surgery. *Obes Facts* 2013;6:449-68.
- Obesity: The Gateway to Ill Health - an EASO Position Statement on a Rising Public Health, Clinical and Scientific Challenge in Europe. *Obes Facts* 2013;6:117-120.

COLLABORATIONS

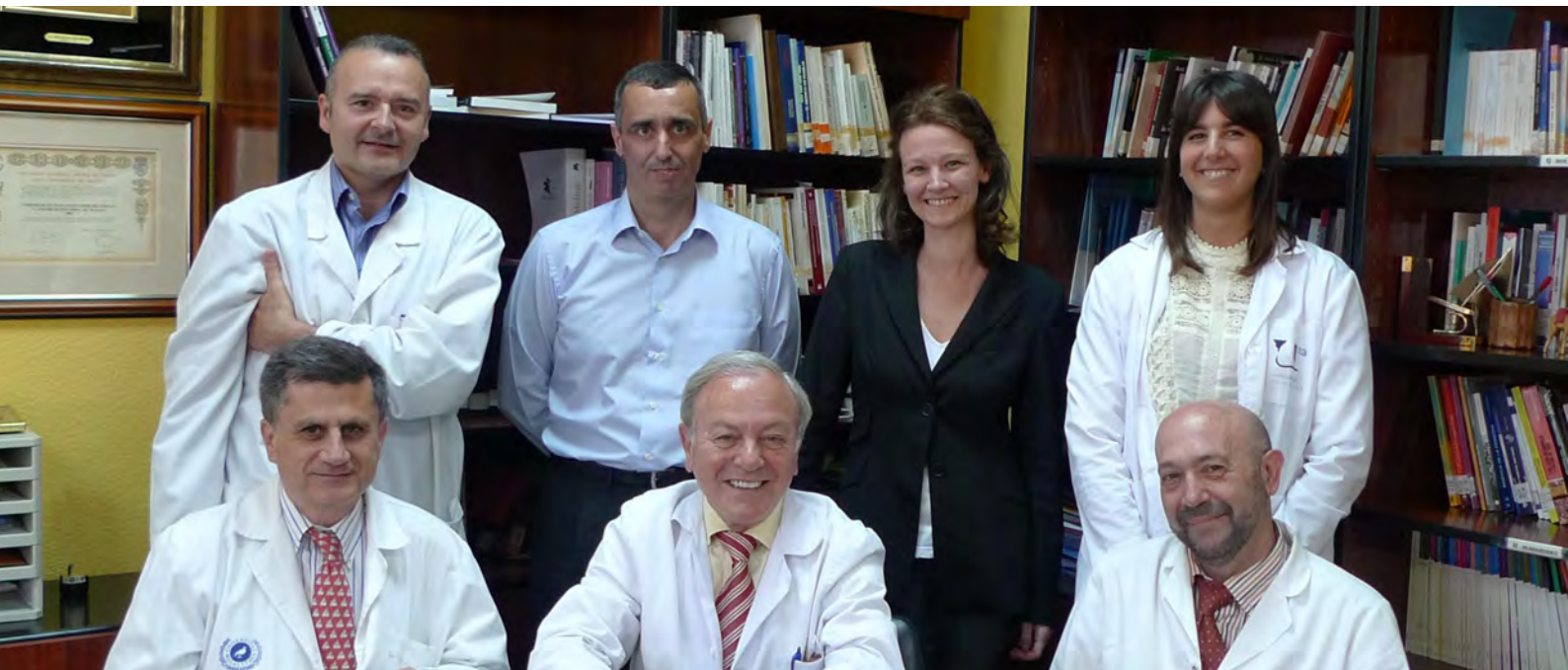
- Predoctoral training of a member of the CIBERobn group Obesidad, Neuroendocrinología y Función Reproductora in the Metabolic Research Laboratory. Collaboration between Córdoba and Pamplona nodes.
- Collaborations & publications with the CIBERobn groups of Drs. Casanueva, Fernández-Real, Fernández-Aranda, Diéguez, Tena-Sempere, Botella, Argente, Tinahones Villaroya.
- International collaborations with Drs. Pietiläinen (Helsinki, Finland) and Calamita (Bari, Italy).

AWARDS

- Albert Struyvenberg Medal 2013 of the European Society for Clinical Investigation (Gema Frühbeck)
- EASO Young Investigator Award in Basic Science 2013 (Amaia Rodríguez)
- SEEDO Basic Research Award in Obesity 2013 (Amaia Rodríguez)

BOOK CHAPTER

- Frühbeck G, Gómez-Ambrosi J. Adipose tissue. In: *Encyclopedia of Human Nutrition* 3rd Edition. Eds: Caballero B, Allen L, Prentice A. Elsevier Ltd., Oxford, United Kingdom, 2013 pages 1-14. (ISBN: 978-0-12-375083-9).



PROGRAMME:
P1. Nutrition

Unidad de Epidemiología Nutricional, Actividad física y Prevención de la Obesidad

Group Members

STAFF MEMBERS

Warnberg, Julia

ASSOCIATED MEMBERS

Fernández-Crehuet Navajas, Joaquín

García Rodríguez, Antonio

Gutiérrez Bedmar, Mario

Warnberg, Julia

Lead Researcher

Gómez Gracia, Enrique



Contact:

Facultad de Medicina de Málaga. Campus Teatinos

Phone: (+34) 952 131 609

E.mail: enap@medprev.uma.es

Website: www.uma.es

Main lines of research

- The Unit for Nutritional Epidemiology, Physical Activity and Obesity Prevention is a multidisciplinary team that includes specialists in Preventive Medicine, Epidemiology, Nutrition, Sports Medicine and Biostatistics.
- We focus our research on studies of primary prevention of chronic diseases with diet (Mediterranean diet), and physical activity and the study of risk factors such as obesity, chronic inflammation and cardiovascular disease in children, adolescents and adults.
- Our research areas are the following:
 - 1) Nutritional Epidemiology and Physical Activity
 - 2) Intervention studies with diet and physical activity
 - 3) Anti-inflammatory effect of diet and food
 - 4) Body composition studies

Most relevant scientific articles

- ESTRUCH R, ROS E, SALAS-SALVADÓ J, COVAS MI, D PHARM, CORELLA D ET AL.. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. *N Engl J Med*. 2013 Feb 25;.
- SÁNCHEZ-VILLEGAS A, MARTÍNEZ-GONZÁLEZ MA, ESTRUCH R, SALAS-SALVADÓ J, CORELLA D, COVAS MI ET AL.. Mediterranean dietary pattern and depression: the PREDIMED randomized trial. *BMC Med*. 2013 Sep 20;11:208.
- GEA A, BEUNZA JJ, ESTRUCH R, SÁNCHEZ-VILLEGAS A, SALAS-SALVADÓ J, BUIL-COSIALES P ET AL.. Alcohol intake, wine consumption and the development of depression: the PREDIMED study. *BMC Med*. 2013 Aug 30;11(1):192.
- TOLEDO E, HU FB, ESTRUCH R, BUIL-COSIALES P, CORELLA D, SALAS-SALVADÓ J ET AL.. Effect of the Mediterranean diet on blood pressure in the PREDIMED trial: results from a randomized controlled trial. *BMC Med*. 2013 Sep 19;11:207.
- CORELLA D, CARRASCO P, SORLÍ JV, ESTRUCH R, RICO-SANZ J, MARTÍNEZ-GONZÁLEZ MA ET AL.. Mediterranean Diet Reduces the Adverse Effect of the TCF7L2-rs7903146 Polymorphism on Cardiovascular Risk Factors and Stroke Incidence: A randomized controlled trial in a high-cardiovascular-risk population. *Diabetes Care*. 2013 Aug 13;.

Highlights

- In 2013 we have been awarded with two grants to co-finance the start-up of the PREDIMEDplus trial; one from the Instituto de Salud Carlos III (Spanish Ministry of Economy and Competitiveness), and the other grant from the Junta of Andalusia (the government of the Autonomous Community of Andalusia).



PROGRAMME:
P1. Nutrition

Antioxidantes Naturales

Group Members

STAFF MEMBERS

Vázquez Dubed, Mónica

ASSOCIATED MEMBERS

Castellote Bargallo, Ana Isabel
 Izquierdo Pulido, María
 López Sabater, María del Carmen
 Martínez Huelamo, Mirian
 Medina Remon, Alexander
 Montes Goyanes, Rosa María
 Quífer Rada, Paula
 Vallverdú Queralt, Anna

CONTRIBUTORS

Tresserra Rimbau, Anna

Lead Researcher

Lamuela Raventós, Rosa M.



Contact:

Bioquímica y Biología Molecular
 Facultad De Farmacia. Universidad De Barcelona
 Diagonal, 645. 08028 Barcelona · Phone: (+34) 93 402 45 23
 E.mail: lamuela@ub.edu
<http://www.polyphenolresearch.com/>

Main lines of research

- 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
- 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

- ESTRUCH R, ROS E, SALAS-SALVADÓ J, COVAS MI, D PHARM, CORELLA D ET AL.. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. *N Engl J Med*. 2013 Feb 25;.
- QUIFER-RADA P, MARTÍNEZ-HUÉLAMO M, JÁUREGUI O, CHIVA-BLANCH G, ESTRUCH R, LAMUELA-RAVENTÓS RM. Analytical condition setting a crucial step in the quantification of unstable polyphenols in acidic conditions: analyzing prenylflavonoids in biological samples by liquid chromatography-electrospray ionization triple quadrupole mass spectrometry. *Anal Chem*. 2013 Jun 4;85(11):5547-54.
- TRESSERRA-RIMBAU A, MEDINA-REMÓN A, PÉREZ-JIMÉNEZ J, MARTÍNEZ-GONZÁLEZ MA, COVAS MI, CORELLA D ET AL.. Dietary intake and major food sources of polyphenols in a Spanish population at high cardiovascular risk: the PREDIMED study. *Nutr Metab Cardiovasc Dis*. 2013 Oct;23(10):953-9.
- VALLVERDÚ-QUERALT A, DE ALVARENGA JF, ESTRUCH R, LAMUELA-RAVENTÓS RM. Bioactive compounds present in the Mediterranean sofrito. *Food Chem*. 2013 Dec 15;141(4):3365-72.
- DI LECCE G, MARTÍNEZ-HUÉLAMO M, TULIPANI S, VALLVERDÚ-QUERALT A, LAMUELA-RAVENTÓS RM. Setup of a UHPLC-QqQ-MS method for the analysis of phenolic compounds in cherry tomatoes, tomato sauce, and tomato juice. *J Agric Food Chem*. 2013 Sep 4;61(35):8373-80.

Highlights

The research work of Dr. Rosa Lamuela, for 2013, is set forth as follows according to the SCI:

Scientific production: 27 papers

Total times cited: 210

Sum of times cited by others (not self-citation): 181

Average citations per article: 7.77

h-Index: 40

Currently they are conducting 4 research projects, of which 1 is European:

- "Risks and benefits of the ethanol and polyphenol content in beer : effects of moderate consumption on cardiovascular system" EA 13 24 (ERAB) - € 60,000.00
- "Guide for the substantiation of health claims on foods: immune function, cognitive and metabolic syndrome" INNPRONTA (Ministry of Economy and Competitiveness) - € 220,000.00
- "Evaluation of the antihypertensive and anti-inflammatory effect of polyphenols, carotenoids and vitamin C from tomato, according to ingested dietary allowance " AGL2010 - 22319 -C03 -01 (Ministry of Science and Innovation) - € 115,000.00
- "Healthy eating in the primary prevention of chronic diseases: Red Predimed" CB06/031024 (Ministry of Health) - € 143,811.56

During the year 2013 conducted two clinical trials, one of which is still ongoing:

- "Use of urinary concentration of tartaric acid as a dietary biomarker of red and white wine: an open randomized cross -over controlled trial" 2012-2013
- "Assessment of the intake of different doses of tomato on blood pressure and endothelial function in patients at high cardiovascular risk, nutrigenomics effect on risk phenotypes " 2011-2015



PROGRAMME:
P1. Nutrition

Nutrición y Prevención de Enfermedades en Atención Primaria

Group Members

STAFF MEMBERS

Leal Cala, Marta
 Martínez Córdoba, Elena

ASSOCIATED MEMBERS

Espinaco Garrido, M^a 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

Lead Researcher

Lapetra Peralta, José



Contact:

Distrito Sanitario Atención Primaria de Sevilla
 C/ Jerusalén s/n. 41007 Sevilla
 Phone: (+34) 954 994 140
 E.mail: jlapetra@ono.com

Main lines of research

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

Most relevant scientific articles

- ESTRUCH R, ROS E, SALAS-SALVADÓ J, COVAS MI, D PHARM, CORELLA D ET AL.. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. *N Engl J Med*. 2013 Feb 25;.
- GUASCH-FERRÉ M, BULLÓ M, MARTÍNEZ-GONZÁLEZ MA, ROS E, CORELLA D, ESTRUCH R ET AL.. Frequency of nut consumption and mortality risk in the PREDIMED nutrition intervention trial. *BMC Med*. 2013 Jul 16;11:164.
- CORELLA D, CARRASCO P, SORLÍ JV, ESTRUCH R, RICO-SANZ J, MARTÍNEZ-GONZÁLEZ MA ET AL.. Mediterranean Diet Reduces the Adverse Effect of the TCF7L2-rs7903146 Polymorphism on Cardiovascular Risk Factors and Stroke Incidence: A randomized controlled trial in a high-cardiovascular-risk population. *Diabetes Care*. 2013 Aug 13;.
- GEA A, BEUNZA JJ, ESTRUCH R, SÁNCHEZ-VILLEGAS A, SALAS-SALVADÓ J, BUIL-COSIALES P ET AL.. Alcohol intake, wine consumption and the development of depression: the PREDIMED study. *BMC Med*. 2013 Aug 30;11(1):192.
- TOLEDO E, HU FB, ESTRUCH R, BUIL-COSIALES P, CORELLA D, SALAS-SALVADÓ J ET AL.. Effect of the Mediterranean diet on blood pressure in the PREDIMED trial: results from a randomized controlled trial. *BMC Med*. 2013 Sep 19;11:207.

Highlights

- Publication in The New England Journal of Medicine of the main results of the PREDIMED Study.
- 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 (2014-2016).
- Grant by Andalusian Health Service (Spain) for Research Project "Validity of glycemic hour after the oral glucose load in the diagnosis of impaired glucose tolerance and hidden diabetes in patients with impaired fasting glucose" (PI-0112-2013). Principal Investigator: José Manuel Santos. Duration: 3 years (2014-2016).



PROGRAMME:
P1. Nutrition;
P2. Adipobiology

Colesterol, Nutrición y Obesidad

Group Members

STAFF MEMBERS

Casado Cerdeño, María Emilia
Fernández Suárez, María Eugenia
Martín Sánchez, Covadonga

ASSOCIATED MEMBERS

Arrieta Blanco, Francisco Jesús
Balsa Barro, José Antonio
Botella Carretero, José Ignacio
Busto Duran, Rebeca
Crespo Toro, Lorena
Gómez-Coronado Cáceres, Diego
Martín Hidalgo, Antonia
Martínez-Botas Mateo, Javier
Prieto Moreno, Ana
Ramírez Ortiz, María Mercedes
Vázquez Martínez, Clotilde
Zamarrón Cuesta, Isabel

Lead Researcher

Lasunción Ripa, Miguel Ángel



Contact:

Servicio de Bioquímica- Investigación
Hospital Ramón y Cajal
Ctra. de Colmenar, km 9.1. 28034 Madrid · Phone: (+34) 91 336 80 77
E.mail: miguel.a.lasuncion@hrc.es
<http://www.ciberobn.es/>

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

- CANFRAN-DUQUE A, CASADO ME, PASTOR O, SÁNCHEZ-WANDELMER J, DE LA PENA G, LERMA M ET AL.. Atypical antipsychotics alter cholesterol and fatty acid metabolism in vitro. *J Lipid Res.* 2012 Nov 21;.
- DAIMIEL LA, FERNÁNDEZ-SUÁREZ ME, RODRÍGUEZ-ACEBES S, CRESPO L, LASUNCIÓN MA, GÓMEZ-CORONADO D ET AL.. Promoter analysis of the 3 β -hydroxysterol Δ 24-reductase (DHCR24) gene: characterization of sterol regulatory element-binding protein (SREBP)-mediated activation. *Biosci Rep.* 2012 Oct 10;.
- CASADO ME, PASTOR O, MARISCAL P, CANFRÁN-DUQUE A, MARTÍNEZ-BOTAS J, KRAEMER FB ET AL.. Hormone-sensitive lipase deficiency disturbs the fatty acid composition of mouse testis. *Prostaglandins Leukot Essent Fatty Acids.* 2013 Jan 28;.
- BOTELLA-CARRETERO JI, CARRERO C, GUERRA E, VALBUENA B, ARRIETA F, CALAÑAS A ET AL.. Role of Peripherally Inserted Central Catheters in Home Parenteral Nutrition: A 5-Year Prospective Study. *JPEN J Parenter Enteral Nutr.* 2012 Aug 16;.
- VÁZQUEZ C, BOTELLA-CARRETERO JI, CORELLA D, FIOL M, LAGE M, LURBE E ET AL.. White fish reduces cardiovascular risk factors in patients with metabolic syndrome: The WISH-CARE study, a multicenter randomized clinical trial. *Nutr Metab Cardiovasc Dis.* 2013 Nov 1;.

Highlights

We previously demonstrated that several amphiphilic drugs, included the selective estrogen-receptor modulators and antipsychotics, inhibit cholesterol biosynthesis. More recently, we showed that both first and second generation antipsychotics also affect the intracellular lipid traffic, which secondarily induces fatty acid biosynthesis and the secretion of apo B and triglyceride. These effects may explain dyslipidemia and obesity often found in patients treated with antipsychotics. Moreover, SERMs upregulate LDL receptor in primary human lymphocytes. DHCR24 catalyses the reduction of the C-24 double bond of sterols during cholesterol biosynthesis and has been involved in cell growth, senescence and cellular response to oncogenic and oxidative stress. We elucidated the mechanism of DHCR24 gene regulation by cholesterol availability and identified other putative cis-acting elements which may be relevant for the regulation of DHCR24 expression. Male hypogonadism has been linked to obesity and diabetes. Recent work from our group shows that bariatric surgery is accompanied by the increase of circulating testosterone in parallel with an improvement in insulin sensitivity. In testes from mice lacking hormone sensitive lipase (HSL-/-), which have impaired spermatogenesis, we found profound alterations in both the sterol content and the fatty acid profile as well as increased expression of HDL receptor SR-BI, changes that may explain the infertility of these mice. Reduction of cardiovascular risk with high consumption of fish in diet is still a matter of debate due to concerns raised from heavy metal contamination. In a multicenter randomized crossover clinical trial including 273 individuals with metabolic syndrome, we found that regular consumption of hake significantly increased serum EPA and DHA and decreased LDL cholesterol concentrations, which was accompanied by a reduction in waist circumference and blood pressure. These findings demonstrate the beneficial effect of white fish consumption in the reduction of cardiovascular risk in patients with metabolic syndrome.

PROGRAMME:
**P1. Nutrition; P5. New
Strategies and Biomarkers**

Nutrigenómica y Síndrome Metabólico

Group Members

STAFF MEMBERS

Camargo García, Antonio
Gómez Arcas, Pilar
Rangel Zuñiga, Oriol Alberto

ASSOCIATED MEMBERS

Alcalá Díaz, Juan Francisco
Almaden Peña, Yolanda
Criado García, Juan
Delgado Casado, Nieves
Delgado Lista, Francisco Javier
Fernández De la Puebla, Rafael A.
Fuentes Jiménez, Francisco
García Ríos, Antonio
Gómez Luna, María José
Gómez Luna, Purificación
Marín Hinojosa, Carmen
Paniagua González, Juan A.
Pérez Jiménez, Francisco
Pérez Martínez, Pablo
Yubero Serrano, Elena María



Lead Researcher

López Miranda, José



Contact:

Hospital Universitario Reina Sofía.
Edif. Consultas Externas.
2ª Planta Medicina Interna. Avda. Menéndez Pidal, s/n. 14004 Córdoba
E.mail: jlopezmir@gmail.com

Main lines of research

- Nutrition and disease
- Gene-environment interaction

Most relevant scientific articles

- CAMARGO A, RANGEL-ZUÑIGA OA, PEÑA-ORIHUELA P, MARÍN C, PÉREZ-MARTÍNEZ P, DELGADO-LISTA J ET AL.. Postprandial changes in the proteome are modulated by dietary fat in patients with metabolic syndrome. *J Nutr Biochem*. 2013 Jan;24(1):318-24.
- CAMARGO A, MENESES ME, RANGEL-ZUÑIGA OA, PÉREZ-MARTÍNEZ P, MARÍN C, DELGADO-LISTA J ET AL.. Endoplasmic reticulum stress in adipose tissue determines postprandial lipoprotein metabolism in metabolic syndrome patients. *Mol Nutr Food Res*. 2013 Dec;57(12):2166-76.
- PEÑA-ORIHUELA P, CAMARGO A, RANGEL-ZUÑIGA OA, PÉREZ-MARTÍNEZ P, CRUZ-TENO C, DELGADO-LISTA J ET AL.. Antioxidant system response is modified by dietary fat in adipose tissue of metabolic syndrome patients. *J Nutr Biochem*. 2013 Oct;24(10):1717-23.
- PÉREZ-HERRERA A, RANGEL-ZUÑIGA OA, DELGADO-LISTA J, MARÍN C, PÉREZ-MARTÍNEZ P, TASSET I ET AL.. The antioxidants in oils heated at frying temperature, whether natural or added, could protect against postprandial oxidative stress in obese people. *Food Chem*. 2013 Jun 15;138(4):2250-9.
- DELGADO-LISTA J, PÉREZ-MARTÍNEZ P, GARCÍA-RÍOS A, PHILLIPS CM, HALL W, GJELSTAD IM ET AL.. A gene variation (rs12691) in the CCAT/enhancer binding protein α modulates glucose metabolism in metabolic syndrome. *Nutr Metab Cardiovasc Dis*. 2013 May;23(5):417-23.

Highlights

During the year 2013, our group has maintained the high level of excellence, accredited in the past. This fact is supported by the following milestones:

We have published 21 articles (JCR), with a high percentage of leadership in these publications (76%, 16/21), and an index of cumulative impact greater than 70 points. In addition, during the year of 2013, we have developed a total of 11 research projects of national competitive calls, a European project and a contract of international collaboration (TNO, Netherlands). Within the catchment of the Group's resources, it should be noted the participation in 6 clinical trials. From the point of view of mobility, three researchers from our group have done stays abroad (two of them in New York (Mount Sinai), and one in Ireland (UCD, Dublin) In addition, we got a Rio-Hortega contract, which made during 2013 an external stay at IMDEA (Madrid), Miguel Servet contract, two Sara Borrell, and a Nicolas Monarde, which translates to the quality of the formation of our group. Following the creation of a technological spin-off in 2012, during the year 2013 we started the marketing of two mobile helper applications for medical professionals, including protocols and algorithms for tackling the main diseases related to food and obesity, as hypertension, coronary artery disease, and hypercholesterolemia. This application (PadMed) has currently reached 30,000 downloads. In addition, we have received "Institute Danone - Marti Henneberg" prize, and the prize "HDL-good cholesterol". Also, were selected by the Royal National Academy of medicine to teach reading of the extraordinary scientific meeting of 2013 "Olive oil, Nutrigenomics and cardiovascular health".



PROGRAMME:

**P3. Complications of obesity;
 P6. Physiopathology of body
 weight homeostasis**

Pediatría, Innovación, Traslación y Tecnología en la Obesidad Infantil

Group Members

STAFF MEMBERS

Calaforra Juan, Óscar
 Cantero Milán, Laura
 Dix, Rachael Ann
 Ivorra Ivorra, Carmen
 Ponce Zanón, Francisco José

ASSOCIATED MEMBERS

Aguilar Bacallado, Francisco
 Álvarez Pitti, Julio
 Pascual Izuel, José María
 Redon i Mas, Josep
 Torro Domenech, María Isabel

Lead Researcher

Lurbe Ferrer, Empar



Contact:

Riesgo Cardiovascular en Niños y Adolescentes
 Hospital General Universitario Valencia.
 Avda. Tres Cruces, 2. Planta 3, pabellón C. 46014 Valencia
 Phone: (+34) 96 197 22 10 · E.mail: empar.lurbe@uv.es

Main lines of research

- Childhood obesity
- Application of new technologies in the evaluation and treatment of obesity (adrenergic activity and cardiovascular risk)
- Study of the impact of intrauterine life and postnatal growth in the development of cardiometabolic disease
- Hypertension in obesity
- Cardiovascular and renal risk in obesity
- Physical activity in the prevention and treatment of obesity
- Role of the incretin axis in obesity and metabolic syndrome

Most relevant scientific articles

- LURBE E, TORRO MI, ALVAREZ J, AGUILAR F, FERNÁNDEZ-FORMOSO JA, REDON J. Prevalence and factors related to urinary albumin excretion in obese youths. *J Hypertens*. 2013 Nov;31(11):2230-6; discussion 2236.
- O'BRIEN E, PARATI G, STERGIU G, ASMAR R, BEILIN L, BILO G ET AL.. European society of hypertension position paper on ambulatory blood pressure monitoring. *J Hypertens*. 2013 Sep;31(9):1731-68.
- LURBE E. Childhood blood pressure: trends and future tracks. *Hypertension*. 2013 Aug;62(2):242-3.
- LURBE E, THIJS L, TORRO MI, ALVAREZ J, STAESSEN JA, REDON J. Sexual dimorphism in the transition from masked to sustained hypertension in healthy youths. *Hypertension*. 2013 Aug;62(2):410-4.
- MARTÍNEZ-GARCÍA F, MANSEGO ML, ROJO-MARTÍNEZ G, DE MARCO-SOLAR G, MORCILLO S, SORIGUER F ET AL.. Impact of obesity-related genes in Spanish population. *BMC Genet*. 2013 Nov 23;14:111.

Highlights

CHILDHOOD OBESITY AND APPLICATIONS OF NEW TECHNOLOGIES.

- The PAIDO programme, which uses a holistic approach in the management of childhood obesity. The program has received the National award from NAOS.
- The PEDITEC Programme, an "unit of action" created with the Polytechnical University of Valencia (VLCCampus). The programme utilizes medical personnel dedicated to the management of obesity with engineers that develop software to capture signals (cardiorespiratory fitness, adrenergic energy, response to exercise), through mobile devices, intelligent t-shirts, for the study of physiological parameters that allow for individualized treatment.

PHYSICAL ACTIVITY IN THE PREVENTION AND TREATMENT OF OBESITY.

- Personalised home-based physical activity programmes through the use of mobile devices, eTIOBE.

STUDY OF THE IMPACT OF INTRAUTERINE LIFE AND POSTNATAL GROWTH IN THE DEVELOPMENT OF CARDIOVASCULAR DISEASE

- Prospective study from birth (FIS project, EUROPA project) which have arrived to 10 years of life in more than 100 subjects. Data on umbilical cord and follow-up of clinical parameters and cardiometabolic phenotype.

HYPERTENSION IN OBESITY

- Studies focused on the components of functional and organic alteration in the large vessels of obese patients with high-normal blood pressure and hypertension.

CARDIOVASCULAR AND RENAL RISK IN OBESITY

- Development of the ESH European Guidelines for the diagnosis, evaluation and treatment of hypertension, as well as the Guidelines for ambulatory blood pressure monitoring (ESH).
- European project for the study of biomarkers of cardiovascular risk through the use of -omics (EU-MASCARA).
- Studies of early renal damage in obesity through the evaluation of podocytes, its molecular phenotype and transcriptomes.
- Studies on the genomic-metabolomic interaction to identify genetic markers associated with the development of early renal damage related to obesity.



PROGRAMME:
P1. Nutrition

Epidemiología Nutricional

Group Members

STAFF MEMBERS

Goñi Ochandorena, Estibaliz

ASSOCIATED MEMBERS

Alonso Gutiérrez, Alvaro

Bes Rastrollo, Maira

Buil Cosiales, Pilar

De Irala Estévez, Jokin

De la Fuente Arrillaga, Carmen

Díez Espino, Javier

García Arellano, Ana

Guillén Grima, Francisco

López De Burgo, Cristina

Ruíz-Canela López, Miguel

Sánchez Tainta, Ana

Serrano Martínez, Manuel

Toledo Atucha, Estefanía A

Zazpe García, Itziar

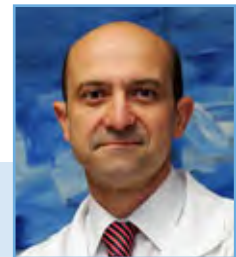
COLABORADORES

Rodríguez Alemany, Susana

Sánchez Adan, David

Lead Researcher

Martínez González, Miguel A.



Contact:

Universidad de Navarra. Campus Univ.

Phone: (+34) 948 425 600, ext. 806463

E.mail: mamartinez@unav.es

http://www.ciberobn.es/index.php?option=com_content&view=article&catid=12:grupos&id=1808&Itemid=13

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

Most relevant scientific articles

- ESTRUCH R, ROS E, SALAS-SALVADÓ J, COVAS MI, D PHARM, CORELLA D ET AL.. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. *N Engl J Med*. 2013 Feb 25;.
- BES-RASTROLLO M, SCHULZE MB, RUÍZ-CANELA M, MARTÍNEZ-GONZÁLEZ MA. Financial conflicts of interest and reporting bias regarding the association between sugar-sweetened beverages and weight gain: a systematic review of systematic reviews. *PLoS Med*. 2013 Dec;10(12):e1001578; discussion e1001578.
- CORELLA D, CARRASCO P, SORLÍ JV, ESTRUCH R, RICO-SANZ J, MARTÍNEZ-GONZÁLEZ MA ET AL.. Mediterranean Diet Reduces the Adverse Effect of the TCF7L2-rs7903146 Polymorphism on Cardiovascular Risk Factors and Stroke Incidence: A randomized controlled trial in a high-cardiovascular-risk population. *Diabetes Care*. 2013 Aug 13;.
- SÁNCHEZ-VILLEGAS A, MARTÍNEZ-GONZÁLEZ MA, ESTRUCH R, SALAS-SALVADÓ J, CORELLA D, COVAS MI ET AL.. Mediterranean dietary pattern and depression: the PREDIMED randomized trial. *BMC Med*. 2013 Sep 20;11:208.
- TOLEDO E, HU FB, ESTRUCH R, BUIL-COSIALES P, CORELLA D, SALAS-SALVADÓ J ET AL.. Effect of the Mediterranean diet on blood pressure in the PREDIMED trial: results from a randomized controlled trial. *BMC Med*. 2013 Sep 19;11:207.

Highlights

In 2013, the main results derived from the PREDIMED trial (2003-2013) have been reported in the *New England Journal of Medicine*. In the frame of this study, our group has also evaluated the effect of the nutritional intervention on blood pressure and the association between alcohol consumption and depression. Moreover, a new international project aiming to analyze the metabolic profile of the PREDIMED participants was initiated. The objectives of this project are to observe if the intervention changed the metabolic profile of the participants, to assess if changes in the metabolic profile mediated the effects of the intervention on the cardiovascular events and to evaluate a potential effect modification of the intervention depending on the baseline metabolic profile of each subject. In addition, in 2013 a project funded by the regional Government of Navarra was completed. This latter project aimed to assess the effect of the intervention of the PREDIMED trial on the cognitive function of the participants.

On the other hand, during 2013, the PREDIMED Plus pilot study was performed and the results analyzed.

Regarding the SUN cohort, results on the association between lifestyle factors and chronic diseases have been published, supported by national and regional founding sources. Thus, we have found an association between fried foods or sweetened carbonated beverages and metabolic syndrome, and between alcoholic beverages and depression or total mortality.

Collaborations with other groups have led to the publication of two papers about a novel index, the lipophilic index, and its association with coronary heart disease.



PROGRAMME:
P1. Nutrition

Nutrición, Obesidad y Salud

Group Members

ASSOCIATED MEMBERS

Campión Zabalda, Francisco Javier
González Muniesa, Pedro
Mansego Talavera, María Luisa
Martí Del Moral, Amelia
Milagro Yoldi, Fermín Ignacio
Moreno Aliaga, María Jesús
Navas Carretero, Santiago
Prieto Hontoria, Pedro Luis
Zulet Alzorriz, M^a Ángeles

COLABORADORES

Jimeno Moreno, Beatriz

Lead Researcher

Martínez Hernández, José A.



Contact:

Universidad de Navarra. Campus Univ.
Phone: (+34) 948 425 600, ext. 806424
E.mail: jalfmtz@unav.es

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

- ESTRUCH R, ROS E, SALAS-SALVADÓ J, COVAS MI, D PHARM, CORELLA D ET AL.. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. *N Engl J Med*. 2013 Feb 25;.
- MOLERES A, CAMPIÓN J, MILAGRO FI, MARCOS A, CAMPOY C, GARAGORRI JM ET AL.. Differential DNA methylation patterns between high and low responders to a weight loss intervention in overweight or obese adolescents: the EVASYON study. *FASEB J*. 2013 Jun;27(6):2504-12.
- GALBETE C, TOLEDO E, MARTÍNEZ-GONZÁLEZ MA, MARTÍNEZ JA, GUILLÉN-GRIMA F, MARTI A. Pro12A-la variant of the PPARG2 gene increases body mass index: An updated meta-analysis encompassing 49,092 subjects. *Obesity (Silver Spring)*. 2013 Jul;21(7):1486-95.
- BOQUÉ N, DE LA IGLESIA R, DE LA GARZA AL, MILAGRO FI, OLIVARES M, BAÑUELOS O ET AL.. Prevention of diet-induced obesity by apple polyphenols in Wistar rats through regulation of adipocyte gene expression and DNA methylation patterns. *Mol Nutr Food Res*. 2013 Aug;57(8):1473-8.
- MILAGRO FI, MANSEGO ML, DE MIGUEL C, MARTÍNEZ JA. Dietary factors, epigenetic modifications and obesity outcomes: progresses and perspectives. *Mol Aspects Med*. 2013 Jul-Aug;34(4):782-812.

Highlights

The achievements of this research team are focused on the interactions between nutrition, obesity and health, with emphasis on those mechanisms involved in the influence of energy balance on inflammation, lipid metabolism, adipokines and intracellular messengers, being this a project partially funded by MINECO.

Also this group has investigated of different molecules and bioactive compounds such as fatty acids, resolvins, polyphenols, etc. and its influence on digestion and intestinal absorption, appetite and nutrigenetic / epigenetic processes, in part linked to INCOMES project.

Biomarker research related to the diagnosis and evolution of processes related to obesity performed by this group have been oriented on the search for nutrigenomics markers (polymorphisms, gene expression) and epigenetic marks (DNA methylation, microRNAs), being partly funded by the EXPLORE project.

Studies of diet therapy and personalized nutrition have investigated the relationship of weight loss in obese individuals according to genotype and the treatments of the different comorbidities that accompany obesity and metabolic syndrome, some of which are integrated in European projects (PREVIEW AND FOOD4ME) and national (PREDIMED).

EUROPEAN PROJECTS LIST

- FOOD4ME - Personalised nutrition: An integrated analysis of Opportunities and challenges.
- PREVIEW - Prevention of diabetes a lifestyle intervention and population studies in Europe and around the World.

NATIONAL PROJECTS LIST

- Bioactive lipid mediators derived from omega-3 fatty acids: potential application in obesity, inflammation and insulin resistance.
- EXPLORE - Hypoxia can be both cause and treatment for obesity and its associated diseases?.
- PREDIMED - healthy in the primary prevention of chronic diseases Power.
- INCOMES- Guide for sustaining health claims on food: immune, metabolic syndrome and cognitive function.



PROGRAMME:
**P5. New Strategies
 and Biomarkers**

Nutrigenómica y Obesidad

Group Members

STAFF MEMBERS

Ceresi, Enzo
 Granados Borbolla, Nuria
 Priego Cuadra, Teresa

ASSOCIATED MEMBERS

Asnani Kishnani, Madhu
 Bonet Piña, M^a Luisa
 Chaplin, Alice
 Dianov Petrov, Petar
 García, Ana Paula
 García Carrizo, Francisco J
 García Ruíz, Estefanía
 Konieczna, Jadwiga
 Laraichi, Sarah
 López Safont, Nora
 Musinovic, Hana
 Nozhenko, Yuriy
 Oliver Vara, Paula
 Palou March, Andreu
 Palou March, Mariona
 Parra Moyá, Pilar
 Picó Segura, Catalina
 Reynes Miralles, Barbara
 Ribot Riutort, Joan
 Rodríguez Guerrero, Ana María
 Serra Vich, Francisca
 Servera Barco, María
 Torrens García, Juana María
 Zamanillo Campos, Rocio

Lead Researcher

Palou Oliver, Andreu



Contact:

Dep. Biología Fundamental y Ciencias de la Salud
 Facultad de Ciencias de Mallorca
 Ctra. de Valldemossa, km 7.5. 07122 Palma de Mallorca, Islas Baleares
 E.mail: andreu.palou@uib.es
 Website: <http://palou.uib.es>

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

- OLIVER P, REYNÉS B, CAIMARI A, PALOU A. Peripheral blood mononuclear cells: a potential source of homeostatic imbalance markers associated with obesity development. *Pflugers Arch*. 2013 Apr;465(4):459-68.
- PRIEGO T, SÁNCHEZ J, PICÓ C, AHRENS W, BAMMANN K, DE HENAUW S ET AL.. Influence of breastfeeding on blood-cell transcript-based biomarkers of health in children. *Pediatr Obes*. 2013 Nov 26;.
- MORENO-NAVARRETE JM, PETROV P, SERRANO M, ORTEGA F, GARCÍA-RUIZ E, OLIVER P ET AL.. Decreased RB1 mRNA, Protein, and Activity Reflect Obesity-Induced Altered Adipogenic Capacity in Human Adipose Tissue. *Diabetes*. 2013 Jan 11;.
- SÁNCHEZ J, NOZHENKO Y, PALOU A, RODRÍGUEZ AM. Free fatty acid effects on myokine production in combination with exercise mimetics. *Mol Nutr Food Res*. 2013 Aug;57(8):1456-67.
- PALOU M, PRIEGO T, SÁNCHEZ J, PALOU A, PICÓ C. Metabolic programming of sirtuin 1 (SIRT1) expression by moderate energy restriction during gestation in rats may be related to obesity susceptibility in later life. *Br J Nutr*. 2012 May 28;:1-8.

Highlights

EUROPEAN PROJECTS:

- BIOCLAIMS ("BIOmarkers of Robustness of Metabolic Homeostasis for Nutrigenomics-derived Health CLAIMS Made on Food", FP7-244995). 2010-2015. Coordinador: Prof. A. Palou
- I. Family ("Determinants of eating behavior in European children, adolescents and their parents", FP7-266044). 2012-2017. IP: Prof. A. Palou por la UIB
- DIABAT ("Recruitment and activation of brown adipocytes as preventive and curative therapy for type 2 diabetes", HEALTH-F2-2011-278373). 2011-2015. IP: Prof. A. Palou por la UIB
- SALUX ("A European Network to follow-up the reformulation of food. Identification and exchange of good practices for SMEs and consumers", grant agreement nº 20101210100865). 2011-2015. IP: Dra. M.L. Bonet por la UIB

NATIONAL PROJECTS:

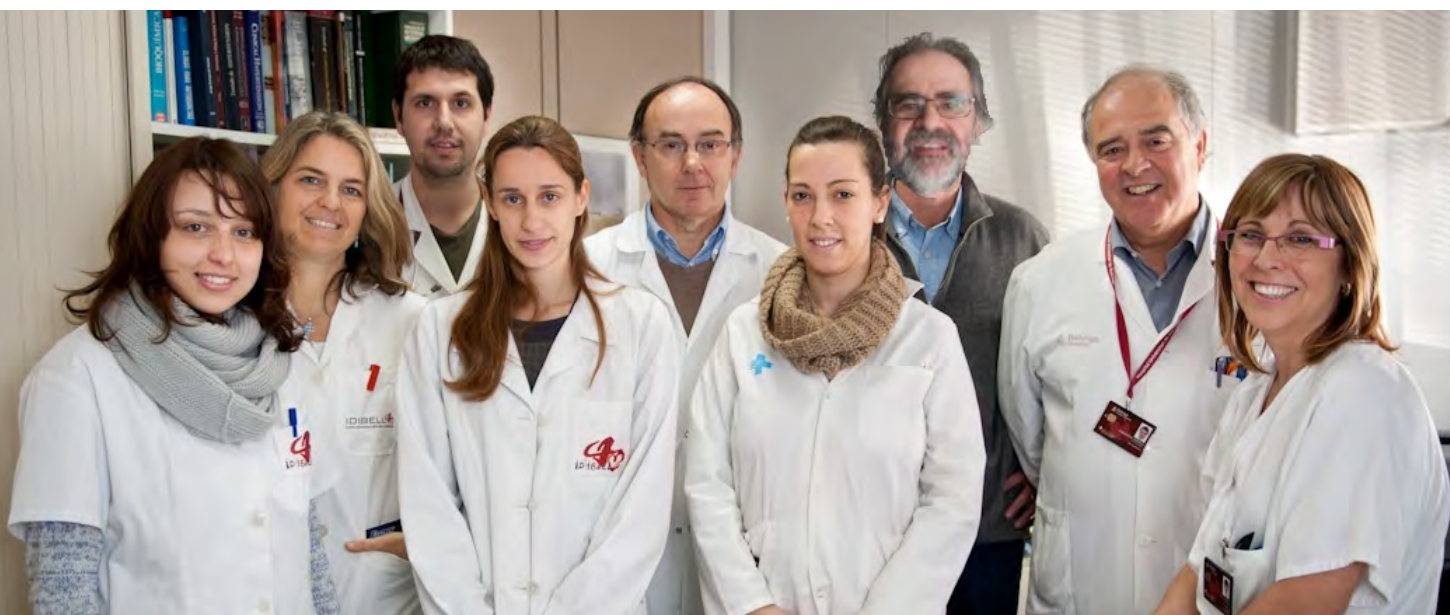
- EPIMILK ("Detección y caracterización de compuestos bioactivos en la leche. Un enfoque nutriepigenético contra la obesidad", AGL2012-33692). 2013-2015. IP: Prof. A. Palou
- "Identificación y caracterización nutrigenómica de marcadores de alteraciones articulares en el sobrepeso y la obesidad y su potencial control por mucopolisacáridos" (CENIT-2008-1004 PRONAOS). 2008-2013. IP: Dra. M.L. Bonet y Prof. A. Palou
- "Nutriepigenética del control de la adiposidad corporal: estudios en modelos animales de susceptibilidad diferencial a la obesidad basados en intervenciones nutricionales en etapas vitales tempranas". Financiado por la Fund. Ramón Areces. 2012-2015. IP: Dra. M.L. Bonet

PATENTE:

"Composiciones y usos en la activación de la termogénesis". A. PALOU, C. PICÓ, E. CERESI, P. OLIVER, M.P. PORTILLO, N. ARIAS, M.T. MACARULLA, J. MIRANDA. Nº de solicitud: P201331329. Fecha de recepción: 12 de Septiembre de 2013

ARTICLES:

- OLIVER P, ET AL. "Peripheral blood mononuclear cells: a potential source of homeostatic imbalance markers associated with obesity development". *Pflugers Arch* 465: 459-68, 2013
- KONIECZNA J, ET AL. "Oral leptin treatment in suckling rats ameliorates detrimental effects in hypothalamic structure and function caused by maternal caloric restriction during gestation". *PLoS One* 8: e81906, 2013
- SÁNCHEZ J, ET AL. "Free fatty acid effects on myokine production in combination with exercise mimetics". *Mol Nutr Food Res* 57: 1456-67, 2013
- MORENO-NAVARRETE JM, ET AL. "Decreased RB1 mRNA, protein, and activity reflect obesity-induced altered adipogenic capacity in human adipose tissue". *Diabetes* 62: 1923-31, 2013
- PALOU A, ET AL. "Nutritional potential of metabolic remodelling of white adipose tissue". *Curr Opin Clin Nutr Metab Care* 16: 650-6, 2013
- BONET ML, ET AL. "Pharmacological and nutritional agents promoting browning of white adipose tissue". *Biochim Biophys Acta* 1831: 969-85, 2013
- PALOU M, ET AL. "Metabolic programming of sirtuin 1 (SIRT1) expression by moderate energy restriction during gestation in rats may be related to obesity susceptibility in later life". *Br J Nutr* 109: 757-764, 2013



PROGRAMME:
P1. Nutrition

Dieta mediterránea, Esteatosis y Riesgo Vascular

Group Members

STAFF MEMBERS

De la Cruz Ballester, Elsa
 Galera Cusí, Ana
 Serra, Merçè
 Valls, Cinta

ASSOCIATED MEMBERS

Corbella Ingles, Emili
 Pujol Farriols, Ramon
 Solanich Moreno, Xavier
 Soler Sancho, Yolanda
 Ortega, Emilio

Lead Researcher

Pinto Sala, Xavier



Contact:

Unidad de Riesgo Vascular, Medicina Interna.
 Hospital Universitario de Bellvitge
 C/ Feixa Llarga, sn. 08907 Hospitalet de Llobregat. Barcelona
 Phone: (+34) 93 260 71 95
 E.mail: riscvascular@bellvitgehospital.cat

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.
- Effect of nicotinic acid on the composition of high density lipoproteins (HDL) and arterial endothelial function in patients with premature ischemic heart disease and high levels of HDL cholesterol.

- 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

- CORELLA D, CARRASCO P, SORLÍ JV, ESTRUCH R, RICO-SANZ J, MARTÍNEZ-GONZÁLEZ MA ET AL.. Mediterranean Diet Reduces the Adverse Effect of the TCF7L2-rs7903146 Polymorphism on Cardiovascular Risk Factors and Stroke Incidence: A randomized controlled trial in a high-cardiovascular-risk population. *Diabetes Care*. 2013 Aug 13;.
- TOLEDO E, HU FB, ESTRUCH R, BUIL-COSIALES P, CORELLA D, SALAS-SALVADÓ J ET AL.. Effect of the Mediterranean diet on blood pressure in the PREDIMED trial: results from a randomized controlled trial. *BMC Med*. 2013 Sep 19;11:207.
- SÁNCHEZ-VILLEGAS A, MARTÍNEZ-GONZÁLEZ MA, ESTRUCH R, SALAS-SALVADÓ J, CORELLA D, COVAS MI ET AL.. Mediterranean dietary pattern and depression: the PREDIMED randomized trial. *BMC Med*. 2013 Sep 20;11:208.
- GUASCH-FERRÉ M, BULLÓ M, MARTÍNEZ-GONZÁLEZ MA, ROS E, CORELLA D, ESTRUCH R ET AL.. Frequency of nut consumption and mortality risk in the PREDIMED nutrition intervention trial. *BMC Med*. 2013 Jul 16;11:164.
- GEA A, BEUNZA JJ, ESTRUCH R, SÁNCHEZ-VILLEGAS A, SALAS-SALVADÓ J, BUIL-COSIALES P ET AL.. Alcohol intake, wine consumption and the development of depression: the PREDIMED study. *BMC Med*. 2013 Aug 30;11(1):192.

Highlights

- Statistical analysis of data collected in the PREDIMED:
 - Effects of dietary intervention on lipid metabolism and its relationship with the incidence of cardiovascular morbidity and mortality.
 - Study of the influence of PREDIMED dietary patterns on liver fat content assessed by NMR.
- Study of the relationship between the composition and functionality of HDL with coronary disease.
- Publication of the main results of PREDIMED study in *N Engl J Med*, April 2013.



PROGRAMME:
P1. Nutrition

Nutrición y Obesidad

Group Members

STAFF MEMBERS

Aguirre López, Leixuri

ASSOCIATED MEMBERS

Alberdi Aresti, Goiuri
Arias Rueda, Noemi
Churruga Ortega, Itziar
Eseberri Barrace, Itziar
Fernández Quintela, Alfredo
Gómez Zorita, Saioa
Lasa Elguezua, Arrate
Macarulla Arenaza, María Teresa
Miranda Gómez, Jonatan
Rodríguez Rivera, Víctor Manuel
Simón Magro, Edurne

Lead Researcher

Portillo Baquedano, M. del Puy



Contact:

Facultad de Farmacia de Vitoria
Pº Universidad, 7. 01006 Vitoria-Gasteiz
E.mail: leixuri.aguirre@ehu.es
Website: <http://www.nutricionyobesidad.com/>

Main lines of research

- Functional foods and obesity
- Functional 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

- ESTRUCH R, ROS E, SALAS-SALVADÓ J, COVAS MI, D PHARM, CORELLA D ET AL.. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet.N Engl J Med. 2013 Feb 25;.
- MILAGRO FI, MIRANDA J, PORTILLO MP, FERNÁNDEZ-QUINTELA A, CAMPIÓN J, MARTÍNEZ JA. High-Throughput Sequencing of microRNAs in Peripheral Blood Mononuclear Cells: Identification of Potential Weight Loss Biomarkers.PLoS One. 2013;8(1):e54319.
- ALBERDI G, RODRÍGUEZ VM, MIRANDA J, MACARULLA MT, CHURRUCA I, PORTILLO MP. Thermogenesis is involved in the body-fat lowering effects of resveratrol in rats.Food Chem. 2013 Nov 15;141(2):1530-5.
- ESEBERRI I, LASA A, CHURRUCA I, PORTILLO MP. Resveratrol Metabolites Modify Adipokine Expression and Secretion in 3T3-L1 Pre-Adipocytes and Mature Adipocytes. PLoS One. 2013;8(5):e63918.
- MIRANDA J, AGUIRRE L, FERNÁNDEZ-QUINTELA A, MACARULLA MT, MARTÍNEZ-CASTAÑO MG, AYO J ET AL.. Effects of Pomegranate Seed Oil on Glucose and Lipid Metabolism-Related Organs in Rats Fed an Obesogenic Diet.J Agric Food Chem. 2013 May 17;.

Highlights

“Nutrition and obesity” is a leading research group within the Basque University System, and it has been graded A category (IT572-13) by the Basque Government in 2013. The funding of our research group mainly came from National Plan projects (AGL2011-27406) and Basque Government projects (PTERORES S-PE12UN024). We also took part in projects and research networks that promote cooperation between Spain and France.

Our scientific activity belongs mainly to preclinical stage. Nevertheless, and thanks to the collaboration with other CIBER groups, we have also taken part in studies carried out with human beings. This activity has led to scientific articles in different journals, mainly in the area of Nutrition, most of which are in the first quartile. Moreover, a patent has been registered in collaboration with a research group from Islas Baleares led by Dr. Andreu Palou.

Another important aspect of our work this year are the activities carried out to dissemination our findings to the society. We have designed, validated and implemented a program to encourage the consumption of fruits and vegetables among children, which has been awarded by Spanish Federation of Townships and Counties (FEMP).



PROGRAMME:

P6. Physiopathology of body weight homeostasis

Regulación del Metabolismo en la Obesidad

Group Members

STAFF MEMBERS

Calderón Domínguez, María
 Romero Romero, María Mar

ASSOCIATED MEMBERS

Alemany Lamana, Mariano
 Ariza Piquer, Javier
 Asins Muñoz, Guillermina
 Barbany Cahiz, Monserrat
 Cabot Majem, Cristina
 Calvo Márquez, Mercè
 Carrillo Blanchar, Manuel
 Casals Farre, Nuria
 Esteve Rafols, Monserrat
 Fernández López, José Antonio
 García Gómez, Jorge
 Grasa Martínez, Mar
 Herrero Rodríguez, Laura
 Malandrino, María Ida
 Marolowski, Kamil
 Ramírez Flores, Sara
 Serra Cucurrull, Dolores

Lead Researcher

Remesar Betlloch, Xavier



Contact:

Nutrición y Bromatología
 Facultad de Biología. Universidad de Barcelona
 C/. Diagonal, 643. 08028 Barcelona
 Phone: (+34) 93 402 15 18

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 in different 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 CPT1 in the development of obesity-induced insulin resistance and type 2 diabetes. In vitro and in vivo studies of fatty-acid oxidation and inflammation in liver and adipose tissue.
- Appetite regulation. Role of fatty acids and CPT1A in the control of food intake. Role of CPT1C in the brain.
- Bioinformatic modeling of CPT1 and its relationship with obesity and type 2 diabetes: in silico design of anti-obesity drugs. Study of derivatives from the potential anti-obesity drug C75 and their interaction with CPT1 in vitro, and in vivo in the hypothalamus.

Most relevant scientific articles

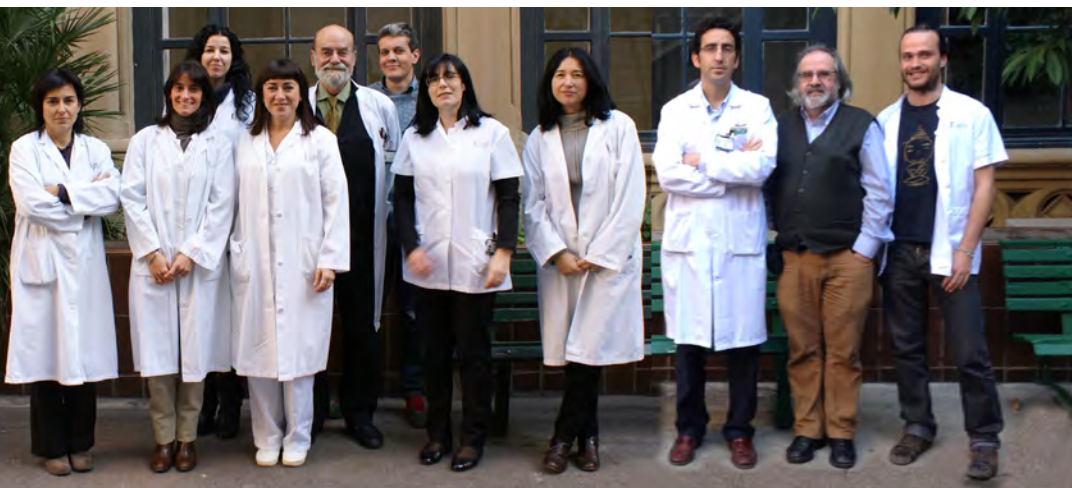
- SERRA D, MERA P, MALANDRINO MI, MIR JF, HERRERO L. Mitochondrial fatty acid oxidation in obesity. *Antioxid Redox Signal*. 2013 Jul 20;19(3):269-84.
- ROMERO MDEL M, HOLMGREN-HOLM F, GRASA MDEL M, ESTEVE M, REMESAR X, FERNÁNDEZ-LÓPEZ JA ET AL.. Modulation in Wistar rats of blood corticosterone compartmentation by sex and a cafeteria diet. *PLoS One*. 2013;8(2):e57342.
- RAMÍREZ S, MARTINS L, JACAS J, CARRASCO P, POZO M, CLOTET J ET AL.. Hypothalamic ceramide levels regulated by CPT1C mediate the orexigenic effect of ghrelin. *Diabetes*. 2013 Jul;62(7):2329-37.
- MAKOWSKI K, MERA P, PAREDES D, HERRERO L, ARIZA X, ASINS G ET AL.. Differential pharmacologic properties of the two C75 enantiomers: (+)-C75 is a strong anorectic drug; (-)-C75 has antitumor activity. *Chirality*. 2013 May;25(5):281-7.
- SABATER D, FERNÁNDEZ-LÓPEZ JA, REMESAR X, ALEMANY M. The use of Transwells™ improves the rates of differentiation and growth of cultured 3T3L1 cells. *Anal Bioanal Chem*. 2013 Jun;405(16):5605-10.

Highlights

Our group has shown that both the CPT1A and CPT1C are involved in hypothalamic modulation of intake. After fasting, or a dose of ghrelin, an increase in hypothalamic levels of ceramide occurs. These are mediated by CPT1C and are required to increase the expression of neuropeptides orexigenic NPY and AgRP. Furthermore, we have shown that the C75, synthetic racemic product that acts as an anticancer agent, also has anorexigenic activity and that activity is due to the inhibitor of the (+)-C75 enantiomer on CPT1 activity. This opens new avenues for studying derivatives of this compound that are able to suppress appetite through inhibition of hypothalamic CPT1. Finally, we have shown that an increase in fatty acid oxidation due to an overexpression of CPT1A in organs like the liver prevents obesity in mice fed fat diet.

We have determined the role of sex and cafeteria diet on the partitioning of plasma corticosterone. Cafeteria diet increased the expression of liver CBG gene, binding plasma capacity and the proportion of blood cell-bound corticosterone. The use of a monoclonal antibody ELISA and a polyclonal Western blot for plasma CBG compared with both specific plasma binding of corticosterone and CBG gene expression suggested the existence of different forms of CBG, with varying affinities for corticosterone in males and females

We also improved methodology for 3T3L1 cell culture, using Transwells™. The methodological improvements presented here allow for more uniform cultured cell yields and a more flexible environment for control of cell size and administration of signaling agents.



PROGRAMME:
P1. Nutrition

Grupo de Nutrición, Lípidos y Riesgo Riesgo Cardiovascular

Group Members

STAFF MEMBERS

Cofan Pujol, Monserrat
 Sala Vila, Aleix
 Serra, Merçè
 Valls, Cinta

ASSOCIATED MEMBERS

Alegret Jordà, Marta
 Laguna Egea, Juan Carlos
 Merlos Roca, Manuel
 Nuñez Lucas, Isabel
 Pérez Heras, Anna Maria
 Roglans Ribas, Nuria
 Sánchez Peñarroya, Rosa María
 Ortega, Emilio

Lead Researcher

Ros Rahola, Emilio



Contact:

Unidad de Lípidos
 Hospital Clínico y Provincial de Barcelona
 C/ Villarroel, 170. 08036 Barcelona · Phone: (+34) 93 227 93 83
 E.mail: eros@clinic.ub.es

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. Biomarkers for regular diet.
- Functionality of whole foods and dietary patterns.
- Specific projects within the PREDIMED study, for which the Group directed the nutritional intervention.
- 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. 6. 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 determinants, 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.

Most relevant scientific articles

- 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.
- ESTRUCH R, ROS E, SALAS-SALVADÓ J, COVAS MI, D PHARM, CORELLA D ET AL.. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. *N Engl J Med*. 2013 Feb 25;.
- Ros E, Hu FB. Consumption of plant seeds and cardiovascular health: epidemiological and clinical trial evidence. *Circulation*. 2013 Jul 30;128(5):553-65.
- CORELLA D, CARRASCO P, SORLÍ JV, ESTRUCH R, RICO-SANZ J, MARTÍNEZ-GONZÁLEZ MA ET AL.. Mediterranean Diet Reduces the Adverse Effect of the TCF7L2-rs7903146 Polymorphism on Cardiovascular Risk Factors and Stroke Incidence: A randomized controlled trial in a high-cardiovascular-risk population. *Diabetes Care*. 2013 Aug 13;.
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- SALA-VILA A, COFÁN M, MATEO-GALLEGO R, CENARRO A, CIVEIRA F, ROS E. Eicosapentaenoic acid in serum phospholipids relates to a less atherogenic lipoprotein profile in subjects with familial hypercholesterolemia. *J Nutr Biochem*. 2013 Sep;24(9):1604-8.

Highlights

Among the actual research interests of the group: diet/nutrition and chronic diseases (leadership of the PREDIMED randomized controlled trial of nutritional intervention for primary cardiovascular prevention), dietary determinants of cognitive function, plant sterols, blood membrane fatty acids, genetic dyslipidemias, and vascular imaging techniques, the most relevant projects and results are:

PROJECTS

- Exploitation of the data collected in the PREDIMED trial: effects of intervention on neurocognition and incidence of dementia; preventive role of vegetable and marine n-3 fatty acids; and role of dietary fructose on overall and cause-specific mortality.
- The WAHA randomized clinical trial, a dual center study (Hospital Clínic of Barcelona and Loma Linda University, California) investigating the 2-y effects of a diet supplemented with walnuts at 15% of energy vs. a control diet on age-related cognitive declines and macular degeneration in 700 volunteers aged 63 to 79 y. The recruitment of 350 participants in our center has been recently completed. The trial will end in the fall 2015.
- To study the benefits of membrane fatty acid enrichment in n-3 fatty acids through three main projects: A. Cardiovascular: predictive value in progression of sub-clinical atherosclerosis and on 6-mo post-ischemic recovery of the myocardium in patients surviving an acute coronary syndrome. B) Neurodegenerative diseases: assessing changes in brain and circulating lipids in relation to progression of Alzheimer's disease. C) AIDS: effects of n-3 fatty acid incorporation into cultured lymphocytes on membrane raft organization and ensuing changes of HIV-1 infectivity.

RESULTS

- Publication of the main results of the PREDIMED trial in *N Engl J Med*, April 2013.
- Publication together with Frank Hu (Harvard University) of a comprehensive review on the cardioprotective properties of the consumption of seeds (whole grains, nuts, pulses, cocoa, and coffee) in *Circulation*, July 2013.



PROGRAMME:
P1. Nutrition

Nutrición y Metabolismo Lipídico

Group Members

ASSOCIATED MEMBERS

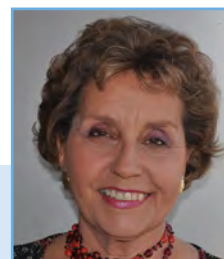
Alemany Alonso, Regina
García García, María
García Rodríguez, Carolina
Guerrero Casas, Aurora
Lillo Villalobos, Pilar
Martínez Force, Enrique
Mate Barrero, Alfonso
Montero Romero, Emilio
Noval Padillo, José Ángel
Pérez Camino, María del Carmen
Vázquez Cueto, Carmen María

CONTRIBUTORS

Alcazar Sánchez, Víctor

Lead Researcher

Ruíz Gutiérrez, Valentina



Contact:

Instituto de la Grasa-CSIC/
Departamento de Alimentación y Salud
Instituto de la Grasa. Avda. Padre García Tejero, 4. 41012 Sevilla
Phone: (+34) 954 611 550 ext 244
E.mail: valruiz@ig.csic.es

Main lines of research

- Nutrition and Lipid Metabolism
- Influence of virgin olive oil on cardiovascular disease
- Mediterranean diet
- Hypertension
- Influence of virgin olive oil on cardiovascular disease.

Most relevant scientific articles

- ESTRUCH R, ROS E, SALAS-SALVADÓ J, COVAS MI, D PHARM, CORELLA D ET AL.. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. *N Engl J Med*. 2013 Feb 25;.
- TOLEDO E, HU FB, ESTRUCH R, BUIL-COSIALES P, CORELLA D, SALAS-SALVADÓ J ET AL.. Effect of the Mediterranean diet on blood pressure in the PREDIMED trial: results from a randomized controlled trial. *BMC Med*. 2013 Sep 19;11:207.
- CORELLA D, CARRASCO P, SORLÍ JV, ESTRUCH R, RICO-SANZ J, MARTÍNEZ-GONZÁLEZ MA ET AL.. Mediterranean Diet Reduces the Adverse Effect of the TCF7L2-rs7903146 Polymorphism on Cardiovascular Risk Factors and Stroke Incidence: A randomized controlled trial in a high-cardiovascular-risk population. *Diabetes Care*. 2013 Aug 13;.
- GUASCH-FERRÉ M, BULLÓ M, MARTÍNEZ-GONZÁLEZ MA, ROS E, CORELLA D, ESTRUCH R ET AL.. Frequency of nut consumption and mortality risk in the PREDIMED nutrition intervention trial. *BMC Med*. 2013 Jul 16;11:164.
- TRESSERRA-RIMBAU A, MEDINA-REMÓN A, PÉREZ-JIMÉNEZ J, MARTÍNEZ-GONZÁLEZ MA, COVAS MI, CORELLA D ET AL.. Dietary intake and major food sources of polyphenols in a Spanish population at high cardiovascular risk: the PREDIMED study. *Nutr Metab Cardiovasc Dis*. 2013 Oct;23(10):953-9.

Highlights

The Nutrition and Lipid Metabolism Group works to determine the role of olive oil in human health. Since the PI described the hypotensive effect of olive oil for the first time in 1996 (*J. Hypertension*), the group has developed many projects about the relationship between olive oil and hypertension, which take advantage of the group's experience in the fields of lipid analysis and metabolism in both laboratory animals and humans.

The group is specialized in the design of long term clinical trials on dietetic interventions and in postprandial phase of virgin olive oil and the Mediterranean diet. The PI has been part of PREDIMED since its founding in 2003, in fact, she proposed the idea of a separate branch devoted to virgin olive oil, contributing also the control and acquisition that olive oil (valued at €1,200,000). She also significantly contributed to the publication of the conclusions in the study published in the *New England Journal of Medicine*, 2013.

Currently, we are developing the AGL2011-23430 project in PREDIMED patients, which is studying the influence of the Mediterranean diet on the composition and dynamics of the lipid membrane and lipoproteins with atherogenic properties in patients who suffer from metabolic syndrome.

The project objectives are centered on the discovery of dietary terpenic markers in serum and/or cells, and the study of their correlation with lipid composition and structure of the lipoproteins and blood cells. The second objective is based on the quantification of the cellular levels of signal proteins (G proteins and protein kinase C), adenylate cyclase and calculation of the correlation with blood pressure.

At the moment, we are focusing on the project which is being developed by the group PREDIMED-PLUS 2013-2016, in which we are researching the mechanisms of hypertension, the composition and dynamics of the lipid membrane and lipoproteins with atherogenic properties.



PROGRAMME:

**P3. Complications of obesity
and childhood obesity**

Patología Oxidativa

Group Members

STAFF MEMBERS

Tormos Muñoz, María del Carmen

ASSOCIATED MEMBERS

Cerdá Mico, Concepción
Iradi Casal, Antonio

Lead Researcher

Sáez Tormo, Guillermo



Contact:

Estrés Oxidativo y Patología Oxidativa de la Obesidad
Facultad de Medicina de Valencia
Avda. Vicente Blasco Ibáñez, 13. 46010 Valencia
E.mail: guillermo.saez@uv.es

Main lines of research

- Role of oxidative stress in the pathophysiology of cardiometabolic diseases. Special study of obesity and its cardiovascular and neoplastic complications.
- Identification of p53 dependent signal transduction pathways involved in the repair of oxidative stress-induced genetic alterations. Repair enzyme expression and identification of genetic polymorphisms.
- Validation oxidative metabolites (8-oxodG and F2-Isoprostanes) as clinical markers of cardiovascular and tumor diseases.

Most relevant scientific articles

- ESTRUCH R, ROS E, SALAS-SALVADÓ J, COVAS MI, D PHARM, CORELLA D ET AL.. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. *N Engl J Med*. 2013 Feb 25;.
- GARCÍA-HEREDIA A, KENSICKI E, MOHNEY RP, RULL A, TRIGUERO I, MARSILLACH J ET AL.. Paraoxonase-1 Deficiency Is Associated with Severe Liver Steatosis in Mice Fed a High-fat High-cholesterol Diet: A Metabolomic Approach. *J Proteome Res*. 2013 Apr 5;12(4):1946-55.
- MEDINA-REMÓN A, VALLVERDÚ-QUERALT A, ARRANZ S, ROS E, MARTÍNEZ-GONZÁLEZ MA, SACANELLA E ET AL.. Gazpacho consumption is associated with lower blood pressure and reduced hypertension in a high cardiovascular risk cohort. Cross-sectional study of the PREDIMED trial. *Nutr Metab Cardiovasc Dis*. 2013 Oct;23(10):944-52.
- TOLEDO E, HU FB, ESTRUCH R, BUIL-COSIALES P, CORELLA D, SALAS-SALVADÓ J ET AL.. Effect of the Mediterranean diet on blood pressure in the PREDIMED trial: results from a randomized controlled trial. *BMC Med*. 2013 Sep 19;11:207.
- TRESSERRA-RIMBAU A, MEDINA-REMÓN A, PÉREZ-JIMÉNEZ J, MARTÍNEZ-GONZÁLEZ MA, COVAS MI, CORELLA D ET AL.. Dietary intake and major food sources of polyphenols in a Spanish population at high cardiovascular risk: the PREDIMED study. *Nutr Metab Cardiovasc Dis*. 2013 Oct;23(10):953-9.

Highlights

The Research Unit of Oxidative Pathology-University of Valencia (UV - POX) has worked actively in the scientific activities of the Thematic Network of Cooperative Research PREDIMED (G03/140). The most important contributions of the group are related to the role of oxidative stress and damage to the genetic material in the pathophysiology of cardiovascular and tumor diseases.

The group led by Prof. Guillermo Sáez has received research grants from public institutions (PI10/0082; ACOM/2012/238; PI13/01848). It has been possible to demonstrate the degree of oxidative modification of different organic molecules in patients at high cardiovascular risk as well as the protective role observed after intervention with Mediterranean diet supplemented with virgin olive oil or nuts. We recently demonstrated the existence of lipid peroxidation damage and oxidative DNA modification in the metabolic syndrome and morbid obesity which is reversed by dietary intervention or surgical treatment respectively. Epidemiological data indicate that the Mediterranean diet is an important source of polyphenols in fruits and olive oil form. Studies with experimental animal have examined the bioavailability of the polyphenol hydroxytyrosol and its metabolic derivatives. Both in cardiovascular risk and obese patients, polymorphisms and enhanced expression of DNA repair enzymes involved in the pathway of p53-dependent signaling molecular (OGG1 , SIRT1 , FOXO1) have been identified together with a reduction of antioxidant enzymes (SOD , GPx and catalase) involved in the control of reactive oxygen species. Biochemical and molecular characterization of oxidative stress in tumors of the gastrointestinal tract has proved a useful tool for a better understanding of the mechanisms of tumor progression and validation of the modified and mutagenic base 8-oxodG as a clinical marker in patients with gastric carcinoma.



PROGRAMME:
P1. Nutrition

Nutrición Humana y Obesidad

Group Members

STAFF MEMBERS

Baldrich Mora, Mónica

ASSOCIATED MEMBERS

Babio Sánchez, Nancy Elvira

Balanza Roure, Rafael

Basora Gallisá, Josep

Berrocal Zaragoza, María Isabel

Bueno Fraile, Olalla

Bulló Bonet, Mònica

Cavallé Busquets, Pere

Fernández Ballart, Joan

Fernández Roig, Silvia

García-Miguillán del Campo, Carlos J.

Guasch Ferré, Marta

Ibarrola Jurado, Nuria

Juanola Falgarona, Martí

Munné i Cueva, Carles

Murphy, Michelle

Quílez Grau, Joan

Lead Researcher

Salas Salvadó, Jordi



Contact:

U. de Nutrición. Fac. de Medicina i Ciències de la Salut
 Universidad Rovira y Virgili

C/ Sant Llorenç, 21 Pl. baja, edificio 4. 43201 Reus, Tarragona

Phone: (+34) 977 759 313

E.mail: info@nutriciohumana.com · <http://www.nutriciohumana.com>

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

- ESTRUCH R, ROS E, SALAS-SALVADÓ J, COVAS MI, D PHARM, CORELLA D ET AL.. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. *N Engl J Med*. 2013 Feb 25;.
- GUASCH-FERRÉ M, BULLÓ M, MARTÍNEZ-GONZÁLEZ MA, ROS E, CORELLA D, ESTRUCH R ET AL.. Frequency of nut consumption and mortality risk in the PREDIMED nutrition intervention trial. *BMC Med*. 2013 Jul 16;11:164.
- DÍAZ-LÓPEZ A, BULLÓ M, JUANOLA-FALGARONA M, MARTÍNEZ-GONZÁLEZ MA, ESTRUCH R, COVAS MI ET AL.. Reduced serum concentrations of carboxylated and undercarboxylated osteocalcin are associated with risk of developing type 2 diabetes mellitus in a high cardiovascular risk population: a nested case-control study. *J Clin Endocrinol Metab*. 2013 Nov;98(11):4524-31.
- DÍAZ-LÓPEZ A, CHACÓN MR, BULLÓ M, MAYMÓ-MASIP E, MARTÍNEZ-GONZÁLEZ MA, ESTRUCH R ET AL.. Serum sTWEAK concentrations and risk of developing type 2 diabetes in a high cardiovascular risk population: a nested case-control study. *J Clin Endocrinol Metab*. 2013 Aug;98(8):3482-90.
- FERNÁNDEZ-ROIG S, CAVALLÉ-BUSQUETS P, FERNÁNDEZ-BALLART JD, BALLESTEROS M, BERROCAL-ZARAGOZA MI, SALAT-BATLLE J ET AL.. Low folate status enhances pregnancy changes in plasma betaine and dimethylglycine concentrations and the association between betaine and homocysteine. *Am J Clin Nutr*. 2013 Jun;97(6):1252-9.

Highlights

The effects of nutrition on health and its role in the incidence and progression of chronic diseases such as obesity, type 2 diabetes mellitus, metabolic syndrome and cardiovascular disease are the neural axis of the current research lines that are being conducted in the Unit of Human Nutrition. Many of the group efforts are focused on the PREDIMED PLUS trial, aimed at assessing the effect of an intensive treatment on lifestyle changes, including physical activity, energy-restricted Mediterranean diet and behavioural treatment on cardiovascular disease prevention. Other current studies are focused on evaluating the effect of several diet components on markers of cardiovascular disease, as well as the mechanisms that underlie the associations between diet and disease. The current research follows the group research trajectory that in the last years have resulted in the publication of numerous articles in scientific journals of international prestige. The background generated during the last years has also allowed the design of several clinical guidelines for the management of obesity and cardiovascular disease.



PROGRAMME:
P1. Nutrition

Nutrición y Toxicología

Group Members

STAFF MEMBERS

Álvarez Pérez, Jacqueline
Díaz Benítez, Elena María

ASSOCIATED MEMBERS

Álvarez Leon, Eva Elisa
Bautista Castaño, Inmaculada
Domínguez Boada, Luis María
Henríquez Sánchez, Patricia
Nissensohn, Mariela
Ortiz Andrelluchi, Adriana
Pérez Luzardo, Octavio Luís
Ribas Barba, María Lourdes
Román Viñas, Blanca
Ruano Rodríguez, Cristina
Sánchez Villegas, Almudena

Lead Researcher

Serra Majem, Lluís



Contact:

Universidad de Las Palmas de Gran Canaria
C/ Juan De Quesada, 30.
35001 Las Palmas de Gran Canaria · Phone: (+34) 928 453 477 Ext. 5263
E.mail: lluis.serra@ulpgc.es · Website: www.iuibslulpgc.es

Main lines of research

- Assessment of nutritional status in different populations
- Antioxidants, and chronic and degenerative diseases.
- Epidemiology and obesity determinants in different populations: children, adolescents and pregnant women.
- Probiotics and functional foods in human nutrition
- Mediterranean diet, chronic and mental diseases. SUN project
- 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.
- Nutritional adequacy methodology in populations and individuals and its repercussions on health.
- PLANT food supplements: Levels of Intake, Benefit and Risk Assessment): PLANTLIBRA
- Role of Zinc in neurodevelopment and growth.
- Network of Excellence developing methodologies to standardise the process of setting micronutrient recommendations. EURRECA

Most relevant scientific articles

- Interaction of the genetic load with the metabolism of some micronutrients and with the load of POPs (Persistent Organic Pollutants), and the development of the obesity.
 - Body composition estimated by bioelectrical impedance and Mediterranean diet.
 - Study of the dietary glycaemic index and dietary glycaemic load
 - Quality of life and Mediterranean diet.
 - Effect of the Mediterranean diet on the development of pregnancy and intrauterine growth.
 - Hydration and health.
- ESTRUCH R, ROS E, SALAS-SALVADÓ J, COVAS MI, D PHARM, CORELLA D ET AL.. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. *N Engl J Med*. 2013 Feb 25;.
 - SÁNCHEZ-VILLEGAS A, MARTÍNEZ-GONZÁLEZ MA. Diet, a new target to prevent depression? *BMC Med*. 2013 Jan 3;11:3.
 - RUANO C, HENRÍQUEZ P, MARTÍNEZ-GONZÁLEZ MÁ, BES-RASTROLLO M, RUÍZ-CANELA M, SÁNCHEZ-VILLEGAS A. Empirically derived dietary patterns and health-related quality of life in the SUN project. *PLoS One*. 2013;8(5):e61490.
 - SÁEZ-ALMENDROS S, OBRADOR B, BACH-FAIG A, SERRA-MAJEM L. Environmental footprints of Mediterranean versus Western dietary patterns: beyond the health benefits of the Mediterranean diet. *Environ Health*. 2013 Dec 30;12:118.
 - SÁNCHEZ-VILLEGAS A, MARTÍNEZ-GONZÁLEZ MA, ESTRUCH R, SALAS-SALVADÓ J, CORELLA D, COVAS MI ET AL.. Mediterranean dietary pattern and depression: the PREDIMED randomized trial. *BMC Med*. 2013 Sep 20;11:208.

Highlights

We have started the national Project PREDIMED PLUS: an intensive weight-loss lifestyle intervention with energy-restricted Mediterranean diet, physical activity and behavioural intervention on the primary prevention of cardiovascular disease (FIS: PI13/00272).

In September began the European Project CREDITS4HEALTH (FP7: 602386) -(credits based, people-centric approach for the adoption of healthy life-styles and balanced Mediterranean diet in the frame of social participation for health promotion”.

In this year we have published the Consensus document “Obesity and sedentarism in the XXI Century: what can be done? And what should be done?, the document gather the preventive proposals.

In November of this year a group of multidisciplinary experts in the areas of nutrition and health met in Chinchón, Madrid, under the auspices of the Nutrition Research Foundation) and with the collaboration of the Madrid Regional Government’s Health Ministry, the International Sweeteners Association and the CIBEROBN. They developed a Consensus Decalogue on the use low- and no-calorie sweeteners (LNCS)

During 2013, in the CIBERObn group of the University of Las Palmas de Gran Canaria 3 doctoral thesis were defended:

- “Influence of the Mediterranean dietary pattern on the distribution of body fat in a sample of Canary subjects at high cardiovascular risk”. (J. Álvarez)
- “Dietetic factors associated with quality of life in the SUN project”. (C. Ruano).
- “Diet as a determinant factor of the levels of POPs (Persistent Organic Pollutants); a study conducted in the population of Canary Island”. (M. Sangil).

Finally it should be pointed out that, as members of the Local Organizing Committee we begun to work in the organization and programming of the III World Congress of Nutrition and Public Health, II Latin-American Congress of Community Nutrition and X Congress of the Spanish Society of Community Nutrition (SENC), (Las Palmas de Gran Canaria-Banjul, noviembre 2014).



PROGRAMME:

P6. Physiopathology of body weight homeostasis

Obesidad, Neuroendocrinología y Función Reproductora (UCO)

Group Members

STAFF MEMBERS

Molero Murillo, Laura

Moreno Herrera, Antonio

Rodríguez Sánchez, Ana Belen

Sánchez-Garrido Noguerras, Miguel A.

ASSOCIATED MEMBERS

Aguilar Benítez De Lugo, Enrique

Benito López, Pedro

Castaño Fuentes, Justo Pastor

Castellano Rodríguez, Juan Manuel

Díaz-Ruiz Ruíz, José Alberto

Fernández Fernández, Rafel

García Galiano, David

García Navarro, María Socorro

Gaytan Luna, Francisco

Leon Tellez, Silvia

Luque Huertas, Raúl M.

Malagón Poyato, María Del Mar

Manferdi Lozano, María

Martínez Fuentes, Antonio Jesús

Peinado Mena, Juan Ramón

Pineda Reyes, Rafael

Pinilla Jurado, Leonor

Roa Rivas, Juan

Ruíz Pino, Francisco

Vázquez Martínez, Rafel Manuel

Vigo Gago, Eva María

Lead Researcher

Tena Sempere, Manuel



Contact:

Facultad de Medicina. Universidad de Córdoba

Avd. Menéndez Pidal s/n. 14004 Córdoba

Phone: (+34) 957 21 82 81

E.mail: fi1tesem@uco.es · Website: www.uco.es

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.

Most relevant scientific articles

- **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.
- SANGIAO-ALVARELLOS S, MANFREDI-LOZANO M, RUÍZ-PINO F, NAVARRO VM, SÁNCHEZ-GARRIDO MA, LEON S ET AL.. Changes in Hypothalamic Expression of the Lin28/let-7 System and Related MicroRNAs During Postnatal Maturation and After Experimental Manipulations of Puberty. *Endocrinology*. 2013 Feb;154(2):942-55.
- SÁNCHEZ-GARRIDO MA, CASTELLANO JM, RUÍZ-PINO F, GARCÍA-GALIANO D, MANFREDI-LOZANO M, LEON S ET AL.. Metabolic programming of puberty: sexually dimorphic responses to early nutritional challenges. *Endocrinology*. 2013 Sep;154(9):3387-400.
- ALMABOUADA F, DIAZ-RUÍZ A, RABANAL-RUÍZ Y, PEINADO JR, VAZQUEZ-MARTÍNEZ R, MALAGON MM. Adiponectin receptors form homomers and heteromers exhibiting distinct ligand binding and intracellular signaling properties. *J Biol Chem*. 2013 Feb 1;288(5):3112-25.
- CÓRDOBA-CHACÓN J, GAHETE MD, POZO-SALAS AI, CASTAÑO JP, KINEMAN RD, LUQUE RM. Endogenous somatostatin is critical in regulating the acute effects of L-arginine on growth hormone and insulin release in mice. *Endocrinology*. 2013 Jul;154(7):2393-8.
- LUQUE RM, IBÁÑEZ-COSTA A, LÓPEZ-SÁNCHEZ LM, JIMÉNEZ-REINA L, VENEGAS-MORENO E, GÁLVEZ MA ET AL.. A cellular and molecular basis for the selective desmopressin-induced ACTH release in Cushing disease patients: key role of AVPR1b receptor and potential therapeutic implications. *J Clin Endocrinol Metab*. 2013 Oct;98(10):4160-9.

Highlights

The research activities carried out by our multidisciplinary team during 2013 have allowed us to advance towards the completion of our major scientific goals. In detail:

1. We have implemented proteomic analyses of the adipose tissue (AT) aiming at the identification of novel molecular targets altered in human AT, deregulated in conditions of obesity and insulin resistance; studies that have been carried out in collaboration with various clinical groups of CIBER.
2. We have completed studies directed towards the characterization of the receptors and signaling routes of adiponectin, as key metabolic signal derived from the AT, involved in the control of insulin sensitivity and whole body metabolism.
3. Mainly through international collaborations, we have carried out a series of studies on the neuroendocrine alterations seen in preclinical models of obesity and other forms of metabolic stress; studies that include the analysis of key signals of the somatotrophic (and related) axis, such as GH, ghrelin, IGF-1 and insulin.
4. We have published studies in preclinical models concerning the analysis of the impact of early obesogenic insults on pubertal timing in both sexes. In addition, we have also completed a first series of analyses on the role of microRNAs in the central (hypothalamic) control of puberty, and its modulation by different (early) regulators, including the nutritional state during the postnatal life.
5. We have advanced towards the characterization of the hypogonadal state frequently linked to obesity, using preclinical (rodent) models of exposure to different obesogenic insults; these studies have also permitted us to elucidate some of the mechanisms involved in this phenomenon.
6. We have continued studies aiming to define the neuroendocrine factors whereby obesity and some endocrine-dependent tumors, such as breast cancer, are associated. In the same vein, we have published data on novel diagnostic approaches to identify some types of tumors of considerable metabolic relevance, such as pituitary corticotropinomas causing Cushing syndrome.



PROGRAMME:

**P3. Complications of obesity
and childhood obesity**

Investigación y Desarrollo en Obesidad y Enfermedades Asociadas

Group Members

STAFF MEMBERS

Coin Aránguez, Leticia

Garrido Sánchez, Lourdes

Oliva Olivera, Wilfredo

Picón César, Inmaculada Concepción

ASSOCIATED MEMBERS

Barbarroja Puerto, Nuria

Cardona Díaz, Fernando

Clemente Postigo, María Mercedes

El Bekay, Raja

Fernández García, Diego

Fernández García, José Carlo

García Almeida, José Manuel

García Fuentes, Eduardo

Gómez Huelgas, Ricardo

López Sigüero, Juan Pedro

Macías González, Manuel

Mancha Doblás, Isabel

Moreno Indias, Isabel

Murri Pierri, Mora

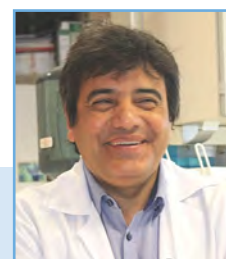
Queipo Ortuño, María Isabel

Roca Rodríguez, María del Mar

Villalobos Martínez, Elena

Lead Researcher

Tinahones Madueño, Francisco



Contact:

Phone: (+34) 951 034 016

E.mail: fjtinahones@hotmail.com

Main lines of research

- Microbiota and related diseases. This line is going to study the intestinal bacterial microflora profiles in lean and obese patients with and without insulin resistance to establish the role of this microflora in the origin of obesity and insulin resistance. We have also started a subline that analyzes changes in the microbiota that can cause certain nutrients rich in polyphenols and the relationship of these changes to metabolic diseases.
- Development of metabolic syndrome and lipodystrophy in HIV-infected patients. The aim of this line is to study the possible association of oxidative stress, chronic inflammatory status and antiretroviral therapy with the development of metabolic syndrome (MS) and lipodystrophy (LP) in HIV-infected patients, by analysis of the most relevant blood biomarkers levels.
- Obesity and associated diseases. We study the relationship between obesity and related metabolic diseases. We tried to elucidate the mechanisms that protect certain individuals with obesity to develop metabolic diseases or to develop these much later. Among the diseases associated with obesity, diabetes and postprandial lipemia are two of the areas where we are deepening.

Most relevant scientific articles

- Transcription and epigenetic factors in the relationship between obesity and diabetes. In this line, we analyze epigenetic modifications of certain genes involved in the relation obesity-diabetes and how these modifications are affecting transcription factors that regulate crucial metabolic or signaling pathways in this relation.
- CAROBBIO S, HAGEN RM, LELLIOTT CJ, SLAWIK M, MEDINA-GÓMEZ G, TAN CY ET AL.. Adaptive changes of the Insig1/SREBP1/SCD1 set point help adipose tissue to cope with increased storage demands of obesity. *Diabetes*. 2013 Nov;62(11):3697-708.
- CLEMENTE-POSTIGO M, QUEIPO-ORTUÑO MI, BOTO-ORDOÑEZ M, COIN-ARAGÜEZ L, ROCA-RODRÍGUEZ MM, DELGADO-LISTA J ET AL.. Effect of acute and chronic red wine consumption on lipopolysaccharide concentrations. *Am J Clin Nutr*. 2013 May;97(5):1053-61.
- BERNAL-LÓPEZ MR, GARRIDO-SÁNCHEZ L, GÓMEZ-CARRILLO V, GALLEGU-PERALES JL, LLORENTE-CORTÉS V, CALLEJA F ET AL.. Antioxidized LDL antibodies are associated with different metabolic pathways in patients with atherosclerotic plaque and type 2 diabetes. *Diabetes Care*. 2013 Apr;36(4):1006-11.
- TINAHONES FJ, COÍN ARAGÜEZ L, MURRI M, OLIVA OLIVERA W, MAYAS TORRES MD, BARBARROJA N ET AL.. Caspase induction and BCL2 inhibition in human adipose tissue: a potential relationship with insulin signaling alteration. *Diabetes Care*. 2013 Mar;36(3):513-21.
- MURRI M, LEIVA I, GÓMEZ-ZUMAQUERO JM, TINAHONES FJ, CARDONA F, SORIGUER F ET AL.. Gut microbiota in children with type 1 diabetes differs from that in healthy children: a case-control study. *BMC Med*. 2013 Feb 21;11:46.

Highlights

During 2013 the research group has received founding from Instituto de Salud Carlos III for 5 projects, PI13/02628, two associated to Miguel Servet type I (CP13/00065 and CP13/00188), two associated to Miguel Servet type II (CPII/13/0041, CP13/0023) and 3 grants from Servicio Andaluz de Salud (PI0173/2013, PI0153/2013 and PI557/2013). We have developing 17 clinical trials supported by private companies, with a total budget of € 697,144.74. We have published 31 papers in first quartile, 12 of them in the first decile.

We have got different awards: one to the best paper presented within the Basic Endocrinology category at the 38th Congress of the Andalusian Society of Endocrinology and Nutrition. Cadiz, 7-9 November 2013: Coin Aragüez Leticia, Rajaa El Bekay, Diego Garcia Fernandez, Wilfredo Olivera Oliva, Rosa López Bernal, Mercedes Clemente Postigo, Javier Delgado list, Alberto Ruiz Diaz, Rocio Ruiz Guzman, Rafael Martínez Vázquez, Vendrell Joan, Malagon Maria del Mar, Francisco José Tinahones Madueño (Effects of GLP-1 on the differentiation of human adipocyte metabolism) and another on Vascular Risk Factors from SEEN Foundation, Granada, May 2013 (Hemoglobin A1C versus oral glucose tolerance test in postpartum diabetes screening). Maria Jose Picon, Mora Murri, Araceli Muñoz, José Carlos Fernández- García, Ricardo Gomez- Huelgas, Francisco J. Tinahones, published in *Diabetes Care*, August 2012;1648-1653.

In addition, our UGC has received in 2013 the award for whole career granted by SEEN



PROGRAMME:
P1. Nutrition

Nutrición, Ejercicio, Riesgo Cardiovascular, Obesidad y Estrés Oxidativo

Group Members

STAFF MEMBERS

Bibiloni Esteva, Maria del Mar

ASSOCIATED MEMBERS

Batle Vidal, Joan Miquel
 De la Peña Fernández, Andrés
 Gámez Martínez, José María
 González Gross, María Marcela
 Jiménez Monreal, Antonia María
 Llompart Alabern, Isabel
 Martínez Tome, Magdalena
 Micol Molina, Vicente
 Murcia Tomás, María Antonia
 Palacios Le Ble, Gonzalo
 Pich Sole, Jorge
 Pons Biescas, Antoni
 Puig Mojer, Marta Sebastiana
 Ripoll Vera, Tomás
 Roche Collado, Enrique
 Sureda Gomila, Antoni

Lead Researcher

Tur Marí, Josep Antoni



Contact:

Facultad de Ciencias de Mallorca
 Cra. de Valldemossa, km 7.5.
 07122 Palma (Illes Balears)
 E.mail: nucox@uib.es · Website: <http://nucox.uib.es/>

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

- FERRER MD, TAULER P, SUREDA A, PALACÍN C, TUR JA, PONS A. Antioxidants restore protoporphyrinogen oxidase in variegate porphyria patients. *Eur J Clin Invest.* 2013 Jul;43(7):668-78.
- BIBILONI MDEL M, PONS A, TUR JA. Defining body fatness in adolescents: a proposal of the AFAD-A classification. *PLoS One.* 2013;8(2):e55849.
- QUIRANTES-PINÉ R, HERRANZ-LÓPEZ M, FUNES L, BORRÁS-LINARES I, MICOL V, SEGURA-CARRETERO A ET AL.. Phenylpropanoids and their metabolites are the major compounds responsible for blood-cell protection against oxidative stress after administration of *Lippia citriodora* in rats. *Phytomedicine.* 2013 Sep 15;20(12):1112-8.
- ROCHE E, RAMÍREZ-TORTOSA CL, ARRIBAS MI, OCHOA JJ, SIRVENT-BELANDO JE, BATTINO M ET AL.. Comparative Analysis of Pancreatic Changes in Aged Rats Fed Life Long With Sunflower, Fish, or Olive Oils. *J Gerontol A Biol Sci Med Sci.* 2013 Oct 17;.
- CUFÍ S, BONAVIA R, VÁZQUEZ-MARTÍN A, COROMINAS-FAJA B, OLIVERAS-FERRAROS C, CUYÁS E ET AL.. Silibinin meglumine, a water-soluble form of milk thistle silymarin, is an orally active anti-cancer agent that impedes the epithelial-to-mesenchymal transition (EMT) in EGFR-mutant non-small-cell lung carcinoma cells. *Food Chem Toxicol.* 2013 Oct;60:360-8.

Highlights

Multidisciplinary and interinstitutional group composed of physiologists, biochemists, psychologists, dietitians, clinical analysts and medical specialists in cardiology and internal medicine that meets at a time, with professional teachers and university and clinical researchers.

In 2013 there have been two competing national projects, two autonomous, two funded by private companies and one by the European Unión; five PhD theses have been defended, and several application patents have been kept alive for pharmaceutical products, which are in use today. This activity has resulted in the maintenance of a spin-off created several years ago.

The group is integrated into the Predimed, Helena and Exernet networks.

The training ability of the Group have resulted in its coordinating role of several Official Masters and interuniversities Doctoral Programs with Mention of Excellence of the Spanish Ministry of Education.

The papers of the Group have been focused on giving a complete answer to questions in community nutrition, physical activity and exercise, cardiovascular risk factors, obesity, oxidative stress and antioxidant action of nutrients and non-nutrients, as well as in the design of functional foods.



PROGRAMME:

P6. Physiopathology of body weight homeostasis

Biología Molecular y Regulación Génica del Tejido Adiposo y sus Patologías

Group Members

STAFF MEMBERS

Agustí Sánchez, Judit Gallego Escudero, José Miguel Gavalda Navarro, Aleix

ASSOCIATED MEMBERS

Armengol Mansilla, Jordi Cairo Calzada, Monserrat Cereijo Tellez, Rubén Díaz Delfín, Julieta Giralt Coll, Albert Giralt Oms, Marta Iglesias Coll, María del Rosario Mampel Astals, Teresa Navarro Reglero, Isis Planadevila Porta, Ana Redondo Angulo, Ibon Ribas Aulinas, Francesc Rosell Mañé, Meritxell Viñas Folch, Octavio

Lead Researcher

Villarroya Gombau, Francesc



Contact:

Nutrición y Bromatología
 Facultad de Biología. Universidad de Barcelona
 Diagonal, 643. 08028 Barcelona · Phone: (+34) 93 402 15 25
 E.mail: fvillarroya@ub.edu
 Website: www.ub.edu/tam

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

- PLANAVILA A, REDONDO I, HONDARES E, VINCIGUERRA M, MUNTS C, IGLESIAS R ET AL.. Fibroblast growth factor 21 protects against cardiac hypertrophy in mice. *Nat Commun.* 2013;4:2019.
- VILLARROYA F, VIDAL-PUIG A. Beyond the sympathetic tone: the new brown fat activators. *Cell Metab.* 2013 May 7;17(5):638-43.
- GIRALT M, VILLARROYA F. White, brown, beige/brite: different adipose cells for different functions? *Endocrinology.* 2013 Sep;154(9):2992-3000.
- GALLEGO-ESCUREDO JM, VILLARROYA J, DOMINGO P, TARGARONA EM, ALEGRE M, DOMINGO JC ET AL.. Differentially altered molecular signature of visceral adipose tissue in HIV-1-associated lipodystrophy. *J Acquir Immune Defic Syndr.* 2013 Oct 1;64(2):142-8.
- VILLARROYA J, CEREJO R, VILLARROYA F. An endocrine role for brown adipose tissue? *Am J Physiol Endocrinol Metab.* 2013 Sep 1;305(5):E567-72.

Highlights

ONGOING PROJECTS, BEING DEVELOPED IN 2013

Novel actos in the intracellular and systemic control of energy metabolism: role of the sirtuin-FGF21 axis. MINECO. Plan Nacional. Biomedicina. IP, F.Villarroya (2012-2014).

Development of novel treatment strategies based on knowledge of cellular dysfunction in diabetes (BetaBat). European Project FP7-Health. General coordinator: D.Eizirik, group coordinator: F.Villarroya (2011-2015)

Genetics and Molecular Biology of Mitochondrial Proteins and Associated Diseases. Generalitat de Catalunya IP, F.Villarroya (2009-2013)

Accelerated ageing in the pathogenesis of lipodystrophy associated with HIV/HA-ART: studies of cellular senescence, autophagy, oxidative stress and inflammation in adipose tissue. Project FIS. ISCIII. IP, M.Giralt (2012-2014)

NEW PROJECTS, STARTING 2013

Identification of novel endocrine factors secreted by brown fat ("batokines") with anti-diabetic action. European Foundation for the Study of Diabetes. IP, F.Villarroya (2013-2015)

Study of FGF21 as new factor present in milk, involved in the beneficial effects of breast feeding. Recercaixa. IP, F.Villarroya (2013-2014)



6

Annexes

CIBEROBN Publications in 2013

Group	Code	Publication	Quartile	FI
Andreu Palou Oliver	24312379	Konieczna J, García AP, Sánchez J, Palou M, Palou A, Picó C. Oral leptin treatment in suckling rats ameliorates detrimental effects in hypothalamic structure and function caused by maternal caloric restriction during gestation. <i>PLoS One</i> . 2013;8(11):e81906.	1	3,73
Andreu Palou Oliver	24277691	Priego T, Sánchez J, Picó C, Ahrens W, Bammann K, De Henauw S et al.. Influence of breastfeeding on blood-cell transcript-based biomarkers of health in children. <i>Pediatr Obes</i> . 2013 Nov 26;.	1	2,276
Andreu Palou Oliver	24010755	Palou A, Bonet ML. Challenges in obesity research. <i>Nutr Hosp</i> . 2013 Sep;28 Suppl 5:144-53.	4	1,305
Andreu Palou Oliver	24100671	Palou A, Picó C, Bonet ML. Nutritional potential of metabolic remodelling of white adipose tissue. <i>Curr Opin Clin Nutr Metab Care</i> . 2013 Nov;16(6):650-6.	1	4,519
Andreu Palou Oliver	23729396	Laraichi S, Parra P, Zamanillo R, El Amarti A, Palou A, Serra F. Dietary supplementation of calcium may counteract obesity in mice mediated by changes in plasma fatty acids. <i>Lipids</i> . 2013 Aug;48(8):817-26.	2	2,557
Andreu Palou Oliver	23650203	Sánchez J, Nozhenko Y, Palou A, Rodríguez AM. Free fatty acid effects on myokine production in combination with exercise mimetics. <i>Mol Nutr Food Res</i> . 2013 Aug;57(8):1456-67.	1	4,31
Andreu Palou Oliver	23423323	Oliver P, Reynés B, Caimari A, Palou A. Peripheral blood mononuclear cells: a potential source of homeostatic imbalance markers associated with obesity development. <i>Pflugers Arch</i> . 2013 Apr;465(4):459-68.	1	4,866
Andreu Palou Oliver	23417844	Priego T, Sánchez J, García AP, Palou A, Picó C. Maternal dietary fat affects milk fatty acid profile and impacts on weight gain and thermogenic capacity of suckling rats. <i>Lipids</i> . 2013 May;48(5):481-95.	2	2,557
Andreu Palou Oliver	23159561	García AP, Priego T, Palou M, Sánchez J, Palou A, Picó C. Early alterations in plasma ghrelin levels in offspring of calorie-restricted rats during gestation may be linked to lower sympathetic drive to the stomach. <i>Peptides</i> . 2013 Jan;39:59-63.	2	2,522
Andreu Palou Oliver	23246573	Bonet ML, Oliver P, Palou A. Pharmacological and nutritional agents promoting browning of white adipose tissue. <i>Biochim Biophys Acta</i> . 2013 May;1831(5):969-85.	1	4,134
Carlos Diéguez González	23348063	Romero-Picó A, Vázquez MJ, González-Touceda D, Folgueira C, Skibicka KP, Alvarez-Crespo M et al.. Hypothalamic μ -Opioid Receptor Modulates the Orexigenic Effect of Ghrelin. <i>Neuropsychopharmacology</i> . 2013 Jan 24;.	1	6,685
Carlos Diéguez González	23142626	Imbernon M, Beiroa D, Vázquez MJ, Morgan DA, Veyrat-Durebex C, Porteiro B et al.. Central Melanin-Concentrating Hormone Influences Liver and Adipose Metabolism Via Specific Hypothalamic Nuclei and Efferent Autonomic/JNK1 Pathways. <i>Gastroenterology</i> . 2013 Mar;144(3):636-649.e6.	1	12,03

Carlos Diéguez González	24378736	Imbernon M, Whyte L, Diaz-Arteaga A, Russell WR, Moreno NR, Vazquez MJ et al.. Regulation of GPR55 in rat white adipose tissue and serum LPI by nutritional status, gestation, gender and pituitary factors. <i>Mol Cell Endocrinol.</i> 2013 Dec 27;383(1-2):159-169.	2	4,039
Carlos Diéguez González	24298283	Novelle MG, Contreras C, Romero-Picó A, López M, Diéguez C. Irisin, Two Years Later. <i>Int J Endocrinol.</i> 2013;2013:746281.	3	2,518
Carlos Diéguez González	23950036	Al Massadi O, Quiñones M, Lear P, Diéguez C, Nogueiras R. The Brain: A New Organ for the Metabolic Actions of SIRT1. <i>Horm Metab Res.</i> 2013 Dec;45(13):960-6.	3	2,145
Carlos Diéguez González	23931752	Menacho-Márquez M, Nogueiras R, Fabbiano S, Sauzeau V, Al-Massadi O, Diéguez C et al.. Chronic sympathoexcitation through loss of Vav3, a Rac1 activator, results in divergent effects on metabolic syndrome and obesity depending on diet. <i>Cell Metab.</i> 2013 Aug 6;18(2):199-211.	1	14,62
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Centro de Investigación Biomédica en Red (CIBER)
Instituto de Salud Carlos III
C/ Monforte de Lemos 3-5. Pabellón 11
28029 Madrid
www.ciberisciii.es



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Edificio D 1º planta
Hospital Clínico Universitario
de Santiago de Compostela
C/ Choupana s/n · 15706 Santiago de Compostela