institute imdea food

Precision Nutrition and Health

# annual report 2020

imdea food institute

www.food.imdea.org

# Director

**Guillermo Reglero**
Director, IMDEA Food Institute
March 2021

2020

annual report
2020
www.food.imdea.org

La pandemia ocasionada por el COVID-19 ha ocupado prácticamente todo el 2020 con gravísimas consecuencias humanas, sanitarias, sociales y económicas que se proyectarán en los próximos años. Sin embargo, al mismo tiempo, es posible que 2020 haya sido un año trascendental para la ciencia, si los gobiernos de los países son capaces de sacar conclusiones de lo sucedido y cambiar lo que se ha visto que es necesario.

Ahora, la población en general ya es más consciente de que de la ciencia vienen las soluciones a los grandes problemas y las aportaciones más significativas a su bienestar. A partir de aquí, los sistemas de ciencia deben reorganizarse, adoptando estrategias de priorización orientadas a solucionar las necesidades más importantes y dotándose de estructuras y procedimientos estables y eficaces.

En 2019 no llegaron a 700 los artículos de investigación que se publicaron sobre SARS-CoV (los coronavirus que provocan *Severe Acute Respiratory Syndrome),* mientras que en 2020 se han publicado más de 110.000. De ellos, un 5% tienen afiliación *Spain*, un porcentaje que casi duplica al habitual de contribución de España a la producción científica mundial. Es decir, la comunidad científica internacional, incluidos los investigadores que trabajan en centros españoles, tiene capacidad de responder con rapidez a los grandes problemas imprevistos.

Pero la culminación de las aportaciones de la ciencia a la lucha contra la COVID-19 se ha producido con el desarrollo de las vacunas, donde las diferencias entre los sistemas de I+D+I se han puesto de manifiesto con claridad. Los países con estructuras bien establecidas han sido capaces de transformar rápidamente conocimientos básicos de biología molecular en vacunas innovadoras, eficaces y seguras, sin dudar que eso era lo primero en este momento.

IMDEA Alimentación se ha adaptado lo mejor posible a las circunstancias derivadas de la COVID-19 y ha tratado de aportar todas sus capacidades a la lucha contra la pandemia. Para ello, en los primeros días, incluso antes del confinamiento, se diseñó un estricto protocolo de prevención de riesgos por COVID-19 que ha permitido minimizar las pérdidas de experimentos y recuperar la actividad del Instituto en grados adaptados a las medidas establecidas en la Región de Madrid y en el contexto general del país.

En las primeras semanas de crisis, IMDEA Alimentación entregó al sistema de salud de Madrid todo el material de protección biológica del que se disponía, ya que los EPIS escaseaban en los hospitales.

En muy pocas horas, tras la convocatoria especial COVID-19 del Gobierno, a través del Instituto de Salud Carlos III, los investigadores del Instituto fueron capaces de generar una decena de proyectos de investigación en los que se aplicaban sus capacidades y experiencia al combate contra el COVID-19. Estos proyectos pueden tener aún un importante recorrido y ya han generado 13 artículos científicos, varios de ellos con un alto número de citas en los pocos meses que han transcurrido desde su publicación. Entre estos proyectos, destaca el ensayo clínico *ONCOVINF* que se desarrolla en colaboración con el Hospital Infanta Sofía de Madrid y la empresa Forchronic SL, en el marco del Programa de Actividades en Tecnologías ALIBIRD2020-CM, con el objetivo de estudiar los efectos de una fórmula bioactiva específica para contrarrestar la susceptibilidad a las infecciones de los enfermos de cáncer, incluida la provocada por el COVID-19.

La producción científica de IMDEA Alimentación en 2020 ha sido la más alta de su historia con 228 artículos SCI publicados, una parte importante en revistas de factor de impacto medio-alto, con algunas de muy alto factor de impacto, como Nature Medicine o Journal of American College of Cardiology. Si se analiza esta producción cien-

# words from the director...

tífica en términos relativos de plantilla y/o presupuesto, se ve que es comparable a la de los mejores institutos a nivel internacional.

La I+D industrial se ha resentido mucho durante 2020, lo que ha obligado a IMDEA Alimentación a redirigir esfuerzos para mantener un elevado nivel de actividad y de captación de recursos. Se ha aumentado la plantilla, superándose el umbral de las 100 personas, con incorporación de varios excelentes investigadores procedentes de centros de investigación tan importantes como Rockefeller University y Memorial Sloan Kettering Cancer Center, de los EEUU, o Bolfson Institute for Biomedical Research y Norwich Medical School, de Reino Unido. Se ha conseguido atraer fondos externos de fuentes competitivas públicas nacionales e internacionales por valor de 2.358.028, de manera que la relación de financiación con la Transferencia Nominativa supera el 1:1. Hay que agradecer a la Consejería de Ciencia, Universidades e Innovación de la Comunidad de Madrid que en tiempos tan difíciles trabaje por incrementar la dotación basal a los IMDEA, prueba de su compromiso con la ciencia de la Comunidad de Madrid.

En cuanto a la transferencia e innovación, 2020 ha sido también un año de significativo progreso para IMDEA Alimentación. Bien a través de *spin off* o de empresas de Madrid, se han puesto en el mercado varios complementos nutricionales y test genéticos que son muestra de la visión del Instituto de la ciencia de utilidad económico-social y del éxito de su misión de llevar a la sociedad productos de alto valor añadido, basados en el conocimiento científico.

La colaboración internacional de IMDEA Alimentación se ha intensificado en 2020 a través de EIT Food que, adaptando a la pandemia sus procedimientos de trabajo, ha logrado mantener el impacto europeo que está logrando en los últimos años en materia de innovación, educación y comunicación.

Desde el principio, IMDEA Alimentación posicionó su proyecto de investigación-innovación en la Nutrición de Precisión, una ciencia que emergió en los primeros años del siglo XXI, pero que en la actualidad despliega ya un enorme potencial de actuaciones orientadas al bienestar de la población y al necesario cambio de modelo económico del sector industrial de la agroalimentación y la nutrición.

Como prueba de ello no hay más que ver que en 2020 la Nutrición de Precisión ha entrado a formar parte del plan estratégico de los *National Institutes of Health (NIH - U.S. Department of Health & Human Services)* que, con una apuesta presupuestaria audaz, tratará de integrar las ideas de la comunidad de la ciencia de la nutrición, los profesionales, los empresarios y el público en general, de cara a impulsar los descubrimientos en nutrición durante los próximos 10 años.

En el mismo sentido y mirando tanto al presente como al futuro, IMDEA Alimentación lidera *INNOLINK*, un HUB de Nutrición de Precisión que cuenta con financiación competitiva de la Comunidad de Madrid y cuyo objetivo es facilitar la llegada a la industria y a la sociedad de la Nutrición de Precisión a través de la transferencia tecnológica y el emprendimiento con el fin último de contribuir a la mejora del bienestar social y al progreso económico.

No puedo terminar sin mencionar que en 2020 se ha producido un cambio en la Presidencia del Patronato de la Fundación IMDEA Alimentación. El Dr. Daniel Ramón, científico de gran prestigio internacional con amplia experiencia en el mundo académico y actualmente Vicepresidente Global de I+D en la multinacional Archer Daniels Midland (Chicago, Illinois), será el nuevo presidente del Patronato.

Después de apoyar el proyecto IMDEA Alimentación desde el principio, aportando lo mejor de su experiencia profesional y sus grandes valores humanos, la Dra. Manuela Juárez deja la presidencia del patronato al final de su carrera científica. Siempre le agradeceremos su excelente trabajo, su entusiasmo y su generosidad.

The pandemic caused by COVID-19 has taken up virtually the entire 2020 with very serious human, health, social and economic consequences that will be projected for years to come. At the same time, however, 2020 may have been a significant year for science, if governments are able to draw lessons from what has happened and change what has been seen to be necessary.

The general public is now more aware that science provides solutions to major problems and the most meaningful contributions to their well-being. From this point on, science systems must be reorganised, adopting prioritisation strategies oriented towards solving the most important needs, and equipping themselves with stable and effective structures and procedures.

In 2019, fewer than 700 research articles were published on SARS-CoV (the coronaviruses that cause *Severe Acute Respiratory Syndrome*), while in 2020 more than 110,000 have been published. Among them, 5% are affiliated to *Spain*, a percentage that is almost two fold the usual contribution of Spain to the world's scientific research output. In other words, the international scientific community, including researchers working in Spanish centres, has the capacity to respond quickly to major unforeseen problems.

But the culmination of science's contributions to the fight against COVID-19 has come with the development of vaccines, where the differences between R&D&I systems have become clearly evident. Countries with well-established structures have been able to rapidly transform basic molecular biological knowledge into innovative, effective and safe vaccines, with no doubt that this came first at this stage.

IMDEA Food has adapted to the best of its abilities to the circumstances arising from COVID-19 and has tried to contribute all its capabilities to the fight against the pandemic. To this end, in the first days, even before the lockdown, a strict risk prevention protocol was designed for COVID-19, which has made it possible to minimise the loss of experiments and to recover the institute's activity to a degree adapted to the measures implemented in the Region of Madrid and in the general context of the country.

In the first weeks of the crisis, IMDEA Food provided Madrid's health system with all the biological protection material available, as there was a shortage of PPE in the hospitals.

In just a few hours, following the government's special COVID-19 call for proposals through *Instituto de Salud Carlos III*, the institute's researchers were able to generate a dozen research projects combining their skills and experience in the fight against COVID-19. These projects may still have a long way to go and have already generated 13 scientific articles, several of them with a high number of references in the few months that have elapsed since their publication. One of these projects is the ONCOVINF clinical trial being carried out in collaboration with Infanta Sofía Hospital in Madrid and the company Forchronic SL, within the framework of the ALIBIRD2020-CM Technology Activities Programme, with the aim of studying the effects of a specific bioactive formula to counteract the susceptibility of cancer patients to infections, including that caused by COVID-19.

IMDEA Food scientific output in 2020 has been the highest in its history with 228 science articles published, a significant part in medium-high impact factor journals, with some with a very high impact factor, such as Nature Medicine or the Journal of American College of Cardiology. If this scientific output is analysed in relative terms of staff and/or budget, it is comparable to that of the best institutes at international level.

Industrial R&D has suffered greatly during 2020, which has forced IMDEA Food to redirect its efforts to keep up a high level of activity and attract resources. Staff numbers have been increased, surpassing the threshold of 100 people, with the incorporation of several excellent researchers from leading research centres such as Rockefeller University and Memorial Sloan Kettering Cancer

Center in the US, or the Wolfson Institute for Biomedical Research and Norwich Medical School in the UK. External funding has been successfully attracted from national and international public competitive sources to the value of 2,358,028, so that the funding ratio with the Nominative Transfer exceeds 1:1. The Regional Department of Science, Universities and Innovation of Madrid's Regional Government is to be thanked for working to increase the fundamental endowment to IMDEA in such difficult times, proof of its commitment to science in Madrid's Region.

In terms of transfer and innovation, 2020 has also been a year of significant progress for IMDEA Food. Either through spin-offs or Madrid-based companies, several nutritional supplements and genetic tests have been brought to market, which are proof of the Institute's vision of science with economic and social benefits and the success of its mission to bring to society products with high added value, based on scientific knowledge.

IMDEA Food's international collaboration has intensified in 2020 through EIT Food which, adapting its working procedures to the pandemic, has managed to keep up the European impact it has achieved in recent years in terms of innovation, education and communication.

From the outset, IMDEA Food positioned its research-innovation project on Precision Nutrition, a science that emerged in the early years of the 21st century, but which currently has enormous potential for actions aimed at the well-being of the population and the necessary change in the economic model of the agri-food and nutrition industrial sector.

Proof of this can be seen in the fact that in 2020 Precision Nutrition has become part of the strategic plan of the National Institutes of Health (NIH - U.S. Department of Health & Human Services) which, with a bold budgetary commitment, will try to integrate the ideas of the nutrition science community, professionals, entrepreneurs and the general public, in order to boost findings in nutrition over the next 10 years.

In the same vein, and looking to both the present and the future, IMDEA Food leads INNOLINK, a Precision Nutrition HUB with competitive funding from the Region of Madrid, which aims to facilitate the arrival of Precision Nutrition to industry and society through technology transfer and entrepreneurship with the ultimate goal of contributing to the improvement of social welfare and economic progress.

I cannot finish without mentioning that in 2020 there has been a change in the Presidency of the Board of Trustees of the IMDEA Food Foundation. Prof. Daniel Ramón, a scientist of great international prestige with extensive experience in academia and currently Global Vice President of R&D at the multinational Archer Daniels Midland (Chicago, Illinois), will be the new Board of Trustees president.

After supporting the IMDEA Food project from the beginning, contributing the best of her professional experience and her great human values, Professor Manuela Juárez leaves the board of trustees' presidency at the end of her scientific career. We will always be grateful for her excellent work, her enthusiasm and her generosity.

**Guillermo Reglero**
Director, IMDEA Food Institute
March 2021


Videa alimentación
2020

# annual report 2020

www.food.imdea.org

2020

editor
IMDEA Food Institute

layout
www.loveodesign.es

D.L.
M-4917-2021

# contents

# about us

The IMDEA Food Institute, one of the seven Madrid Institutes for Advanced Studies (IMDEA), is a public research centre founded in 2007 by Madrid's regional government. The goal of the Institute is to generate science of excellence in the field of food on which to support solutions to social problems and to contribute to a knowledge-based economic model capable of generating high added value.

## mission

The mission of the IMDEA Food Institute is to generate scientific knowledge of excellence in the field of food, to improve the quality of life of the population and to contribute to the development of an economic model based on the creation of value from knowledge-based innovation.

The Institute's hallmark is the study of the relationship between genes and nutrients with special emphasis on the prevention and treatment of chronic diseases through precision nutrition.

## vision

IMDEA Food advances its lines of research through the strategies and tools of nutritional genomics, in fields such as cancer, ageing, obesity and cardiometabolic diseases.

**IMDEA FOOD ORGANIZES ITS ACTIVITIES AROUND THREE STRATEGIC AXES:**

## science

Advancing scientific knowledge in the area of food and health, with a special focus on the prevention of chronic diseases.

## industry

Contributing towards the economic development and competitiveness of the food industry via the design and validation of nutritional strategies and food products of proven effectiveness in the prevention and treatment of chronic diseases.

## society

Contributing towards the reduction of healthcare costs and improving the wellbeing of the population through the study of the relationship between diet and health, the execution of communication programmes, and via the dissemination of nutrition advice.

**RESEARCH PROGRAMMES**

- Precision Nutrition and Aging
- Precision Nutrition and Cancer
- Precision Nutrition and Obesity
- Precision Nutrition and Cardiometabolic Health
- Childhood Precision Nutrition

**RESEARCH PLATFORMS**

- Platform for Clinical Trials in Nutrition and Health. GENYAL + P4H
- Innovation, Communication and Education Unit

# people

The core strength of the Institute is its international **research team, consisting of talented researchers from 12 different nationalities**, which carries out new scientific discoveries in Food Science, and foster the development of emerging technologies.

**93**
**researchers**
**57** Ph.D., **26** no Ph.D. y **10** technicians

**12**
**different nationalities**

**15**
**research groups**

**10**
**people in management**

# laboratory

**The facilities of IMDEA Food Institute**
The building and laboratories of IMDEA Food Institute are located at the Cantoblanco University Hospital, next to the Universidad Autónoma de Madrid campus, with which the Institute collaborates closely.

**4.595 $m^2$ area**
**2 symmetrical areas of 5 floors each**
**Maximum capacity of 100 researchers and has 6 research labs**

## human resources

**93** Researchers

**15** Research Groups

**39** Spanish Ph.D.

**16** Foreign Ph.D.

## scientific results

**228** Scientific Papers

**55** Invited Talks

**13** Scientific Papers about COVID-19

**18** Theses since 2008

**18** Ongoing Theses

science

## technology transfer

## projects and fellowships

**13** Contracts with Companies

**+2500** Clinical Nutrigenomic Volunteers Cohort

**18** National Projects

**2** Spin-Off-EBT

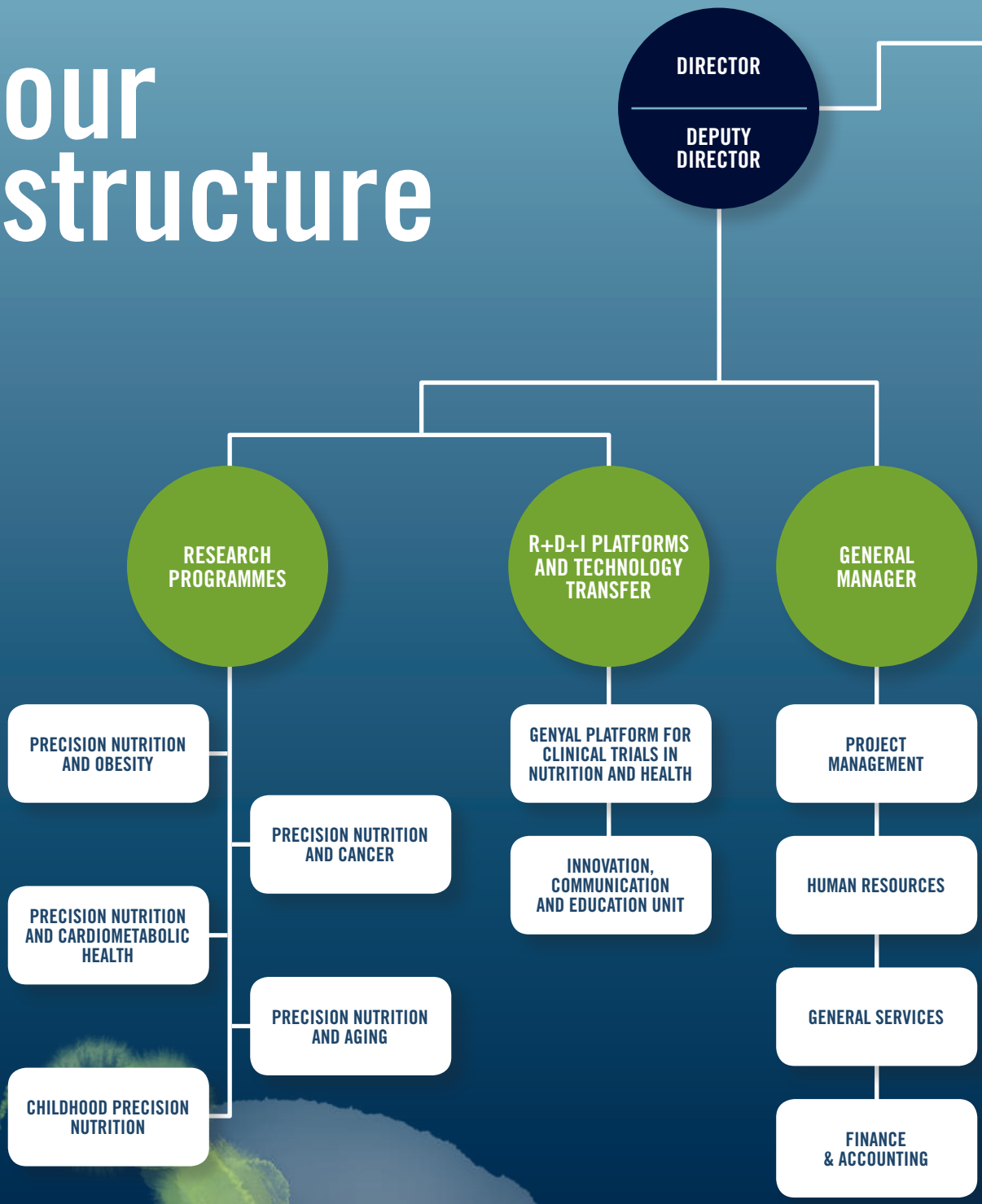
**35** Clinical Nutrigenomics Interventions

**39** R&D Grants

**18** R&D International Projects

ustry society

# our structure



## BOARD OF TRUSTEES

### CHAIRWOMAN / CHAIRMAN OF THE FOUNDATION

**D.ª Manuela Juárez Iglesias**
(Until December 4th)
Ad Honorem" Research Professor
CSIC. Spain

**D. Daniel Ramón Vidal**
(From December 4th)
Scientific Director and Chief Executive Officer BIÓPOLIS, S.L. Spain

### VICE CHAIRMAN OF THE FOUNDATION

**D. Eduardo Sicilia Cavanillas**
Counsellor of Science, Universities and Innovation. Madrid Regional Government. Spain

### REGIONAL ADMINISTRATION REPRESENTATIVES

**D.ª María Luisa Castaño Marín**
General Director of Research and Technological Innovation. Madrid Regional Government. Spain

**D.ª Sara Gómez Martín**
General Director of Universities and Higher Education. Madrid Regional Government. Spain

**D.ª Bárbara Fernández-Revuelta Fernández-Durán**
Deputy General Director of Research. Madrid Regional Government. Spain

**D. José de la Sota Ríus**
Scientific-Technical Coordinator. Madrimasd Foundation for Knowledge. Spain

### INSTITUTIONAL TRUSTEES

**D. Javier Ortega García**
Vice-Rector for Innovation, Transfer and Technology. Universidad Autónoma de Madrid. Spain

**D. Alberto Garrido Colmenero**
Vice-Rector for Quality and Efficiency. Polytechnic University of Madrid. Spain

**D.ª Mercedes Gómez Bautista**
Vice-Rector of Knowledge Transfer and Entrepreneurship. Universidad Complutense de Madrid. Spain

**D.ª María Isabel Medina Méndez**
Coordinator of the Food Science and Technology Area. CSIC. Spain

### SCIENTIFIC TRUSTEES

**D. Michael Heinrich**
Centre for Pharmacognosy and Phytotherapy University of London. UK

**D. Daniel Ramón Vidal**
Scientific Director and Chief Executive Officer. BIÓPOLIS, S.L. Spain

**D. Gregorio Varela Moreiras**
Professor of Nutrition and Health CEU San Pablo University. Spain

**D. Francisco A. Tomás Barberán (outstanding)**
Research Professor. CEBAS-CSIC. Spain

### EXPERT TRUSTEES

**D. Jorge Jordana Butticaz de Pozas**
Director of the Agrifood Area of the LAFER Foundation. Spain

**D. Juan G. Vargas Olmo**
Technical Director. ADAM FOODS, S.L.U. Spain

### COMPANY TRUSTEES

**DANONE, S.A. Spain**
D.ª Leonor Paloma Frial Suárez

**FRIAL TECHNOLOGIES SL. Spain**
D. Rafael Urrialde de Andrés
Health and Nutrition Director.
Coca-Cola Iberian Division. Spain

**NATAC BIOTECH S.L. Spain**
D. José Carlos Quintela Fernández
Scientific General Director

**ASEACAM-Asociación empresarial de Industrias Alimentarias de la Comunidad de Madrid**
Spain

### SECRETARY

**D. Alejandro Blázquez Lidoy**
Spain

## DELEGATE COMMISSION

### PRESIDENT

**Dª. María Luisa Castaño**

### SECRETARY

**D. Julián García Pareja**

### MEMBERS

**Dª. Bárbara Fernández-Revuelta Fernández-Durán**

**D. José de la Sota Ríus**

## SCIENTIFIC COUNCIL

### PRESIDENT

**Dra. Manuela Juárez Iglesias**
(Until December 4th)
Currently Research Professor of the CSIC "Ad Honorem"

**D. Daniel Ramón Vidal**
(From December 4th)
Scientific Director and Chief Executive Officer BIÓPOLIS, S.L. Spain

### MEMBERS

**Dr. Michael Heinrich**
Director of the Centre for Pharmacognosy and Phytotherapy. Full Professor UCL School of Pharmacy University of London. UK

**Dr. Carlos Fernández-Hernando**
Associate Professor at Yale University School of Medicine and University of New York. US

**D. Daniel Ramón Vidal**
BIOPOLIS, S.L.
Spain

**Dr. Francisco Pérez Jiménez**
Professor of Medicine at the University of Cordoba and Scientific Director of IMIBIC (Maimonides Institute of Biomedical Research of Cordoba). Spain

**Dr. Carlos López Otín**
Professor in the area of Biochemistry and Molecular Biology Department of Biochemistry at the University of Oviedo. Spain

**Dr. Rafael Urrialde de Andrés**
Health and Nutrition Director
Coca-Cola Iberian Division. Spain

**D. Gregorio Varela Moreiras**
Department of Pharmaceutical and Health Sciences
CEU San Pablo University. Spain

### MEMBER AND SECRETARY

**Dr. Francisco Tomás-Barberán**
Researcher Professor
CEBAS-CSIC. Spain

## ETHICS COMMITTEE

### PRESIDENT

**D. J. Alfredo Martínez Hernández**
Director of the Precision Nutrition and Cardiometabolic Health Programme and Group Leader of Cardiometabolic Nutrition Group.
IMDEA Food. Spain

### VICE-PRESIDENT

**D.ª Viviana Loria-Kohen**
Researcher / Senior Nutritionist and Group Leader of the Food and Clinical Trials Unit.
IMDEA Food. Spain

### SECRETARY

**D.ª Elena Aguilar Aguilar**
Researcher / Senior Nutritionist
IMDEA Food. Spain

### MEMBERS

**D. José Carlos Quintela Fernández**
Scientific General Director
Natac Biotech S.L. Spain

**D.ª Ana Ramírez de Molina.**
Director of the Precision Nutrition in Cancer Programme and Group Leader of the Molecular Oncology Group.
IMDEA Food. Spain

**D. Juan José Montoya Miñano**
PDI.
Faculty of Medicine of the Universidad Complutense de Madrid. Spain

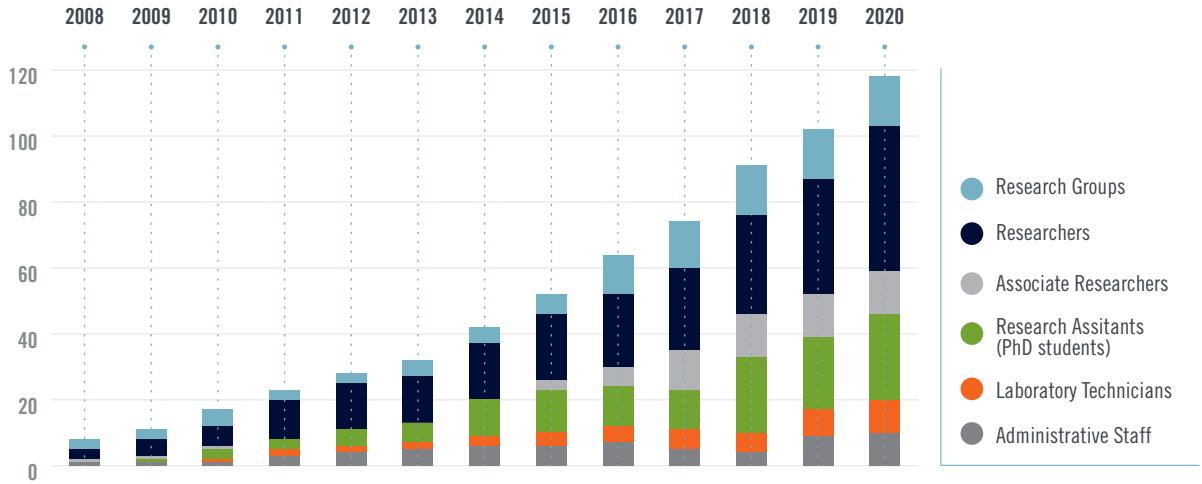
**D.ª María del Mar Ruperto López**
Associate Professor.
CEU San Pablo University and Alfonso X El Sabio University, Spain

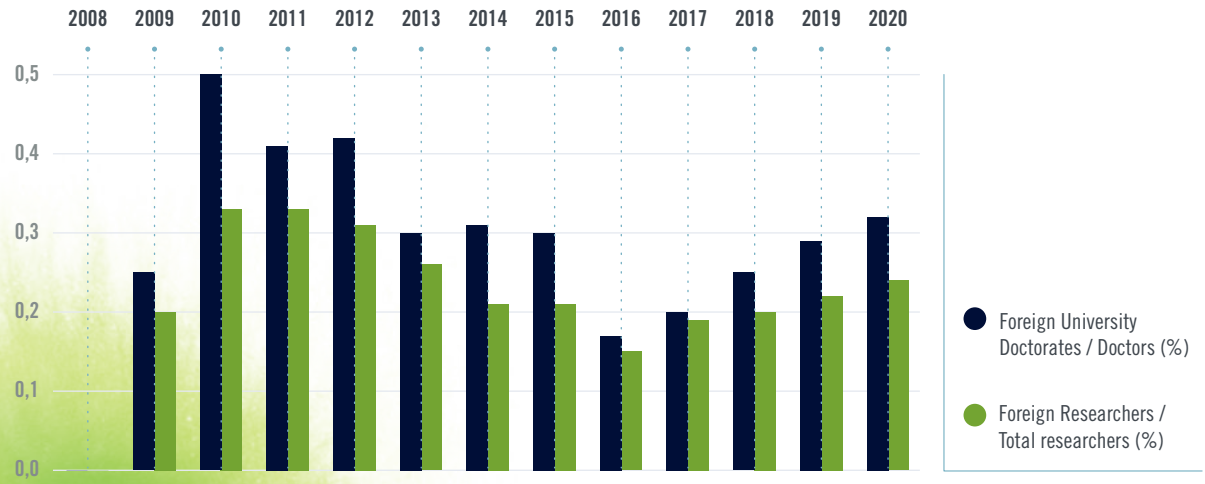
**D. José Mª Carrascosa Baeza**
Professor of Molecular Biology.
CBM "Severo Ochoa". Spain

**D.ª María Victoria Moreno-Arribas**
Scientific Researcher
CSIC-CIAL. Spain

# in figures

## human resources



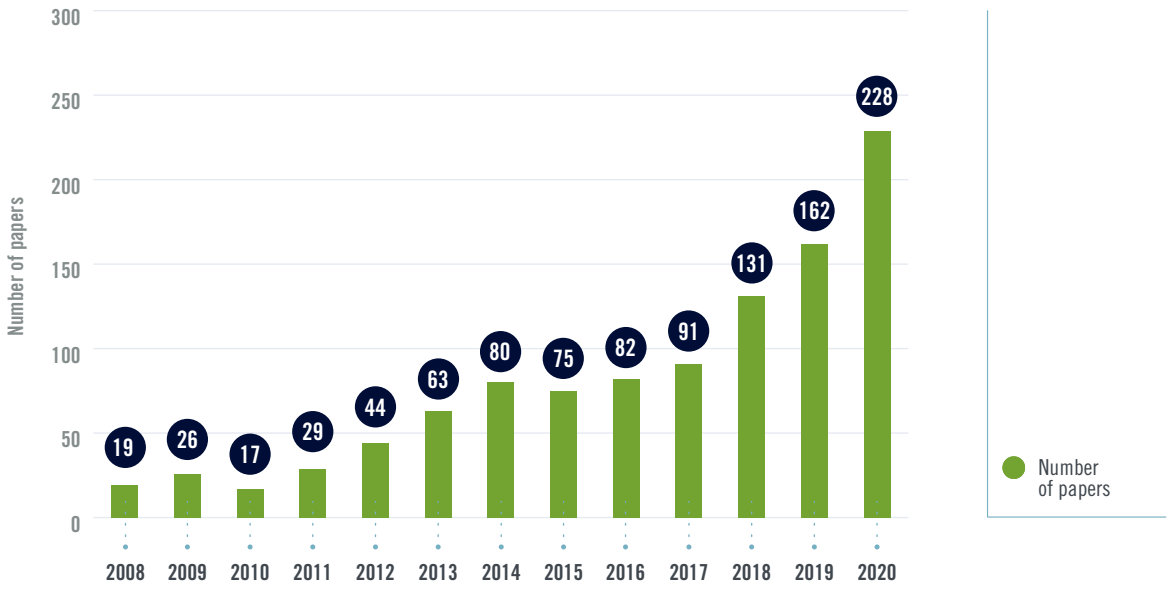




**Technology and knowledge transfer to society through talent transfer**

**18** Defended Ph.D. Theses since 2008

**18** On going Ph.D. Theses

# scientific results




**55** Keynote/ invited talks

# technology transfer

The Institute has a portfolio of five patents, four of which have been granted and two have been internationally licensed. Two patents have been also transferred to the company CANAAN through the granting of an exclusive license with the right to sublicense, develop, use and market the international patent PCT/ ES2017/070263 and the Spanish priority patent number P201131733. Two products derived from the invention P201830740 have been licensed to the company YNSADIET. Also, IMDEA Food, participates in two EBT (technology - based company) PRECISION FORHEALTH, S.L. (P4H) constituted in February 2018 and FORCHRONIC S.L. constituted in March 2019. Finally, the following shows the companies that have been collaborating with the centre during 2020, the agreements agreed with International Universities and Research Institutes, as well as the different scientific and technological international partnerships that IMDEA Alimentación has:

## International joint Ph.D. supervision agreements

EPFL
UAM Universidad Autónoma de Madrid
ETH zürich
CEU Universidad San Pablo
KU LEUVEN
UNIVERSITY OF WARSAW
UNIVERSITY OF HOHENHEIM
QUEEN'S UNIVERSITY BELFAST
UNIVERSIDAD DE MURCIA
University of Reading
TUM
UNIVERSITÀ DEGLI STUDI DI TORINO
TECHNION Israel Institute of Technology
UNIVERSITY OF CAMBRIDGE

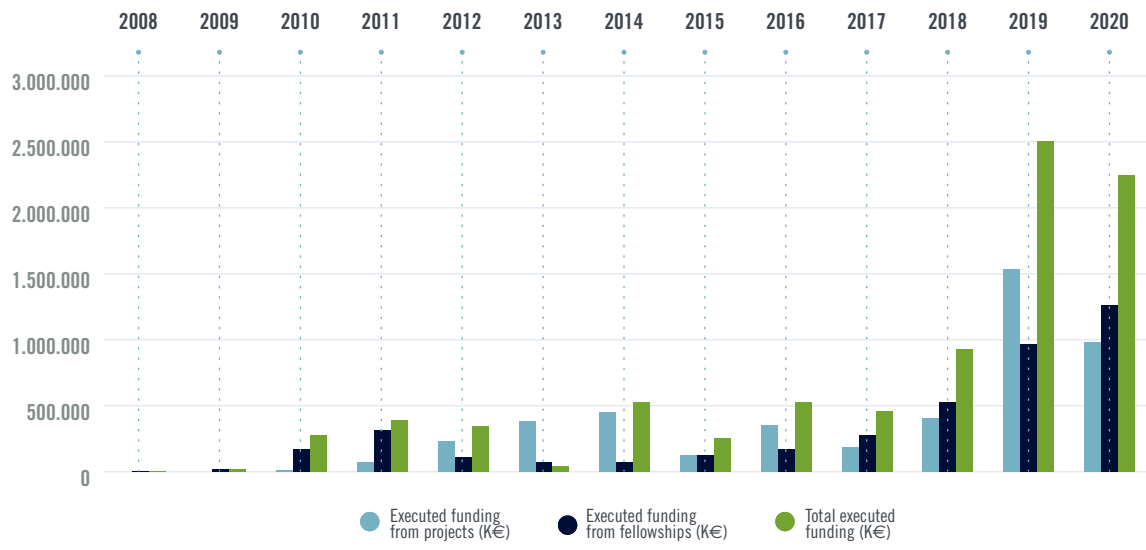
## Scientific/Technological international partnership

EPITRAN
Parc Sanitari Pere Virgili
CEBAS
FNS - Cloud
DANA-FARBER
Hospital Universitario Infanta Sofía
LifeTime
Hospital Universitario La Paz
CSIC
METABOLON
Hospital Universitario Ramón y Cajal
GILEAD
GBT
VTT
ILSI International Life Sciences Institute
CONACYT
TRANSBIONET
CREAS
eit Food
IMIBIC
cnio Centro Nacional de Investigaciones Oncológicas
MATIS BEAUTY EXPERT

## Companies which had active collaboration with IMDEA Food during 2020

P4H
AMC Innova
DÖHLER
4CHRONIC SCIENCE 2 HEALTH
gullón
Valio
LEITAT managing technologies
MASPEX
abp Food Group
Bio Sabor
Grupo AN
Waitrose
BGG
PEPSICO
JOHN DEERE

# projects and fellowships




**18** International projects

**18** National Projects

**3** Regional Projects

**13** Contracts with industry

**91** R&D

# social networks

**4.744** reached people

**5.648** views

**5.600** reached people

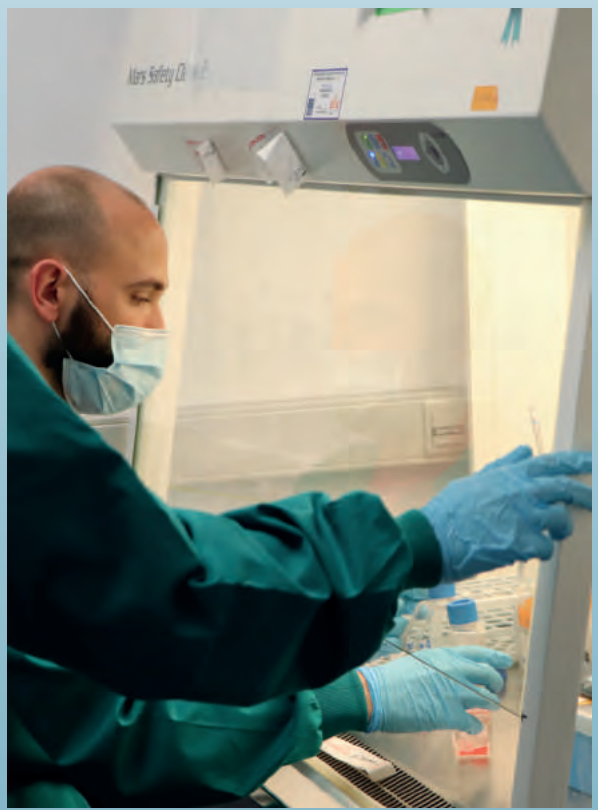
**+1.900** followers

# research

IMDEA Food focuses its scientific project on Precision Nutrition. The development of products and therapies for various chronic diseases is based on new scientific knowledge of the molecular mechanisms that give rise to different physiological processes. The identification of therapeutic targets that can be modulated by the nutrients is key for the food to reach the therapeutic character attributed to it in the current scientific context. IMDEA Food traces its lines of research through the strategies and tools of nutritional genomics, in fields such as cancer, ageing, obesity and cardiometabolic diseases.

The Institute's organizational structure is based on five thematic research programmes with the common denominator of precision nutrition. Each of the Programmes are divided into Groups, whose leaders are senior researchers. This structure is completed with three Technology and Technology Transfer Platforms.

The scientific staff is distributed in the five Research Programmes led by a principal researcher and focused on lines of strategic interest within the field of Nutrition, Food and Health. All of them carry out applied scientific research, fundraising for projects, scientific publications and transfer of results.

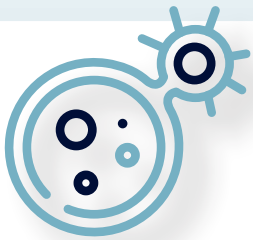


# research programmes

## Precision Nutrition and Aging Programme

### Dr. Manuel Serrano

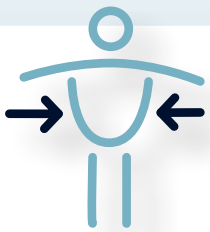
- Metabolic Syndrome Research Group
  **Dr. Pablo Fernández**
- Nutritional Interventions Research Group
  **Dr. Rafael de Cabo**
- Hepatic Regenerative Medicine Research Group
  **Dr. Manuel Fernández Rojo**
- Posttranscriptional regulation of metabolic diseases Research Group
  **Dr. Cristina Ramírez**



## Precision Nutrition and Cancer Programme

### Dr. Ana Ramírez de Molina

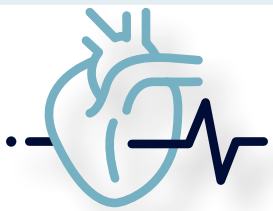
- Molecular Oncology Research Group
  **Dr. Ana Ramírez de Molina**
- Clinical Oncology Research Group
  **Dr. Enrique Casado and Dr. Jaime Feliú**
- Molecular Immunonutrition Research Group
  **Dr. Moisés LaParra**
- Computational Biology Research Group
  **Dr. Enrique Carrillo**



## Precision Nutrition and Obesity Programme

**Dr. Jose María Ordovás**

- Nutritional Genomics and Epigenomics Research Group
  **Dr. Jose María Ordovás**
- Cardiovascular Nutritional Epidemiology Research Group
  **Dr. Fernando Rodríguez Artalejo**
- Nutritional Control of the Epigenome Research Group
  **Dr. Lidia Daimiel**



## Precision Nutrition and Cardiometabolic Health Programme

**Dr. Alfredo Martínez**

- Cardiometabolic Nutrition Research Group
  **Dr. Alfredo Martínez**
- Bioactive Ingredients Food Research Group
  **Dr. Francesco Visioli**
- Epigenetics of Lipid Metabolism Research Group
  **Dr. Alberto Dávalos**

## Childhood Precision Nutrition Programme

**Dr. Jesús Argente / Dr. Julie Chowen**

- Childhood Obesity Research Group
  **Dr. Jesús Argente and Dr. Julie Chowen**

# research platforms

## Innovation, Communication and Education Unit

**Dr. Guillermo Reglero**

- Innovation & Business Creation
  **Dr. Ana Ramírez de Molina**
- Education
  **Dr. María Jesús Latasa**
- Communication
  **Sara Castillo**

## Platform for Clinical Trials in Nutrition and Health. GENYAL

**Dr. Ana Ramírez de Molina**

- Nutrition and Clinical Trials Unit
  **Dr. Viviana Loria**
- Nutritional Genomics and Health
  **Dr. Maria Isabel Espinosa**
- Biostatistics and Bioinformatics Unit
  **Dr. Gonzalo Colmenarejo**
- GENYAL Lab
  **Dr. Susana Molina**

# facilities

IMDEA Food headquarters are located in the old main building of the Cantoblanco Hospital since beginning of 2014. The building, ceded to the Institute by Regional Government of Madrid, is an excellent space in which to undertake scientific research.

It is located next to the Cantoblanco Campus of the Autonomous University of Madrid with which the Institute has strong cooperative ties within the grounds of the Cantoblanco University Hospital.

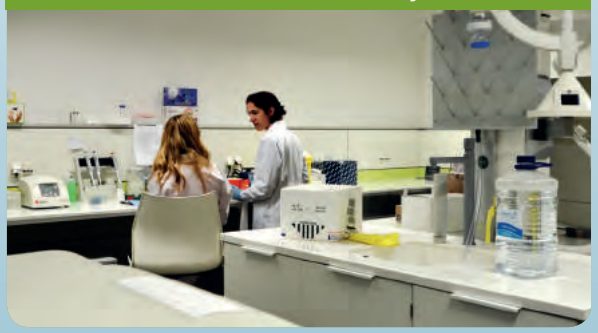
The building occupies an area of 4.595 $m^2$ and is divided into two symmetrical main sections of five stories each that can house up to 100 researchers. It is equipped

## Laboratory 1. Cell Culture Laboratory (Biosafety Level 2)

This Biosafety Level 2 laboratory allows research to be undertaken on a wide range of moderate risk agents. It is routinely used in experimentation on, and the maintenance of, cell cultures.

It is equipped with incubators for maintaining cells under optimum growth conditions, laminar flow cabinets for working in sterile conditions, plus all the basic equipment needed for work on cell cultures, such as microscopes, water baths, centrifuges and cell counters. It also has a fluorescence microscope and a nucleoflector system, which are required in certain experiments. It has the latest equipment for analysis of metabolic activity (SeaHorse) apparatus, along with a fluorescence microscope and a nucleofector, a pressure reducer, an apparatus with micro-electric biosensors for cellular assays with real-time results and an analyzer with Luminex technology.

## Laboratory 2. Genomics Laboratory



The Genomics Laboratory contains equipment required for genetic, genomic, transcriptomic and epigenetic analyses, etc. It is fitted with all the basic equipment required, such as thermocyclers for performing conventional PCR work, an ABI PRISM HT 7900 apparatus for real-time PCR, plus equipment for gene expression and high-performance genotyping analysis, such as the la- test generation QuantStudioTM apparatus. The versatility of these systems allows analyses to be performed in different formats depending on the number of samples to be tested, from the use of 96-well plates through to chips capable of performing. 3.072 genotyping reactions. These devices have different applications, such as digital PCR, DNA fragment analysis, expression/ gene quantification analysis, allele discrimination using TaqMan probes, and the detection of SNPs and mutations, etc.

The laboratory has a designated clean area for processing and extracting nucleic acids from samples originating from clinical trials.

with laboratories of molecular and cellular biology P2, genomics and instrumental analysis, as well as facilities for clinical trials in humans.

The project for completing the Institute's Insfraestructures in the west wing of the building includes the construction of new research areas (including new laboratories and experimental animal facilities) provided with advanced technical and scientific equipment.

Currently the building is equipped with research laboratories, all of which are fitted with advanced scienti–fic-technical hardware.

## Laboratory 3. Biochemical Instrumental Techniques Laboratory

This multifunctional laboratory is fitted with a range of small apparatuses for the preparation of reagents and solutions, plus more specific equipment for use in biochemical and molecular biological investigations, such as plate readers, a luminometer, a NanoDrop 2000 spectro- pho-tometer, a SpeedVac sample concentrator, and an HPLC apparatus.

It is divided into different areas where different techniques, such as Western blotting and agarose gel separations, and microbiological techniques for the cultivation and handling of bacteria, can be followed.

## Laboratory 4. General Biochemistry and Molecular Biology Laboratory


This is where the different research Groups undertake their normal laboratory work. Each Group has its own space equipped with benches and all the reagents and materials required for its re-search line. Predoctoral students and those undertaking laboratory experience also work in these areas. Fume cupboards are available for handling volatile compounds, there are cupboards for the storage of flammable products and acids etc., and freezers for preserving samples and reagents.

The IMDEA Food installations also have a cold room, a freezing room, a dark room, a cooling and ultrafreezing room, and a cryopreservation tank.

programme

# Precision Nutrition and Aging

## Goal and vision

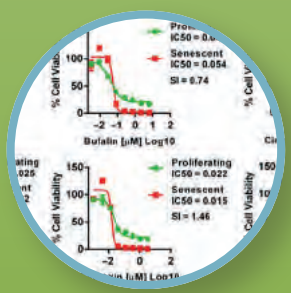
The Precision Nutrition and Aging Program at IMDEA Food focuses on the multifaceted connections between nutrition and the aging process. Our program takes advantage of multiple models of age-related metabolic diseases, including cardiovascular disease, non-alcoholic fatty liver disease, obesity, neurodegenerative diseases, hepatic regeneration or diabetes. We are also studying how different nutritional interventions slow down the aging process and delay age-related diseases, such as calorie restriction, intermittent fasting or different fasting-mimicking bioactive products. Finally, our research is focused on the molecular mechanisms that regulate metabolic pathologies and aging-delaying interventions, ranging from mitochondrial function, miRNA expression, insulin signaling, senescence or exosome production and function. Together, we cover a wide range of molecular approaches to fight aging through nutrition.

Programme Director

**Dr. Manuel Serrano**
Director of the Precision Nutrition and Aging Programme and Chair of the Ageing & Metabolism Programme, Institute for Research in Biomedicine (IRB)

Ph.D. in Biochemistry and Molecular Biology. His work is focused in Ageing, metabolism, cellular senescence, cellular reprogramming, fibrotic diseases, cancer.

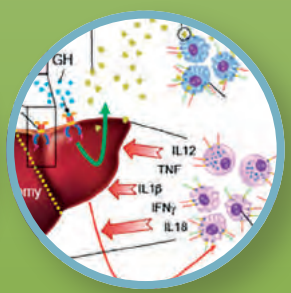
# Research groups




## Metabolic Syndrome

Group Leader

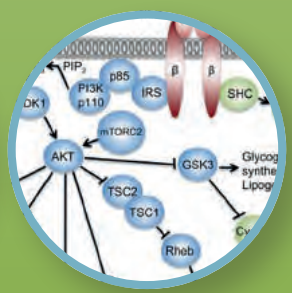
**Dr. Pablo J. Fernández**




## Hepatic Regenerative Medicine Laboratory

Group Leader

**Dr. Manuel Fernández**




## Posttranscriptional Regulation Of Metabolic Diseases

Group Leader

**Dra. Cristina Ramírez**


## Nutritional Interventions

Group Leader

**Dr. Rafael de Cabo**

# research group

# Metabolic Syndrome

## GROUP LEADER

**Dr. Pablo J. Fernández**
Metabolic Syndrome Group Leader

Ph.D. in Molecular Biology. His work is focused in Nutritional interventions that delay aging, more precisely on intermittent fasting (IF). IF elicits unique metabolic responses affecting insulin, PI3K and mTOR signaling, mitochondrial function, autophagy, senescence and redox homeostasis. In my group, we search for compounds that mimic fasting by eliciting these molecular mechanisms and study their mechanisms of action. We also investigate on the potential applications of intermittent fasting or fasting mimicking strategies, as the enhancement of chemotherapy in cancer patients or the prevention or treatment of obesity, diabetes or cardiovascular diseases.

## Objetives

- Molecular and physiological mechanisms of intermittent fasting in mice and humans.
- Fasting-mimicking bioactive compounds against age-related diseases: PI3K-inhibitors, mitohormetics, senolytics, NAD+ and NADPH boosters.
- Short-term fasting during chemotherapy administration: reduction of toxicity and enhancement of the anti-tumor immune response.
- Sirtuins in cancer: roles of Sirt3 and Sirt1 in liver and lung carcinogenesis.

## Projects in Focus

**Sirtuins as biomarkers and targets in cancer: Sirt1 and Sirt3 in lung and liver carcinogenesis – SIRTBIO**
**Funding:** Asociación Española Contra el Cáncer - AECC
**Project Period:** 2018 - 2021
**Principal Investigator at IMDEA Food:** Dr.Pablo J. Fernandez-Marcos.

**Ramón y Cajal Program. RYC-2017-22335**
**Funding:** Spanish Ministry of Science, Innovation and Universities.
**Project Period:** 2018 - 2022
**Principal Investigator at IMDEA Food:** Dr.Pablo J. Fernandez-Marcos.

**Characterization of the molecular mechanisms of short-term fasting as an enhancer of chemotherapy. SAF2017-85766-R**
**Funding:** Spanish Ministry of Economy, Industry and Competitiveness.
**Project Period:** 2018 - 2021
**Principal Investigator at IMDEA Food:** Dr.Pablo J. Fernandez-Marcos

**Marie Curie Horizon 2020 Framework Programme, 832741**
**Funding:** European Commission
**Project Period:** 2019 - 2021
**Principal Investigator at IMDEA Food:** Dr. Ildefonso Rodriguez Ramiro and Dr. Pablo J. Fernandez-Marcos.

## Researchers

**Dr. Marta Barradas Solas**
Postdoctoral Researcher
Ph.D. in Chemistry

**Dr. Cristina Pantoja Castro**
Postdoctoral Researcher
Ph.D. in Biochemistry

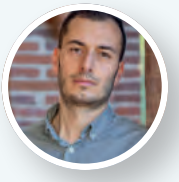
**Dr. Adrián Plaza**
Postdoctoral Researcher
Ph.D. in Pharmacy

**Arantzazu Sierra Ramírez**
Ph.D. student
BSc in Biology

**Andrés Pastor Fernández**
Ph.D. student
BSc in Biotechnology

**Jose Luis López**
Technician

## Head of Research Line



**Dr. Ildefonso Rodríguez-Ramiro**
Senior researcher IF-MSCA Fellow and Head of Research Line on the Gut-Liver Axis Metabolism

Ph.D. in Molecular Biology. His work is focused on the molecular mechanisms underlying the impact of bioactive compounds on the prevention of metabolic diseases in the gut-liver axis.

### Objectives

- Discovery of Bioactive Compounds targeting metabolic syndrome.
- Characterization of novel metabolic pathways to treat non-alcoholic fatty liver disease (NAFLD).
- Dissecting the role of the gut on NAFLD progression.

### Projects in Focus

**Marie Curie Horizon 2020 Framework Programme, 832741**
**Funding:** European Commission
**Project Period:** 2019 - 2021
**Principal Investigator at IMDEA Food:** Dr. Ildefonso Rodriguez Ramiro and Dr. Pablo J. Fernandez-Marcos.

research group

# Hepatic Regenerative Medicine Laboratory

## GROUP LEADER

**Dr. Manuel A. Fernández-Rojo**
Head of the Hepatic Regenerative Medicine Laboratory

Ph.D. in Biology. His work is focused in Application of regenerative medicine against chronic liver diseases and cancer, metabolic disorders and aging-related diseases.

## Objetives

- Development of novel strategies to promote the regeneration of damaged liver linked to chronic liver diseases, metabolic disorders and infection.
- Restoring the regenerative capacity of the aged liver.
- Molecular mechanisms driving the inhibition of liver cancer.
- Characterizing signaling axis regulating mitochondrial function in health and disease.

## Projects in Focus

**Consequence of inflammation, elevated tissue-derived ferritin (from damaged liver cells) plays a role in mediating processes associated with hepatic injury by acting as a damage-associated molecular pattern (DAMP), via the inflammasome in HSCs**
**Funding:** NHMRC Grant
**Project Period:** 2018-2020
**Associated Investigator:** Dr. Manuel A. Fernández-Rojo

**HLA-G/H2BI is Critical for Regulating Inflammation in the Liver**
**Funding:** NHMRC Grant
**Project Period:** 2018-2020
**Co-Principal Investigator:** Dr. Manuel A. Fernández-Rojo

**Diet modifications to improve liver regeneration and reduce liver cancer**
**Funding:** Talento Project Grant, Community of Madrid
**Project Period:** 2017-2021
**Principal Investigator at IMDEA Food:** Dr. Manuel A. Fernández-Rojo

# Researchers

**Dr. Luis Herrera**
Postdoctoral Researcher
Ph.D. in Biochemistry and Molecular Biology

**Dr. Maite Martínez Uña**
Postdoctoral Researcher
Ph.D. in Molecular Biology and Biomedicine

**Yaiza López Mancheño**
Predoctoral researcher

# Head of Research Line

**Dra. María Ikonomopoulou**
Senior researcher and Head of Research Line in Translational Venomics

Ph.D. in Biomedical Sciences. Our work is focused on the biodiscovery, pharmacological characterisation, and optimisation of animal venom compounds for their therapeutic potentials and applications as anticancer, senolytic) and anti-aging drug candidates. We utilise interdisciplinary approaches, including molecular, cell biology, state-of-the-art venomics, animal models of chronic diseases, cancer, and metabolic disorders as well as medicinal chemistry. Our goal is to apply our candidates into clinic and attract the Biopharma industry for their commercialization applications.

## Personnel

**Dr. Javier Moral Sanz**
Postdoctoral researcher

**Rachael Ryan**
Ph.D. student, co-supervision

**Sabela Fernández-Vila**
Ph.D. student, co-supervision

## Objectives

- Identification, characterisation & optimisation of novel venom-derived compounds targeting metastatic melanoma of BRAF mutation.
- Exploration of the senolytic properties of venom-compounds for improving aging and aging-related diseases.
- Applications of animal venoms in immunotherapy.

## Projects in Focus

**Programme: PEJ-2020-AI/BIO-17904**
**Period:** 2021-2023
**Funding Institution:** General Department of Research and Innovation. Madrid Regional Government

**Programme: 2018-T1/BIO-11262**
**Period:** 2019-2023
**Funding:** Talento mod. 1 Project Grant, Madrid Regional Government

## research group

# Posttranscriptional Regulation of Metabolic Diseases

### GROUP LEADER

**Dra. Cristina Ramírez**
Posttranscriptional Regulation of Metabolic Diseases Group Leader

Ph.D. in Molecular Biology and Cellular. Her work is focused in Molecular Basis of the Regulation of Aging related-metabolic diseases by microRNAs and RNA binding proteins: Non-coding RNAs and RNA Binding Proteins in Aging; Posttranscriptional Regulators as molecular link between Diabetes, Obesity and Alzheimer's Disease. Targets of Insulin Resistance, Mitochondrial dysfunction and Autophagy; Role of non-coding RNAs and RNA Binding Proteins in the regulation of glucose homeostasis and their implication in Diabetes, Metabolic Syndrome and Obesity. Potential effect of Aging on endothelial dysfunction and Atherosclerosis: Role of Caveolin-1.

## Objetives

- Posttranscriptional Regulators as molecular links between diabetes, obesity and Alzheimer's disease. Targets of insulin resistance, mitochondrial dysfunction, autophagy.
- Role of non-coding RNAs and RNA binding proteins in the regulation of glucose homeostasis and their implication in diabetes, metabolic syndrome and obesity.
- Non-coding RNAs and RNA binding proteins in aging.
- Potential effect of aging on endothelial dysfunction and atherosclerosis. Role of Caveolin-1.

## Projects in Focus

**New posttranscriptional regulators as a molecular link between Diabetes, Obesity and Alzheimer's**
**Funding:** Spanish Ministry of Science, Innovation and Universities.
**Project Period:** 2018-2020
**Principal Investigator at IMDEA Food:** Dr. Cristina Ramírez

# Researchers

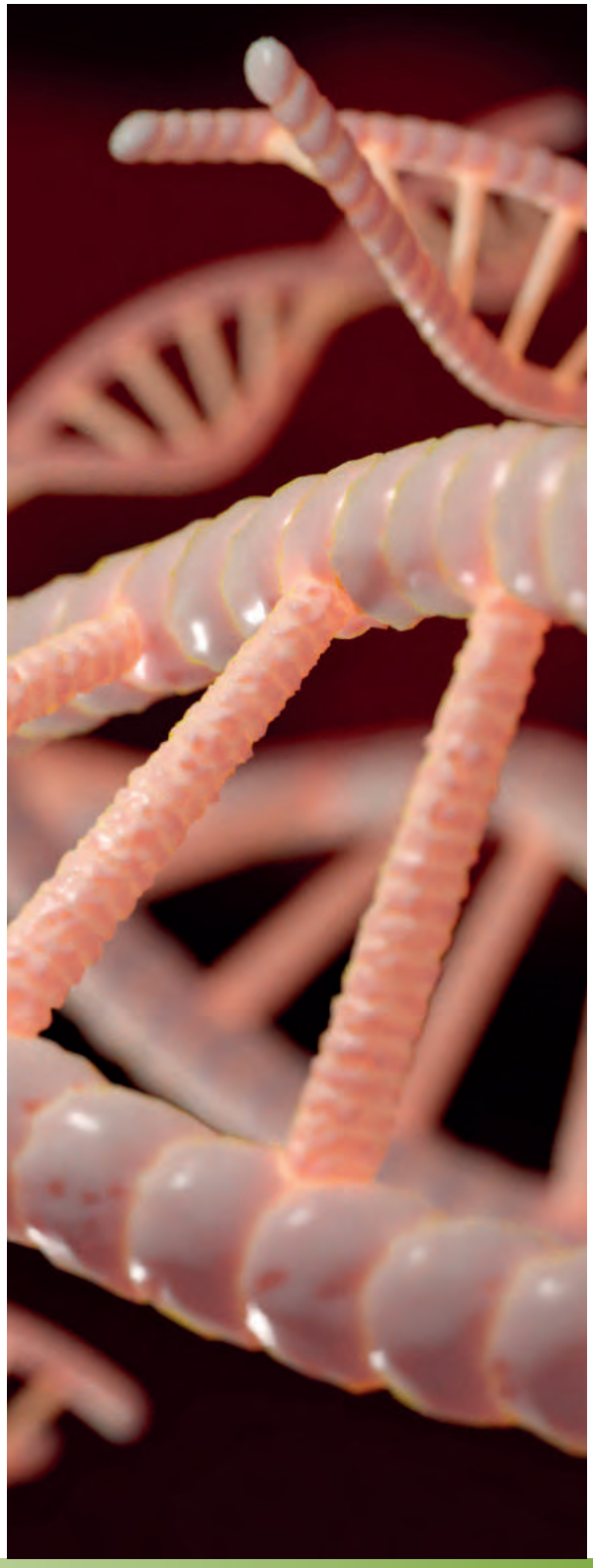
**Yolanda Martín Martín**
Predoctoral researcher

**Dr. Virginia Pardo Marqués**
Posdoctoral Researcher
Ph.D. in Biology

**Mario Fernández de Frutos**
Predoctoral researcher

**Dr. Ana Pérez García**
Postdoctoral researcher
Ph.D in Biomedicine

**Marta Torrecilla**
Predoctoral researcher



## research group

# Nutritional Interventions

### GROUP LEADER

**Dr. Rafael de Cabo**
Nutritional Intervention Group Leader.

Ph.D. in Nutrition. His work is focused in Interventions for Healthy Aging Based on Manipulations of Energy Intake. Nutritional Strategies to Maintain Redox Homeostasis.

## Objetives

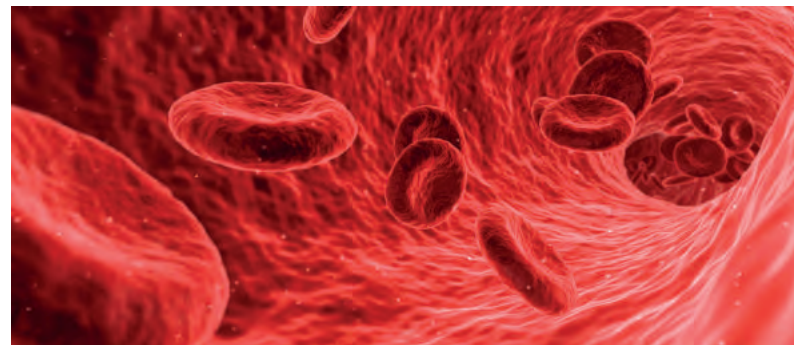
- Development of Viable Interventions to preserve function until late in life
- Study of Daily Eating Patterns to modulate energy demand and cellular energetic metabolism.
- Characterization of circulating factors in the aging process

## Publications

*A Central Role for the Gasotransmitter H2S in Aging.* de Cabo R, Diaz-Ruiz A. **Cell Metab.** 2020 Jan 7;31(1):10-12. doi: 10.1016/j.cmet.2019.11.015. Epub 2019 Dec 5. PMID: 31951564 Free article.

*Energy Restriction and Colorectal Cancer: A Call for Additional Research.* Castejón M, Plaza A, Martinez-Romero J, Fernandez-Marcos PJ, de Cabo R, Diaz-Ruiz A**. Nutrients.** 2020 Jan 1;12(1):114. doi: 10.3390/nu12010114. PMID: 31906264 Free PMC article. Review.

*NQO1 protects obese mice through improvements in glucose and lipid metabolism.* Di Francesco A, Choi Y, Bernier M, Zhang Y, Diaz-Ruiz A, Aon MA, Kalafut K, Ehrlich MR, Murt K, Ali A, Pearson KJ, Levan S, Preston JD, Martin-Montalvo A, Martindale JL, Abdelmohsen K, Michel CR, Willmes DM, Henke C, Navas P, Villalba JM, Siegel D, Gorospe M, Fritz K, Biswal S, Ross D, de Cabo R. **NPJ Aging Mech Dis.** 2020 Nov 19;6(1):13. doi: 10.1038/s41514-020-00051-6. PMID: 33298924 Free PMC article.



# Researchers

**María Castejón**
Predoctoral Researcher

**Lorena Blanco**
Lab technician

## Head of Research Line

**Dr. Alberto Díaz-Ruiz**
Senior Researcher and Head of Research Line in Aging and Longevity

Ph.D. in Sciences. His work is focused on D.V.M. and PhD. in Science. I am a M. Sc. Veterinary Medicine specialized in the fields of metabolism, obesity, and aging. I integrate whole-body physiological approaches with omics to characterize age-driven changes in physical, behavioral, and metabolic performances. My research focuses on the effects of nutritional interventions and fasting-mediated strategies on lifespan and healthspan in mice and humans. I am devoted to study the impact of fine-tuning our daily eating patterns to our energetic demands for the enhancement of health and longevity.

### Objectives

- Microbiome-based approaches to promote healthy aging.
- Anti-aging interventions in obesity context.
- Inter-tissue identification of molecular signatures of aging.

### Personnel

**Maria Castejón**
PhD Student. Co-supervision
PEJD-2019-PRE/BMD-17041

**Lorena Blanco**
Lab technician
PEJ-2019-TL/BMD-15706

### Projects in Focus

**From Aging Biology to Sustainable Interventions: a microbiome-based approach. PID2019-106893RA-I00**
**Principal Investigator:** Alberto Diaz-Ruiz.
**Project period:** 2020-2024.
**Awarding Institution:** Spanish Ministry of Science, Innovation and Universities.

**Estrategias alternativas para extender la longevidad y mejorar la calidad de vida: ciclos de ayuno 4:10. 2018 T1/BMD11966**
**Principal Investigator:** Alberto Diaz-Ruiz.
**Project period:** 2019-2022.
**Awarding Institution:** TALENTO" Project Grant, Comunidad de Madrid.

**From Aging Biology to Sustainable Interventions: a microbiome-based approach. PID2019-106893RA-I00**
**Principal Investigator:** Alberto Diaz-Ruiz.
**Project period:** 2020-2024.
**Awarding Institution:** Spanish Ministry of Science, Innovation and Universities.

**Unraveling the role of several plant extracts as potential treatment against obesity, type 2 diabetes and aging**
**Principal Investigator:** Alberto Díaz-Ruiz.
**Project period:** 2019-2021.
**Funding Company:** Sponsored Research Agreement with private company (Biosabor, Almería, Spain)

**Impact of extracelular matrix remodeling in adipocyte plasticity in human obesity**
**Principal Investigator at IMDEA Food:** Alberto Díaz-Ruiz.
**Project period:** 2019 Finish: 2021.
**Awarding Institution:** Junta de Andalucía

# Scientific highlights

This year, the Precision Nutrition and Aging Programme has made important discoveries. It has identified a novel target to treat atherosclerosis (Zhang et al., 2020). In particular, we have discovered that autophagy protects from the formation of atheromas induced by hypercaloric diets and hypercholesterolemia. Autophagy is a key cellular process involved in the degradation of intracellular waste products. Moreover, we have identified a particular protein target, Cav1, whose inhibition promotes autophagy and protection from atherosclerosis (Figure 1). Pharmacologic targeting of Cav1 could be important to prevent or delay atherosclerosis.

## Reference

Zhang, X., Ramírez, C.M., Aryal, B., Madrigal-Matute, J., Liu, X., Diaz, A., Torrecilla-Parra, M., Suárez, Y., Cuervo, A.M., Sessa, W.C., et al. (2020). Cav-1 (Caveolin-1) Deficiency Increases Autophagy in the Endothelium and Attenuates Vascular Inflammation and Atherosclerosis. Arterioscler. Thromb. Vasc. Biol. 40, 1510–1522.

Another important discovery of the Programme concerns role of cellular senescence in obesity. A new group of bioactive products, termed senolytics, is showing promise against several human diseases. Senolytics selectively kill senescent cells that accumulate in the body with aging and stresses such as chronic obesity. We have found that two senolytic agents, navitoclax and dasatinib/quercetin,

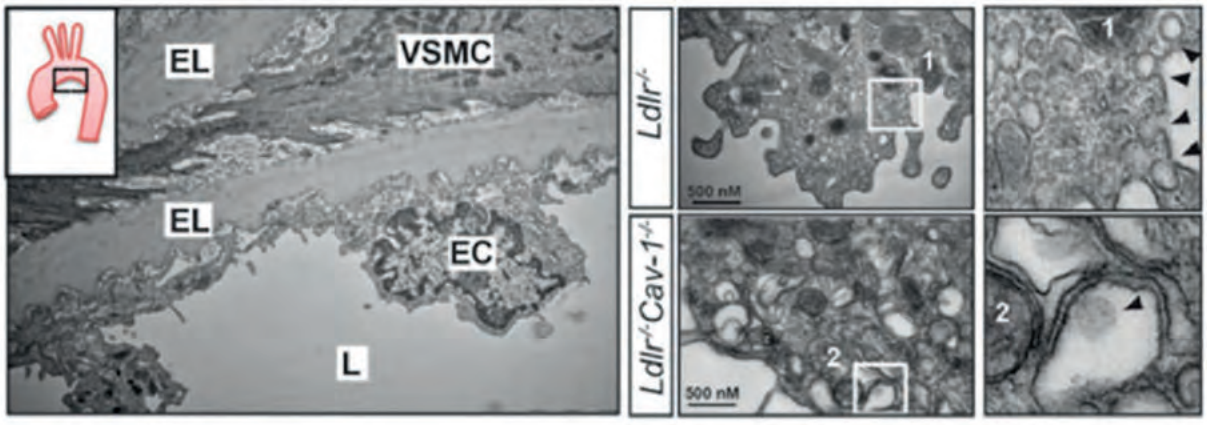



***Figure 1.- Lack of Cav-1 (caveolin-1) in endothelial cells (ECs) promotes autophagy in vivo.*** *A, Representative electron microscopy (EM) image of the lesser curvature of Ldlr–/– mice (left). Right, representative EM images of aortic ECs from the lesser curvature of Ldlr–/– and Ldlr–/–Cav-1–/– mice. EL indicates elastic lamina; L, lumen; and VSMC, vascular smooth muscle cell.*

reduce senescence in the white adipose tissue (Figure 2). Obese mice treated with these senolytics showed improved glucose tolerance, insulin sensitivity and reduced inflammation (Sierra-Ramirez et al., 2020). These results open the path for future tests with senolytics in human patients.

## Reference

Sierra-Ramirez, A., López-Aceituno, J.L., Costa-Machado, L.F., Plaza, A., Barradas, M., and Fernandez-Marcos, P.J. (2020). Transient metabolic improvement in obese mice treated with navitoclax or dasatinib/quercetin. Aging (Albany. NY). 12.

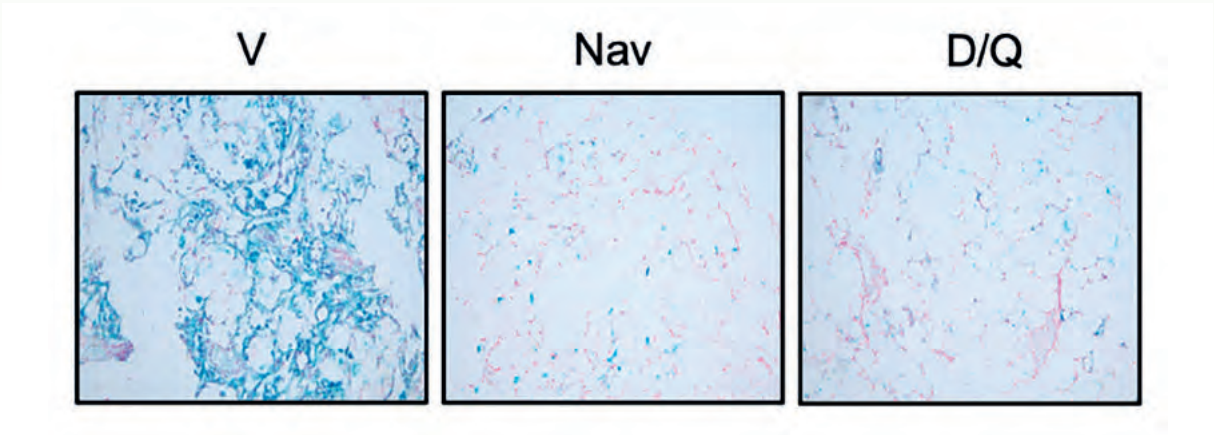



***Figure 2. Treatment of diabetic mice with senolytics reduces senescence and improves glucose metabolism.*** *The pictures show the white adipose tissue of obese, diabetic mice treated with vehicle (V), navitoclax (Nav) or dasatinib+quercetin (D/Q), stained for the senescence-associated beta-galactosidase activity (SA-βGal, colored in blue). Reduction of this marker was strongly associated to improved glucose tolerance, insulin sensitivity and reduced inflammation.*

# programme

# Precision Nutrition and Cancer

## Goal and vision

The programme of Precision Nutrition and Cancer aims to better understand the interplay of nutrients, metabolism, immunity, and cancer, providing the scientific bases to develop precision nutritional strategies with therapeutic effects on cancer patients.

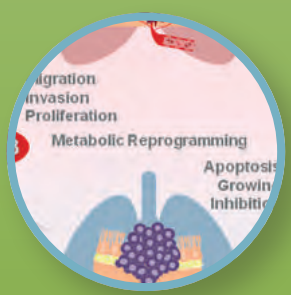
In the era of Personalized Medicine and taking into account the strong relationship between nutrition and cancer, precision nutrition has to be part of the integral management of cancer patients. Essential events in cancer development and progression such as genetics, metabolism and immunity are strongly influenced by environmental factors, affecting signalling pathways controlling cell function and treatment response. In this programme, we combine molecular and cellular oncology techniques, computational biology approaches and clinical trials to further understand how metabolism and immunity are affected by genetic and life-style factors, aiming to develop therapeutic interventions and precision nutritional products focused on improving the response to treatments and quality of life of cancer patients.

Programme Director

**Dr. Ana Ramírez de Molina**
Deputy Director of IMDEA Food. Director of the Precision Nutrition and Cancer Programme

Ph.D. in Molecular Biology. Her work is focused in Tumor cells reprogram the metabolism to obtain the energy and structural components needed to proliferate and invade other tissues. It has also been shown that there is an important metabolic regulation of the immune response, essential in the development and progression of tumors. Our main interest is to understand these processes in order to develop strategies that, through the regulation of metabolism and the enhancement of innate immunity, have a therapeutic effect on cancer. We carry out multidisciplinary research focused on: exploring metabolic reprogramming as a biomarker and therapeutic target in cancer; the study of the relationship between lifestyle factors (nutrition, physical activity), genetics (individual susceptibility), the consequent global metabolic state (healthy/unhealthy), its relationship with chronic inflammation and the immune response, and the development, progression, and response to treatment of patients with cancer.

# Research groups




## Molecular Oncology Research Group

Group Leader

**Dr. Ana Ramírez de Molina**

## Clinical Oncology Research Group

Group Leader

**Dr. Enrique Casado**
**Dr. Jaime Feliú**

## Molecular Immunonutrition Research Group

Group Leader

**Dr. Moisés Laparra**


## Computational Biology Research Group

Group Leader

**Dr. Enrique Carrillo de Santa Pau**

# research group

# Molecular Oncology

## GROUP LEADER

**Dr. Ana Ramírez de Molina**
Deputy Director of IMDEA Food. Director of the Precision Nutrition and Cancer Programme
Ph.D. in Molecular Biology

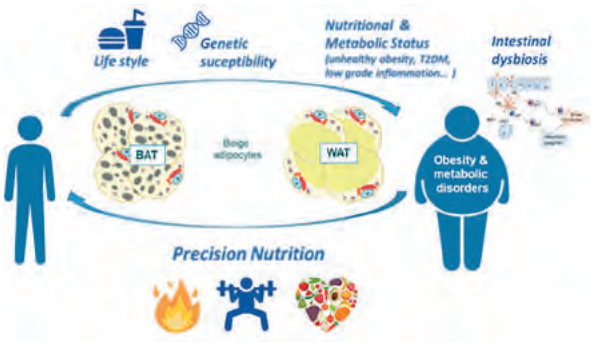
## Objetives

The group is currently focused on three research topics:

1. **Lipid metabolism alterations in cancer:** identification of new biomarkers and therapeutic targets in diet-related tumors such as colon or pancreatic cancer. We are especially interested in identifying metabolic profiles associated to the disease progression together with treatment response and analysing their role from in-vitro cell systems to organoids and cancer patients. These analyses are mainly focused on the identification of metabolic pathways and distinctive oncometabolites that may constitute novel markers and targets for the development of future cancer precision therapies. Besides, alterations of lipid metabolism at the local level and at the systemic level promote the development of a low degree of chronic inflammation and immune system dysfunction, with strong impact in patient clinical prognosis.

2. Metabolic reprogramming analysis in cancer and its relationship with other associated diseases such as obesity, diabetes and metabolic syndrome. We are especially interested in the relationship between genetics, nutritional and metabolic status in order to determine a **nutri-metabolic score of cancer risk** mainly based on life-style factors, genetic susceptibility and lipid profile.

3. **Precision nutrition strategies in cancer treatment.** Analysis of the activity and mechanism of action of bioactive compounds and targeted nutritional strategies as effective dietary supplements approaches in the treatment of cancer and associated metabolic disorders. The objective is to establish the scientific basis for the development of precision nutrition strategies in oncology by including or avoiding specific products due to their effect on specific cancer signalling pathways.




# Projects in Focus

### Nutritional strategies and bioactive compounds to target lipid metabolism alterations in cancer: Platform of Patient derived Paired Organoids for Precision Nutrition

The constitution of a Platform of Patient derived Paired Organoids in collaboration with the Medical Oncology Service of Infanta Sofía Hospital is being constituted within this project for the analysis of lipid metabolism alterations in cancer and identification of the most appropriate molecular nutritional approach for its specific metabolic alteration.

**Principal Investigator:** Ana Ramírez de Molina.
**Period:** 2019 –2021
**Funding:** Ramón Areces Foundation: Life Science and Matter Call 2019. CIVP19A5937
**Partner:** Infanta Sofía University Hospital

### Highly effective nutritional formulas for chronic disease management (FORDISCOVERY)

This project aims to contribute to the improvement of cancer treatment through precision nutritional products developed for specific groups of patients according to their metabolic alterations. It develops and demonstrates the efficacy of precision nutritional formulations by using computational models to identify the most appropriate bioactive compounds for each type of patient according to their metabolic alterations, as well as in vitro systems, and clinical trials to demonstrate their effectiveness.

**Principal Investigator:** Ana Ramírez de Molina
**Date:** 2020-2022
**Funding:** Ministerio de Economía y Competitividad. Programa Estatal de investigación, desarrollo e innovación orientada a los retos de la sociedad (PID2019/110183RB-C21).
**Partner:** Infanta Sofía University Hospital

### OnCOVinf Project

This project arises from the urgent need to carry out actions in the field of research aimed at combating the effects of the COVID-19 infection. Cancer patients undergoing antitumor treatment are at high risk of developing infections, more accentuated in the current situation due to COVID-19 pandemic. Within the frame of ALIBIRD-2020 (Precision nutrition approaches for cancer patients), we are conducting this randomized, double-blind, placebo-controlled clinical trial for the evaluation of a precision immune-enhancing nutritional supplement in the prevention of infections during the Covid-19 pandemic in cancer patients receiving antitumor treatment.

**Principal Investigators:** Ana Ramírez de Molina and Enrique Casado
**Date:** 2020-2021
**Funded by:** Comunidad de Madrid (P2018/BAA-4343)
**Partner:** Infanta Sofía University Hospital

### Nutri-metabolic score biomarker of cancer development and progression

Analysis of the relationship between lifestyle factors (nutrition, physical activity), genetics (individual susceptibility), the consequent global metabolic state (healthy/unhealthy), and relationship with chronic inflammation and the immune response, as well as the development, progression, and response to treatment of patients with cancer. Development of a Nutri-metabolic score related to metabolic health as a new integrative biomarker of cancer development and progression of diet related tumors, mainly focused on early-onset colorectal cancer, lung and pancreatic cancer.

**Principal Investigator:** Ana Ramírez de Molina,
**Funded by:** Comunidad de Madrid (P2018/BAA-4343). European cooperation in science & technology, cost action Transcoloncan.
**Partners:** Infanta Sofía University Hospital, La Paz University Hospital, Fundación Jiménez Díaz

# Coordination of the Precision Nutrition and Cancer Lab

The Precision Nutrition and Cancer laboratory is a multidisciplinary group coordinated by Dr. Ana Ramírez de Molina, working on the identification and application of personalized molecular nutrition strategies to improve response to treatments and quality of life of cancer patients.

This multidisciplinary Lab includes:

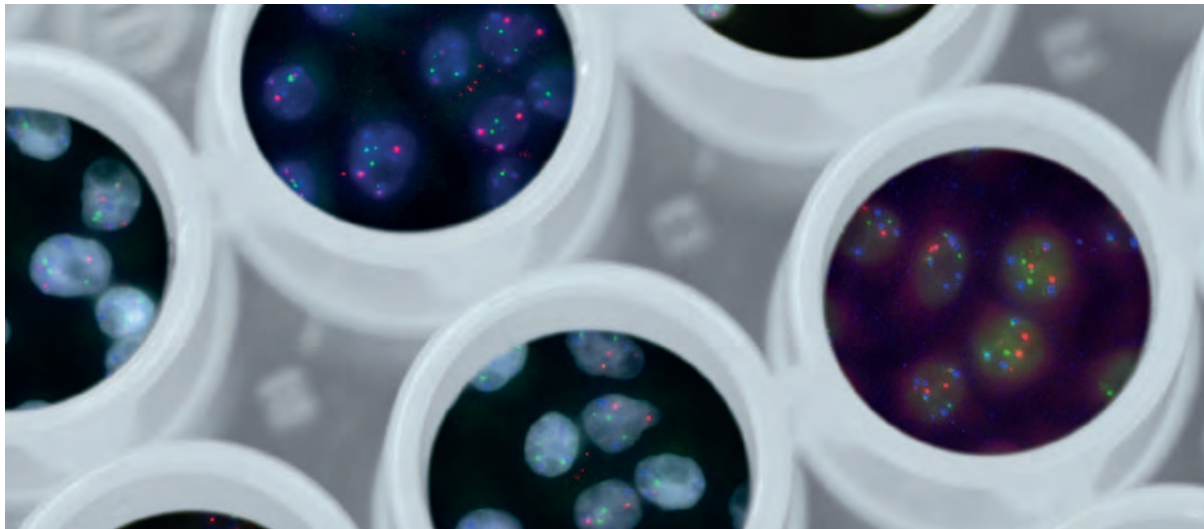
- Molecular Oncology Group
- Clinical Oncology Group
- GENYAL Platform of Clinical Trials in nutrition and Health. Nutritional Genomics and Health Unit.
- Industrial doctorate program for the development of bioactive products for precision nutrition applications

These groups constitute a multidisciplinary alliance working in coordination and continuous collaboration with the mission of establishing a network of knowledge and work that encompasses a multitasking team to develop precision nutrition strategies for cancer patients.

The scope of action goes from the study and identification of molecular and metabolic alterations in cancer patients, and the analysis of in vitro mechanisms of action of the different nutritional strategies and bioactive products targeting these alterations, towards the application of identified personalized nutritional strategies in humans, including clinical trials in both, healthy volunteers and cancer patients.

Finally, to promote transfer of knowledge to society, we count on the participation of two spin-off companies of IMDEA Food and Universidad Autónoma de Madrid, Precision For Health (P4H), focused on personalized nutrigenetic advice, and Forchronic focused on the development of specific bioactive formulations for precision nutrition. Furthermore, the Industrial doctorate program for the development of bioactive products works in this group within the frame of an applied research in this area in collaboration with different companies interested in the development of personalized nutrition for disease prevention and treatment.

This group is included in ALBIBIRD2020-CM Project: “Precision nutrition therapeutic formulations for cancer”.



## Researchers

**Dr. Marta Gómez de Cedrón**
Postdoctoral Researcher
Ph.D. in Science

**Dr. Lara P. Fernández Álvarez**
Postdoctoral Researcher
Ph.D. in Biochemistry, Molecular Biology and Biomedicine

**Dr. María José Barrero**
Postdoctoral Researcher
Ph.D. in Biology

**Dr. Cristina Maria Fernández**
Postdoctoral Researcher
Ph.D. in Biology

**Dr. Silvia Cruz Gil**
Postdoctoral researcher and senior program technician
Ph.D. in Biology

## Head of Research Line

**Dr. María E. Rodríguez García-Rendueles**
Senior researcher and Head of Research Line in Thyroid Cancer

Ph.D in Endocrinology. Her work is focused in Investigate thyroid tumorigenesis and tumor progression by using multidisciplinary genetic, biochemical, and cell biological approaches to understand the functional consequences of the key drivers of the disease. Focusing on identifying potential targets and new approaches based on this dependency on new therapies.

### Objectives

- Study the role of YAP in thyroid tumorigenesis and progression.
- Study YAP as a mechanism of drug resistance: YAP-dependent mechanism of adaptive resistance of BRAF-mutant thyroid cancers to RAF inhibitors.
- Study weather YAP regulates the expression of thyroid marker genes implicated in the iodine uptake and metabolism and weather restore thyroid marker genes expression after MAPK inhibitors, improving the RAI therapy in thyroid cancer patients.
- Determine the effect of YAP activation on the tumor microenvironment.

### Projects in Focus

**YAP in thyroid cancer: role in tumorogenesis and progression of the disease and its implication in drug response**
**Reference:** YAP in thyroid cancer_2019-T1/BMD-13039_MER
**Funding Institution:** Atraccion de Talento Madrid Modalidad 1
**Period:** 2019 - 2023

# research group

# Clinical Oncology

## GROUP LEADERS

**Dr. Enrique Casado**
Clinical Oncology Group Leader. Head of Medical Oncology Service, Infanta Sofía University Hospital

Ph.D. in Medicine. His work is focused in Precision Oncology.

**Dr. Jaime Feliú**
Clinical Oncology Group Leader. Head of Medical

Oncology Service, La Paz University Hospital

Ph.D in Medicine. His work is focused in Colon and pancreatic cancer, tumor biomarkers, epigenetics and genetics of cancer.

## Objetives

- Identification of molecular biomarkers of cancer prognosis and treatment response.
- Clinical trials and application of molecular nutrition strategies for improvement of response to treatments and quality of life of cancer patients.

## Projects in Focus

### OnCOVinf Project

This project arises from the urgent need to carry out actions in the field of research aimed at combating the effects of the COVID-19 infection. Cancer patients undergoing antitumor treatment are at high risk of developing infections, more accentuated in the current situation due to COVID-19 pandemic. Within the frame of ALIBIBIRD-2020 (Precision nutrition approaches for cancer patients), we are conducting this randomized, double-blind, placebo-controlled clinical trial for the evaluation of a precision immune-enhancing nutritional supplement in the prevention of infections during the Covid-19 pandemic in cancer patients receiving antitumor treatment.

**Principal Investigators:** Ana Ramírez de Molina and Enrique Casado
**Date:** 2020-2021
**Funded by:** Comunidad de Madrid (P2018/BAA-4343)
**Partner:** Infanta Sofía University Hospital

### mHealth platform for the personalized follow up of cancer patients

Within the frame of ALIBIBIRD-2020 (Precision nutrition approaches for cancer patients), we are developing a platform with a dual application to cancer patients and oncologists to monitor symptoms, treatment response and life style of cancer patients.

**Principal Investigator:** Enrique Casado
**Date:** 2020-2021
**Funded by:** Comunidad de Madrid (P2018/BAA-4343)
**Partner:** Infanta Sofía University Hospital, Universidad Politécnica de Madrid, CSIC

**Clinical-pathological and molecular characterization of long-term survivors with advanced non-small cell lung cancer**

Long-term survivors (LS) of non-small cell lung cancer (NSCLC) without driver alterations, displaying an overall survival (OS) of more than 3 years, comprise around 10% of cases in several series treated with chemotherapy. There are classical prognosis factors for these cases, but more data are required in the literature. We conduct a multi-center study to perform a clinical-pathological and molecular characterization of these patients.

**Principal Investigator:** María Sereno
**Date:** 2019-2021
**Partner:** Infanta Sofía University Hospital, Ramón y Cajal University Hospital, San Carlos University Hospital, Gregorio Marañón University Hospital, 12 de Octubre University Hospital, Alcorcón Foundation Hospital, Príncipe de Asturias University Hospital, La Paz University Hospital and Torrejón University Hospital

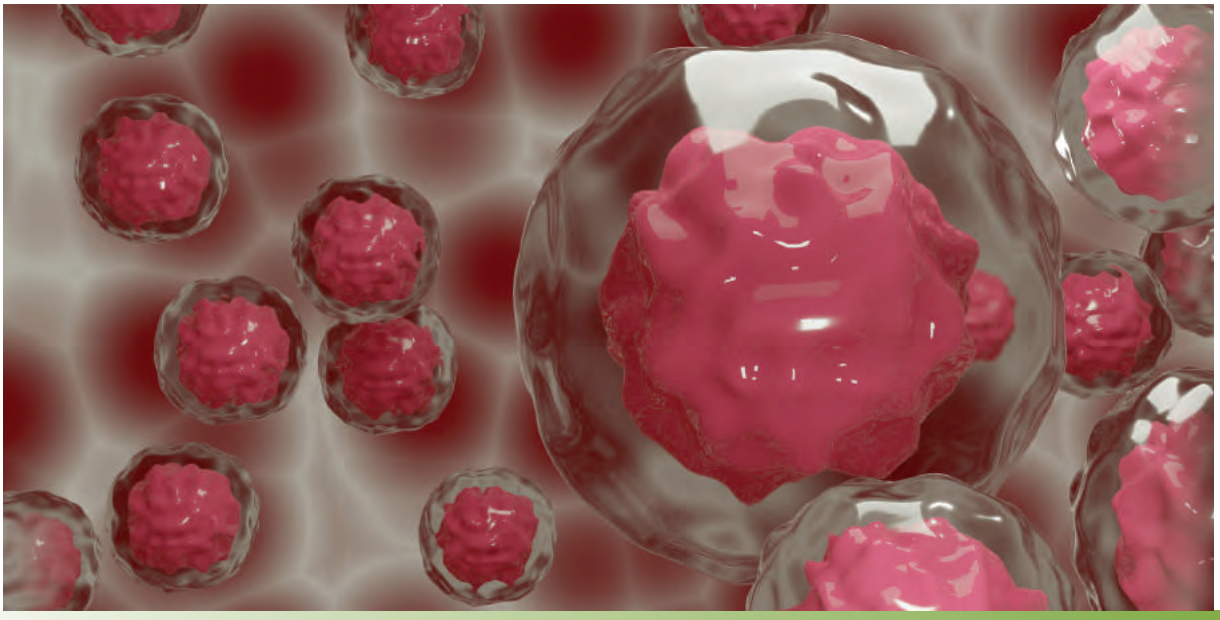
## Researchers

**Dr. María Sereno Moyano**
Postdoctoral Researcher
Ph.D. in Medicine

**Dr. César Gómez Raposo**
Postdoctoral Researcher
Ph.D. in Medicine

**Dr. Juan Moreno Rubio**
Postdoctoral Researcher
Ph.D. in Molecular Biology

**Ana María Jimenez Gordo**
Postdoctoral Researcher
Ph.D. in Medicine



# research group

# Molecular Immunonutrition

## GROUP LEADER

**Dr. Moisés Laparra**
Head of the Molecular Immunonutrition Group

Ph.D. in Pharmacy. His work is focused in Immunonutritional agonists, innate immune biology, macrophages, microbiota, micronutrients.

## Objetives

- **Immunonutritional intervention strategies on the myeloid- lymphoid relationship to establish adequate metabolic conditions within the gut-live axis.**
  The role of immunonutritional agonists in the control of intestinal players such as macrophages and gut microbiota influencing the IL-23/IL-22 pathway has important effects on the control of metabolic alterations. Our research established a role for the F4/80+ population in the innate signaling that stem at intestinal level in the regulation of immunometabolic events within the gut-liver axis health.

- **Nutritional approaches to innate immune regulation response.**
  Definition of early innate immune regulatory response(s) against the initial tissue damage accompanied by the transition and activation of macrophages in tumor control. Elucidation of innate cell biology as a path forward to develop durable and long-lasting immune response(s). RYC-2015-18083, Molecular immunonutrition of the metabolic dysfunction and antitumoral response.

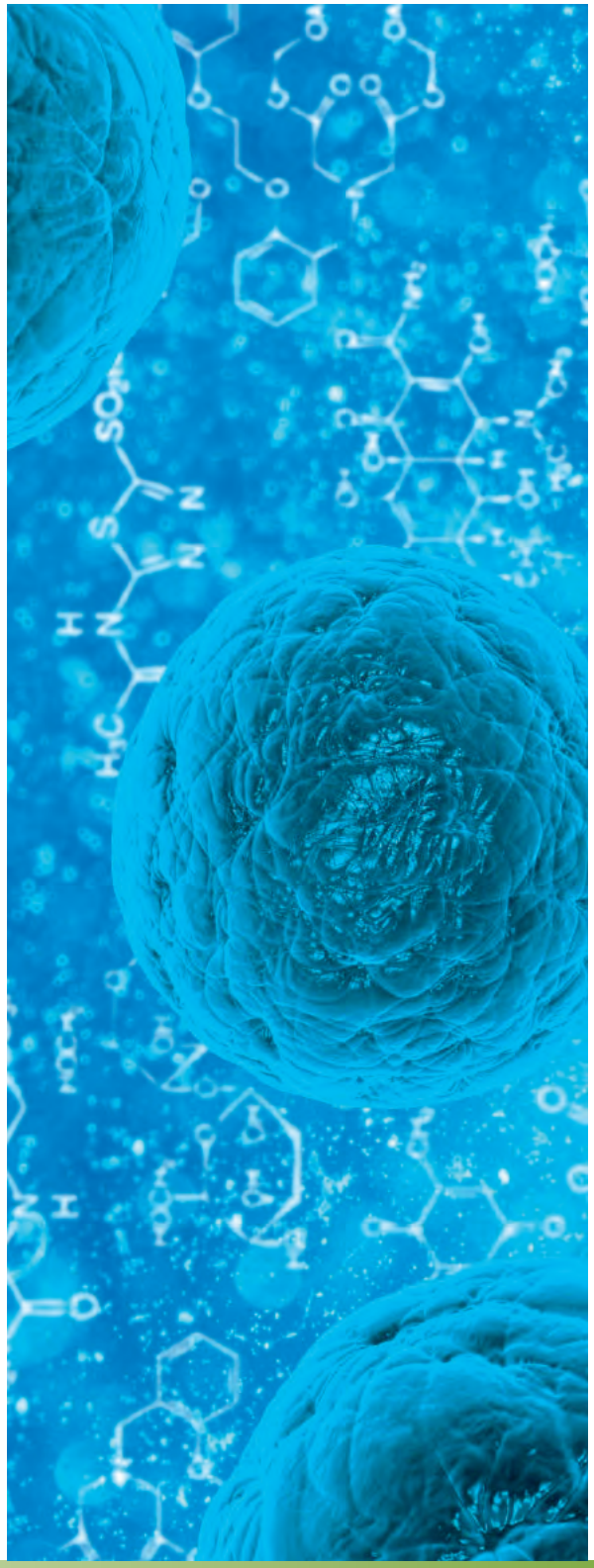
- **Analysis of the dynamic interplay of improved food formulations with immunonutritional benefits in the prevention and onset of liver dysfunction.**
  Knowledge about the impact of food on citizens' health and well-being has become a major factor for the consumers' concern and food industry's competitiveness. Nowadays, nutrition is demanded as a way to reduce the risk of suffering immunometabolic diseases, and can even offer a therapeutic potential on these. In these context, our goal, in collaboration with IATA and Valencian International University, is the metabolic reprogramming of innate lymphoid and myeloid components of the immune system, which is key to establish an adequate tissue metabolism to prevent/correct the distinctive stamp in alterations to the homeostasis of nutrients in which nutritional strategies can play a key role. Immun4Nut PRP_PID_2019, Understanding the dynamic interplay of improved food formulations with immunonutritional benefits in the prevention and onset of liver dysfunction.

# Projects in Focus

**Understanding the dynamic interaction of enhanced food formulations with immunonutritional benefits in the prevention and appearance of hepatic disfunction (PID2019-107650RB-C22)**
**Principal Investigator:** Moisés Laparra Llopis
**Partners:** Valencian International University and CSIC
Call 2019 R&D&I Projects - RTI Type Coord.

The present project considers the specific use of quinoa and chia grains as sources of specific immunonutritional ingredients in the formulation of food products. The aim is to improve their influence and interaction with the microbiota and the innate immune system, in order to achieve a better control in the prevention of chronic diseases that increase the risk of cancer.

**Development and validation of nutritional formulations as therapeutic adjuncts in food-related chronic diseases**
**Principal Investigator:** Moisés Laparra Llopis
**Ph.D. Director and Co-Director:** Ana Ramírez de Molina, Moisés Laparra Llopis
**Tutor/co-director business environment:** Enrique Sainz Martínez - CANAAN RESEARCH¬INVESTMENT, S.L.
**Date:** 2018-2021
**Funded by:** Comunidad de Madrid. Doc. Industriales 2017/BIO-7857_MLL



# research group

# Computational Biology

## GROUP LEADER

**Dr. Enrique Carrillo de Santa Pau**
Group Leader

Ph.D. in Molecular Biology and Biochemistry (2007); MSc in Bioinformatics and Computational Biology (2010); MSc in Applied Statistics (2014); Executive Education Program: "Accelerate: Building Business from Science and Technology" (2017). His work is focused in Develop and apply integrative bioinformatic and computational solutions to study the variability and individual responses to food or bioactives and its relationship to complex diseases like cancer and other metabolic disorders, which will allow establishing precision personalized nutrition strategies based on individual molecular backgrounds with particular emphasis in genetic, epigenetic, metabolic and microbiota profiles.

## Objetives

Our overall aim is to understand the molecular crosstalk between food nutrients/diets and cells in the development and management of non-communicable diseases. We apply high-performance analysis tools to integrate different data sources from genes, environment, lifestyle or microbiology to move forward in the development of precision nutrition strategies based on individual molecular background. The group is currently focused in four topics:

- Understanding human metabolism variability with epigenomic and transcriptomic large datasets to evaluate the benefits of nutrients and food supplements in cancer patients and healthy subjects for personalized nutrition strategies in complex diseases. We participate in "Chronic Disease Control through VERY effective nutritional FORmulae" (FORDISCOVERY-PID2019-110183RB-C21) and the Spanish Infrastructure of Precision Medicine (IMPaCT).

- Development of computational tools to aggregate information about food/diet – drug interactions from structured and unstructured resources to study the complex molecular relationships of these interactions for negative (decreasing drug bioavailability or blocking the mechanism of action) or positive (maximize drug effect or reduce side effects) effects. Participation in Food Nutrition Security Cloud (FNS-Cloud): Cloud solution facilitates access to food and nutrition information (H2020-EU.3.2.2.3, Grant agreement ID: 863059. Funded under: (2019-2023)).

- Characterization of microbiome disruption in complex diseases like colorectal cancer or celiac disease and study the effects of bioactive compounds in microbiome modulation for a healthy gut. We lead the project "Profiling host-microbiome interactions in non-responding Celiac Disease symptoms persistence" ESCMID (2020-2021). Participation in "From Aging Biology to Sustainable Interventions: a microbiome-based anti-aging approach" (PID2019-106893RA-100) and COST Action CA18131 ("Statistical and machine learning techniques in human microbiome studies") (2018-2022).

- Bring the science and knowledge generated in our group closed to the people. We lead the projects "Picture your microbes: A co-creation participatory action to empower citizens on nutritional health decisions" (2021), EIT-FOOD and "Food Science Shop" (2020), Open Life Science program (OLS), to strengthen the relationship between scientists and the civil society. In addition, we develop games to stress the importance of having a healthy diet for a healthy gut #Bichindario (https://bichindario.imdeafoodgamers.com/).

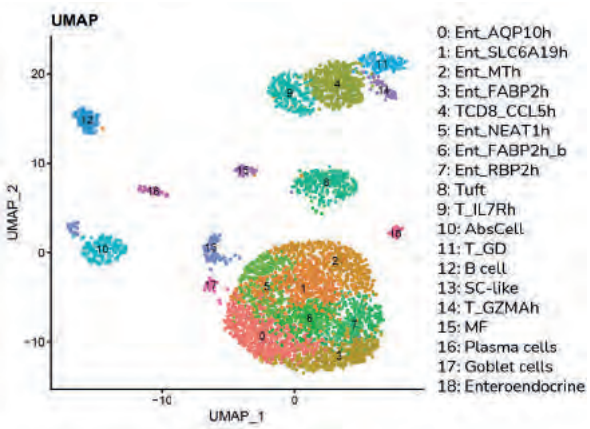



*Fig. 1: UMAP dimensional reduction of scRNAseq data from human healthy rectum tissue (He et al. 2020)*

# Projects in Focus

**"Profiling host-microbiome interactions in non-responding Celiac Disease symptoms persistence"**

**Period:** 2020 –2021

**Funding:** European Society of Clinical Microbiology and Infectious Diseases (ESCMID).

**Principal Investigator:** Laura Judith Marcos-Zambrano.

Summary:

Celiac Disease (CD) is a chronic immune-related inflammatory disease characterised by gluten intolerance developed in genetically susceptible individuals under environmental factors. The treatment for CD involves adherence to a gluten-free diet (GFD) that leads to the duodenal mucosa's healing. However, up to 30% of patients with CD show persistent enteropathy symptoms after one year on a GFD, having the so-called non-responsive CD. Recently, it has been observed that gut microbiota differs among subgroups of CD patients according to specific clinical manifestations and symptoms, suggesting that it may play an essential role in the persistence of symptoms in non-responding patients. This project aims to **study the association of microbiome metabolic profiles with the persistence of symptoms and inflammatory exacerbation in non-responding CD** through the functional metagenomic characterisation and the study of the faecal metabolome of patients undergoing a GFD for more than 12 months, with the purpose of favour decisions on new personalised drug treatments and food supplements for these patients.

**"Study of the human metabolism variability in cancer disease for personalized nutrition strategies"**
**Period:** 2019 – 2023
**Funding:** H2020-EU.3.2.2.3, Grant agreement ID: 863059 (2019-2023) & PID2019-110183RB-C21.
**Principal Investigator:** Teresa Laguna Lobo & Enrique Carrillo de Santa Pau

Summary:
In order to design personalized nutrition to specific groups of cancer patients, we explored different cell subpopulations that can be responsible for the disease or the worsening of its symptoms. For this purpose, we are analyzing single-cell RNA sequencing data (scRNAseq) from gut tissues, such as rectum (Fig. 1). We will infer relevant cell subpopulation fractions in the colon of different human subjects using deconvolution of DNA methylation data, with the final aim of classifying them by clustering techniques. We plan to build several networks of similarities between subject clusters and expression profiles produced by bioactives / food components to evaluate the putative benefits of food compounds in cancer patients and healthy subjects (Fig.2).

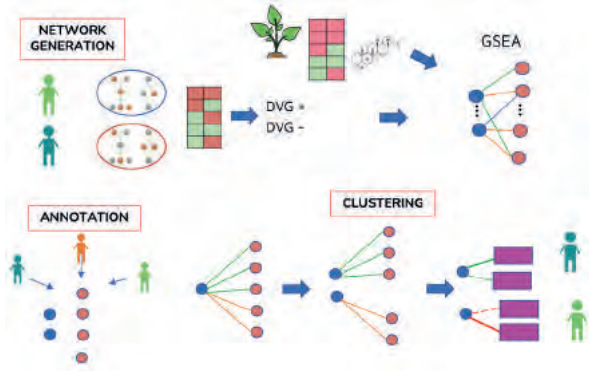



*Fig. 2: Project scheme to evaluate best bioactives as supplement for health and disease*

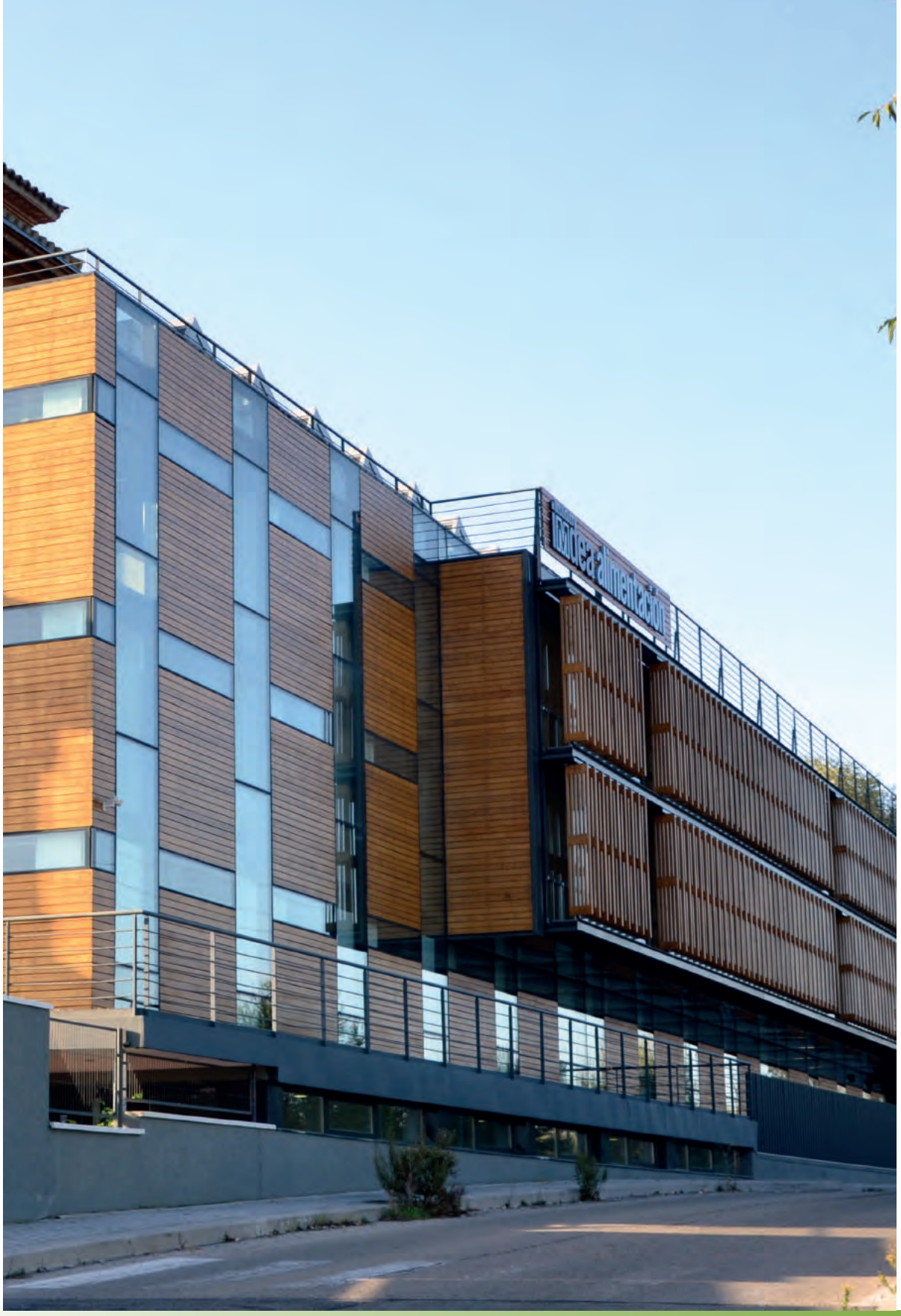
## Researchers

**Dr. Teresa Laguna Lobo**
Postdoctoral Researcher
Ph.D. in PhD in Immunology & MSc in Omics Data Analysis

**Dr. Laura Judith Marcos Zambrano**
Postdoctoral Researcher
Ph.D. in Microbiology and Parasitology

**Marco Garranzo Asensio**
Predoctoral Researcher

**Carlos Madariaga Aramendi**
Research Technician


Istituto Alimentazione

# Scientific highlight

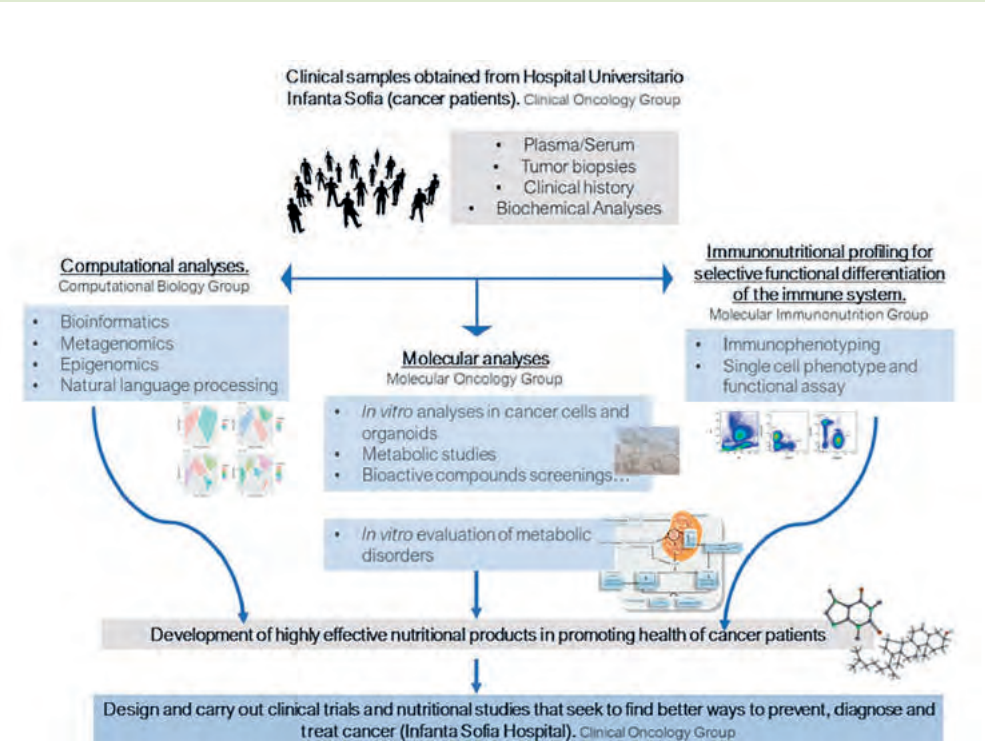
## Precision nutrition for cancer prevention and treatment

The challenge of this project consists of the development of molecular nutrition strategies and formulations for the targeted treatment of cancer patients. This multidisciplinary project requires to gain knowledge of the different molecular characteristics of cancer patients that can be targeted through nutrition, as well as the development of computational tools to support the design and development of specific products, the validation of their molecular effects, first on cells and organoids derived from patients, and finally in clinical trials. Only with a multidisciplinary team as that included in the research program, is it possible to face this challenge.

The approach of the identification of the molecular characteristics of cancer patients that can be targeted through precision nutrition is focused on the regulation of metabolism and associated processes such as inflammation and immunity. Metabolic reprogramming is considered one of the "hallmarks" in cancer. Along with the increase in aerobic glycolysis (Warburg effect) and glutaminolysis, reprogramming of lipid metabolism has become a key factor in cancer initiation and progression. Thus, different oncogenic pathways activate de novo synthesis of fatty acids and cholesterol and / or increase lipid uptake from the extracellular medium; lipids participate in different signalling pathways, being important mediators of inflammation associated with tumor progression, and they model the tumor microenvironment facilitating tumor dissemination by reprogramming adipocytes and fibroblasts (CAAs, CAFs), as well as cells of the immune system (polarization Protumoral Th2), and stimulation of angiogenesis, among other processes.

To address this objective, clinical samples of cancer patients are analysed and classified regarding specific metabolic and molecular characteristics. The Clinical Oncology Group is in charge of recruiting cancer patients, that will be further analysed by the Molecular Oncology group, focused on an extensive metabolic and genetic analysis, including biomarkers of immune and inflammatory status, and anthropometry and dietary and life-style patterns. Then, the Computational Biology Group has built a molecular database from 119 studies with 334 food experiments and calculated transcriptomic signatures for each of them. The database has been compiled mining GEO Database with food terms in FoodDatabank, FoodDB and Phenolexplorer in collaboration with Food Nutrition Security Cloud activities (FNS-Cloud; H2020-EU.3.2.2.3 ID863059). This database will be used later on to stratify patients by their transcriptomic similarity for molecular responses to food bioactives. In addition, analyses of bulk tissues are the standard in clinical settings without consider the sum of cell types and their specific responses to drugs or food supplements. The Computational Biology group is applying methods in collaboration with University College of London (UCL, UK) and the Cancer Research Centre of Toulouse (CRCT, France) to create molecular signatures from 366,650 colon cells (Smillie et al. 2019) and deconvolute the signal in bulk colon tissues, in collaboration with the Computational Biology Institute of Shanghai, (PICB, China), to stratify colon cancer patients by their cell type structure and infers different origins and responses to food supplements.

On the other hand, organoids of patients are obtained and cultured by the Molecular Oncology Group in order to determine the most effective molecular nutrition approach for each metabolic-type of cancer patients. Representative nutritional compounds and strategies are assayed as co-adjuvants in cancer treatment, analysing their func-




tional activity and mechanism of action. In addition, the Immunonutrion Group addresses the complex interactions between immune and cancer cells, analysing the effect of nutritional compounds as agonists able to modulate innate immune signalling, and potential "trained immunity" interventions. Furthermore, the Computational Biology Group apply the developments described above to study the potentially most effective food bioactives for each patient with the aim of improving efficacy of cancer treatments. Finally, selected compounds and precision nutrition strategies are conducted to clinical trials in humans through the GENYAL Platform of Clinical Trials in Nutrition and Health in healthy volunteers, and the Clinical Oncology Group at Infanta Sofía Hospital for cancer patients.

The final goal is to efficiently employ the knowledge of cellular, molecular, physiological, chemical or genetic processes to identify metabolic biomarkers of relapse and apply effective molecular nutrition approaches to improve cancer treatments and quality of life of cancer patients.

programme

# Precision Nutrition and Obesity

## Goal and vision

The Precision Nutrition and Obesity Program aims to understand the inter-individual variability in the response to any therapeutic diet or physical regime with the aim to prevent obesity and/or return to a healthy body weight. The individual's susceptibility to becoming obese and the individual responsiveness to weight loss interventions are the result of an intricate network of linked biological mechanisms that, together, compose the biology of the system. We base on the n-equal-to-one approach to evaluate the individual response to diet and physical activity intervention by gathering genetic, epigenetic and metabolomic knowledge at individual level following systems biology approaches in large populations.

Programme Director

**Dr. Jose María Ordovás**
Director of Precision Nutrition & Obesity Programme

Ph.D. on Biochemistry. His main research interests are the identification of novel gene-diet interactions that modulate individual response to life-style interventions to prevent cardiovascular disease, the integration of multiomic data in large population studies through n-equal-to-one and machine learning approaches to advance in the practical application of precision nutrition.

# Research groups

## Nutritional Genomics And Epigenomics Research Group

Group Leader

Dr. Jose María Ordovás

## Cardiovascular And Nutritional Epidemiology Research Group

Group Leader

Dr. Fernando Rodríguez

## Nutritional Control Of The Epigenome Research Group

Group Leader

Dr. Lidia Daimiel

# research group

# Nutritional Genomics and Epigenomics

## GROUP LEADER

**Dr. Jose María Ordovás**
Director of Precision Nutrition & Obesity Programme
Ph.D. in Biochemistry

## Objetives

Our group aims to provide genomic tools and knowledge to manage obesity and related co-morbidites at the individual level through:

- The identification of genetic variants predisposing to obesity.
- The definition of how these variants interact with the diet to modulate such predisposition.
- The understanding of the dietary modulation of the how diet can modulate the obesogenic epigenome.

These general aims are developed through specific research projects aimed to:

- Identify postprandial methylation marks in response to a fat load in subjects with cardiovascular disease. In collaboration with the researcher of the CORDIOPREV study at the IMIBIC (Córdoba) and, as members of the European DIMENSION Consortium, we have studied how methylation marks change in the postprandial phase after a fat load. Our results will contribute to the current knowledge of the system biology in the postprandial stage.
- Identify methylation marks associated with consumption of ultra-processed food (UPF). Current scientific evidence on the impact of UPF consumption on health rely on observational population studies that have associated UPF consumption with total mortality and markers of cardiometabolic health. However, little is known about the mechanisms that link UPF consumption to health. We will contribute to elucidate the biological impact of UPF consumption at the epigenetic level through our METHYL-UP study and in collaboration with researchers of the ENRICA-Seniors II cohort.

# Projects in Focus

### METHYL-UP: Targeting DNA-methylation fingerprints linked to ultra-processed foods consumption to prevent non-communicable diseases

**Funding:** Proyectos de I+D+i «Retos Investigación», del Programa Estatal de I+D+i Orientada a los Retos de la Sociedad
**Partners:** Facultad de Medicina, Universidad Autónoma de Madrid. Estudio ENRICA-Seniors II
**Principal Investigator:** José Mª Ordovás (PI)
**Start/end date:** 01/01/2019 – 31/12/2021

The hypotheses of the METHYL-UP project are: 1) high consumption of UPF exerts epigenetics changes compared to low consumption of UP foods; 2) these epigenetics changes induced by high consumption of UPF are associated with development of non-communicable diseases (NCDs) and 3) an intervention with unprocessed or minimally processed foods can revert the epigenetic modifications induced by the consumption of UPF.

The overall aims of the METHYL-UP study are to identify UPF-induced epigenetic fingerprints that can be associated with NCDs development, and to reverse them through a dietary intervention with unprocessed or minimally processed foods. Our study will contribute to fill the current biological gap between UPF consumption and health.

Our preliminary analyses have contributed to define the limitations of the main UPF classification systems (NOVA, IARC, UNC and IFIC) and the low inter-classification concordance.

These results highlight the need of more precise systems and tools to evaluate subjects UPF consumption. Following the identification of such need, we have developed a precise, fast and easy-to-administer 14-item questionnaire to score and classify subject's UPF consumption.

# Researchers

**Dr. Celia Martínez**
Postdoctoral Researcher
Ph.D. in Neuroscience

**Cristina Climent Mainar**
Predoctoral Researcher

**Paloma Ruiz Valderrey**
Laboratory technician

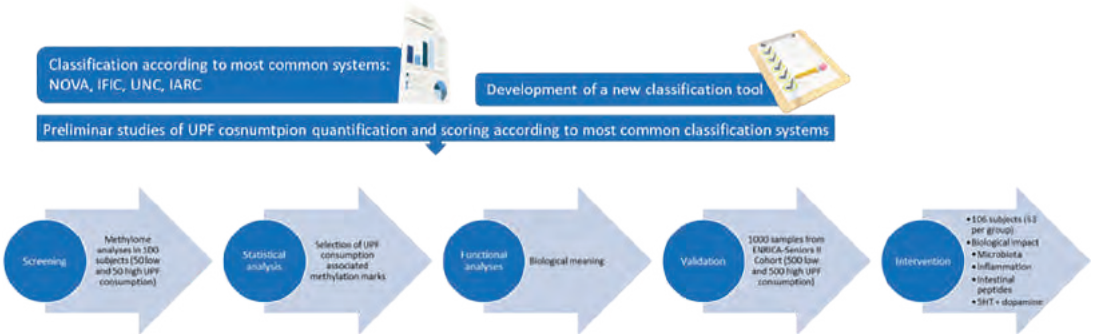



*Figure. METHYL-UP workflow and preliminary results.*

research group

# Cardiovascular and Nutritional Epidemiology

## GROUP LEADER

**Dr. Fernando Rodríguez**
Cardiovascular and Nutritional Epidemiology Group Leader

MD and Ph.D. in Medicine. His main research interests are the study of the influence of non-cardiac factors on the prognosis of patients with heart failure, the population-based assessment of cardiovascular health, and the study of the effect of lifestyle on improving cardiovascular health and quality, as well as reversing frailty, in older adults.

## Objetives

Our strategic objective is to produce relevant information to support clinical and population-based policies aimed at controlling cardiovascular diseases and their functional adverse outcomes. Specifically, we work on the following research areas:

- Nutritional and omic determinants of frailty and functional status in the older adult.
- Diet and physical activity as determinants of obesity and cardiovascular risk in the elderly.

The results of our studies have been incorporated into the National Strategy for Ischemic Heart Disease Control, the National Strategy for Obesity Prevention and Control, and the National Strategy on Disease Prevention and Health Promotion, elaborated by the Ministry of Health of Spain.

## Projects in Focus

Frailty is a geriatric syndrome with multiple causes and contributors, which is manifested by fatigue, diminished strength, and reduced physical functioning and leads to a higher risk of dependency and death. Due to the aging of the population, an increasing number of people are at risk of developing frailty. Therefore, identifying determinants of frailty is important to support evidence-based preventive interventions. So far, there is little information on whether consumption of sugar-sweetened beverages (SSBs), artificially sweetened beverages (ASBs), and fruit juices influences the risk of frailty.

Authors studied the association of consumption of SSBs, ASBs, and fruit juices with the risk of frailty among of 71,935 older women participating in the Nurses' Health Study (NHS). During 22 years of follow-up, a higher con-

sumption of SSBs and ASBs was associated with a higher risk of frailty, whereas higher orange juice consumption was associated with a lower risk. These associations were independent of lifestyle, medication use, and the quality of the rest of the diet.

This study suggests that habitual SSBs drinking increases the risk of frailty in older women. Due to the high SSBs intake and its many adverse health effects, possibly including frailty, older adults should be advised to limit SSBs consumption. It is unclear why ASBs were associated with frailty risk. Further research should assess this association and its mechanisms.

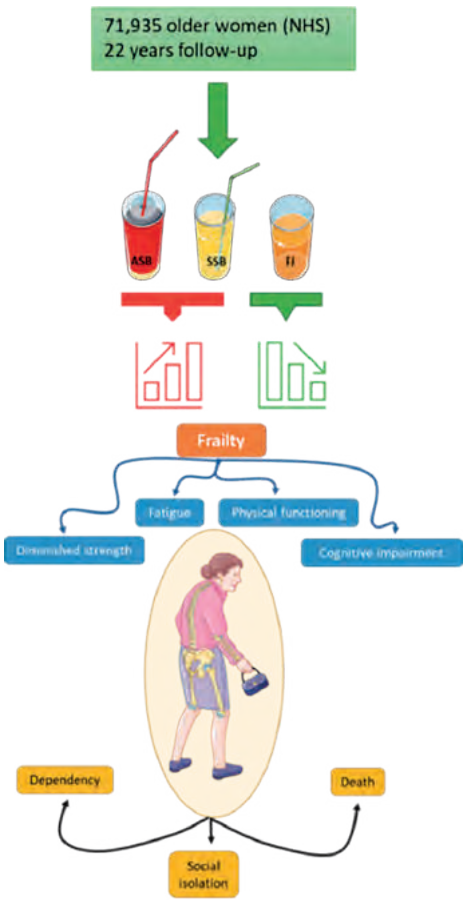



*Figure: Graphical summary of described results.*

## Reference

Struijk EA, Rodríguez-Artalejo F, Fung TT, Willett WC, Hu FB, Lopez-Garcia E. Sweetened beverages and risk of frailty among older women in the Nurses' Health Study: A cohort study. PLoS Med. 2020 Dec 8;17(12):e1003453.

*Images use: some images contain elements of Servier Medical Art, an image library that can be used under CC-BY license. https://smart.servier.com/*

# Researchers

**Dr. Carolina Donat Vargas**
Postdoctoral Researcher
Ph.D in Applied Medical Research

**Dr. Verónica Cabanas-Sánchez**
Postdoctoral Researcher
Ph.D. in Physical Activity and Sports Sciences

# Heads of Research Line

## Dr. Pilar Guallar Castillón

Senior researcher and Head of Research Line in the influence of diet on the development of cardiometabolic diseases

Ph.D in Medicine and Surgery. Her work is focused in Dietary patterns and cardiovascular health, Dietary patterns and age-related frailty.

### Personnel

**Dr. Carolina Donat Vargas**
Ph.D.

### Objectives

- Influence of ultraprocessed food consumption on cardiovascular health.
- Influence of ultraprocessed food consumption on age-related frailty.
- Influence of phthalate consumption on cardiovascular health.

### Projects in Focus

**Ultra-processed food consumption and subclinical atherosclerosis progression: The role of specific food groups, phthalates, and phosphates.**

## Dr. Esther López García

Senior researcher and Head of Research Line in Nutritional and omic determinants of frailty, multimorbidity and unhealthy aging in the older adults

Ph.D. in Epidemiology. Dr. López-García has assessed in detail the effect of the Mediterranean dietary patterns, coffee, meat and dairy consumption, on the risk of CVD and disability, using data from large population studies in the USA, UK and Spain. She has also examined the biological mechanisms that may explain these associations, including inflammation and endothelial dysfunction, glucose metabolism and leptin, and more recently metabolomics profiles of physical impairment and functional disability.

### Objectives

- Epidemiology and prevention of obesity and cardiovascular disease through diet and lifestyle.
- Diet and the risk of physical function impairment, frailty and disability in the older population.
- Metabolomics in frailty and disability.

### Projects in Focus

**The impact of lifestyles on the development of multimorbidity on older adults.**

## Dr. David Martínez

Senior researcher and Head of Research Line in Physical activity and sedentary behaviors as determinants of obesity and cardiovascular and death risk in the general population.

Ph.D. in Sports Sciences and Physical activity, by Universidad Autónoma of Madrid, Spain

Research interests:

Cardiovascular risk factors, cardiovascular disease, physical activity assessments, aging, survival, physical activity promotion.

### Personnel

**Verónica Cabanas-Sánchez**
Ph.D.

### Objectives

- To describe physical activity patterns in population-based cohorts
- To examine the association of physical activity with key health outcomes;
- To promote physical activity at population level across the lifespan

### Projects in Focus

**Population-based cohorts in international collaborations**
ActiveKIT Ranzomized Clinical Trial (AES 2020, Referencia PI20/00657)

# research group

# Nutritional Control of the Epigenome

## GROUP LEADER

**Dr. Lidia Daimiel**
Nutritional Control of the Epigenome Group Leader

Ph.D. in Biology. Her main research interest is the study of how nutrients modulate epigenetic mechanisms, with a focus on DNA methylation and microRNAs, related to nutrient sensing pathways and molecular hallmarks of aging.

## Objetives

Our group aims to gain knowledge of the epigenetic mechanisms that control the individual's response to diet to promote a healthy aging. Our executive objectives are:

- The identification of microRNAs modulated by diet that regulate nutrient sensing pathways.
- The description of how interventions to prevent obesity based on diet and physical exercise modulate molecular hallmarks of aging, including telomerase activity, epigenetic regulation of gene expression and immunosenescence.
- The understanding of the relationship between obesity, diet and physical activity and neurocognitive decline in the elderly.

To address these general aims, we are currently developing some ongoing projects focusing on the definition of the impact of lifestyle interventions that include diet, specifically Mediterranean diet, and physical activity on molecular hallmarks of aging. In this regard, we are investigating how these lifestyle interventions modulate leukocyte telomere length (LTL), T lymphocyte senescence, telomerase activity and the expression of circulating and macrophage age-related microRNAs.

# Projects in Focus

## Effect of a lifestyle intervention based on Mediterranean diet and physical activity on molecular hallmarks of aging

**Funding:** Instituto de Salud Carlos III, Acción estratégica de la Salud, Fondos de Investigación Sanitaria
**PI:** Lidia Daimiel
**Start/end date:** 01/01/2018 – 31/12/2021
**Partners:** PREDIMED-Plus consortium

PREDIMED-Plus is an ongoing randomized clinical trial aiming to describe the effect of an intensive lifestyle intervention based on an energy-reduced Mediterranean diet, physical activity and behavioral support on the primary prevention of cardiovascular disease in a population with overweight/obesity and metabolic syndrome, in comparison with usual primary care for patients with metabolic syndrome. PREDIMED-Plus has recruited 6,874 subjects in 23 Spanish research centers and is currently in its fifth year of follow-up of a total of 8 years. Within the PREDIMED-Plus study, our research group conduct molecular studies aiming to unravel the impact of this intensive lifestyle intervention on molecular hallmarks of aging and the biological age.

Our aims are:

- To describe the effect of the intervention on circulating and macrophage microRNAs regulating lipid metabolism, nutrient sensing, and immune function.
- To describe the effect of the intervention on relative leukocyte telomere length.
- To describe the effect of the intervention on immunosenescence.
- To describe the effect of the intervention on reverse cholesterol transport.

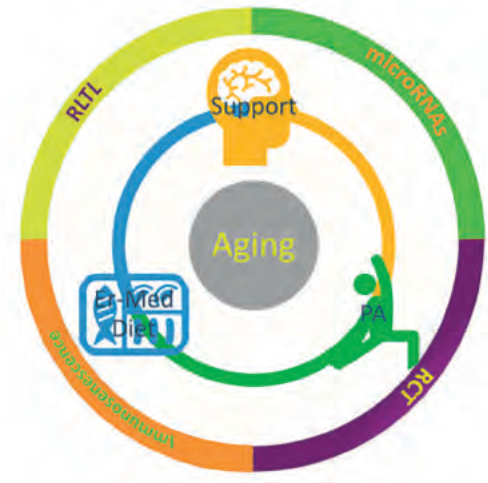



*Figure. Graphical summary of the project*
*Er-Med Diet, energy-restricted Mediterranean diet; PA, physical activity; RCT, reverse cholesterol transport; RLTL, relative leukocyte telomere length.*

# Researchers

**Laura Díez Ricote**
Predoctoral Researcher

**Laura Berninches Pintado**
Nutricionist

**Dr. Esther Cuadrado Soto**
Postdoctoral Researcher

Ph.D. in Pharmacy

**José Antonio Celada Guerrero**
Nutricionist

**Paloma Ruiz Valderrey**
Laboratory technician

# Scientific highlights

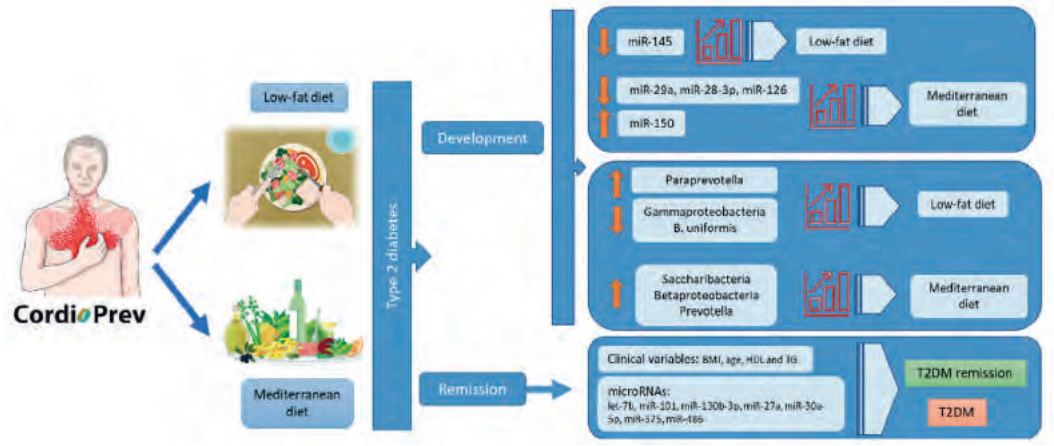
## Nutritional Genomics and Epigenomics Group

In 2020, the Nutritional Genomics and Epigenomics Group led by Prof. José Mª Ordovás has contributed to the development of epigenetic scores to define the individual risk of disease and the biological age. Working in collaboration with investigators of the CORDIOPREV study, the group has contributed to define individual biological and phenotypic factors related to the development or remission of type 2 diabetes in patients with cardiovascular disease. In the CORDIOPREV study, patients with cardiovascular disease follow a low-fat diet or a Mediterranean diet. In this sub-study, the development of type 2 diabetes in those patients without the disease at enrolment or the remission of the disease in those patients with diabetes at enrolment is studied. The group has developed a score base on 7 microRNAs and clinical variables (HDL, body mass index, age, and triglycerides) with the potential to predict type 2 diabetes remission in these patients. Another set of microRNAs was associated to the development of type 2 diabetes in patients without the disease at enrolment with differences in the risk according to the intervention diet. The group has also identified specific microbiota profiles associated to the development of type 2 diabetes differently in these patients in relation to the intervention diet.

It should also be highlighted that Prof. José Mª Ordovás has been part of a panel of experts that has proposed a consensus definition of Personalized Nutrition with the aim of joining efforts to advance in this research field by delineating the needs for the promotion of education, clinical practice, and policy developments in this research field.

### References

1. Rangel-Zuñiga OA, Vals-Delgado C, Alcala-Diaz JF, et al. A set of miRNAs predicts T2DM remission in patients with coronary heart disease: from the CORDIOPREV study. Mol Ther Nucleic Acids. 2020 Nov 11;23:255-263. doi: 10.1016/j.omtn.2020.11.001.




*BMI, body mass index; T2DM, type 2 diabetes mellitus; TG, triglyceride*
*This figure contains free images from pixabay and Servier Medical Art under CC licence*

2. Jimenez-Lucena R, Alcala-Diaz JF, Roncero-Ramos I, et al. MiRNAs profile as biomarkers of nutritional therapy for the prevention of type 2 diabetes mellitus: From the CORDIOPREV study. Clin Nutr. 2021 Mar;40(3):1028-1038. doi: 10.1016/j.clnu.2020.06.035.

3. Camargo A, Vals-Delgado C, Alcala-Diaz JF, et al. A Diet-Dependent Microbiota Profile Associated with Incident Type 2 Diabetes: From the CORDIOPREV Study. Mol Nutr Food Res. 2020 Oct 16:e2000730. doi:10.1002/mnfr.202000730.

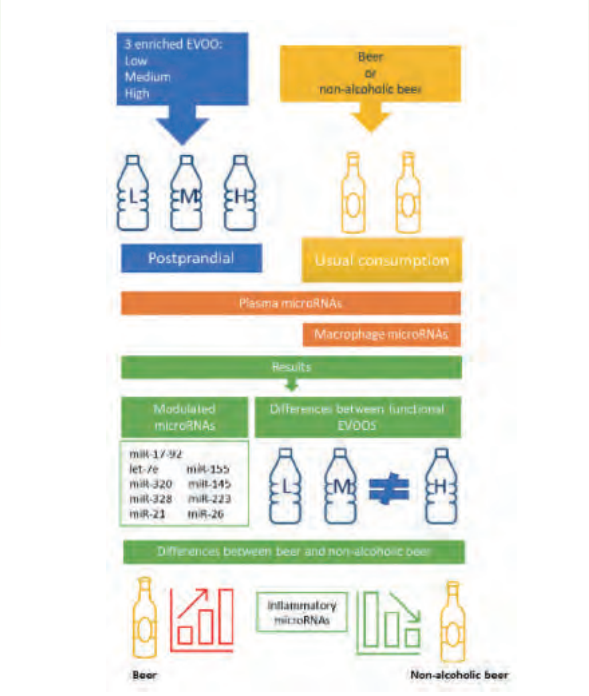
4. Bush CL, Blumberg JB, El-Sohemy A, et al. Toward the Definition of Personalized Nutrition: A Proposal by The American Nutrition Association. J Am Coll Nutr. 2020 Jan;39(1):5-15. doi:10.1080/07315724.2019.1685332.

## Nutritional Control of the Epigenome Group

In 2020, the **Nutritional Control of the Epigenome Group**, led by Dr. Lidia Daimiel has published interesting works showing how the consumption of different Mediterranean foods modifies the expression of circulating and macrophage microRNAs related to cardiovascular disease and aging pathways. Thanks to the funding of Fundación Cerveza y Salud, Fundación Salud 2000, Fundación Merck-Serono and Instituto de Salud Carlos III and in collaboration with Rosa Mª Solá from Universidad Rovira y Virgily and Hospital del Mar Medical Research and with Ana Rodriguez Mateos from, King's College London we have shown how extra-virgin olive oil (EVOO) differently enriched in polyphenols and how beer and non-alcoholic beer modify differently the expression of a panel of 53 microRNAs related to cardiovascular disease and aging.

Our studies showed that:

- Some microRNAs are commonly modified by all enriched EVOO and by beer, specifically, some members of the miR-17-92 cluster.
- The low and medium enriched functional EVOOs showed a similar pattern of microRNAs, whereas the highly enriched EVOO showed a different microRNA profile.
- There is an interesting opposite effect of beer and non-alcoholic beer on the expression of studied microRNAs, suggesting a most inflammatory profile for beer and an anti-inflammatory profile for non-alcoholic beer.




## References

1. Daimiel L, Micó V, Díez-Ricote L, et al. Alcoholic and Non-Alcoholic Beer Modulate Plasma and Macrophage microRNAs Differently in a Pilot Intervention in Humans with Cardiovascular Risk. Nutrients. 2020 Dec 28;13(1):69. doi: 10.3390/nu13010069.

2. Daimiel L, Micó V, Valls RM, et al. Impact of Phenol-Enriched Virgin Olive Oils on the Postprandial Levels of Circulating microRNAs Related to Cardiovascular Disease. Mol Nutr Food Res. 2020 Aug;64(15):e2000049. doi: 10.1002/mnfr.202000049

## Cardiovascular and Nutritional Epidemiology Group

In 2020, the Cardiovascular and Nutritional Epidemiology Group led by Prof. Fernando Rodríguez-Artalejo has studied the relationship between consumption of ultra-processed food and human health in large cohorts such as Aragon Workers Health Study (AWHS) and Seniors-ENRICA-1; main results show a detrimental effect of UPF consumption on obesity and subclinical atherosclerosis. Also, researchers from this group have characterized the dose-response association between physical activity and development of cardiovascular risk factors, showing that habitually engaging in activity levels with lower amount that the usually recommended translates into reduced cardiovascular risk. This supports the common advice addressed to the general population stating that "some physical activity is better than none".

### References:

1. Sandoval-Insausti H, Jiménez-Onsurbe M, Donat-Vargas C, et al. Ultra-Processed Food Consumption Is Associated with Abdominal Obesity: A Prospective Cohort Study in Older Adults. Nutrients. 2020 Aug 7;12(8):2368. doi: 10.3390/nu12082368.

2. Montero-Salazar H, Donat-Vargas C, Moreno-Franco B, et al. High consumption of ultra-processed food may double the risk of subclinical coronary atherosclerosis: the Aragon Workers' Health Study (AWHS). BMC Med. 2020 Aug 13;18(1):235. doi: 10.1186/s12916-020-01678-8.

3. Martinez-Gomez D, Esteban-Cornejo I, Lopez-Garcia E, García-Esquinas E, Sadarangani KP, Veiga OL, Rodriguez-Artalejo F. Physical activity less than the recommended amount may prevent the onset of major biological risk factors for cardiovascular disease: a cohort study of 198919 adults. Br J Sports Med. 2020 Feb;54(4):238-244

## Collaborations within the Programme

It is worth mentioning the strong collaborations between the groups of the program. By sharing data and samples from multiple cohorts, researchers of the different groups have developed high-impact collaborative studies. They are joining efforts to deepen the knowledge of the relationship between ultra-processed food consumption and health and to unravel the biological and molecular mechanisms beyond such relationship.

programme

# Precision Nutrition and Cardiometabolic Health

## Goal and vision

The Precision Nutrition and Cardiometabolic Health programme aims to integrate nutriomic and metagenomic approaches to understand the phenotypic responses of specific nutrients and diets that trigger physiopatological pathways common to obesity, cardiovascular, metabolic, liver and cancer diseases.

The programme is focused on the analysis and implementation of new biomarkers with potential diagnostic and prognostic value, as well as on the study of the bases of the interaction between diet and genes. In this interaction, the effect of different functional foods on gene expression is sought in order to understand the molecular bases of the disease, develop therapeutic tools based on non coding-RNAs, extracellular vesicles, functional foods and design and define strategies for the implementation of precision nutrition.

Programme Director

**Dr. Alfredo Martínez**
Director of the Precision Nutrition and Cardiometabolic Health Programme

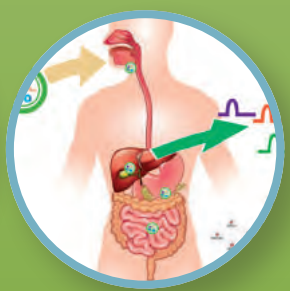
Ph.D. Nutrition being also PharmD and MD. He has addressed the topic of Personalized (and Precision) Nutrition, nutrigenetics and nutrigenomics. Among these publications are the position papers from ISNN (International Society of Nutrigenetics/Nutrigenomics). This research has been proposed as guides for the provision of personalized nutritional advice and the consolidation of knowledge in nutrigenetics and its applicability in personalized dietary advice. The integration of this knowledge allows every day a greater number of food and health professionals to offer this type of analysis for better management in nutritional prevention and treatment.

# Research groups

## Cardiometabolic Nutrition Research Group

Group Leader

**Dr. Alfredo Martínez**



## Epigenetic of Lipid Metabolism Research Group

Group Leader

**Dr. Alberto Dávalos**

## Bioactive Ingredients Food Group

Group Leader

**Dr. Francesco Visioli**

# research group

# Cardiometabolic Nutrition

## GROUP LEADER

**Dr. Alfredo Martínez**
Director of the Precision Nutrition and Cardiometabolic Health Programme.
Leader of Cardiometabolic Nutrition Research Group

Ph.D. Nutrition being also PharmD and MD

## Objetives

a) **Characterization of inter-individual response to dietary intake as a function of phenotypic and genotypic factors to provide Precision Nutrition management.**
Integration in the near future of omics data into Precision Nutrition will allow the implementation of personalized nutritional treatments to prevent and manage chronic diseases and to monitor the individual's response to novel therapeutical interventions.

b) **Establish new markers for the integration of dietary, nutritional, phenotypic and genetic data.**
These markers are derived from the analysis of large cohort databases through advanced statistical tools, such as multivariate analysis and machine learning techniques, to facilitate the evaluation of patient's metabolic dysfunctions and unhealthy conditions involved in the development of obesity and associated cardiometabolic complications.

c) **Integration of the markers obtained in clinical practice and precision nutrition.**
The definition of these markers will help the translation and transmission of information from scientific evidence in progress for its application in clinical practice of precision nutrition and to discriminate responders to a given nutritional prescription, that allows an action directed to each person through individual characterization.

d) **Define the role of chrononutrition on the individualized nutritional advice.**
Characterize the role of chrononutrition for individualized nutritional counselling. That is, how lifestyle factors such as diet or physical activity impact on intestinal microbiota composition, with possible influence in body weight homeostasis/maintenance, type 2 diabetes, cardiovascular or liver diseases.

## Projects in Focus

**NutrIMDEA study**
**Funding:** IMDEA and Finut
**Project Period:** 2020-2023
**Principal Investigator at IMDEA Food:** J. Alfredo Martinez

This study aims to analyze the information on nutritional status aimed at personalizing individualized nutritional advice, with which an improvement in life and eating habits that improve the health of participants can be achieved by reducing the risk to develop future cardiometabolic diseases. In addition, potential low-cost, easy-to-use markers can be obtained from the study results that can be applied in clinical practice for screening patients. The results of this study may be integrated into clinical services and future studies, allowing to determine the type of complementary information needed (from biochemical, metabolomic or genetic analysis) to achieve greater precision and personalization in nutritional counseling.

The aim of the present study is to determine the main characteristics for the development of a nutritional status assessment tool focused on precision nutrition. To achieve this, the objectives are:

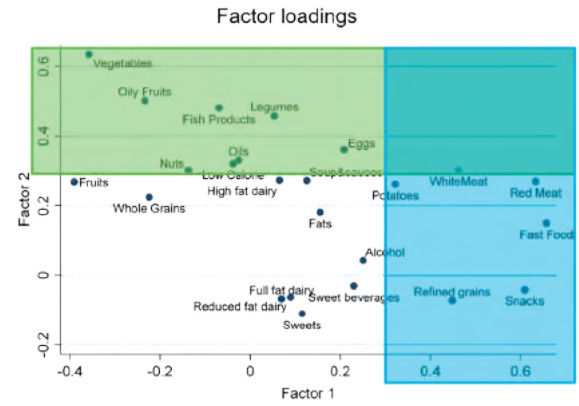
- Implementation of questionnaires that include the main markers (dietary, phenotypic and genetic) associated with nutritional status (Predictors).
- Integration of markers for the development of qualitative categorization (Nutrindex) through an index for the assessment of nutritional status and dietary patterns (Dietotype).
- Design of decision algorithms for the personalization of the nutritional advice based on the assessment of the nutritional status according to the predictors.

In this study have been performed a rationale approach based on clinical literature and evidence in scientific literature, and for weighting and prioritising tailored nutritional advice assessment required for each Nutritype cluster previously defined. The review of the current bibliography in order to select self-reported questionnaires that allow to collect sociodemographic information, anthropometric measurements, clinical and family history, lifestyle and dietary habits and the perception of healthy feeding and personal health. The information collected has been integrated into an electronic format that can be easily sent by email to be filled in on computers or electronic devices (as tablets). Simultaneously, we have designed the reports which inform the participants about the nutritional status assessment based on the information reported by the participants through the questionnaires.

A total of 15000 participants have accessed to the questionnaire available in an on line platform where the volunteers can send the survey data. All those individuals who show interest to be part of the study will be provided with an informed consent in which will be described all the procedures performed in the study. The data collected have been coded for preprocessing and subsequent analysis to determine the most important variables associated with nutritional status. First, all those questionnaires will be coded for which it is possible to obtain a score according to the indications. From these scores, association studies with phenotypic variables will be carried out to study the

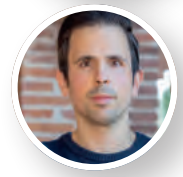
strength of association with the different indicators of nutritional status. Complementarily, sensitivity studies will be carried out with the different components of the indices to determine those elements that are capable of collecting the greatest range of variability of nutritional status (Predictors) so that they can be integrated into a new tool that covers a wider range of aspects related to cardiometabolic diseases (Nutriscore). In addition, exploratory multivariate analysis (analysis of factor or principal components) will be carried out in order to analyze the dietary patterns and profiles present in our population sample and determine the characteristics that define them (Dietotypes). These characteristics can be used to determine the decision algorithms that help classify people according to their nutritional status (Nutritype) through confirmatory analysis (through structural equation modeling «SEM»). Based on the joint integration of the Nutriscore and the Nutritype, the nutritional status of the participants can be determined and the risk of each of them can be predicted to develop some of the cardiometabolic diseases through logistic regression models that integrate all the selected variables and help to weigh the importance of each item.

From the analysis of the results of the questionnaires, a series of values associated with the presence of healthy dietary habits will be obtained. These values obtained from the nutritional screening questionnaires will present an inverse association with people´s fat markers, while the association with diet quality markers will have a positive association. Subsequently, the grouping of these factors in relation to the adherence of the different dietary patterns previously described for the Spanish population will be studied. The subsequent multivariate study of the factors that present a high discriminant value will be used to categorize our population sample according to the risk of presenting an imbalance in nutritional status. Finally, the effectiveness of the personalized nutritional advice provided will be evaluated by repeating the measures taken at the beginning of the study.




## Researchers

**Dr. Rodrigo San Cristóbal**
Postdoctoral researcher
Ph.D. in Food Science, Physiology and Health



**Dr. Iñaki Milton Laskibar**
Postdoctoral researcher
Ph.D. in Human Nutrition and Dietetics

**Dr. Victor Micó Moreno**
Postdoctoral researcher
Ph.D. in Biology

**Dr. Judit Gil Zamorano**
Technician Doctor of the laboratory
Ph.D. in Biology

# research group

# Bioactive Ingredients

## GROUP LEADER

**Dr. Francesco Visioli**
Bioactive Ingredients Food
Group Leader
Ph.D. in Biotechnology

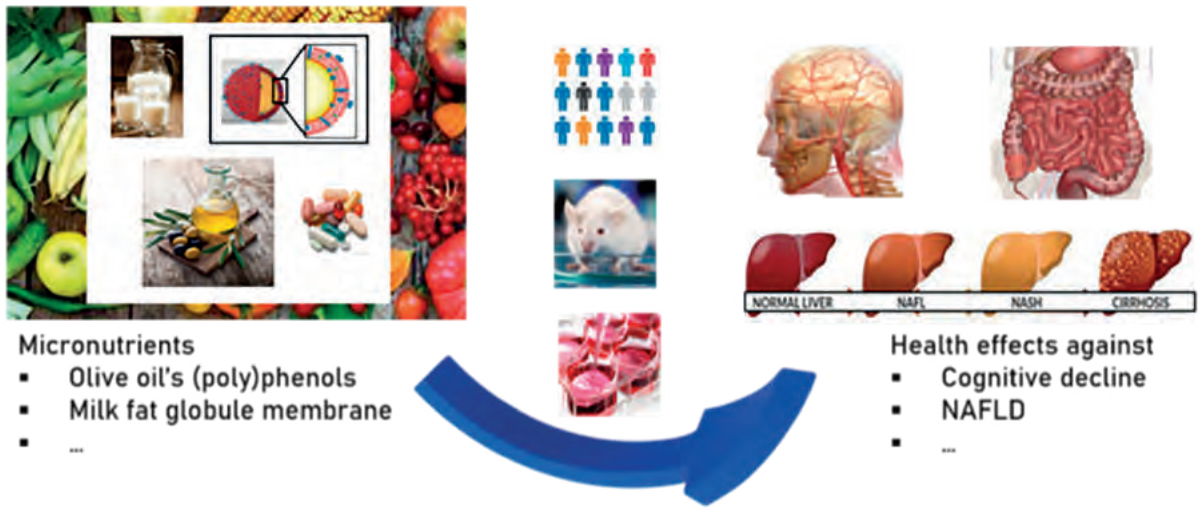
## Objetives

The group aims at developing research lines that build upon strong basic research foundations. The findings are usually validated in pre-clinical models and finally tested in human trials. In close collaboration with private companies and also applying for research funds, the group maintains a strong publication record and entertains several collaborations worldwide. The core investigation activity of the group concerns (poly)phenols, namely those of olives for which the group is renown and that often attracts the interest of media and international bodies, such as the International Olive Council. In addition, the group enjoys a close collaboration with the CIAL/CSIC, with which develops investigation on milk fat globule membranes.

- **Milk fat globule membranes and their role in slowing cognitive decline and in infant nutrition.**

- **Milk fat globule membranes and their role in the immune system** ("immunefitness"). The group is developing a functional food composed of such membranes and carotenoids, with particular focus in the gastrointestinal tract, where immunity is largely regulated.

- **Olive (poly)phenols and their actions on the cardiovascular system.** In particular, the group is studying Non-Alcoholic Fatty Liver Disease (NAFLD), whose prevalence is rapidly increasing worldwide. Its modulation by olive phenols and the search for microRNAs to be employed diagnostically are now at the forefront of the group's research.




# Projects in Focus

**Evaluation of hydroxytyrosol in nonalcoholic fatty liver disease**

**Funding:** Spanish company
**Partners:** IMDEA Food- Hospital Universitario del Tajo- Hospital Universitario Santa Cristina
**Project Period:** 2021-2022
**Principal Investigator at IMDEA Food:** Dr. João Tiago Estevão Tomé Carneiro

Nonalcoholic fatty liver disease (NAFLD) is the most prevalent liver disease in the world and, although several are under clinical evaluation, there are still no specific therapies or medications approved for its treatment. Nowadays, lifestyle changes (Mediterranean diet and physical exercise) are the only effective way to drive back the disease. Among others, therapies based on the use of anti-inflammatories and antioxidants could help to counteract NAFLD. Supplementation with hydroxytyrosol (HT), present in olive oil and with recognized beneficial health properties, such as a reduction in pro-oxidant and inflammatory status, could help reverse the progression of NAFLD, mainly in the initial stages of the disease, when its characteristic imbalances are less drastic. Taking this into account, in the following two years, a 26-week randomized clinical trial will be carried out in patients with NAFLD, with the main objective of evaluating the effect of HT on metabolic blood biomarkers and cellular oxidation and inflammation parameters.

# Researchers

**João Tiago Estevao Tomé Carneiro**
Postdoctoral researcher
Ph.D. in Integration and Modulation of Signals in Biomedicine

**Carmen Crespo Lorenzo**
Postdoctoral researcher
Ph.D. in Pharmacology and Physiology

# research group

# Epigenetic of Lipid Metabolism

## GROUP LEADER

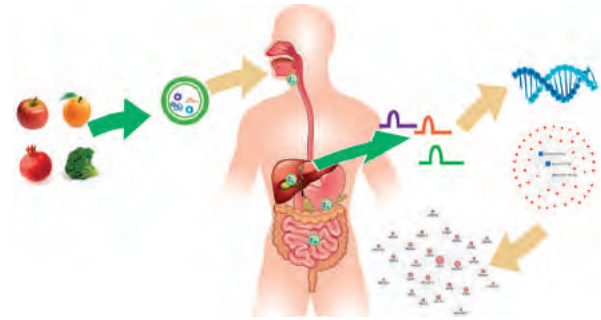
**Dr. Alberto Dávalos**
Principal investigator
Ph.D. in Pharmacy

## Objetives

- Understand how different **non-coding RNAs regulate lipid metabolism** during states of health and disease, developing new strategies, both pharmacological and dietetic, to modulate their function.
- Understand **lifestyle modification of the epigenome** in order to try to personalize the health of individuals using epigenetics for the development of Precision Nutrition.
- **Pharmacological or dietary modulation of the activity of non-coding RNAs** that, ultimately, regulate the metabolism of lipids lead to the prevention or treatment of cardiometabolic diseases.
- Understand the possible regulatory role of dietary miRNAs on **genoma modulation via cross kingdom communication**.
- **Exploit the use of extracellular vesicles**, from different fruits and vegetables, as drug delivery vehicle for miRNA-based therapy determining their biological impact in the consumer and evaluate their potential application in the transport of other bioactive compounds.
- Understand the **role of endogenous and exogenous sORFs** (micropeptides) in the gut-liver axis in the context of lipid metabolism and evaluate the impact of dietary components in their modulation.
- Understanding the molecular mechanism by which consumption of **micro and nanoplastics** via the food chain impact our genome affecting to metabolic diseases development.

# Projects in Focus

**"The journey of edible plants-derived extracellular vesicles through the mammalian body: extracellular ncRNAs as potential bioactive components of foods" (FoodVesiclerapy)**
**Funding:** Agencia Estatal de Investigación
**Partners:** IMDEA Alimentación
**Period:** 2020-2023
**Principal Investigator at IMDEA Food:** Alberto Dávalos



It is believed that plant foods may have health beneficial effects, but is it only due to bioactive compounds? Recently, various reports revealed that plant non-coding RNAs (ncRNAs) share a certain degree of similarity and exhibit perfect complementarity to mammals. Research is in progress to determine whether dietary ncRNAs act as bioactive molecules and may regulate target genes in other kingdoms (i.e. animals). However, to produce any biological effect, dietary ncRNAs must first resist the different steps of the digestion process; second, they would have to be taken up and distributed throughout the tissues until arriving at the target cell. At this point they would have to maintain the minimum dose required to regulate host gene expression and influence cell communication. The possibility of transferring ncRNAs by extracellular vesicles (EVs) would increase the probability of attaining this transference. Plants also produce EVs named exosome-like nanoparticles (ELNPs) that could transport different type of molecules including ncRNAs. Whether plant-derived ncRNAs enclosed in ELNPs could resist the harsh gastrointestinal conditions, being taken up and reach target tissues where directly modulate the gene expression will be studied in the present project.

If plant-derived ncRNAs are demonstrated to produce cross-kingdom communication, this will dramatically alter the prevalent nutrition paradigm. That is to say, they will need to be considered not only as new potentially source of bioactive components but will also have important regulatory concerns. A better understanding of the mechanism that contribute to the resistance, absorption, biodistribution and biological effects of dietary ncRNAs transported in EVs may open-up novel plant-based ncRNA therapeutic approaches.

# Researchers

**Maria-Carmen López de las Hazas Mingo**
PostDoctoral Researcher
Ph.D. in Agricultural and Food Science and Technology

**Belén Ruiz-Roso Guerra**
PostDoctoral Researcher
Ph.D. in Pharmacy

**Judit Gil Zamorano**
Staff Scientist
Ph.D. in Biology

**Diana Mantilla Escalante**
Predoctoral Student
Ph.D. in Food Science

**Lorena del Pozo Acebo**
Predoctoral Student
Ph.D. in Biology

**Luis A. Chapado**
Predoctoral Student
Ph.D. in Food Science

# Head of Research Line

## Aida Sierra

Senior reseracher and Head of Research Line of +Pec Proteomics

Ph.D. in Food Science and Technology. Her work is focused in Clinical proteomics and mass spectrometry; protein post-translational modifications and their role(s) in health and disease investigated by unbiased discovery-driven shotgun proteomics; extracellular vesicles and intracellular communication; foodomics to research on food proteomes and cryptome-derived peptides.

## Personnel

**Cristina Lorca Romero**
Predoctoral researcher.

## Objectives

- Extracellular vesicles in Health and diseases
- Circular economy and nanocarriers
- Discovery driven mass spectrometry proteomics

## Projects in Focus

**20. 2018-T1/BIO-10633 (Aid for the implementation of talent attraction contracts Modality 1)**
**Funding Entity:** Directorate General for Research and Innovation-CM
**Duration:** 01/06/2019 to 31/05/2023

## Almudena García-Ruiz

Senior researcher and Head of Research Line of human-miRNA-gut microbiota

Ph.D. in Food Science and Technology and Chemistry Engineering. My main interest is focused to research the modulation of the gut microbiota by human miRNAs, with the final goal to search and provide novel therapies to modulate the gut microbiota composition by miRNAs transported within bovine milk exosomes in order to prevent or treat human diseases associated with dysbiosis. In addition, I also investigate the identification and characterization of smORF-encoded peptides from the intestine.

## Objectives

Identification and characterization of smORF-encoded peptides (peptidomics, RNA-Seq, Ribo-Seq, CRISPR-Cas9) that regulate lipid metabolism in the axis intestine-liver in response to dietary excess. Modulation of the gut microbiota composition by human miRNAs. Encapsulation of human miRNAs in dietary exo-somes.

## Project in focus

**"Regulation of gut microbiota through the transfer of host and dietary miRNAs: dietary exosomes and exosome mimetics (miRBiota)" RTI2018-093873-A100**

**"Small open reading frames (smORF) as novel modulators of disorders of dietary excess" H2020-MSCA-IF-2016, proposal number 746435**

# Visiting Scientist

**Prof. Wilza A. F. Peres**
Universidade Federal do Rio de Janeiro. Departament of Nutrition and Dietetics. October 2020-January 2021. She is specialist on Clinical Nutrition and NAFLD

# Scientific Highlights

This year, the work of the different groups of the Precision Nutrition and Cardiometabolic Health Program has been reflected in a number of contributions:

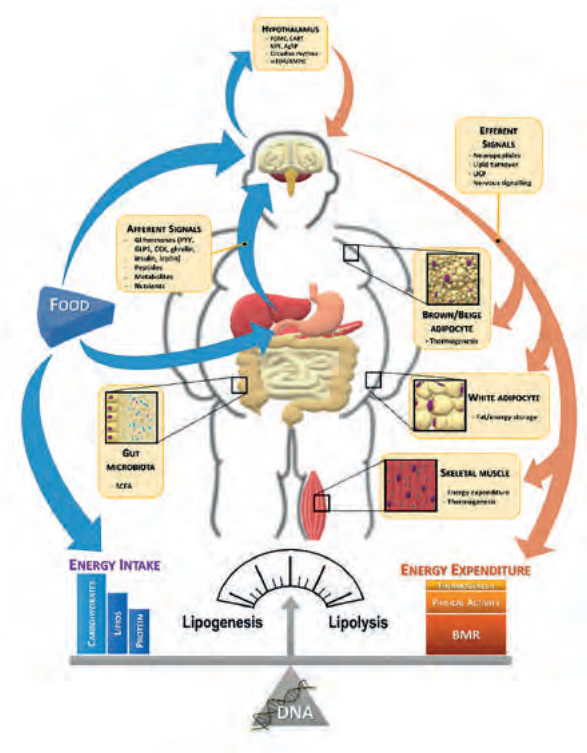
The **Cardiometabolic Nutrition Group**, led by Prof. Dr. Alfredo Martínez has contributed to the update of the reference nutritional recommendations for the Spanish population, participating in the desing of the Report of the Agency's Scientific Committee Spanish Food Safety and Nutrition (AESAN) to update the Reference Nutritional Intakes.

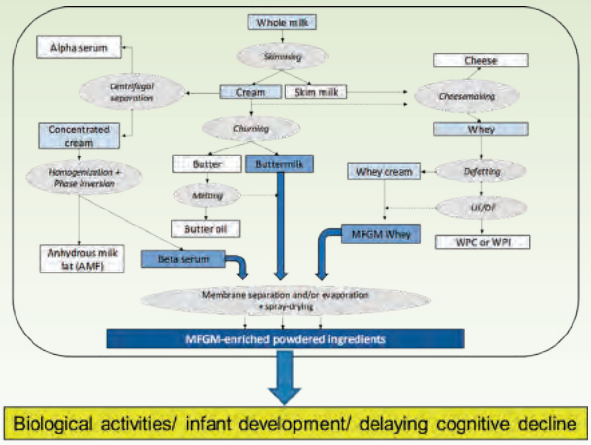
In this line, the group has published a complete revision that summarize the current research concerning associations between the intake of different macronutrients and weight gain and adiposity. They discuss insights into possible differential mechanistic pathways where macronutrients might act on either appetite or adipogenesis to cause weight gain. They also explore the role of dietary macronutrient distribution on thermogenesis or energy expenditure for weight loss and maintenance. Based on the data analyzed, they described a novel way to manage excessive body weight; namely, prescribing personalized diets with different macronutrient compositions according to the individual's genotype and/or enterotype. In this context, the interplay of macronutrient consumption with obesity incidence involves mechanisms that affect appetite, thermogenesis and metabolism, and the outcomes of these mechanisms are altered by an individual's genotype and microbiota. Indeed, the interactions of the genetic make-up and/or microbiota features of a person with specific macronutrient intakes or dietary pattern consumption help to explain individualized responses to macronutrients and food patterns, which might represent key factors for comprehensive precision nutrition recommendations and personalized obesity management.

## Key points

- Body weight and adiposity rely on energy equilibrium driven by energy-yielding macronutrient intake and energy expenditure under strict neuroendocrine control.
- Complex energy homeostasis interactions between carbohydrates, lipids and proteins (dietary quantity and quality) follow the interpretation of their separate roles on fuel metabolism.
- The intake of simple sugars and some saturated fatty acids has adverse effects on body adiposity, while protein and fiber consumption seem to beneficially modulate satiety and energy metabolism-related processes.
- Personal genetic background and gut microbiota features contribute to explaining some metabolic inter-individual differences to macronutrient consumption.
- Advances in understanding metabolism pathways and hormonal control depending on macronutrient intake involved in energy utilization are needed for precision and public health nutrition.

**The Bioactive Ingredients group** published approximately 20 papers in International journals and gave invited talks in several meetings and summer schools, e.g. the one of the Universidad del País Vasco. The group co-developed the EIT Food course "Nutrition, Health, ad Sustainability". This course has been designed with and for medical students (undergrad or higher), and has been produced by the University of Reading, the University of Torino, the University of Hohenheim, the University of Groningen, IMDEA Food Institute and the Spanish National Research Council (CSIC), in collaboration with experts from the EAT-Lancet Commission and the International Federation of Medical Students Associations (IFMSA).




**The Epigenetics of Lipid Metabolism group**'s research has resulted in numerous contributions to aid in the understanding of the molecular basis regulating the modification of gene expression by dietary components.

Among them, we can highlight, in association with the Bioactive Ingredients group of Dr. Francesco Visioli, a compendium about olive oil consumption in the world and its possible adverse effects. Olive oil is the main source of fat in the Mediterranean diet, which is inversely associated with the prevalence of obesity and cardiometabolic disorders. Although foods rich in monounsaturated fatty acids, such as olive oil, are healthier than foods rich in unsaturated and trans fats, their immoderate use can have adverse effects on health. They have compiled information on the typical use of olive oil, its components, the factors influencing its composition as well as potential adverse effects in both animal models and humans, of olive oil and its main components (oleic acid and hydroxytyrosol).

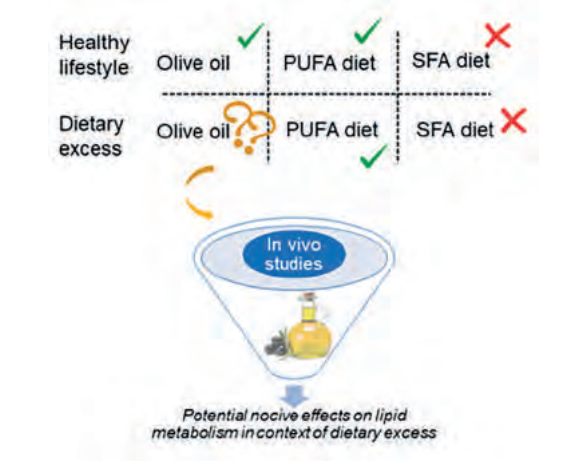
In conclusion, detrimental effects of excessive olive oil consumption on lipid metabolism are mostly out-weighed by the numerous health benefits of olive oil. However, in the context of postprandial lipemia (especially in individuals with dyslipidemia or diabetes) is a cardiovascular risk factor and has been reported following olive oil con-

## Reference

San-Cristobal, R., Navas-Carretero, S., Martínez-González, M. et al. Contribution of macronutrients to obesity: implications for precision nutrition. Nat Rev Endocrinol 16, 305–320 (2020). https://doi.org/10.1038/s41574-020-0346-8

Finally, the group is finalizing the AGL 2017-87884 project that yielded important publications and applied to another MINECO project titled "Impact of milk fat globule membrane-enriched supplement on health in both in vitro and in vivo trials and its potential mechanisms of action", in collaboration with CIAL/CSIC.

sumption. Thus, while extra virgin olive oil is healthful and should be used preferentially within the context of a balanced diet, excessive consumption should be avoided.

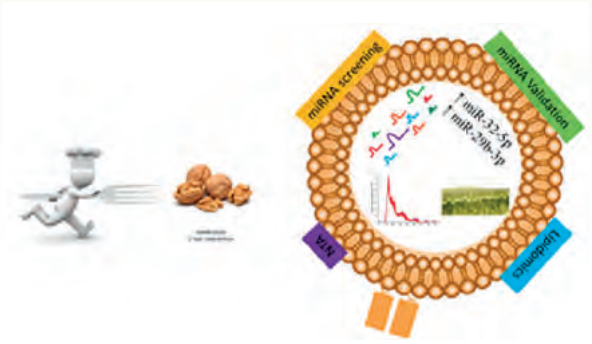



## Reference

Tomé-Carneiro J, Crespo MC, López de Las Hazas MC, Visioli F, Dávalos A. Olive oil consumption and its repercussions on lipid metabolism. Nutr Rev. 2020 Nov 1;78(11):952-968. doi: 10.1093/nutrit/nuaa014. PMID: 32299100.

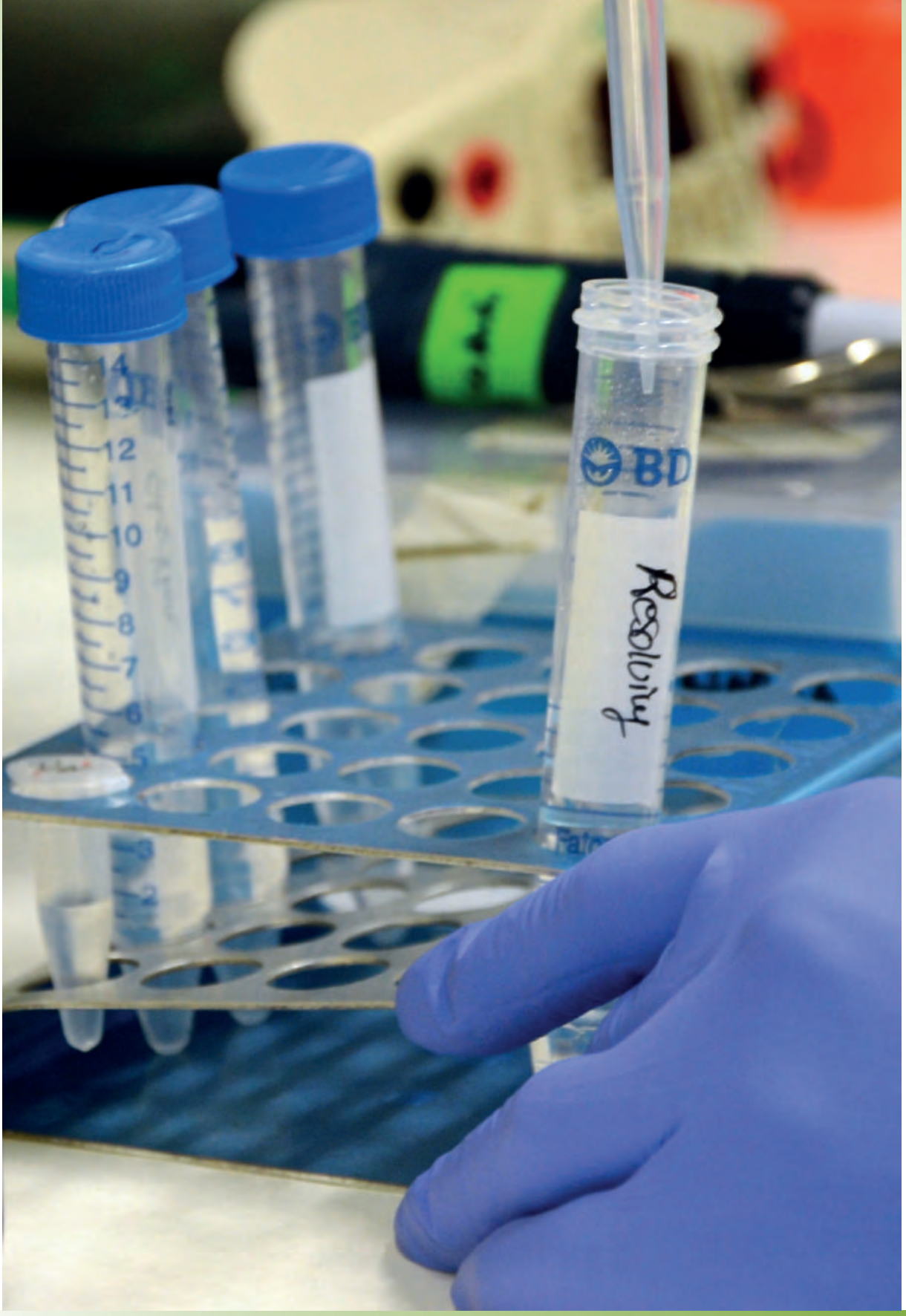
Another work, carried out in the framework of the Walnuts And Healthy Aging (WAHA) study, reflects the objectives of the group and highlights its interest in the search for the molecular mechanisms that regulate gene expression in relation to different components of the diet. Their knowledge of microRNAs as posttranscriptional modulators of gene expression and exosomes that mediate intercellular communication has led them to determine whether walnut consumption modulates circulating miRNAs (c-miRNAs) transported in these extracellular vesicles.

C-miRNAs were selected and validated in a cohort of healthy elderly subjects randomized to either control (n = 110, abstaining from walnuts) or daily supplementation with walnuts (15% of their total energy, ≈30–60 g/day, n = 101) for 1-year. They found that hsa-miR-32-5p and hsa-miR-29b-3p exosomes were consistently induced by walnut consumption, providing evidence for the effect of food in modulating gene expression by epigenetic mechanisms. Thus, this work contributes to this concept and opens new perspectives for understanding the regulatory mechanisms.




## Reference

López de Las Hazas MC, Gil-Zamorano J, Cofán M, Mantilla-Escalante DC, Garcia-Ruiz A, Del Pozo-Acebo L, Pastor O, Yañez-Mo M, Mazzeo C, Serra-Mir M, Doménech M, Valls-Pedret C, Rajaram S, Sabaté J, Ros E, Sala-Vila A, Dávalos A. One-year dietary supplementation with walnuts modifies exosomal miRNA in elderly subjects. Eur J Nutr. 2020 Sep 26. doi: 10.1007/s00394-020-02390-2. Epub ahead of print. PMID: 32979076.


BD

programme

# Childhood Precision Nutrition

## Goal and vision

Our goal is to understand, prevent and treat the different causes of childhood obesity. Childhood obesity is an important problem in developed countries, as not only will many of these children be obese adults, but the comorbidities associated with this disease can develop at an earlier age and thus be a more chronic burden not only on the person's health but also on the healthcare system. Understanding all aspects of obesity and the acceptance that obese children are not small obese adults, is of utmost importance in order to curtail this epidemic; however, it is now clear that the underlying cause is heterogeneous and that we should speak of "obesities" instead of "obesity" and that effective treatment will also differ depending on etiology. This research programme focuses on the integral understanding of children with obesity on a clinical, genetic, epigenetic, biochemical, metabolomic, and inflammatory basis in order to focus treatment protocols and to reduce the risk of future comorbidities.

# Programme Directors

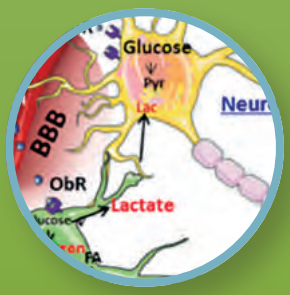
**Dra. Julie Chowen**
Co-Director of the Childhood Precision Nutrition Programme. Senior Investigator, Foundation for Biomedical Investigation Hospital Infantil Niño Jesús

Ph.D. in Physiology and Biophysics. Her work is focused in Neuroendocrine control of metabolism, Glial cell in metabolic control, Early nutritional and hormonal effects on long-term metabolism.

**Dr. Jesús Argente**
Co-Director of the Childhood Precision Nutrition Programme. Full Professor, Autonomous University of Madrid, Director of Pediatrics and Director of Endocrinology, Hospital Infantil Universitario Niño Jesús, Madrid. Head of Group in the Spanish Network for the study of obesity and nutrition (CIBEROBN).

Ph.D in Medicine. His work is focused in Childhood obesity, the control of pubertal onset, growth abnormalities and eating disorders.

# Research groups




## Childhood Obesity Research Group

### Group Leader

**Dr. Julie Chowen**
**Dr. Jesús Argente**

# research group

# Childhood Obesity

## GROUP LEADER

**Dr. Julie Chowen**
Co-Director of the Childhood Precision Nutrition Programme. Senior Investigator, Foundation for Biomedical Investigation Hospital Infantil Niño Jesús

Ph.D. in Physiology and Biophysics

**Dr. Jesús Argente**
Co-Director of the Childhood Precision Nutrition Programme. Full Professor, Autonomous University of Madrid, Director of Pediatrics and Director of Endocrinology, Hospital Infantil Universitario Niño Jesús, Madrid. Head of Group in the Spanish Network for the study of obesity and nutrition (CIBEROBN).

Ph.D in Medicine

## Objetives

- To study the molecular basis of childhood obesity and its comorbidities in order to promote precision therapies, including nutritional approaches and new treatments for monogenic obesity.
- To investigate the interaction between epigenetics, genetics, genomics and diet, both quantity and quality, and their influence on long-term health outcomes.
- To understand the effects of early nutrition and hormonal changes on long-term metabolic health and how the brain, especially glial cells, responds to specific nutrients that affect metabolism and neuroinflammation.

# Projects in Focus

**National Network for the study of Obesity and Nutrition (CIBERobn)**
**Principal Investigator:** Jesús Argente; **CoPrincipal Investigator:** Julie Chowen
**Funding Agency:** Fondo Investigación Sanitaria, Instituto Carlos III
**Period:** 2006 - present
**Project number:** CB06/03/0022

**Project title: Cross-talk between hypothalamic astrocytes and perivascular adipose tissue in metabolism and cardiovascular function: Impact of diet**
**Principal Investigator:** Julie Ann Chowen King
**Funding Agency:** Ministerio de Economía y Competitividad
**Period:** 01/01/2018 31/1-2/2021
**Project number:** BFU2017-82565-C2-1-R

**Project title: The study of newly identified regulatory factors in the GH/IGF system: Implications in human pathology, analysis of the underlying mechanisms and development of potential therapies.**
**Principal Investigator:** Jesús Argente Oliver
**Funding Agency:** Fondo Investigación Sanitaria Financiación, Instituto Carlos III
**Period:** 01/01/2017 hasta 31/12/2019
**Project number:** PI19/00166

# Scientific highlights

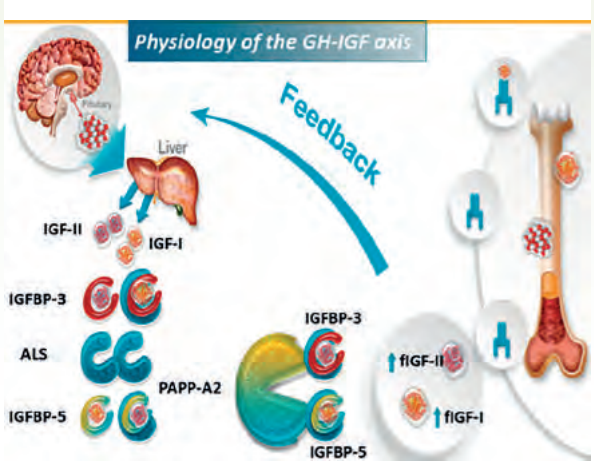
In the past few years, we have made important advances in understanding the genetics and genomics that underlie severe early onset obesity, and we are now approaching the possibility of precision treatments for specific monogenic forms of obesity.

- Efficacy and safety of setmelanotide, an MC4R agonist, in individuals with severe obesity due to LEPR or POMC deficiency: single-arm, open-label, multicentre, phase 3 trials. Clément K, van den Akker E, Argente J, Bahm A, Chung WK, Connors H, De Waele K, Farooqi IS, Gonneau-Lejeune J, Gordon G, Kohlsdorf K, Poitou C, Puder L, Swain J, Stewart M, Yuan G, Wabitsch M, Kühnen P; Setmelanotide POMC and LEPR Phase 3 Trial Investigators. Lancet Diabetes Endocrinol. 2020 Dec;8(12):960-970. doi: 10.1016/S2213-8587(20)30364-8. PMID: 33137293.

- Heterozygous rare genetic variants in non-syndromic early-onset obesity. Serra-Juhé C, Martos-Moreno GÁ, Bou de Pieri F, Flores R, Chowen JA, Pérez-Jurado LA, Argente J. Int J Obes (Lond). 2020 Apr;44(4):830-841. doi: 10.1038/s41366-019-0357-5. PMID: 30926952.

- Novel genes involved in severe early-onset obesity revealed by rare copy number and sequence variants. Serra-Juhé C, Martos-Moreno GÁ, Bou de Pieri F, Flores R, González JR, Rodríguez-Santiago B, Argente J*, Pérez-Jurado LA*. *co-corresponding authors. PLoS Genet. 2017;13(5):e1006657. doi: 10.1371/journal.pgen.1006657. PMID: 28489853.

Understanding other factors that influence the propensity to become obese, as well as the possibility of developing secondary complications associated to obesity is fundamental for implementation of preventive treatments. This is especially true in pediatric patients with obesity. We have made important advances in this area in the past 5 years.




A combination of circulating chemokines as biomarkers of obesity-induced insulin resistance at puberty.

- Rivera P, Martos-Moreno GÁ, Barrios V, Suárez J, Pavón FJ, Chowen JA, Rodríguez de Fonseca F, Argente J. Pediatr Obes. 2021;16(2):e12711. doi: 10.1111/ijpo.12711.PMID: 32856418.

- Sex, puberty, and ethnicity have a strong influence on growth and metabolic comorbidities in children and adolescents with obesity: Report on 1300 patients (the Madrid Cohort). Martos-Moreno GÁ, Martínez-Villanueva J, González-Leal R, Chowen JA, Argente J. Pediatr Obes. 2019;14(12):e12565. doi: 10.1111/ijpo.12565. PMID: 31373441.

- Metabolomics allows the discrimination of the pathophysiological relevance of hyperinsulinism in obese prepubertal children.Martos-Moreno GÁ, Mastrangelo A, Barrios V, García A, Chowen JA, Rupérez FJ, Barbas C, Argente J. Int J Obes (Lond). 2017;41(10):1473-1480. doi: 10.1038/ijo.2017.137. PMID: 28588306.

In both clinical and basic studies, we are actively studying the importance of the GH/IGF system, with a special emphasis on newly identified factors, in pathology including obesity.

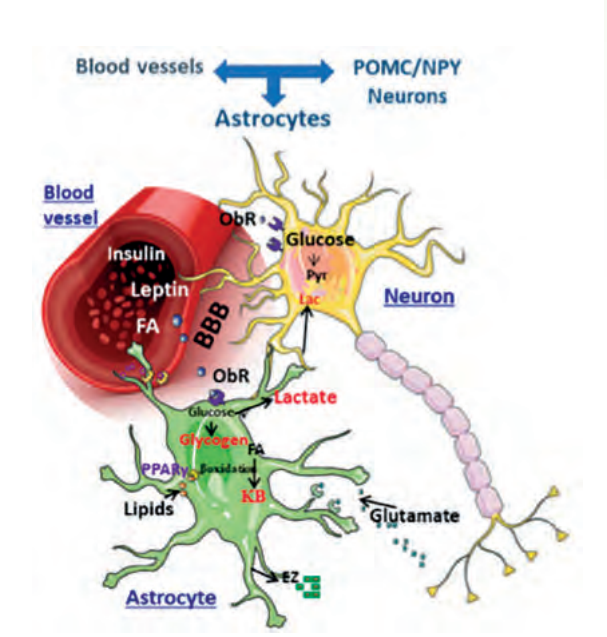
In animal models we have shown that numerous factors, including sex, maternal and neonatal dietary composition, as well as interactions between dietary phenols and fatty acid content, can influence long-term metabolic health.

- Sex Differences in Long-term Metabolic Effects of Maternal Resveratrol Intake in Adult Rat Offspring. Ros P, Díaz F, Freire-Regatillo A, Argente-Arizón P, Barrios V, Argente J, Chowen JA. Endocrinology. 2020;161(8). doi: 10.1210/endocr/bqaa090. PMID: 32502250.

- Maternal hypercaloric diet affects factors involved in lipid metabolism and the endogenous cannabinoid systems in the hypothalamus of adult offspring: sex-specific response of astrocytes to palmitic acid and anandamide. Rivera P, Guerra-Cantera S, Vargas A, Díaz F, García-Úbeda R, Tovar R, Ramírez-López MT, Argente J, de Fonseca FR, Suárez J, Chowen JA. Nutr Neurosci. 2020 Sep 21:1-14. doi: 10.1080/1028415X.2020.1821519.PMID: 32954972.

- Neurobiological characteristics underlying metabolic differences between males and females. Chowen JA, Freire-Regatillo A, Argente J. Prog Neurobiol. 2019;176:18-32. doi: 10.1016/j.pneurobio.2018.09.001. PMID: 30194984.

One of the current areas of active investigation is to understand the interactions between neurons and astrocytes in metabolic control, with a focus on communication by exosomes.



# Innovation, Communication and Education Unit

## Goal and vision

We aim to search and facilitate the transfer of knowledge generated through applied and basic research into Precision Nutrition applications, and from whose use Society and Industry can equally profit. This unit focuses on fostering and boosting innovation in the Food arena. Communication is the springboard to engage the general public to participate in the changes driving this innovation under the 2030 Agenda objectives.

This unit brings Science to both Industry and Society through 3 strategic pillars:

- Innovation & Business Creation
- Education
- Communication

IMDEA Food, in association with the Universidad Autónoma de Madrid, is a partner of EIT Food, a Knowledge and Innovation Community (KIC) established by the European Institute for Innovation & Technology (EIT), an independent EU body set up in 2008 to drive innovation and entrepreneurship across Europe. Following EIT Food functional structure, the EIT Food Innovation&Business Creation, Education and Communication Groups address and connect three of the EIT Food's pillars to develop world-class solutions to make the food system more sustainable, healthy and trusted by consumers and to catalyse food entrepreneurship and innovation.

Unit Director

**Prof. Guillermo J. Reglero Rada**
IMDEA Food Director and Director of the Innovation and Communication Unit

Ph.D. in Food Science. His work is focused in Food as a preventive and therapeutic tool for health improvement. Design, study of the activity and demonstration of effects of food products for health specific use.

# Units

## Innovation & Business Creation Group

Head of Unit

**Dr. Ana Ramírez de Molina**


## Education Group

Head of Unit

**Dr. María Jesús Latasa Sada**

## Communication Group

Head of Unit

**Sara Castillo Alonso**

unit

# Innovation & Business Creation

## HEAD OF UNIT

**Dr. Ana Ramírez de Molina**
Deputy Director of IMDEA Food. Director of the Precision Nutrition and Cancer Programme. Master contact of EIT Food for UAM-IMDEA Food

Ph.D. in Molecular Biology

## Projects in Focus

Four pillars drive the Innovation & Business Creation activities:

- Entrepreneurship projects with start-up compannies
- EIT Food innovation & business creation projects
- Industrial Ph.D. projects
- Innolink project (2018 Call for Linking Innovation Entities in Comunidad de Madrid)

### Entrepreneurship Projects with Start-up companies

**Neotec**

"INNO-FORCHRONIC". "Precision Nutritional Formulas for Immune and Inflammatory Diseases". Project coordinated by the company FORCHRONICA, with the aim of carrying out the industrial development of a product that is a vehicle for food phytochemicals, and validating in humans the preventive and/or therapeutic effects of various formulas for infectious and/or chronic diseases related to immunity and inflammation.

**Partners:** FORCHRONIC S.L
**IMDEA Food participant researchers:** Dr. Ana Ramírez de Molina and Dr. Guillermo Reglero
**Funded by:** NEOTEC Program. CDTI.
**Project Period:** 2 years (01/01/2021 – 31/12/2022)

**Health4Brain**

Precision nutrition for the maintenance and improvement of cognitive function (RTC2019-007294-1).

**Partners:** Precision FORHEALTH, S.L, Natac Biotech, S.l y Fundación IMDEA Alimentación
**IMDEA Food participant researchers:** Dr. Ana Ramírez de Molina, Dr. Carolina Maestre, Dr. Isabel Espinosa and Dr. Guillermo Reglero
**Funded by:** Spanish Ministry of Science and Innovation
**Project Period:** 3 years (01/04/2020 – 31/03/2023)

HEALTH4BRAIN is an innovative project that will develop a nutrigenetic test that will make it possible to offer precision nutrition recommendations aimed at maintaining and improving cognitive function.

The IMDEA Food Institute in collaboration with the companies PRECISION FORHEALTH, SL and NATAC BIOTECH SL make up the consortium of the HEALTH4BRAIN project that will work for three years with the aim of contributing to the personalization of the diet to improve the health and quality of life of the population, helping to maintain your cognitive function.

The project will design personalized functional foods, as well as a nutrigenetic test that will make it possible to offer personalized recommendations, based on the genetic profile of each person, which will be validated in a nutritional intervention study developed by IMDEA Food.

## EIT Food Innovation and Business Creation Projects

IMDEA Food role within EIT Food guides and accelerates the innovation process that will transform the food system. We are committed to overcoming low consumer trust, creating consumer-valued food for healthier nutrition through Precision Nutrition, building a consumer-centric connected food system and enhancing sustainability through promoting a circular Bioeconomy.

### SPIN Project

SPIN project aims to develop a nutritional supplement based on natural antiviral ingredients to support the immune system in the fight against infection by SARS-CoV-2. As part of the EIT's Crisis Response Initiative, this activity directly contributes to the European Union's response to the COVID-19 pandemic.

### MAKE-IT! An infrastructure to hack simpler and smarter food value chains 2020

This project aims to develop an infrastructure and capacity to stimulate and support innovation and entrepreneurship by designing and delivering a series of hackathons across Europe. Different stakeholders come together to find solutions to identified industry challenges in specific value chains.

## Industrial Ph.D. Projects

IMDEA Food is carrying out three projects, funded by the Madrid Regional Government through the Calls for applications for industrial doctorates in Comunidad de Madrid, to promote innovation and technology transfer to industry:

**Identificación de la actividad de compuestos activos de la Miracle Berry sobre la modulación de rutas implicadas en enfermedades crónicas no comunicables. Validación del uso de Sweetalin® en una Nutrición de Precisión efectiva en la promoción de la salud (IND2018/BIO-10097)**

### Researcher: Sonia Wagner

The project aims to add value to the nutritional products derived from the Miracle Berry (MB) by basing this value on solid scientific studies by studying the molecular pathways involved in the bioactive effects and their functional impact on the cell. The effect of MB-derived products as Novel Food will be analysed holistically using "omics" based strategies and assessed from a Precision Nutrition perspective, taking into account individual gene and genomic characteristics.

**Desarrollo y validación de formulaciones nutricionales como complementos terapéuticos en enfermedades crónicas relacionadas con la alimentación (IND2017/BMD-7857)**

### Researcher: Adrián Bouzas

The project aims to design and develop new formulas for humans, effective in the regulation of the molecular mechanisms of cellular cholesterol transport and the activation of fatty acid synthesis, fundamental routes in the development of cancer, obesity and metabolic syndrome, to achieve high added value food products, highly effective as nutritional supplements aimed at improving the treatment of these diseases.

**Identificación del efecto molecular de extractos de plantas para el desarrollo de nutraceuticos eficaces en nutrición de precisión frente en la prevención y el tratamiento del envejecimiento y sus enfermedades crónicas asociadas (IND2017/BIO-7826)**

### Researcher: Marina Reguero

Study of plant extracts in precision nutrition, within the field of metabolic nutrigenomics. Different phytochemicals effective in the treatment and/or prevention of the ageing process and its genetic predisposition, especially related to chronic metabolic diseases such as obesity, have been precisely selected. The main objective is to analyse the modulation of specific molecular targets to improve the population's metabolic profile.

## Innolink Project

InnoLink 012018/INNOLINK5352 | Comunidad de Madrid | FEDER Fondo Europeo de Desarrollo Regional UNIÓN EUROPEA "Una manera de hacer Europa"

This initiative is part of the framework of Linking Entities in Innovation promoted by Comunidad de Madrid. Its goal is to potentiate and energise the Food ecosystem within the Madrid region by facilitating the necessary networking capabilities IMDEA Food holds through its participation in the EIT Food consortium. The project allows the involvement of the food sector from the Madrid region in different activities developed under the umbrella of EIT Food to push the internalisation of this ecosystem and, at the same time, attract innovative talent to generate new businesses based on technological innovation. Our vision is to develop a transversal technology platform of precision nutrition innovation risen from sound scientific research. This platform will promote collaboration among the various stakeholders from the food, precision nutrition, and health sectors and constitute a node to collate the knowledge, stakeholders, and technology implicated in the advancement of translational research in the precision nutrition arena. This node will function as a tractor for innovation within a consolidated food ecosystem, give support to technology-based newly generated businesses on Precision Nutrition, and attract genetics and health-related industries interested in partaking in the nutrition field.

unit

# Education

## HEAD OF UNIT

**Dr. María Jesús Latasa Sada**
Head of Education Programmes EIT Food UAM-IMDEA Food

Ph.D. in Pharmacy, Biochemistry and Molecular Biology. Her work is focused in The effect of diet on the regulation of microRNAs and other non-coding RNAs expression. Development of R&D&I activities to promote Innovation around nutrigenomics and nutrigenetics to implement Precision Nutrition – based strategies. Management and implementation of educational activities around Food Innovation through international and national programmes.

IMDEA Food is greatly involved in many education activities, promoting and implementing different programmes along with various EIT Food partners. These programmes are aimed at current and future students as well as professionals either wanting to work or already working in the food sector. They are designed together with industry professionals and entrepreneurs to offer:

- **career development** by taking part in a range of courses for professional development to keep up-to-date and develop new skills.
- **global challenges solving skills** by co-creating new solutions to transform the food system and have real impact in the world.
- **business creation and growth** with our courses for entrepreneurs and SME owners, helping you to transform towards a more sustainable future.
- **learning** by joining one of our online courses about the food system and how future trends will change how we produce and consume food.

## Projects in Focus

### Food Systems Master of Science Programme (MFS)

Participants will develop in-depth knowledge about food systems through studying consecutively at three distinct European academic institutions and use their knowledge to drive the future transformation of the food system. The programme is based on a combination of essential entrepreneurial skills, which helps participants to become an effective innovator, and key technical skills that are tailored to their career ambition in the sector.

### Global Food Venture Programme (GFVP)

EIT Food's flagship Global Food Venture programme is a dedicated offering to Doctoral Students across Europe working on food system challenges, offering a 6-month curriculum designed to address the needs of aspiring entrepreneurs and early phase start-up ventures from Ph.D. students.

### European Food Systems Education and Training (EFSET)

This programme addresses the increasingly challenging array of food-related problems, such as food waste or malnutrition. Through multidisciplinary and collaborative approaches that simultaneously target different parts of the food system, the course gives postgraduate students the confidence and skills necessary to bring about positive change. EFSET provides students at European universities unique and exciting opportunities to address real-world Food System Challenges set by industry partners.

### WE Lead Food

This programme is creating a network of women leaders who wish to drive change, innovation and sustainability within the food sector as we face supply chain challenges. The WE Lead Food Programme is designed to equip the participants with the tools to make that difference and achieve results. The network is open to all discipline backgrounds; research, business, policy, civil society members.

### WeValueFood (WVF)

This activity aims to educate, engage and advance the young Europeans' knowledge of and appreciation of food, thereby empowering the next generations to make the best choices about the food that they eat. #WeValueFood engages with students from primary, secondary and tertiary education all over Europe, as well as parents, educators, and representatives from the European agri-food industry.

### Human Capital – XKIC

Supported by the European Institute of Technology (EIT), the Human Capital project, which focuses on innovation in education and on digital skills and competencies, is an EU-wide effort to build bridges between research communities in climate, energy, food, health, manufacturing, raw materials, urban mobility and digital technologies. IMDEA Food specifically participates in the WP4 Consumer & Customer Engagement (Healthy Citizen and Consumer Engagement) developing and implementing new digital educational and engaging tools to divulge healthy food habits.

### Open call for online courses: "Revolutionising the Food Chain with Technology" (MOOC)

This course helps to discover how innovative technologies could revolutionise the food sector. As food quality and safety are increasingly under threat as natural resources are stretched by climate change, hunger, and explosive population growth, in this course the participants will learn how the food sector can respond to these challenges by adopting innovative tech. They will discover how data-enabled technologies are becoming more accessible and affordable, driving a revolution in how the food business operates.

### Open call for online courses: "Nutrition: Health and Sustainability" (SPOC)

This course has been developed for medical students or people working in health and wellbeing sector to explore the relationship between nutrition, health and sustainability and understand how healthy eating can prevent disease.

unit

# Communication

## HEAD OF UNIT

**Sara Castillo Alonso**
Head of Communication Programmes EIT Food UAM-IMDEA Food

Bachelor Degree in Economics. Her work is focused in Dissemination activities and communication projects linked to research, education, innovation and business creation programmes. Development of international and national projects, to disseminate scientific and innovation results around Precision Nutrition. Encouraging the promotion of a healthier and sustainable Nutrition to improve the well-being of society.

IMDEA Food aims to disseminate the Institute research results, leading to changes in society's behaviour and attitudes towards a healthier and more sustainable food system. There is a low flow of information among scientists, industry and end-users, which delays knowledge transfer, and prevents citizens from partaking in the creative process driving innovation. The communication group aims to catalyse the interaction between the IMDEA Food research community and relevant stakeholders.

The Institute, along with EIT Food vision, is building an inclusive and innovative community where the consumer can be actively involved. Together, we can deliver an innovative food sector that produces healthy and sustainable food and is trusted by society. All the communication activities are designed to engage with people to become agents of change in the food system.

## Projects in Focus

### The #AnnualFoodAgenda

IMDEA Food participated as a partner in the different international consortia for several EIT Food projects, but for #AnnualFoodAgenda, IMDEA Food has acted as the leading partner, coordinating the various events that took place during the implementation of this Communication activity.

# The AnnualFoodAgenda encourages consumers to think about the food they eat, increasing their knowledge of the entire value chain and linking healthy diets to an active and healthy lifestyle, as well as to a healthier planet.

The project encompasses a series of interactive events, which provide a space to explore food topics with large numbers of people across Europe. Events taking place include interactive exhibitions, scientific cafes and hands-on

activities and are designed to inspire debate and foster dialogue between experts and consumers.

This project was developed in 4 countries simultaneously, designing, planning and implementing quarterly events. Every quarter the events shared a common general topic, such as Healthier Nutrition, Food Sustainability, Food Trends and Future Consumers and Trusting in Food, amounting to a total of 33 events developed during 2020.

### The #FutureKitchen Virtual Reality and EatingHealthy Video Infotainment Series 2020

The project engages especially young generations in a conversation about food tech by making them (for example via Virtual Reality videos), an on-site viewer of how food science, technology and innovation can advance sustainability. They can learn about the food journey from farm/marine to fork, eating healthy, cooking and food sector innovations that will shape the future of our food. The videos aim to make them curious, reflect on our food systems or even consider careers in food tech.

In 2020, the series emphasised health and nutrition, robotics, personalised diets, food mindfulness, alternative foods and proteins and food processing.

All videos were developed in a co-creation process, together with academia, start-ups, and industry partners to create honest and impactful food stories.

### Curating Citizen Engagement: Food solutions for future generations

The Curating Citizen Engagement project is an innovative way of solving grand societal challenges by creating a platform for massive public involvement and knowledge generation, specifically targeting food-related issues.

Through a training developed by partners representing different aspects of the food ecosystem (from sensory perception to nutrition to food policy), the project educates the next generation of students to be able to engage and involve the public in tackling food-related societal challenges. The participants learn iterative prototyping skills in order to create museum installations with built-in data collection points, that will engage the public and assist in shaping future food solutions. Thus, citizens are not only provided with knowledge on food related topics, but are empowered and encouraged to actively use it, leading to more trust in the food sector in general.

# Innovation, Communication and Education Unit

## Personnel

**Lorena Carrillo**
Comunication Programs Manager EIT Food UAM-IMDEA Food

**Carolina Rodríguez**
Innovation and Communication Coordinator of INNOLINK Project

**Dr. Carolina Maestre**
Postdoctoral Researcher
Ph.D. in Biology

**Sonia Wagner**
Predoctoral researcher Industrial doctorate project

**Marina Reguero**
Predoctoral researcher Industrial doctorate project

**Adrián Bouzas**
Predoctoral researcher Industrial doctorate project

**Manuela Fuentes**
EIT Food Financial Officer

# Highlight

Where does our food come from? How does food affect our health? And our planet? Knowing the answers to these questions is crucial to overcome the major problems our society is facing today in terms of obesity, food waste and the impact of our food system on the environment. WeValueFood is an Education project funded by EIT Food which aim is to engage and empower the next generation of European consumers to make improved food choices. Led by QUB, WeValueFood implemented three distinctive activities to engage the younger generations via three different approaches.

In Iceland, project partner Matís designed the Krakkar Kokka (Kids Cooking) programme, through which primary and lower secondary school children learned about the United Nations's global goals, food traditions, local resources and sustainability through play and education. This 'infotainment' method aims to increase children's knowledge about regional food production and raise their awareness of responsible consumption behaviour and sustainable production methods. As part of this programme, children went on field trips to primary food producers in the area and gathered raw ingredients in the wild. Afterwards, they learned how to cook these ingredients and had a chance to eat what they prepared. These trips were documented so children all over the country could learn from them. For this purpose, children themselves were involved in making the videos, with the help of their teachers.

Partners from Finland and Poland, University of Helsinki and University of Warsaw, introduced the Finnish food educational tool called "Trip to the store" into schools. This initiative aimed to increase the interest and understanding of third-fifth grade pupils regarding food. Children were educated about the origin of food and healthy eating. The idea was that by raising young people's interest in food, their awareness and appreciation of food also increased. Due to the ongoing COVID-19 pandemic, trips to the stores were conducted virtually. Via a remote connection, children had the opportunity to speak to a store manager and to go online grocery shopping. By doing this, they have learned where the products in a store come from, which bread is the richest in fibre and which food products are domestically produced. Besides the store visits, children also visited a goat farm and enjoyed an online chat with a farmer.

British and Spanish partners chose to implement a peer-to-peer communication approach, where young food-savvy consumers, called Food Champions, were recruited to inspire their peers through sharing food-related knowledge on social media and school networks. In this way, the Food Champions contribute to a society that is more knowledgeable and discerning about the origin of food and how it affects our health and planet. At Queen's University Belfast, a group of students who were already highly engaged with food matters, received training and support from

highlight

communication experts on how to share evidence-based information, to amplify their voice online, and to engage with followers. The students communicated the value of food through social media and peer-to-peer activities, empowering their existing networks to make healthy lifestyle choices. Another group of students, more disengaged with food issues, participated in a parallel programme aimed to develop their food skills. Through online workshops and cooking classes, students learned about topics such as food waste, food labels, and food safety.

In Spain, IMDEA Food and the Food Science department of the Universidad Autónoma de Madrid (UAM), fostered a network of Food Champions. These Food Champions included food and science graduates, and they were encouraged to attend online events addressing nutrition and health-related topics as well as to create their own social media channels and communicate about such topics. The Food Champions were inspired to build a meaningful connection with their audience, combining a flair for communication with a robust background in food and health science. The Spanish Food Champions Madres Científicas, CocinaCorreCome, beFEEDus, Fermentilandia even made a video to introduce themselves and their social media channels, the reason why they decided to join the WeValueFood project, and their project activities. The online Final Gala of the programme included a "Master Chef"-like activity and a beer-tasting session led by Basque Culinary Center.

# GENYAL Platform of Clinical Trials in Nutrition and Health

## Platform Director

**Dr. Ana Ramírez de Molina**
Deputy Director of IMDEA Food

Ph.D. in Molecular Biology

## Goal and vision

The Platform for Clinical Trials in Nutrition and Health (GENYAL) constitutes a high-level scientific tool to assess the biological activity and health properties of food, supplements, targeted nutritional strategies and functional foods, taking into account the specific characteristics of population subgroups. Thus, GENYAL is a specialized platform for clinical trials in Precision Nutrition.

Both observational and clinical intervention studies involving healthy subjects and those with pathologies can be performed (obesity, diabetes, dyslipidemias, celiac disease, etc.), both in adults and childhood. We investigate how individual characteristics (genetics, microbiome, physiology, etc..) interact with nutrients and food components, in order to provide specific recommendations and products to promote health.

GENYAL caters Spanish and foreign research groups and companies working on nutritional genomics and targeted nutrition, interested in:

- Nutritional intervention studies required for product development or for obtaining official approval of the nutritional and health claims made for products.

- The generation of the information needed to provide added value to new and existing products (e.g., the identification of new indications and the most appropriate target groups of population). Main activities include postprandial response to different functional food and bioavailability components studies in humans, or the determination of the effectiveness of nutritional products in health promotion taking into account specific characteristics that might condition efficacy.
- The identification of (mainly) genetic or metabolic markers involved in the response to product consumption. Analysis of the interaction among genotype-microbiota and food components.
- Targeted nutrition for specific populations, including both, health (childhood, post- menopausal period, sport performance, etc..) and disease (obesity, metabolic syndrome, dyslipemias, etc..). Nutrigenetic

# Units and lab

## Nutrition & Clinical Trials Unit

Head of Unit

**Dr. Viviana Loria**

## Nutritional Genomics & Health Unit

Head of Unit

**Dr. María Isabel Espinosa**

## Biostatistics And Bioinformatics Unit

Head of Unit

**Dr. Gonzalo Colmenarejo**

## Genyal Lab

Lab Manager

**Dr. Susana Molina**

GENYAL
PLATAFORMA DE GENÓMICA NUTRICIONAL Y ALIMENTACIÓN

unit

# Nutrition & Clinical Trials

## HEAD OF UNIT

**Dr. Viviana Loria**
Head of the Food and Clinical Trials Unit of GENYAL Platform. Nutritionist and Senior Researcher

Ph.D in Medicine and MSc in Clinical Nutrition. Her work is focused in Designing and development of clinical trials to provide strong experimental evidence between functional food components and health or disease. Designing nutrition programmes to improve or maintain the health of adult and child pop- ulation and to develop preventive tools against obesity, heart disease, or other high prevalent diseases. Study of the gen-diet interactions. Identification of prevention/intervention profiles and development of personalized nutritional recommendations.

The Nutrition and Clinical Trials Unit (Registered in the Community of Madrid with number CS13175 (13/05/2015) conducts nutritional intervention studies designed to evaluate the biological activity and health properties of functional foods/bioactive compounds and diets in humans.

This Unit designs and develop nutrition programs to improve or maintain the health of adult and child population, developing preventive tools against obesity, as well as other high prevalent diseases.

## Projects in Focus

### Childhood obesity prevention. GENYAL Study

The main objective of this study is to design and validate a machine learning-based predictive model that identifies children who would benefit most from actions aimed at reducing the risk of obesity and its complications, considering both environmental and genetic factors, and applicable at the beginning of the school stage. The nutrition education developed in the intervention's schools will be also evaluated as part of the predictive model. The study is a cluster randomized clinical trial with 5-year follow-up.

**Funding:** IMDEA Alimentación
**Partners:** Colegios Públicos Juan Zaragüeta, Fernando el Católico, Fernández Moratín, La Rioja, Concepción Arenal and Rosa Luxemburgo.
**Project Period:** 2017-2021
**Principal Investigator at IMDEA Food:** Dr. Viviana Loria

### Precision nutrition for healthy aging. NUTRIPRECISION Study

This project aims to develop new food products and technology platforms to design precise nutritional strategies with the aim of effectively preventing ailments associated with ageing, and of improving the quality and lifestyle of older demographics. AMC Innova Juice and Drinks, Iberfruta Muerza, Hijo de José Martínez Somalo, Grupo ICA, Congelados de Navarra, Galletas Gullón

and Europastry comprise the consortium of companies that unite six research centres and lead the new NUTRI-PRECISION project Funding: Programa Estratégico de Consorcios de Investigación Empresarial Nacional (CIEN), Centro para el Desarrollo Tecnológico e Industrial (CDTI). Reference number: IDI-20160734.

**Partners:** Consorcio formado por AMC Innova Juice and Drinks S.L. (empresa líder), Iberfruta Muerza, S.A., Hijo de José Martínez Somalo, S.L., Grupo ICA, S.L., Congelados de Navarra, S.A.U., Galletas Gullón, S.A. y Europastry, S.A.
**Principal Investigator at IMDEA Food:** Guillermo Reglero and Ana Ramírez de Molina
**Ref.** IDI-20160734

### POLIMICROBIO

Metabolites and gut microbiota associated with polyphenol metabolism: Metabotyping of normal-weight and obese volunteers.

**Funding:** Laboratorio de Alimentación y Salud. Grupo de Calidad, Seguridad y Bioactividad de Alimentos Vegetales; CEBAS-CSIC (Murcia).
**Partners:** CEBAS-CSIC (Murcia).
**Principal Investigator:** Juan Carlos Espín
**Principal Investigator at IMDEA Food:** Ana Ramírez de Molina

## Researchers

**Dr. Elena Aguilar Aguilar**
Postdoctoral Research and Senior Nutritionist
Ph.D. in Nutrition

**Helena Marcos Pasero**
Nutricionist and Predoctoral Researcher

unit

# Nutritional Genomics & Health

## HEAD OF UNIT

**Dr. María Isabel Espinosa**
Head of the Nutritional Genomics and Health Unit of GENYAL Platform. Senior Nutritionist

Ph.D. in Biology and Food Sciences. Her work is focused in measure and provide evidence of the effectiveness of precision nutrition strategies for health promotion.

This unit conducts studies to provide a precision approach to classical nutritional strategies, based on individual variations. The objective of this unit is to evaluate and improve precision nutrition strategies to achieve better adherence and effectiveness of nutritional treatments.

## Projects in focus

**mHealth Platform**

Analysis of the applicability for an e-health platform and the impact on the follow-up of cancer patients: a pilot study in a sample of patients with advanced non-small cell lung carcinoma.

**Funding:** ALIBIRD2020-CM. Community of Madrid and European Union Structural Funds.
**Partners:** UPM, Hospital Infanta Sofía, IMDEA Food, UAM, Hospital La Paz, CSIC
**Project Period:** 2020-2022
**Principal Investigator:** Enrique Gómez (UPM) and Dr. María Sereno (Hospital Infanta Sofía)
**Principal Investigators at IMDEA Food:** Dr. Ana Ramírez de Molina and Dr. Isabel Espinosa

**Food Nutrition Security Cloud (FNS-Cloud): Cloud solution facilitates access to food and nutrition information**

The main aim of the EU-funded FNS-Cloud project is to overcome fragmentation by federating FNS data on diet, health, and consumer behaviour as well as sustainable agriculture and the bio-economy. The implemented cloud solution will increase the exploitation of FNS knowledge and will contribute to reducing knowledge gaps that inhibit public health and agricultural policy. Furthermore, it will support the food industry in reducing development and production costs and increasing sustainable production. Ultimately, the cloud solution will facilitate informed and healthy choices by consumers.

**Funding:** H2020-EU.3.2.2.3, GRANT AGREEMENT ID: 863059.
**Project Period:** 2019-2023
**Principal Investigator:** Enrique Carrillo

**SPIN Project**

SPIN project aims to develop a nutritional supplement based on natural antiviral ingredients to support the immune system in the fight against infection by SARS-CoV-2. As part of the EIT's Crisis Response Initiative, this activity directly contributes to the European Union's response to the COVID-19 pandemic.

**Funding:** EIT Food
**Project Period:** 2020
**Principal Investigator:** Ana Ramírez de Molina

unit

# Biostatistics and Bioinformatics

## HEAD OF UNIT

**Dr. Gonzalo Colmenarejo**
Senior Biostatistician

Ph.D. in Biology; M. Sc in Biostatistics and Bioinformatics. His work is focused in Cheminformatics of food and bioactive compounds, using Statistical, Machine Learning and Deep Learning methods together with Computational Chemistry approaches and/or experimental data: structure-activity/property models, generative molecular design, virtual screening, pharmacophore building and molecular simulations. Aiming at understanding and predicting the biological effect and mechanism of action of food compounds and drugs on health and the design of novel bioactive molecules with improved efficacy and tailored functionality.

The Biostatistics & Bioinformatics Unit collaborates with the different groups in IMDEA Food and external groups in order to perform complex Bioinformatic analyses: phenotype/genotype associations, identification of biomarkers, the analysis of gene expression microarray data, RT-qPCR analysis, next-generation sequencing (NGS) data analysis, etc; as well as Biostatistical analyses: multivariate analyses, design of experiments, longitudinal analyses, survival analyses, Machine Learning and Deep Learning. In addition, their members develop their own research lines, on Artificial Intelligence in Molecular Design, and on new bioinformatics tools for Nutritional Genomics research.

## Projects in Focus

**Cheminformatics of bioactive compounds**

Cheminformatics of food and bioactive compounds, using Artificial Intelligence (Deep Learning) methods together with Computational Chemistry approaches and/or experimental data: structure-activity/property models, generative molecular design, virtual screening, pharmacophore building and molecular simulations. Aiming at understanding and predicting the biological effect and mechanism of action of food compounds on health and the design of novel bioactive molecules with improved efficacy and tailored functionality.

- Identification of mechanisms of action of bioactive compounds through computational approaches.
- Structure-activity/property modeling.
- Generative design of new molecules with improved properties or activities using Artificial Intelligence.

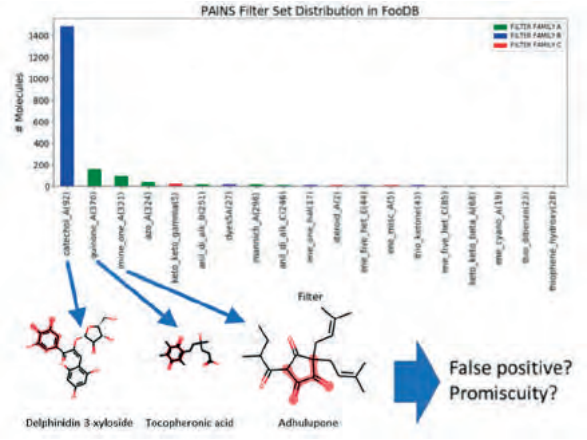



*Figure. Identification of nuisance substructures (PAINS filters) in a database of food compounds (Kaya, I.; Colmenarejo, G. Analysis of nuisance substructures and aggregators in a comprehensive database of food chemical compounds (2020) J Agricultural & Food Chem. 68, 8812–8824*

### Bioinformatics analysis of genomics data

- Computational analysis of massive gene expression data.
- Data integration for functional interpretation of omics data.
- Modelling of molecular networks to interpret associations between multi-omics data.
- Integrative analysis of nutrigenomics experiments using distinct data mining techniques.
- Development of algorithms and web-based applications for the study of molecular nutrition.

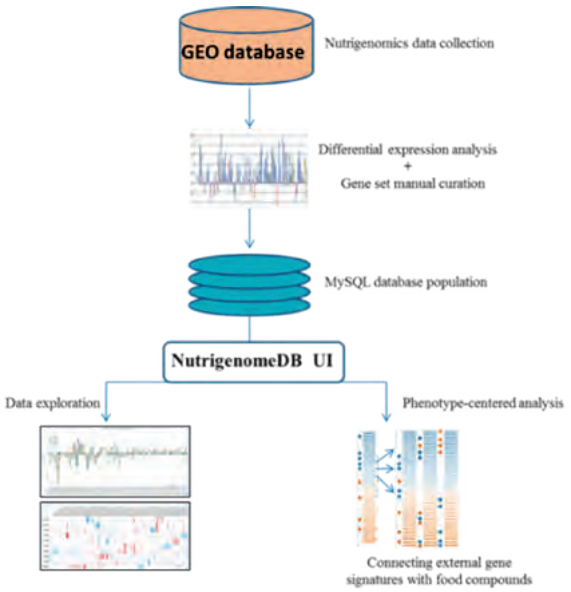
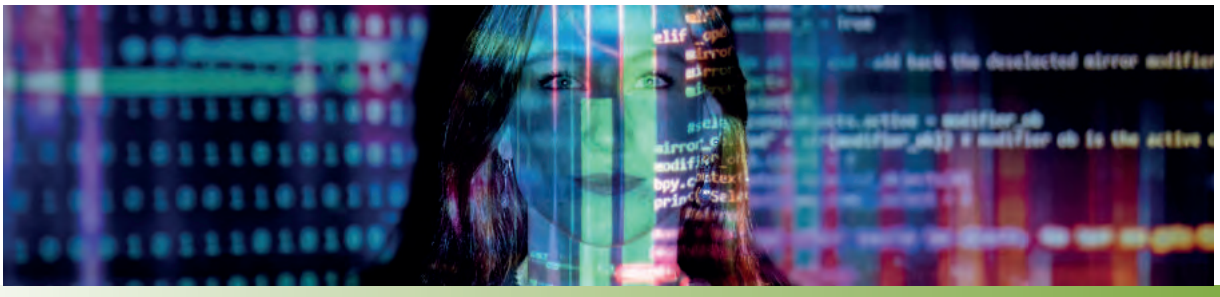



*Figure. NutrigenomeDB platform for analysis of nutrigenomic data. R. Martín-Hernández, G. Reglero, JM. Ordovás, A. Dávalos. NutriGenomeDB: a nutrigenomics exploratory and analytical platform. Database (Oxford), Volume 2019, 2019.*

## Researchers

**Dr. Roberto Martín-Hernández**
Postdoctoral Researcher and Senior Bioinformatician

Ph.D. in Nutrition Sciences



# laboratory

# GENYAL Lab

## LAB MANAGER

**Dr. Susana Molina**
LabManager and Technical Manager of the Genomics Laboratory

Ph.D. in Molecular Biology. Her work is focused in Genetics and genomics; cell biology; molecular biology.

The Genomics Laboratory (GenyalLab) provides genetic and genomic services, as well as metabolomic analysis, providing technical and scientific support to researchers and private companies. Its activities range from sample processing and nucleic acid extraction to gene expression analysis and high-throughput genotyping. It is also complemented by equipment for metabolite analysis, detection of secreted proteins or monitoring of cell metabolism, which complement the data obtained in nutrigenetics and nutrigenomics studies. This laboratory belongs to REDLAB, a network of Laboratories of the Community of Madrid with registration 440, and participates in ALIBIRD2020-CM project (S2018/BAA-4343, supported by programme call of R & D Activities among Research Groups of the Community of Madrid (Technologies 2018) and co-financed with European Union Structural Funds.

## Personnel

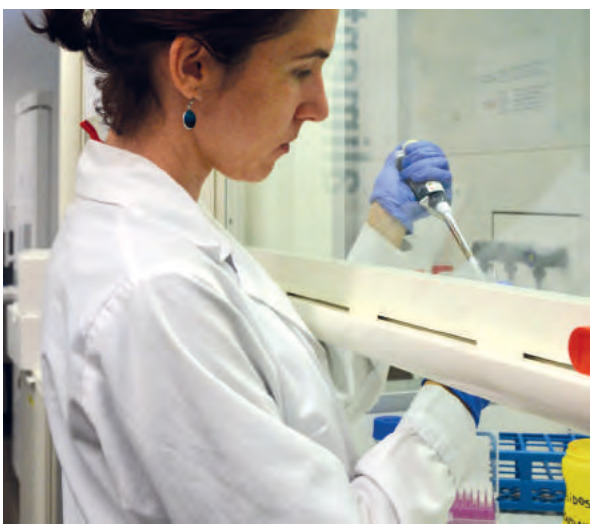
**Mónica Gómez Patiño**
Biosafety and occupational risk prevention Manager. Senior Lab Technician

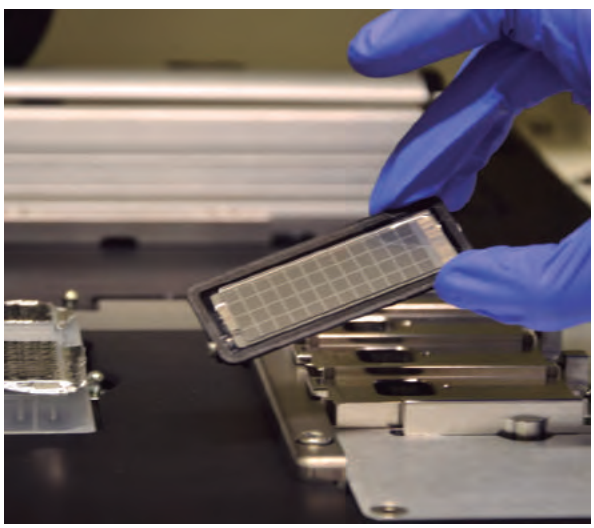
**Beatriz Martínez Blanco**
Laboratory Technician

**Dr. Carmen Crespo Lorenzo**
Postdoctoral researcher and Technician Doctor of the laboratory

Ph.D. in Pharmacology and Physiology


GENYAL





# Scientific highlights

## Precision Nutrition for preventing childhood obesity: GENYAL STUDY

GENYAL study is focused on the prevention of childhood obesity through the use of a machine learning-based predictive model that identifies children who would benefit most from actions aimed at reducing the risk of obesity and its complications, considering both environmental and genetic factors, and applicable at the beginning of the school stage. The Nutrition and Clinical Trials Unit has implemented nutritional assessments that started in 2017 following children in different schools from the Community of Madrid. In 2020, the fourth nutritional and educational interventions were carried out, gathering new information on the evolution of children's nutritional status, dietary habits, and physical activity, together with the influence of genetics as a main factor. In this sense, in collaboration with the Nutritional Genomics and Health Unit, a genetic test to determine the personal susceptibility to develop obesity has been developed and applied to this population, and saliva samples were obtained from children and processed and analyzed at GENYAL Lab. the Biostatistics and Bioinformatics Unit has applied machine learning techniques to establish predictive models for the prevention of obesity at early stages.

## Relevant Scientific Production

### Publications


- Marcos-Pasero H, Colmenarejo G, Aguilar-Aguilar E, Ramírez de Molina A, Reglero G, Loria-Kohen V. Ranking of a wide multidomain set of predictor variables of children obesity by machine learning variable importance techniques. Sci Rep. 2021 Jan 21;11(1):1910.

- Aguilar-Aguilar E, Marcos-Pasero H, Ikonomopoulou MP, Loria-Kohen V. Food Implications in Central Sensitization Syndromes. J Clin Med. 2020 Dec 19;9(12).

- Colmenarejo G. Machine Learning Models to Predict Childhood and Adolescent Obesity: A Review. Nutrients. 2020 Aug 16;12(8).

- de la Iglesia R, Espinosa-Salinas I, Lopez-Silvarrey FJ, Ramos-Alvarez JJ, Segovia JC, Colmenarejo G, Borregon-Rivilla E, Marcos-Pasero H, Aguilar-Aguilar E, Loria-Kohen V, Reglero G, Ramirez de Molina A. A Potential Endurance Algorithm Prediction in the Field of Sports Performance. Front Genet. 2020 Aug 11;11(711):711.

- Kaya I, Colmenarejo G. Analysis of Nuisance Substructures and Aggregators in a Comprehensive Database of Food Chemical Compounds. J Agric Food Chem. 2020 Aug 19;68(33):8812–24.

- Espinosa-Salinas I, San-Cristobal R, Colmenarejo G, Loria-Kohen V, Molina S, Reglero G, Ramirez de Molina A, Martines JA. Polymorphic Appetite Effects on Waist Circumference Depend on rs3749474 CLOCK Gene Variant. Nutrients. 2020 Jun;12(6):1846.

- Marcos-Pasero H, Aguilar-Aguilar E, Colmenarejo G, Ramírez de Molina A, Reglero G, Loria-Kohen V. The Q223R Polymorphism of the Leptin Receptor Gene as a Predictor of Weight Gain in Childhood Obesity and the Identification of Possible Factors Involved. Genes (Basel). 2020 May 17;11(5).

- Cortés-Martín A, Colmenarejo G, Selma MV, Espín JC. Genetic Polymorphisms, Mediterranean Diet and Microbiota-Associated Urolithin Metabotypes can Predict Obesity in Childhood-Adolescence. Sci Rep. 2020 May 12;10(1):7850.

- Moreno-Rubio J, Ponce S, Álvarez R, Olmedo ME, Falagan S, Mielgo X, Navarro F, Cruz P, Cabezón-Gutiérrez L, Aguado C, Colmenarejo G, Munóz-Fernández de Leglaria M, Enguita AB, Cebollero M, Benito A, Alemany I, del Castillo C, Ramos R, Ramírez de Molina A, Casado E, Sereno M. Clinical-pathological and molecular characterization of long-term survivors with advanced non-small cell lung cancer. Cancer Biol Med. 2020 May 15;17(2):444–57.

- Camblor Murube M, Borregon-Rivilla E, Colmenarejo G, Aguilar-Aguilar E, Martínez JA, Ramírez De Molina A, Reglero G, Loria-Kohen V. Polymorphism of CLOCK Gene rs3749474 as a Modulator of the Circadian Evening Carbohydrate Intake Impact on Nutritional Status in an Adult Sample. Nutrients. 2020 Apr 19;12(4).

- Daimiel L, Martínez-González MA, Corella D, Salas-Salvadó J, Schröder H, Vioque J, Romaguera D, Martínez JA, Wärnberg J, Lopez-Miranda J, Estruch R, Cano-Ibáñez N, Alonso-Gómez A, Tur JA, Tinahones FJ, Serra-Majem L, Micó-Pérez RM, Lapetra J, Galdón A, Pintó X, Vidal J, Micó V, Colmenarejo G, Gaforio JJ, Matía P, Ros E, Buil-Cosiales P, Vázquez-Ruiz Z, Sorlí JV, Paz Graniel I, Cuenca-Royo A, Gisbert-Sellés C, Galmes-Panades AM, Zulet MA, García-Ríos A, Díaz-López A, de la Torre R, Galilea-Zabalza I, Ordovás

JM. Physical fitness and physical activity association with cognitive function and quality of life: baseline cross-sectional analysis of the PREDIMED-Plus trial. Sci Rep. 2020 Feb 26;10(1):3472.

- Harupa A, De Las Heras L, Colmenarejo G, Lyons-Abbott S, Reers A, Caballero Hernandez I, Chung CW, Charter D , Myler PJ, Fernández-Menéndez RM, Calderón F, Palomo S, Rodríguez B, Berlanga M, Herreros-Avilés E, Staker BL, Fernández Álvaro E, Kaushansky A. Identification of Selective Inhibitors of Plasmodium N-Myristoyltransferase by High-Throughput Screening. J Med Chem. 2020 Jan 23;63(2):591–600.

- Fernandez, L.P.; Merino, M.; Colmenarejo, G.; Moreno-Rubio, J.; Sánchez-Martínez, R.; Quijada-Freire, A.; Gómez de Cedrón, M.; Reglero, G.; Casado, E.; Sereno, M.; Ramírez de Molina, A. "Metabolic Enzyme ACSL3 is a Prognostic Biomarker and correlates with Anticancer effectiveness of Statins in Non-small cell lung cancer". (2020) Molecular Oncology. 14, 3135-3152. DOI: 10.1002/1878-0261.12816.

## Featured scientific communications

- Aguilar-Aguilar E, Marcos-Pasero H, Colmenarejo G, Ramírez De Molina A, Reglero G, Loria-Kohen V. "El polimorfismo LEPR rs1137101 como indicador de riesgo de incremento ponderal a edad temprana". IV Congreso Virtual FESNAD 2020.

- Marcos-Pasero H, Aguilar-Aguilar E, Colmenarejo G, Ramírez De Molina A, Reglero G, Loria-Kohen V. "La actividad física como posible modulador de la ganancia de peso en escolares portadores del polimorfismo rs1137101 del gen LEPR". IV Congreso Virtual FESNAD 2020.

- Loria-Kohen V, Camblor Murube M, Aguilar-Aguilar E, Marcos-Pasero H, Colmenarejo G, Ramírez De Molina A, Reglero G. "Presencia del polimorfismo CLOCK rs3749474 como modulador del efecto de la ingesta vespertina de hidratos de carbono sobre el estado nutricional". IV Congreso Virtual FESNAD 2020.

- Espinosa-Salinas MI, Marcos-Pasero H, Aguilar-Aguilar E, Molina S, San-Cristóbal R, Reglero G, Ramírez De Molina A, Loria-Kohen V. "Efecto la ingesta de selenio sobre los valores de hemoglobina glicosilada en población mayor". IV Congreso Virtual FESNAD 2020.

- Kaya, I; Colmenarejo, G. Analysis of Nuisance Substructures and Aggregators in FooDB, a Comprehensive Database of Food Molecules. UK QSAR Autumn 2020 Meeting. 2020-10-15.

## Awarded Projects

### NUTRIPRECISIÓN

**Strategies for improving the quality of life of pre-senior and senior groups based on precision nutrition**

**Funding:** Fondo Europeo de Desarrollo Regional (FEDER), Consorcios de Investigación Empresarial Nacional (CIEN), gestionada por el Centro para el Desarrollo Tecnológico e Industrial (CDTI).
**Partners:** Consorcio formado por AMC Innova Juice and Drinks S.L. (empresa líder), Iberfruta Muerza, S.A., Hijo de José Martínez Somalo, S.L., Grupo ICA, S.L., Congelados de Navarra, S.A.U., Galletas Gullón, S.A. y Europastry, S.A.
**Principal Investigator at IMDEA Food:** Guillermo Reglero and Ana Ramírez de Molina
**Ref.** IDI-20160734

### POLIMICROBIO

**Metabolites and gut microbiota associated with polyphenol metabolism: Metabotyping of normal-weight and obese volunteers**

**Funding:** Laboratorio de Alimentación y Salud. Grupo de Calidad, Seguridad y Bioactividad de Alimentos Vegetales; CEBAS-CSIC (Murcia).
**Partners:** CEBAS-CSIC (Murcia).
**Principal Investigator:** Juan Carlos Espín
**Principal Investigator at IMDEA Food:** Ana Ramírez de Molina

### PREVENTOMICS

**Empowering consumers to PREVENT diet-related diseases through OMICS-based personalized nutrition**

**Funding:** Fondo Europeo Horizonte 2020, Programa Europeo de Investigación "Horizon 2020".
**Partners:** Centro tecnológico LEITAT
**Principal Investigator at IMDEA Food:** Viviana Loria-Kohen
**Ref.** DT-SFS-14-2018

### HEALTH4BRAIN

**Precision Nutrition for cognitive function improvement**

**Funding:** Proyectos de I+D+i «Retos- Colaboración» del Programa Estatal de Investigación, Desarrollo e Innovación Orientada a los Retos de la Sociedad, en el marco del Plan Estatal de Investigación Científica y Técnica y de Innovación 2017-2020. Agencia Estatal de Investigación and la Secretaría de Estado de Investigación, Desarrollo e Innovación.
**Partners:** IMDEA Food, NATAC BIOTECH S.L. Precision For-Health S.L.
**Principal Investigator at IMDEA Food:** Guillermo Reglero / Ana Ramírez de Molina
**Ref.** RTC2019-007294-1- HEALTH4BRAIN.

### ALIBIRD

**Therapeutic formulas of precision nutrition for cancer**

**Funding:** Programme call of R & D Activities among Research Groups of the Community of Madrid and European Union Structural Funds.
**Partners:** CSIC, UPM, IdiPAZ, IMDEA Food, HUIS, UAM.
**Project Period:** 2019 - 2022
**Principal Investigator at IMDEA Food:** Dr. Ana Ramírez de Molina
**Ref.** ALIBIRD2020-CM. S2018/BAA-4343

### PROBIOMIC

**Design of new cereal products with probiotics adapted to optimal infant nutrition using omics technologies**

**Partners:** EMPRESA VIDA (Food Innovation and Development Vertex, S.A.U. CDTI Programe)
**Principal Investigator:** Viviana Loria Kohen
**Period:** 2019-2020
**Ref.** IDI-20200341 VIDA

# Management Unit

## Unit Director

**Alejandro Arranz Calvo**
General Manager


# Personnel

**Inmaculada Galindo Fernández**
Programme Coordinator

**Roberto Huecas Sotelino**
Financial and Procurement Manager

**Mónica Gomez Patiño**
Head of Occupational Risk Prevention and Covid-19 Prevention Plan Manager.

**Gema Alegre Pulido**
Accounting Manager

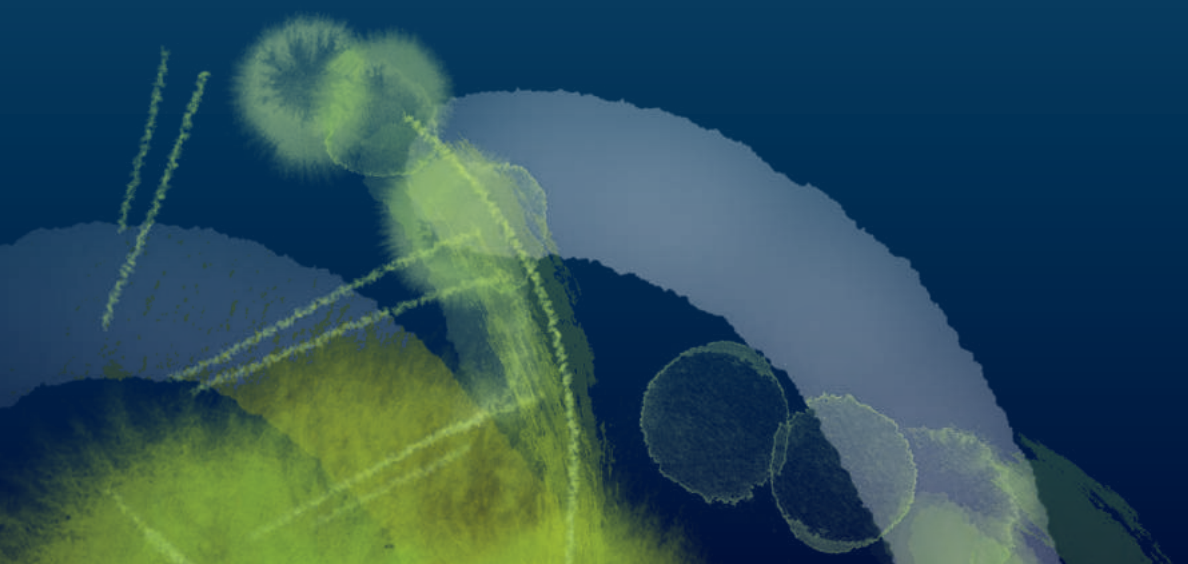
**Mar Mesas Ruiz**
R&D Project Management Technician

**Álvaro Ruiz Cuevas**
Infrastructure and Services Manager

**Leyre Castelló Soler**
R&D Talent Project Management Technician

# annex





# 1. R&D projects and contracts

## 1.1. International Projects

**Title:** COST Action CA17118 - Identifying Biomarkers Through Translational Research for Prevention and Stratification of Colorectal Cancer
**Period:** 2018 - 2022
**Funding Institution/Programme:** European Commission
**Principal Investigators:** Ana Ramírez de Molina and Marta Gomez de Cedron

**Title:** COST Action CA 16120. European Epitranscriptomics Network
**Period:** 2017 – 2021
**Funding Institution/Programme:** European Commission
**Principal Investigator:** Alberto Dávalos

**Title:** COST Action CA18131 - Statistical and machine learning techniques in human microbiome studies
**Period:** 2018 - 2022
**Funding Institution/Programme:** European Commission
**Principal Investigator:** Enrique Carrillo

**Title:** 18249-20. Food System Master of Science Program
**Period:** 2018 - 2020
**Funding Institution/Programme:** EU Framework Programme Horizon 2020. EIT Food
**Principal Investigators:** Maria Jesús Latasa Sada

**Title:** 18250-20. Global Food Venture Program
**Period:** 2019 - 2020
**Funding Institution/Programme:** EU Framework Programme Horizon 2020. EIT Food
**Principal Investigators:** Maria Jesús Latasa Sada

**Title:** 18268-20. Human Capital
**Period:** 2019 - 2020
**Funding Institution/Programme:** EU Framework Programme Horizon 2020. EIT Food
**Principal Investigators:** Maria Jesús Latasa Sada

**Title:** 19029-20. The FutureKitchen Virtual Reality and EatingHealthy Video Infotainment Series.
**Period:** 2019 - 2020
**Funding Institution/Programme:** EU Framework Programme Horizon 2020. EIT Food
**Principal Investigators:** Lorena Carrillo

**Title:** 19126-20 EFSET - European Food Systems Education and Training
**Period:** 2020
**Funding Institution/Programme:** EU Framework Programme Horizon 2020. EIT Food
**Principal Investigators:** Maria Jesús Latasa Sada

**Title:** 19152-20. IValueFood.
**Period:** 2019 - 2020
**Funding Institution/Programme:** EU Framework Programme Horizon 2020. EIT Food
**Principal Investigators:** Maria Jesús Latasa Sada

**Title:** 19169-20. The #AnnualFoodAgenda.
**Period:** 2019 - 2020
**Funding Institution/Programme:** EU Framework Programme Horizon 2020. EIT Food
**Principal Investigators:** Sara Castillo

**Title:** 19180-20 MAKE-IT! An infrastructure to hack simpler and smarter food value chains
**Period:** 2019 - 2020
**Funding Institution/Programme:** EU Framework Programme Horizon 2020. EIT Food
**Principal Investigators:** Ana Ramírez de Molina

**Title:** 19186-20 WE Lead
**Period:** 2019 - 2020
**Funding Institution/Programme:** EU Framework Programme Horizon 2020. EIT Food
**Principal Investigators:** Ana Ramírez de Molina

**Title:** 20102. Curating citizen engagement: Food solutions for future generations
**Period:** 2020
**Funding Institution/Programme:** EIT Food
**Principal Investigators:** María Jesús Latasa

**Title:** 20357 Open call for online courses
**Period:** 2020
**Funding Institution/Programme:** EU Framework Programme Horizon 2020. EIT Food
**Principal Investigators:** Maria Jesús Latasa

**Title:** 20403. SPIN: SPermidin and eugenol INtegrator for contrasting incidence of coronavirus in EU population
**Period:** 2020
**Funding Institution/Programme:** EIT Food
**Principal Investigators:** Sara Castillo

**Title:** Grant Agreement number: 863059 FNS-Cloud “Food Nutrition Security Cloud”
**Period:** 2019- 2023
**Funding Institution/Programme:** H2020-SFS-2019-1 Call. EU Research and Innovation Framework Programme. Horizon 2020.
**Principal Investigators:** Enrique Carrillo

**Title:** GAA-2020_LJMZ ESCMID Profiling host-microbiome interactions in non-responding Celiac Disease symptoms persistence.
**Period:** 2020-2021
**Funding Institution/Programme:** ESCMID Research Grants
**Principal Investigators:** Laura Judith Marcos

**Title:** CSA-Coordination and support action 43525 LifeTime Revolutionizing Healthcare by Tracking and Understanding Human Cells during Disease
**Period:** 2020
**Funding Institution/Programme:** EU Framework Programme Horizon 2020
**Principal Investigators:** Ana Ramírez de Molina and Enrique Carrillo

## 1.2. National R&D Projects

**Title:** AGL2017-90623-REDT Precision nutrition and physical exercise as modulators of the epigenome in pathologies of dietary excesses.
**Period:** 2018-2020
**Funding Institution/Programme:** Spanish Ministry of Science, Innovation and Universities - AGI
**Principal Investigators:** Alberto Dávalos Herrera

**Title:** PI17/00508 PREDIMED+DM: Effect of weight loss with a low-calorie Mediterranean diet and promotion of physical activity on the prevention of type 2 diabetes in people with metabolic syndrome.
**Period:** 2018-2021

**Funding Institution/Programme:** Carlos III Institute of Health (ISCIII) and co-funded by ERDF/ESF, "A way to make Europe"/"Investing in your future").
**Principal Investigators:** Lidia Daimiel Ruiz

**Title:** SAF2017-85766-R Characterising the molecular mechanisms of short-term fasting as a chemotherapy enhancer.
**Period:** 2018-2021
**Funding Institution/Programme:** Spanish Ministry of Science, Innovation and Universities - AGI
**Principal Investigators:** Pablo Fernández Marcos

**Title:** PCI2018-093009 "Study on diet-induced changes in the metelone and transcriptome to assess the impact of nutrition on cardiometabolic health".
**Period:** 2019-2021
**Funding Institution/Programme:** Spanish Ministry of Science, Innovation and Universities
**Principal Investigators:** José María Ordovás

**Title:** RTI2018-093873-A-I00 "Regulation of gut microbiota by host and dietary mirnas: dietary exosomes and mimetic exosomes".
**Period:** 2019-2021
**Funding Institution/Programme:** Spanish Ministry of Science, Innovation and Universities.
**Principal Investigators:** Almudena García Ruiz

**Title:** RTI2018-095061-B-I00 "New post-transcriptional regulators as a molecular link between diabetes, obesity and Alzheimer's disease".
**Period:** 2019-2021
**Funding Institution/Programme:** Spanish Ministry of Science, Innovation and Universities
**Principal Investigators:** Cristina Ramírez Hidalgo

**Title:** RTI2018-095569-B-I00 "Identification of methylation fingerprints associated with consumption of ultra-processed foods to prevent NCDs".
**Period:** 2019-2021
**Funding Institution/Programme:** Spanish Ministry of Science, Innovation and Universities
**Principal Investigators:** José María Ordovás

**Title:** EIN2019-103470. Food technology applications to modulate the microbiome and microbiome interference on tumour cells for the treatment of colorectal cancer.
**Period:** 2019-2021
**Funding Institution/Programme:** Spanish Ministry of Science, Innovation and Universities
**Principal Investigators:** Laura Judith Marcos

**Title:** PID2019-110183RB-C21. FORDISCOVERY "Development of precision food formulations for colon cancer treatment"
**Period:** 2019 – 2022
**Funding Institution/Programme:** Spanish Ministry of Science, Innovation and Universities
**Principal Investigators:** Ana Mª Ramírez de Molina

**Title:** PDI2019-10765RB-C22. Food4ImNut "Understanding the dynamic interaction of enhanced food formulations with immunonutritional benefits in the prevention and onset of liver dysfunction"
**Period:** 2019 - 2023
**Funding Institution/Programme:** Spanish Ministry of Science, Innovation and Universities
**Principal Investigators:** Moisés La Parra

**Title:** PID2019-109369RB-I00. FoodVesicleTherapy "The journey of edible plants-derived extracellular vesicles through the mammalian body: extracellular ncRNAs as potential bioactive components of foods"
**Period:** 2019 - 2023
**Funding Institution/Programme:** Spanish Ministry of Science, Innovation and Universities
**Principal Investigators:** Alberto Dávalos

**Title:** PID2019-106893RA-I00 ABSIMA "From Aging Biology to Sustainable Interventions: a microbiome-based approach"
**Period:** 2019 - 2024
**Funding Institution/Programme:** Spanish Ministry of Science, Innovation and Universities
**Principal Investigators:** Alberto Díaz Ruiz

**Title:** RTC2019-007294-1. HEALTH4BRAIN: Precision nutrition for the maintenance and improvement of cognitive function
**Period:** 2020-2022
**Funding Institution/Programme:** Spanish Ministry of Science, Innovation and Universities. State R&D Program Oriented to the Challenges of the Society. Collaboration Challenges Programme.
**Principal Investigators:** Ana Mª Ramírez de Molina, Isabel Espinosa and Guillermo Reglero

## 1.3. Regional Projects

**Title:** B2017/BMD-3686 CIFRA2-CM. Consortium for the study of acute renal failure: pathophysiology, novel therapies, biomarkers and experimental models.
**Period:** 2018-2021
**Funding Institution/Programme:** Department of Education and Research. Madrid Regional Government
**Principal Investigators:** Moisés Laparra Llopis

**Title:** S2018/BAA-4343 ALIBIRD2020-CM. Precision nutrition therapeutic formulations for cancer.
**Period:** 2019-2022
**Funding Institution/Programme:** General Department for Research and Innovation. Madrid Regional Government and co-funded by ERDF/ESF, "A way to make Europe"/"Investing in your future").
**Principal Investigators:** Ana Ramírez de Molina (ONCOGENOM) and Susana Molina (REDLAB 440)

**Title:** OI2018/INNOLINK-5352. Dynamisation of Madrid's food ecosystem based on innovation through the implementation and expansion of the European project EIT-Food. **Period:** 2019-2022
**Funding Institution/Programme:** General Department for Research and Innovation. Madrid Regional Government
**Principal Investigators:** Ana Ramírez de Molina

## 1.4. Privately – Funded R&D Projects

**Title:** Modulation of miRNA- and lncRNA-transporting exosomes for intercellular communication as a therapeutic tool for dyslipidaemia.
**Period:** 2017-2020
**Funding Institution/Programme:** Ramón Areces Foundation
**Principal Investigators:** Alberto Dávalos Herrera

**Title:** New bioactive products against obesity and diabetes.
**Period:** 2017-2020
**Funding Institution/Programme:** Ramón Areces Foundation
**Principal Investigators:** Pablo Fernández Marcos

**Title:** Sirtuins as biomarkers and targets in cancer: Sirt1 and Sirt3 in lung and liver carcinogenesis – SIRTBIO.
**Period:** 2018-2020
**Funding Institution/Programme:** Spanish Association against Cancer. AECC
**Principal Investigators:** Pablo Fernández Marcos

**Title:** Nutritional strategies and bioactive compounds to target lipid metabolism alterations in cancer: Platform of Patient derived Paired Organoids for Precision Nutrition.
**Period:** 2019-2022
**Funding Institution/Programme:** Ramón Areces Foundation
**Principal Investigators:** Ana Ramírez de Molina

**Title:** GLD18/00143 "Search for new biomarkers for diagnosis and stratification of NAFLD/ NASH: can circulating exosomal mirnas play a role?". Convenio VI Edición Becas Gilead a la Investigación Biomédica GLD18/00143.
**Period:** 2019-2021
**Funding Institution/Programme:** Gilead Foundation
**Principal Investigators:** Dr. Alberto Dávalos

## 1.5. R&D Contracts

**Title:** NUTRIPRECISION
**Company/Institution:** AMC INNOVA S.L.
**Principal Investigators:** Guillermo Reglero Rada y Ana Ramírez de Molina.
**Period:** 2017-2020

**Title:** NUTRIPRECISION
**Company/Institution:** GALLETAS GULLÓN S.A.
**Principal Investigators:** Guillermo Reglero Rada.
**Period:** 2017-2020

**Title:** PROBIOMIC IDI-20200341 VIDA.
**Company/Institution:** Vertice de Innovación y Desar. De Alimentos, S.A.U. Vida (Food Innovation and Development Vertex, S.A.U. CDTI Programe)
**Principal Investigator:** Viviana Loria Kohen
**Period:** 2019-2020

**Title:** ANSTAXANTIHIN (BGG)
**Company/Institution:** BGG Europe SA
**Principal Investigators:** Viviana Loria Kohen and Francesco Visioli.
**Period:** 2019-2020

**Title:** PREVENTOMICS
**Company/Institution:** Acondicionamiento Tarrasense LEITAT
**Principal Investigators:** Viviana Loria Kohen.
**Period:** 2019-2020

**Title:** MORINGA
**Company/Institution:** BIOSABOR SAT
**Principal Investigators:** José Alberto Díaz-Ruiz
**Period:** 2019-2021

**Title:** Determinación de variantes genéticas asociadas a estudios de genética, nutrición y salud
**Company/Institution:** PRECISION FOR HEALTH, S.L. (P4H)
**Principal Investigators:** Susana Molina Arranz
Period: 15/01/2019 - (prórroga tácita)

**Title:** Procesado epigenético de muestras Predimed (Subproyecto UProcesados)
**Company/Institution:** Consorcio Centro de Investigación Biomedica en Red M.P.(CIBER)
**Principal Investigators:** Lidia Daimiel Ruiz
**Period:** 2020

**Title:** TELOTRISTAD
**Company/Institution:** FMD ANDERSON INTERN. ESPAÑA
**Principal Investigators:** Pablo José Fernandez Marcos
**Period:** 2020

**Title:** Actividades del proyecto La Noche de los Investigadores 2020
**Company/Institution:** Madri+d
**Principal Investigators:** Sara Castillo
**Period:** 2020

**Title:** MetaboGut
**Company/Institution:** Centro de Edafología y Biología Aplicada del Segura (CEBAS-CSIC)
**Principal Investigators:** Ana Ramírez de Molina
**Period:** 2020-2021

**Title:** Actividad extractos sobre panel tumoral - inflamación
**Company/Institution:** HEALTH MICROBIOTICS SPAIN, SL
**Principal Investigators:** Guillermo Relgero Rada and Ana Ramírez de Molina
**Period:** 2020

**Title:** INNO-FORCHRONIC
**Funding /Programme:** CDTI. NEOTEC Programme.
**Company/Institution:** Precision for Health S.L
**Principal Investigators:** Ana Ramírez de Molina and Guillermo Reglero
**Period:** 2021-2022

### 1.6. Licenses

**Name:** SeneYn and ObeYn. Products to reduce metabolic decline and control obesity derived from the Patent ES2739133 licensed to the company Ynsadiet S.A. Madrid
**Licesors:** IMDEA Food, Universidad Autónoma de Madrid and Hospital Pal Paz de Madrid.
**Period:** 2019-2020
**Principal Investigator:** Guillermo Reglero.

## 2. fellowships

### 2.1. National

**Programme:** Ramón y Cajal Grant for contracting (RYC-2015-18083)
**Project:** Influence of bioactive components in the entero-hepatic axis
**Period:** 2016-2021
**Funding Institution:** Spanish Ministry of Economy and Competitiveness
**José Moisés Laparra Llopis**

**Programme:** PTA2017-14689-I
**Period:** 2019-2022
**Funding Institution:** Spanish Ministry of Science, Innovations and Universities
**José Luis López Aceituno**

**Programme:** Ramón y Cajal Grant for contracting RYC-2017-22335
**Period:** 2019-2024
**Funding Institution:** Spanish Ministry of Science, Innovations and Universities
**Pablo Fernández Marcos**

**Programme:** PREDOCTORAL GRANT IN ONCOLOGY (APRO)
**Project:** Characterization of the molecular mechanisms of short term fasting as a chemotherapy enhancer
**Period:** 2019-2022
**Funding Institution:** Spanish Association against Cancer. AECC
**Andrés Pastor**

**Programme:** IJC2018-038008-I
**Project:** Physical activity behaviors: determinants and relationships with social and mental health in old age
**Period:** 01/02/2020 - 31/01/2023
**Funding Institution:** Spanish Ministry of Science, Innovations and Universities
**Veronica Cabanas Sánchez**

**Programme:** FJC2018-038168-I (Juan de la Cierva-formation)
**Period:** 2019-2022
**Funding Institution:** Spanish Ministry of Science, Innovations and Universities
**Rodrigo San Cristóbal Blanco**

**Programme:** IJC2019-042188-I (Juan de la Cierva-Incorporación)
**Period:** 01/05/2021 - 30/04/2024
**Funding Institution:** Spanish Ministry of Science and Innovation
**Laura Judith Marcos Zambrano**
**Resolución date:** 21/11/2020

**Programme:** FJC2019-038925-I (Juan de la Cierva-Formación)
**Period:** 01/01/2021 - 31/12/2022
**Funding Institution:** Spanish Ministry of Science and Innovation
**Iñaki Milton Laskibar**
**Resolution date:** 21/11/2020

### 2.2. International

**Programme:** Research Fellowship SFRH/BD/124022/2016
**Period:** 2017-2020
**Funding Institution:** Foundation for Science and Technology Ministry of Science, Technology and Higher Education (Portugal)
**Luis Filipe Costa Machado**

**Programme:** Marie Skłodowska-Curie Individual Fellowships-IF-2016/H2020-MSCA-746435
**Period:** 2018-2021
**Funding Institution:** European Commission
**Almudena García Ruíz**

**Programme:** Marie Skłodowska-Curie Individual Fellowships-GA-832741-Food-PPP-NAFLD_PF
**Period:** 2019-2022
**Funding Institution:** European Commission
**Ildefonso Rodríguez Ramiro**

### 2.3. Regional

**Programme:** Grant to carry out contracts Attracting talent Mode 1 (2016-T1/BIO-1854)
**Period:** 2017-2020
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Manuel Alejandro Fernández Rojo**

**Programme:** PEJD-2017 PRE/BIO 5100
**Period:** 2018-2020
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Lorena del Pozo Acebo**

**Programme:** PEJD-2017 PRE/BMD 4561
**Period:** 2018-2020
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Arantzazu Sierra Ramírez**

**Programme:** PEJD-2017 PRE/SAL 5109
**Period:** 2018-2020
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Laura Díez Ricote**

**Programme:** PEJD-2017 PRE/BMD 3394
**Period:** 2018-2020
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Adriana Quijada Freire**

**Programme:** AT1_2017-T1/BMD-5333
**Period:** 2018-2022
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Cristina Ramírez Hidalgo**

**Programme:** TL_PEJ-2017-TL/SAL-7141
**Period:** 2018-2022
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Paloma Ruiz Valderrey**

**Programme:** IND2017/BIO-7826
**Period:** 2018-2021
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Marina Reguero Simon**

**Programme:** IND2017/BIO-7857
**Period:** 2018-2021
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Adrián Bouzas Muñoz**

**Programme:** PEJD-2018-POST/BIO-8933
**Period:** 2018-2022
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**María Belén Ruiz Roso**

**Programme:** PEJD-2018-POST/BMD-8900_CR
**Period:** 2018-2022
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Ana Pérez García**

**Programme:** IND2018/BIO-10097
**Period:** 2019-2022
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Sonia Wagner Reguero**

**Programme:** 2018-T1/BMD-11966
**Period:** 2019-2023
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**José Alberto Díaz-Ruiz Ruiz**

**Programme:** 2018-T1/BIO-11262
**Period:** 2019-2023
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**María Ikonomopoulou**

**Programme:** 2018-T1/BIO-10633
**Period:** 2019-2023
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Aida Serra Maqueda**

**Programme:** PEJ-2018-AI/BMD-9724
**Period:** 2019-2021
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Marta Torrecilla**

**Programme:** CM-PEJ-2019-TL/BMD-15706_ADR
**Period:** 01/06/2020-31/05/2022
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Lorena Blanco Calcerrada**

**Programme:** CM-PEJD-2019-PREBMD-17041
**Period:** 01/06/2020-31/05/2022
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**María Castejón Mariscal de Gante**

**Programme:** CM-PEJD-2019-PREBMD-14499
**Period:** 01/06/2020-31/05/2022
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Yolanda Martín Martín**

**Programme:** CM-PEJD-2019-PRE/BIO-16475
**Period:** 01/07/2020-30/06/2022
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Mª Cristina Lorca Romero**

**Programme:** CM-PEJD-2019-POSTBMD-14722
**Period:** 01/06/2020-31/05/2022
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Luis Vicente Herrera Marcos**

**Programme:** CM-PEJD-2019-POSTBIO-15004
**Period:** 01/06/2020-31/05/2022
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Cristina Mª Fernández Díaz**

**Programme:** CM-PEJD-2019-POST/SAL-15164
**Period:** 01/07/2020-30/06/2021
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Esther Cuadrado Soto**

**Programme:** CM-PEJD-2019-POST/SAL-15892
**Period:** 01/06/2020-31/05/2021
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Celia Martínez Pérez**

**Programme:** 2019-T2-BMD-15849 Grants for the implementation of contracts Attraction of talent Modality 2- young doctors
**Period:** 25/06/2020 -24/05/2024
**Funding Institution:** Directorate General for Research and Innovation Community of Madrid
**Carolina Donat VARGAS**

**Programme:** 2019-T1-BMD-13039 Grants for the implementation of contracts Attraction of talent Modality 2- young doctors
**Period:** 01/09/2020 -31/08/2024
**Funding Institution:** Directorate General for Research and Innovation Community of Madrid
**Mª Elena Rodríguez García-Rendueles**

**Programme:** PRE2019-087643 Grants for Predoctoral Contracts for the training of PhDs
**Period:** 01/10/2020-30/09/2024
**Funding Institution:** MICINN
**Cristina Climent Mainar**

**Programme:** 2020-5A/BIO-19724 (Grants for the implementation of contracts "Talent Attraction" Modality 1- Talent Fifth year)
**Period:** 10/04/2021 - 09/04/2022
**Funding Institution:** Counseling of Science, Universities and Innovation. Madrid Regional Government
**Manuel Alejandro Fernández Rojo**
**Resolución date:** 2/12/2020

# 3. scientific results

## 3.1. Publications

1. García-Serrano A, Tomé-Carneiro J, Carmen Crespo M, Visitación Calvo M, Pereda-Pérez I, Baliyan S, Burgos-Ramos E, Montero O, Dávalos A, Venero C, Visioli F, Fontecha J. *Concentrates of buttermilk and krill oil improve cognition in aged rats.* **Prostaglandins Leukot Essent Fatty Acids** 155, 2020.

2. Visioli F., Davalos A., López de las Hazas M.C., Crespo M.C., Tomé-Carneiro J. *An overview of the pharmacology of olive oil and its active ingredients.* **British Journal of Pharmacology 177,** 1316 – 1330, 2020.

3. Martínez-González MA, Fernandez-Lazaro CI, Toledo E, Díaz-López A, Corella D, Goday A, Romaguera D, Vioque J, Alonso-Gómez ÁM, Wärnberg J, Martínez JA, Serra-Majem L, Estruch R, Tinahones FJ, Lapetra J, Pintó X, Tur JA, López-Miranda J, Cano-Ibáñez N, Delgado-Rodríguez M, Matía-Martín P, Daimiel L, Sánchez VM, Vidal J, Vázquez C, Ros E, Buil-Cosiales P, Portoles O, Soria-Florido M, Konieczna J, Navarrete-Muñoz EM, Tojal-Sierra L, Fernández-García JC, Abete I, Henríquez-Sánchez P, Muñoz-Garach A, Santos-Lozano JM, Corbella E, Bibiloni MDM, Becerra-Tomás N, Barragán R, Castañer O, Fiol M, García de la Hera M, Belló-Mora MC, Gea A, Babio N, Fitó M, Ruiz-Canela M, Zazpe I, Salas-Salvadó J. *Carbohydrate quality changes and concurrent changes in cardiovascular risk factors: a longitudinal analysis in the PREDIMED-Plus randomized trial.* **Am J Clin Nutr, 111**, 291 – 306, 2020.

4. Daimiel L, Martínez-González MA, Corella D, Salas-Salvadó J, Schröder H, Vioque J, Romaguera D, Martínez JA, Wärnberg J, Lopez-Miranda J, Estruch R, Cano-Ibáñez N, Alonso-Gómez A, Tur JA, Tinahones FJ, Serra-Majem L, Micó-Pérez RM, Lapetra J, Galdón A, Pintó X, Vidal J, Micó V, Colmenarejo G, Gaforio JJ, Matía P, Ros E, Buil-Cosiales P, Vázquez-Ruiz Z, Sorlí JV, Graniel IP, Cuenca-Royo A, Gisbert-Sellés C, Galmes-Panades AM, Zulet MA, García-Ríos A, Díaz-López A, de la Torre R, Galilea-Zabalza I, Ordovás JM. *Physical fitness and physical activity association with cognitive function and quality of life: baseline cross-sectional analysis of the PREDIMED-Plus trial.* **Sci Rep 10**, 3472, 2020.

5. Silva Meneguelli T, Viana Hinkelmann J, Hermsdorff HHM, Zulet MÁ, Martínez JA, Bressan J. *Food consumption by degree of processing and cardiometabolic risk: a systematic review.* **Int J Food Sci Nutr 13**, 1 – 15, 2020.

6. Mena-Sánchez G, Babio N, Becerra-Tomás N, Martínez-González MÁ, Díaz-López A, Corella D, Zomeño MD, Romaguera D, Vioque J, Alonso-Gómez ÁM, Wärnberg J, Martínez JA, Serra-Majem L, Estruch R, Bernal R, Lapetra J, Pintó X, Tur JA, Lopez-Miranda J, Cano-Ibáñez N, Gaforio JJ, Matía-Martín P, Daimiel L, Caro JLL, Vidal J, Vázquez C, Ros E, Arellano AG, Palau A, Fernández-Carrión R, Pérez-Vega KA, Morey M, de la Hera MG, Vaquero-Luna J, Carmona-González FJ, Abete I, Álvarez-Pérez J, Casas R, Fernández-García JC, Santos-Lozano JM, Corbella E, Sureda A, Ruiz-Canela M, Barragán R, Goday A, Martín M, Altozano Rodado MC, Toledo E, Fitó M, Salas-Salvadó J; PREDIMED-PLUS investigators. *Association between dairy product consumption and hyperuricemia in an elderly population with metabolic syndrome.* **Nutr Metab Cardiovasc Dis 30**, 214 – 222, 2020.

7. Bullón Vela MV, Abete I, Zulet MLÁ, Tur JA, Pintó X, Corbella E, Martínez González MÁ, Corella D, Macías González M, Tinahones F, Fitó M, Estruch R, Ros E, Salas Salvadó J, Daimiel L, Martínez JA. *Risk factors differentially associated with non-alcoholic fatty liver disease in males and females with metabolic syndrome.* **Rev Esp Enferm Dig 112**, 94 – 100, 2020.

8. Ramos-Lopez O, Cuervo M, Goni L, Milagro FI, Riezu-Boj JI, Martinez JA. *Modeling of an integrative prototype based on genetic, phenotypic, and environmental information for personalized prescrip-*

*tion of energy-restricted diets in overweight/obese subjects.* **Am J Clin Nutr 111**, 459 – 470, 2020.

9. Fuentes GC, Castañer O, Warnberg J, Subirana I, Buil-Cosiales P, Salas-Salvadó J, Corella D, Serra-Majem L, Romaguera D, Estruch R, Martínez JA, Pintó X, Vázquez C, Vidal J, Tur JA, Arós F, Bullo M, Fitó M, Schröder H. *Prospective association of physical activity and inflammatory biomarkers in older adults from the PREDIMED-Plus study with overweight or obesity and metabolic syndrome.* **Clin Nutr 3**, 30038, 2020.

10. Assmann TS, Riezu-Boj JI, Milagro FI, Martínez JA. *Circulating adiposity-related microRNAs as predictors of the response to a low-fat diet in subjects with obesity.* **J Cell Mol Med 24**, 2956 – 2967, 2020.

11. Radziejewska A, Muzsik A, Milagro FI, Martínez JA, Chmurzynska A. *One-Carbon Metabolism and Nonalcoholic Fatty Liver Disease: The Crosstalk between Nutrients, Microbiota, and Genetics*. **Lifestyle Genom 13**, 53 – 63, 2020.

12. Fernández-García JC, Muñoz-Garach A, Martínez-González MÁ, Salas-Salvado J, Corella D, Hernáez Á, Romaguera D, Vioque J, Alonso-Gómez ÁM, Wärnberg J, Martínez JA, Serra-Majem L, Estruch R, Lapetra J, Pintó X, Tur JA, Garcia-Rios A, García Molina L, Gaforio JJ, Matía-Martín P, Daimiel L, Martín Sánchez V, Vidal J, Prieto L, Ros E, Goñi N, Babio N, Ortega-Azorin C, Castañer O, Konieczna J, Notario Barandiaran L, Vaquero-Luna J, Benavente-Marín JC, Zulet MA, Sanchez-Villegas A, Sacanella E, Gómez Huelgas R, Miró-Moriano L, Gimenez-Gracia M, Julibert A, Razquin C, Basora J, Portolés O, Goday A, Galmés-Panadés AM, López-García CM, Moreno-Rodriguez A, Toledo E, Díaz-López A, Fitó M, Tinahones FJ, Bernal-López MR; PREDIMED-Plus Investigators. *Association Between Lifestyle and Hypertriglyceridemic Waist Phenotype in the PREDIMED-Plus Study.* **Obesity (Silver Spring) 28**, 537 – 543, 2020.

13. Bibiloni MDM, Bouzas C, Abbate M, Martínez-González MA, Corella D, Salas-Salvadó J, Zomeño MD, Vioque J, Romaguera D, Martínez JA, Wärnberg J, López-Miranda J, Estruch R, Bueno-Cavanillas A, Alonso-Gómez Á, Tinahones F, Serra-Majem L, Martín V, Lapetra J, Vázquez C, Pintó X, Vidal J, Daimiel L, Delgado-Rodríguez M, Matía P, Ros E, Fernández-Carrión R, Garcia-Rios A, Zulet MA, Asensio A, Schröder H, Fitó M, Becerra-Tomás N, Basora J, Cenoz JC, Diez-Espino J, Toledo E, Tur JA. *Nutrient adequacy and diet quality in a Mediterranean population with metabolic syndrome: A cross-sectional study.* **Clin Nutr 39(3)**, 853 – 861, 2020.

14. Todendi PF, Martínez JA, Reuter CP, Matos WL, Franke SIR, Razquin C, Milagro FI, Kahl VFS, Fiegenbaum M, Valim ARM. *Biochemical profile, eating habits, and telomere length among Brazilian children and adolescents*. **Nutrition 71**, 110645, 2020.

15. Bullón-Vela V, Abete I, Tur JA, Pintó X, Corbella E, Martínez-González MA, Toledo E, Corella D, Macías M, Tinahones F, Fitó M, Estruch R, Ros E, Salas-Salvadó J, Daimiel L, Zulet MA, Martínez JA; PREDIMED Plus investigators. *Influence of lifestyle factors and staple foods from the Mediterranean diet on non-alcoholic fatty liver disease among older individuals with metabolic syndrome features.* **Nutrition 71**, 110620, 2020.

16. Castro-Barquero S, Tresserra-Rimbau A, Vitelli-Storelli F, Doménech M, Salas-Salvadó J, Martín-Sánchez V, Rubín-García M, Buil-Cosiales P, Corella D, Fitó M, Romaguera D, Vioque J, Alonso-Gómez ÁM, Wärnberg J, Martínez JA, Serra-Majem L, Tinahones FJ, Lapetra J, Pintó X, Tur JA, Garcia-Rios A, García-Molina L, Delgado-Rodriguez M, Matía-Martín P, Daimiel L, Vidal J, Vázquez C, Cofán M, Romanos-Nanclares A, Becerra-Tomas N, Barragan R, Castañer O, Konieczna J, González-Palacios S, Sorto-Sánchez C, Pérez-López J, Zulet MA, Bautista-Castaño I, Casas R, Gómez-Perez AM, Santos-Lozano JM, Rodríguez-Sanchez MÁ, Julibert A, Martín-Calvo N, Hernández-Alonso P, Sorlí JV, Sanllorente A, Galmés-Panadés AM, Cases-Pérez E, Goicolea-Güemez L, Ruiz-Canela M, Babio N, Hernáez Á, Lamuela-Raventós RM, Estruch R. *Dietary Polyphenol Intake is Associated with HDL-Cholesterol and A Better Profile of other Components of the Metabolic Syndrome: A PREDIMED-Plus Sub-Study.* **Nutrients 12**, 689, 2020.

17. Swindell N, Rees P, Fogelholm M, Drummen M, MacDonald I, Martinez JA, Navas-Carretero S, Handjieva-Darlenska T, Boyadjieva N, Bogdanov G, Poppitt SD, Gant N, Silvestre MP, Brand-Miller J, Schlicht W, Muirhead R, Brodie S, Tikkanen H, Jalo E, Westerterp-Plantenga M, Adam T, Vestentoft PS, Larsen TM, Raben A, Stratton G. *Compositional analysis of the associations between 24-h movement behaviours and cardio-metabolic risk factors in overweight and obese adults with pre-diabetes from the PREVIEW study: cross-sectional baseline analysis.* **Int J Behav Nutr Phys Act 17**, 29, 2020.

18. Gómez de Cedrón M, Mouhid L, García-Carrascosa E, Fornari T, Reglero G, Ramírez de Molina A. *Marigold Supercritical Extract as Potential Co-adjuvant in Pancreatic Cancer: The Energetic Catastrophe Induced via BMP8B Ends Up With Autophagy-Induced Cell Death.* **Front Bioeng Biotechnol 7**, 455, 2020.

19. Morillo-Bernal J, Fernández LP, Santisteban P. *FOXE1 regulates migration and invasion in thyroid cancer cells and targets ZEB1.* **Endocr Relat Cancer 27**, 137 – 151, 2020.

20. Aguilar-Aguilar, E. Marcos-Pasero, H., Ikonomopoulou, M.P., Loria-Kohen, V. (2020). *Food implications in central sensitization syndromes.* **Journal of Clinical Medicine 9(12): 4106**. 2020.

21. Roncero-Ramos I, Alcala-Diaz JF, Rangel-Zuíñiga OA, Gomez-Delgado F, Jimenez-Lucena R, García-Rios A, Vals-Delgado C, Romero-Baldonado C, Luque RM, Ordovas JM, Perez-Martinez P, Camargo A, Lopez-Miranda J. *Prediabetes diagnosis criteria, type 2 diabetes risk and dietary modulation: The CORDIOPREV study.* **Clin Nutr 39**, 492 – 500, 2020.

22. Sotos-Prieto M, Smith CE, Lai CQ, Tucker KL, Ordovas JM, Mattei J. *Mediterranean Diet Adherence Modulates Anthropometric Measures by TCF7L2 Genotypes among Puerto Rican Adults.* **J Nutr. 150**, 167 – 175, 2020.

23. Bush CL, Blumberg JB, El-Sohemy A, Minich DM, Ordovás JM, Reed DG, Behm VAY. *Toward the Definition of Personalized Nutrition: A Proposal by The American Nutrition Association.* **J Am Coll Nutr. 39**, 5 – 15, 2020.

24. Ruiz-Moreno C, Lara B, Salinero JJ, Brito de Souza D, Ordovás JM, Del Coso J. *Time course of tolerance to adverse effects associated with the ingestion of a moderate dose of caffeine.* **Eur J Nutr**. 2020.

25. Pozuelo-Sanchez I, Villasanta-Gonzalez A, Alcala-Diaz JF, Vals-Delgado C, Leon-Acuí±a A, Gonzalez-Requero A, Yubero-Serrano EM, Luque RM, Caballero-Villarraso J, Quesada I, Ordovas JM, Pí©rez-Martinez P, Roncero-Ramos I, Lopez-Miranda J. *Postprandial Lipemia Modulates Pancreatic Alpha-Cell Function in the Prediction of Type 2 Diabetes Development: The CORDIOPREV Study.* **J Agric Food Chem 68**, 1266 – 1275, 2020.

26. Moreno V, Areces F, Ruiz-Vicente D, Ordovás JM, Del Coso J. *Influence of the ACTN3 R577X genotype on the injury epidemiology of marathon runners.* **PLoS One. 15**, e0227548, 2020.

27. Coltell O, Sorlí JV, Asensio EM, Barragán R, González JI, Gimí©nez-Alba IM, Zanón-Moreno V, Estruch R, Ramírez-Sabio JB, Pascual EC, Ortega-Azorín C, Ordovas JM, Corella D. Genome-Wide *Association Study for Serum Omega-3 and Omega-6 Polyunsaturated Fatty Acids: Exploratory Analysis of the Sex-Specific Effects and Dietary Modulation in Mediterranean Subjects with Metabolic Syndrome.* **Nutrients 12**, 310, 2020.

28. Rafael de Cabo; Alberto Diaz Ruiz. *A Central Role for the Gasotransmitter H[2]S in Aging.* 10 – 12, 2020.

29. Castejón M, Plaza A, Martinez-Romero J, Fernandez-Marcos PJ, Cabo R, **Diaz-Ruiz A.** *Energy Restriction and Colorectal Cancer: A Call for Additional Research.* 2020.

30. Ryan R. Y. M., Lutzky V.P., Herzig V., Smallwood T.B., Potriquet J., Wong, Y., Masci P., Lavin M.F., King G.F. J., Lopez A., Ikonomopoulou M.P., Miles, J.J. (2020). *Venom of the red-bellied black snake Pseudechis porphyriacus shows immunosuppressive potential.* **Toxins 12(11): E674**. 2020.

31. Romero-Sanchiz P, Nogueira-Arjona R, Araos P, Serrano A, Barrios V,Argente J, Garcia-Marchena N, Lopez-Tellez A, Rodriguez-Moreno S, Mayoral F, Pavón FJ, Fonseca FR. *Variation in chemokines plasma concentrations in primary care depressed patients associated with Internet-based cognitive-behavioral therapy.* **Sci Rep. 10**, 1078. 2020.

32. Freire-Regatillo A, Fernández-Gómez MJ, Díaz F, Barrios V, Sánchez-Jabonero I, Frago LM, Argente J, García-Segura LM, Chowen JA. *Sex differences in the peripubertal response to a short-term, high-fat diet intake.* **J Neuroendocrinol. 10**, e12756. 2020.

33. Carrillo B, Collado P, Díaz F, Chowen JA, Grassi D, Pinos H. *Blocking of Estradiol Receptors ERα, ERα and GPER During Development, Differentially Alters Energy Metabolism in Male and Female Rats.* **Neuroscience. 426**, 59 – 68. 2020.

34. Elizabeth MSM, Verkerk AJMH, Hokken-Koelega ACS, Verlouw JAM, Argente J, Pfaeffle R, Visser TJ, Peeters RP, De Graaff LCG. *Unique near-complete deletion of GLI2 in a patient with combined pituitary hormone deficiency and post-axial polydactyly.* **Growth Horm IGF Res. 50**, 35 – 41. 2020.

35. Chowen JA, Garcia-Segura LM. *Microglia, neurodegeneration and loss of neuroendocrine control.* **Prog Neurobiol 184**, 101720. 2020.

36. Laura Judith Marcos-Zambrano, María Ángeles Bordallo-Cardona, Elisa Borghi, Monica Falleni, Delfina Tosi, Patricia Muñoz, Pilar Escribano, Jesús Guinea. *Candida Isolates Causing Candidemia Show Different Degrees of Virulence in Galleria Mellonella.* **Med. Mycol 58**, 83 – 92. 2020.

37. Miriam Marqués, Robin Tranchant, Blanca Risa-Ebrí, María L Suárez-Solís, Luis C Fernández, Enrique Carrillo-de-Santa-Pau, Natalia Del Pozo, Jaime Martínez de Villarreal, Clément Meiller, Yves Allory, Yuna Blum, Christine Pirker, Balazs Hegedus, Simon T Barry, Amancio Carnero, Walter Berger, Didier Jean, Francisco X Real. *Combined MEK and PI3K/p110βInhibition as a Novel Targeted Therapy for Malignant Mesothelioma Displaying Sarcomatoid Features.* **Cancer Research 80**, 843 – 856. 2020.

38. Pawluczyk IZ, Didangelos A, Barbour SJ, Er L, Becker JU, Martin R, Taylor S, Bhachu JS, Lyons EG, Jenkins R, Fraser D, Molyneux K, Perales-Patón J, Saez-Rodriguez J, Barratt J. *Differential expression of microRNAs in IgA Nephropathy: miR-150-5p, a potential mediator and marker of disease progression.* **Kidney International.** 2020.

39. Fernández-Sanjurjo M., Úbeda N., Fernández-García B., Del Valle M., Ramírez de Molina A.,

Crespo MC., Martin-Hernández R., Casas-Agustench P., Martínez-Camblor P., de Gonzalo-Calvo D., Díez-Robles S., Garcia-Gonzalez A., Montero A., González-González F., Rabadán M., Díaz-Martínez AE., Whitham M., Iglesias-Gutiérrez E., Dávalos A. *Exercise Dose Affects the Circulating microRNA Profile in Response to Acute Endurance Exercise in Male Amateur Runners.* **Scandinavian Journal of Medicine & Science in Sports.** 2020.

40. Harupa, A.; De Las Heras, L.; Colmenarejo, G.; Lyons-Abbott, S.; Reers, A.; Caballero-Hernandez, I.; Chung, C.W.; Charter, D.; Myler, P.J.; Fernandez-Menendez, R.M.; Calderon, F.; Palomo, S.; Rodríguez, B.; Berlanga, M.; Herreros-Avilés, E.; Staker, B.L.; Fernández-Alvaro, E.; Kaushansky, A. *Identification of selective inhibitors of Plasmodium N-myristoyltransferase by high-throughput screening.* **J. Med. Chem 63,** 591 – 600. 2020.

41. Ricardo Fernández-Musoles, Aurora García Tejedor, José Moisés Laparra. *Immunonutritional contribution of gut microbiota to fatty liver disease.* **Nutr Hosp 17,** 193 – 206. 2020.

42. Maša Srdić, Ivana Ovčina, Bartosz Fotschki, Claudia Monika Haros, Jose Moises Laparra Llopis. C. quinoa and S. hispanica L. *Seeds Provide Immunonutritional Agonists to Selectively Polarize Macrophages.* **Cells 2,** 593. 2020.

43. Pearen MA, Liam HK, Gratte FD, **Fernandez-Rojo MA,** et al. *Murine Precision-Cut Liver Slices: a Flexible ex vivo Model of Liver Biology.* **J Vis Exp 14**. 2020.

44. Tome-Carneiro, Joao; Crespo, Maria Carmen; Lopez de Las Hazas, Maria Carmen; Visioli, Francesco; Davalos, Alberto. *Olive oil consumption and its repercussions on lipid metabolism.* **Nutrition Reviews**. 2020.

45. Scarmozzino F. and Visioli F. *Covid-19 and the subsequent lockdown modified dietary habits of almost half the population in an Italian sample.* **Foods 9**. 2020.

46. Crocamo A, Demola P., Pinelli S., Soldarini A., Visioli F., Corradi D., Vignali L., Pelà G. *Hypertrophic cardiomyopathy and nephrogenic diabetes insipidus associated with chronic lithium carbonate use.* **Psychiatry Research 291**. 2020.

47. Ruíz-Roso M.B., de Carvalho Padilha P., Mantilla-Escalante D.C., Ulloa N., Brun P., Acevedo-Correa D., Arantes Ferreira Peres W., Martorell M., Aires M., de Oliveira Cardoso L., Carrasco-Marín F., Paternina-Sierra K., Rodriguez-Meza J.E., Montero P.M., Bernabè G., Pauletto A., Taci X., Visioli F., Dávalos A. *Covid-19 confinement and changes of adolescent's dietary trends in Italy, Spain, Chile, Colombia and Brazil.* **Nutrients 12**. 2020.

48. Marangoni F, Agostoni C, Borghi C, Catapano A.L., Cena H., Ghiselli A., La Vecchia C., Lercker G., Manzato E., Pirillo A., Riccardi G., Risé P., Visioli F., and Poli A. *Dietary linoleic acid and human health: focus on cardiovascular and cardiometabolic effects.* **Atherosclerosis 292**, 90 – 98. 2020.

49. Scarmozzino F., Poli A., and Visioli F. *Microbiota and cardiovascular disease risk: a scoping review.* **Pharmacological Research 159**. 2020.

50. Fontecha J., Brink L., Wu S., Yves Pouliot Y., Visioli F., and Rafael Jiménez-Flores. *Sources, production, and clinical treatments of milk fat globule membranes for infant nutrition and well-being.* **Nutrients 12**. 2020.

51. Ben Menni H, Belarbi M, Menni DB, Bendiab H, Kherraf Y, Ksouri R, Djebli N, Visioli F. *Anti-inflammatory activity of argan oil and its minor components.* **International Journal of Food Sciences and Nutrition 71**, 307 – 314. 2020.

52. X Gallart-Palau, X Guo, A Serra*, SK Sze* (co-corresponding author*). Alzheimer's disease progression characterized by alterations in the molecular profiles and biogenesis of brain extracellular vesicles.* **Alzheimer's research & therapy (1st Decile) 12**, 1 – 15. 2020.

53. Espinosa-Salinas I, San-Cristobal R, Colmenarejo G, Loria-Kohen V, Molina S, Reglero G, Ramirez de Molina A, Martinez JA. *Polymorphic Appetite Effects on Waist Circumference Depend on rs3749474 CLOCK Gene Variant.* **Nutrients 12**, 1846. 2020.

54. Marcos-Pasero H, Aguilar-Aguilar E, Colmenarejo G, Ramírez de Molina A, Reglero G, Loria-Kohen V. *The Q223R Polymorphism of the Leptin Receptor Gene as a Predictor of Weight Gain in Childhood Obesity and the Identification of Possible Factors Involved.* **Genes (Basel) 11**, 560. 2020.

55. Moreno-Rubio J, Ponce S, Álvarez R, Olmedo ME, Falagan S, Mielgo X, Navarro F, Cruz P, Cabezón-Gutiérrez L, Aguado C, Colmenarejo G, Muñoz-Fernández de Leglaria M, Enguita AB, Cebollero M, Benito A, Alemany I, Del Castillo C, Ramos R, Ramírez de Molina A, Casado E, Sereno M. *Clinical-pathological and molecular characterization of long-term survivors with advanced non-small cell lung cancer.* **Cancer Biol Med 17**, 444 – 457. 2020.

56. Camblor Murube M, Borregon-Rivilla E, Colmenarejo G, Aguilar-Aguilar E, Martínez JA, Ramírez De Molina A, Reglero G, Loria-Kohen V. *Polymorphism of CLOCK Gene rs3749474 as a Modulator of the Circadian Evening Carbohydrate Intake Impact on Nutritional Status in an Adult Sample.* **Nutrients 12**, 1142. 2020.

57. Sandoval-Insausti H, Blanco-Rojo R, Graciani A, López-García E, Moreno-Franco B, Laclaustra M, Donat-Vargas C, Ordovás JM, Rodríguez-Artalejo F, Guallar-Castillón P. *Ultra-processed Food Consumption and Incident Frailty: A Prospective Cohort Study of Older Adults.* **J Gerontol A Biol Sci Med Sci 75**, 1126 – 1133. 2020.

58. Chen Y, Jiang W, Liu X, Du Y, Liu L, Ordovas JM, Lai CQ, Shen L. *Curcumin supplementation improves heat-stress-induced cardiac injury of mice: physiological and molecular mechanisms.* **J Nutr Biochem 78**, 108331. 2020.

59. Westerman K, Liu Q, Liu S, Parnell LD, Sebastiani P, Jacques P, DeMeo DL, Ordovás JM. *A gene-diet interaction-based score predicts response to dietary fat in the Women's Health Initiative.* **Am J Clin Nutr. 111**, 893 – 902. 2020.

60. San-Cristobal R, Navas-Carretero S, Martínez-González Mí , Ordovas JM, Martínez JA. *Contribution of macronutrients to obesity: implications for precision nutrition.* **Nat Rev Endocrinol 16**, 305 – 320. 2020.

61. Westerman K, Fernández-Sanlí©s A, Patil P, Sebastiani P, Jacques P, Starr JM, J Deary I, Liu Q, Liu S, Elosua R, DeMeo DL, Ordovás JM. *Epigenomic Assessment of Cardiovascular Disease Risk and Interactions With Traditional Risk Metrics.* **J Am Heart Assoc. 9**, e015299. 2020.

62. Liu Y, Smith CE, Parnell LD, Lee YC, An P, Straka RJ, Tiwari HK, Wood AC, Kabagambe EK, Hidalgo B, Hopkins PN, Province MA, Arnett DK, Tucker KL, Ordovas JM, Lai CQ. *Salivary AMY1 Copy Number Variation Modifies Age-Related Type 2 Diabetes Risk.* **Clin Chem 66**, 718 - 126. 2020.

63. Zheng Y, Huang T, Wang T, Mei Z, Sun Z, Zhang T, Ellervik C, Chai JF, Sim X, van Dam RM, Tai ES, Koh WP, Dorajoo R, Saw SM, Sabanayagam C, Wong TY, Gupta P, Rossing P, Ahluwalia TS, Vinding RK, Bisgaard H, Bí¸nnelykke K, Wang Y, Graff M, Voortman T, van Rooij FJA, Hofman A, van Heemst D, Noordam R, Estampador AC, Varga TV, Enzenbach C, Scholz M, Thiery J, Burkhardt R, Orho-Melander M, Schulz CA, Ericson U, Sonestedt E, Kubo M, Akiyama M, Zhou A, Kilpelí¤inen TO, Hansen T, Kleber ME, Delgado G, McCarthy M, Lemaitre RN, Felix JF, Jaddoe VWV, Wu Y, Mohlke KL, Lehtimí¤ki T, Wang CA, Pennell CE, Schunkert H, Kessler T, Zeng L, Willenborg C, Peters A, Lieb W, Grote V, Rzehak P, Koletzko B, Erdmann J, Munz M, Wu T, He M, Yu C, Lecoeur C, Froguel P, Corella D, Moreno LA, Lai CQ, Pitkí¤nen N, Boreham CA, Ridker PM, Rosendaal FR, de Mutsert R, Power C, Paternoster L, Sí¸rensen TIA, Tjí¸nneland A, Overvad K, Djousse L, Rivadeneira F, Lee NR, Raitakari OT, Kí¤hí¶nen M, Viikari J, Langhendries JP, Escribano J, Verduci E, Dedoussis G, Kí¶nig I, Balkau B, Coltell O, Dallongeville J, Meirhaeghe A, Amouyel P, et al. *Mendelian randomization analysis does not support causal associations of birth weight with hypertension risk and blood pressure in adulthood.* **Eur J Epidemiol**. 2020.

64. Zhou B, Ichikawa R, Parnell LD, Noel SE, Zhang X, Bhupathiraju SN, Smith CE, Tucker KL, Ordovas JM, Lai CQ. *Metabolomic Links between Sugar-Sweetened Beverage Intake and Obesity.* **J Obes 7154738.** 2020.

65. Liu Y, Shen Y, Guo T, Parnell LD, Westerman KE, Smith CE, Ordovas JM, Lai CQ. *Statin Use Associates With Risk of Type 2 Diabetes via Epigenetic Patterns at ABCG1.* **Front Genet 11**, 622. 2020.

66. Lidia Daimiel, Víctor Micó, Rosa M Valls, Anna Pedret, María José Motilva, Laura Rubió, Montse Fitó, Marta Farrás, María Isabel Covas, Rosa Solá, José M Ordovás. *Impact of Phenol-Enriched Virgin Olive Oils on the Postprandial Levels of Circulating microRNAs Related to Cardiovascular Disease.* **Mol Nutr Food Res e2000049**. 2020.

67. Berry SE, Valdes AM, Drew DA, Asnicar F, Mazidi M, Wolf J, Capdevila J, Hadjigeorgiou G, Davies R, Al Khatib H, Bonnett C, Ganesh S, Bakker E, Hart D, Mangino M, Merino J. *Human postprandial responses to food and potential for precision nutrition.* **Nat Med. 26**, 964 – 973. 2020.

68. Ortiz-Morales AM, Alcala-Diaz JF, Rangel-Zuí±iga OA, Corina A, Quintana-Navarro G, Cardelo MP, Yubero-Serrano E, Malagon MM, Delgado-Lista J, Ordovas JM, Lopez-Miranda J, Perez-Martinez P. *Biological senescence risk score. A practical tool to predict biological senescence status.* **Eur J Clin Invest e13305.** 2020.

69. Fujii TMM, Norde MM, Fisberg RM, Marchioni DML, Ordovás JM, Rogero MM. *FADS1 and ELOVL2 polymorphisms reveal associations for differences in lipid metabolism in a cross-sectional population-based survey of Brazilian men and women.* **Nutr Res. 78**, 42 – 49. 2020.

70. Klimentidis YC, Arora A, Newell M, Zhou J, Ordovas JM, Renquist BJ, Wood AC. *Phenotypic and Genetic Characterization of Lower LDL-C and Increased Type-2 Diabetes Risk in the UK Biobank.* **Diabetes.** 2020.

71. A Marcos-Delgado, E López-García, M A Martínez-González, J Salas-Salvadó, D Corella, M Fitó, D Romaguera, J Vioque, A M Alonso-Gómez, J Wärnberg, J A Martínez, L Serra-Majem, R Estruch, J C Fernández-García, J Lapetra, X Pintó, J A Tur, J López-Miranda, N Cano-Ibañez, M Delgado-Rodríguez, P Matía-Martín, L Daimiel, E Carriedo, J Vidal, C Vázquez, E Ros, E Lozano-Oloriz, M Bulló, J V Sorlí, M D Zomeño, M Fiol, S González-Palacios, C Sorto-Sánchez, N Pérez-Farinós, N Goñi-Ruiz, A Sanchez-Villegas, A Muñoz-Garach, J M Santos-Lozano, A Galera, C Bouzas, E Toledo, N Babio, J I González, J L Del Val-García, M Moñino, M C Martínez-Vergaran, L Goicolea-Güemez, I Galilea-Zabalza, J Basora, M A Muñoz, P Builf, T Fernández-Villa, PREDIMED-Plus investigators. *Health-related quality of life in individuals with metabolic syndrome: A cross-sectional study.* **Semergen S1138-3593,** 30130 – 30131. 2020.

72. Alba Marcos-Delgado, Tania Fernández-Villa, Miguel Ángel Martínez-González, Jordi Salas-Salvadó, Dolores Corella, Olga Castañer, J Alfredo Martínez, Ángel M Alonso-Gómez, Julia Wärnberg, Jesús Vioque, Dora Romaguera, José López-Miranda, Ramon Estruch, Francisco J Tinahones, José Lapetra, J LLuís Serra-Majem, Laura García-Molina, Josep A Tur, José Antonio de Paz, Xavier Pintó, Miguel Delgado-Rodríguez, Pilar Matía-Martín, Josep Vidal, Clotilde Vázquez, Lidia Daimiel, Emilio Ros, Nancy Babio, Ignacio M Gimenez-Alba, Estefanía Toledo, María Dolores Zomeño, M A Zulet, Jessica Vaquero-Luna, Jessica Pérez-López, Ana Pastor-Morel, Aina M Galmes-Panades, Antonio García-Rios, Rosa Casas, María Rosa Bernal-López, José Manuel Santos-Lozano, Nerea Becerra-Tomás, Carolina Ortega-Azorin, Zenaida Vázquez-Ruiz, Karla Alejandra Pérez-Vega, Itziar Abete, Carolina Sorto-Sánchez, Antoni Palau-Galindo, Iñigo Galilea-Zabalza, Júlia Muñoz-Martínez, Vicente Martín. *The Effect of Physical Activity and High Body Mass*

*Index on Health-Related Quality of Life in Individuals with Metabolic Syndrome.* **Int J Environ Res Public Health 17,** 3728. 2020.

73. Gallardo-Alfaro, L; Bibiloni, Maria del Mar; Mascaró, Catalina M; Montemayor, S; Ruiz-Canela, M; Salas-Salvadó, J; Corella, D; Fitó, M; Romaguera, Dora; Vioque, Jesús; Alonso-Gómez, Ángel M; Wärnberg, Julia; Martínez, J Alfredo; Serra-Majem, Lluís; Estruch, Ramon; Fernández-García, José Carlos; Lapetra, José; Pintó, Xavier; García Ríos, Antonio; Bueno-Cavanillas, Aurora; Gaforio, José J; Matía-Martín, Pilar; Daimiel, Lidia; Micó-Pérez, Rafael M; Vidal, Josep; Vázquez, Clotilde; Ros, Emilio; Fernandez-Lázaro, Cesar Ignacio; Becerra-Tomás, Nerea; Gimenez-Alba, Ignacio Manuel; Zomeño, María Dolors; Konieczna, Jadwiga; Compañ-Gabucio, Laura; Tojal-Sierra, Lucas; Pérez-López, Jéssica; Zulet, M Ángeles; Casañas-Quintana, Tamara; Castro-Barquero, Sara; Gómez-Pérez, Ana María; Santos-Lozano, José Manuel; Galera, Ana; Basterra-Gortari, F Javier; Basora, Josep; Saiz, Carmen; Pérez-Vega, Karla Alejandra; Galmés-Panadés, Aina M; Tercero-Maciá, Cristina; Sorto-Sánchez, Carolina; Sayón-Orea, Carmen; García-Gavilán, Jesús; Muñoz-Martínez, Júlia; Tur, Josep A. *Leisure-Time Physical Activity, Sedentary Behaviour and Diet Quality are Associated with Metabolic Syndrome Severity: The PREDIMED-Plus Study.* **Nutrients 12,** 1013. 2020.

74. Paz-Graniel I, Babio N, Serra-Majem L, Vioque J, Zomeño MD, Corella D, Díaz-López A, Pintó X, Bueno-Cavanillas A, Tur JA, Daimiel L, Martínez JA, Becerra-Tomás N, Navarrete-Muñoz EM, Schröder H, Fernández-Carrión R, Ortiz-Andrellucchi A, Corbella E, Riquelme-Gallego B, Gallardo-Alfaro L, Micó V, Zulet M, Barrubés L, Fitó M, Ruiz-Canela M, Salas-Salvadó J. *Fluid and total water intake in a senior mediterranean population at high cardiovascular risk: demographic and lifestyle determinants in the PREDIMED-Plus study.* **Eur J Nutr. 59,** 1595 – 1606. 2020.

75. Cano-Ibáñez N, Gea A, Ruiz-Canela M, Corella D, Salas-Salvadó J, Schröder H, Navarrete-Muñoz EM, Romaguera D, Martínez JA, Barón-López FJ, López-Miranda J, Estruch R, Riquelme-Gallego B, Alonso-Gómez Á, Tur JA, Tinahones FJ, Serra-Majem L, Martín V, Lapetra J, Vázquez C, Pintó X, Vidal J, Daimiel L, Gaforio JJ, Matía P, Ros E, Fernández-Carrión R, Díaz-López A, Zomeño MD, Candela I, Konieczna J, Abete I, Buil-Cosiales P, Basora J, Fitó M, Martínez-González MA, Bueno-Cavanillas A. *Diet quality and nutrient density in subjects with metabolic syndrome: Influence of socioeconomic status and lifestyle factors. A cross-sectional assessment in the PREDIMED-Plus study.* **Clin Nutr. 39**, 1161 – 1173. 2020.

76. Alvarez-Alvarez I, Toledo E, Lecea O, Salas-Salvadó J, Corella D, Buil-Cosiales P, Zomeño MD, Vioque J, Martinez JA, Konieczna J, Barón-López FJ, López-Miranda J, Estruch R, Bueno-Cavanillas A, Alonso-Gómez ÁM, Tur JA, Tinahones FJ, Serra-Majem L, Martín V, Ortega-Calvo M, Vázquez C, Pintó X, Vidal J, Daimiel L, Delgado-Rodríguez M, Matía P, González JI, Díaz-López A, Paz-Graniel I, Muñoz MA, Fito M, Pertusa-Martinez S, Abete I, García-Ríos A, Ros E, Ruiz-Canela M, Martínez-González MÁ. *Adherence to a priori dietary indexes and baseline prevalence of cardiovascular risk factors in the PREDIMED-Plus randomised trial.* **Eur J Nutr. 59**, 1219 – 1224. 2020.

77. Gabriela Desdín-Micó, Gonzalo Soto-Heredero, Juan Francisco Aranda, Jorge Oller, Elisa Carrasco, Enrique Gabandé-Rodríguez, Eva Maria Blanco, Arantzazu Alfranca, Lorena Cussó, Manuel Desco, Borja Ibañez, Arancha R Gortazar, Pablo Fernández-Marcos, Maria N Navarro, Bruno Hernaez, Antonio Alcamí, Francesc Baixauli, María Mittelbrunn. *T Cells With Dysfunctional Mitochondria Induce Multimorbidity and Premature Senescence.* **Science 368,** 1371 – 1376. 2020.

78. Arantzazu Sierra-Ramirez, José Luis López-Aceituno, Luis Filipe Costa-Machado, Adrián Plaza, Marta Barradas, Pablo Jose Fernandez-Marcos. *Transient Metabolic Improvement in Obese Mice Treated With Navitoclax or dasatinib/quercetin.* **Aging 12**, 11337 – 11348. 2020.

79. **Ramírez CM***, Zhang X.*, Aryal B, Madrigal-Matute J, Liu X, Diaz A, **Torrecilla-Parra M**, Suárez Y, Cuervo AM, Sessa WC, Fernández-Hernando C. *"Cav-1 (Caveolin-1) Deficiency Increases Autophagy in the Endothelium and Attenuates Vascular Inflammation and Atherosclerosis.* **ATVB 6**, 1510 – 1522. 2020.

80. Serra-Juhé C, Martos-Moreno GÁ, Bou de Pieri F, Flores R, Chowen JA, Pérez-Jurado LA, Argente J. *Heterozygous rare genetic variants in non-syndromic early-onset obesity.* **Int J Obes (Lond) 44**, 830 – 841. 2020.

81. García-Marchena N, Maza-Quiroga R, Serrano A, Barrios V, Requena-Ocaña N, Suárez J, Chowen JA, Argente J, Rubio G, Torrens M, López-Gallardo M, Marco EM, Castilla-Ortega E, Santín LJ, Rodríguez de Fonseca F, Pavón FJ, Araos P. *Abstinent patients with alcohol use disorders show an altered plasma cytokine profile: Identification of both interleukin 6 and interleukin 17A as potential biomarkers of consumption and comorbid liver and pancreatic diseases.* **J Psychopharmacol**. 2020.

82. Bruch A, **Laguna T**, Butter F, Schaffrath R, Klassen R. *Misactivation of multiple starvation responses in yeast by loss of tRNA modifications.* **Nucleic Acids Res**. 2020.

83. Cortés-Martin, A.*; **Colmenarejo, G.***; Selma, M.V.; Espín, J.C. *Genetic Polymorphisms, Mediterranean Diet and Microbiota-Associated Urolithin Metabotypes can Predict Obesity in Childhood-Adolescence.* **Sci Rep 10**, 7850. 2020.

84. De La Iglesia, R.; Espinosa-Salinas, I.; Lopez-Silvarrey, J.; Ramos-Alvarez, J.; Segovia, J.C.; **Colmenarejo, G.**; Borregon-Rivilla, E.; Marcos-Pasero, H.; Aguilar-Aguilar, E.; Loria-Kohen, V.; Reglero, G.; Ramírez de Molina, A. *A Potential Endurance Algorithm Prediction in the Field of Sports Performance.* **Frontiers in Genetics.** 2020.

85. Kaya, I.; **Colmenarejo, G.** *Analysis of nuisance substructures and aggregators in a comprehensive database of food chemical compounds.* **J Agricultural & Food Chem**. 2020.

86. Marcos-Pasero, H.*, **Colmenarejo, G.***, Aguilar-Aguilar, E.; Ramírez De Molina, A.; Reglero, G., Loria-Kohen, V. *Ranking of a wide multidomain set of predictors of children obesity by Machine Learning variable importance techniques.* **Sci Rep**. 2020.

87. **Colmenarejo, G.** *Machine Learning Models to Predict Childhood and Adolescent Obesity: A Review.* **Nutrients**. 2020.

88. Jose Moisés Laparra Llopis, Daniel Brown, Blanca Saiz. *Chenopodium Quinoa and Salvia Hispanica Provide Immunonutritional Agonists to Ameliorate Hepatocarcinoma Severity under a High-Fat Diet.* **Nutrients 30**, E1946. 2020.

89. Ishikawa M*, Brooks AJ*, **Fernández-Rojo MA***, et al. *Growth hormone stops excessive inflammation after partial hepatectomy allowing liver regeneration and survival via induction of H2-Bl/HLA-G.* **Hepatology**. 2020.

90. Calvopina DA, Noble C, Weis A, Hartel GF, Ramm LE, Balouch F, Fernandez-Rojo MA, Coleman MA, Lewindon PJ, Ramm GA. *Supersonic shear-wave elastography and APRI for the detection and staging of liver disease in pediatric cystic fibrosis.* **J. of Cystic Fibrosis 2021.** 2020.

91. Guasch-Ferré M, Santos JL, Martínez-González MA, Clish CB, Razquin C, Wang D, Liang L, Li J, Dennis C, Corella D, Muñoz-Bravo C, Romaguera D, Estruch R, Santos-Lozano JM, Castañer O, Alonso-Gómez A, Serra-Majem L, Ros E, Canudas S, Asensio EM, Fitó M, Pierce K, Martínez JA, Salas-Salvadó J, Toledo E, Hu FB, Ruiz-Canela M. *Glycolysis/gluconeogenesis- and tricarboxylic acid cycle-related metabolites, Mediterranean diet, and type 2 diabetes.* **Am J Clin Nutr 111**, 835 – 844. 2020.

92. Huttunen-Lenz M, Raben A, Meinert-Larsen T, Drummen M, Macdonald I, Martínez JA, Handjieva-Darlenska T, Poppitt SD, Jalo E, Muirhead R, Schlicht W. *Sociocognitive factors associated with lifestyle intervention attrition after successful weight loss among participants with prediabetes-The PREVIEW study.* **Public Health Nurs 37**, 393 – 404. 2020.

93. Livingstone KM, Celis-Morales C, Navas-Carretero S, San-Cristobal R, Forster H, Woolhead C, O'Donovan CB, Moschonis G, Manios Y, Traczyk I, Gundersen TE, Drevon CA, Marsaux CFM, Fallaize R, Macready AL, Daniel H, Saris WHM, Lovegrove JA, Gibney M, Gibney ER, Walsh M, Brennan L, Martinez JA, Mathers JC. *Characteristics of participants who benefit most from personalised nutrition: findings from the pan-European Food4Me randomised controlled trial.* **Br J Nutr 123**, 1396 – 1405. 2020.

94. Cuevas-Sierra A, Riezu-Boj JI, Guruceaga E, Milagro FI, Martínez JA. *Sex-Specific Associations between Gut Prevotellaceae and Host Genetics on Adiposity.* **Microorganisms 8**. 938. 2020.

95. Huttunen-Lenz M, Hansen S, Vestentoft PS, Meinert Larsen T, Westerterp-Plantenga M, Drummen M, Adam T, Macdonald I, Taylor M, Simpson E, Martinez JA, Navas-Carretero S, Handjieva-Darlenska T, Poppitt SD, Silvestre MP, Fogelholm M, Jalo E, Muirhead R, Brodie S, Brand-Miller J, Raben A, Schlicht W. *Goal achievement and adaptive goal adjustment in a behavioral intervention for participants with prediabetes.* **J Health Psychol 10**. 2020.

96. Pano O, Sayón-Orea C, Gea A, Bes-Rastrollo M, Martínez-González MÁ, Martínez JA. *Nutritional Determinants of Quality of Life in a Mediterranean Cohort: The SUN Study.* **Int J Environ Res Public Health 17,** 3897. 2020.

97. de la O V, Zazpe I, Martínez JA, Santiago S, Carlos S, Zulet MÁ, Ruiz-Canela M. *Scoping review of Paleolithic dietary patterns: a definition proposal.* **Nutr Res Rev 2**, 1. 2020.

98. Gonzalez-Freire M, Diaz-Ruiz A, Hauser D, Martinez-Romero J, Ferrucci L, Bernier M, de Cabo R. *The road ahead for health and lifespan interventions.* **Ageing Res Rev.** 2020.

99. Guzmán-Ruiz R, Tercero-Alcázar C, Rabanal-Ruiz Y, **Díaz-Ruiz A**, El Bekay R, Rangel-Zuñiga OA, Navarro-Ruiz MC, Molero L, Membrives A, Ruiz-Rabelo JF, Pandit A, López-Miranda J, Tinahones FJ, Malagón MM. *Adipose tissue depot-specific intracellular and extracellular cues contributing to insulin resistance in obese individuals.* **FASEB J**. 2020.

100. **Aida Serr**a, Xavier Gallart-Palau, Siu Kwan Sze. *Extracellular vesicles: Insights into mechanisms underlying Alzheimer's disease.* Research Outreach (Articulo de divulgación científica). 2020.

101. Aguilar-Aguilar E. *Menstrual disorders: what we know about dietary-nutritional therapy.* **Nutr Hosp 37**, 52 – 56. 2020.

102. Sereno M, Gutiérrez-Gutiérrez G, Sandoval C, Falagan S, Jimenez-Gordo AM, Merino M, López-Menchaca R, Martínez-Martin P, Roa S, Casado E. *A favorable outcome of pneumonia COVID 19 in an advanced lung cancer patient with severe neutropenia: Is immunosuppression a risk factor for SARS-COV2 infection?* **Lung Cancer 2020 july**, 213 - 215. 2020.

103. Viñal D, Rodriguez-Salas N, Perez-Wert P, Higuera O, Ghanem I, Feliu J. *Efficacy of capecitabine when used concomitantly with proton pump inhibitors in cancer patients: a systematic review.* **Clin Transl Oncol 22,** 1288 – 1294. 2020.

104. Bockorny B, Semenisty V, Macarulla T, Borazanci E, Wolpin BM, Stemmer SM, Golan T, Geva R, Borad MJ, Pedersen KS, Park JO, **Ramirez RA,** Abad DG, Feliu J, Muñoz A, Ponz-Sarvise M, Peled A, Lustig TM, Bohana-Kashtan O, Shaw SM, Sorani E, Chaney M, Kadosh S, Vainstein Haras A, Von Hoff DD, Hidalgo M. *BL-8040, a CXCR4 antagonist, in combination with pembrolizumab and chemotherapy for pancreatic cancer: the COMBAT trial.* **Nat Med. 26**, 878 – 885. 2020.



105. Segui MA, Cruz JJ, Alba E, Feliu J, Jara C, Rivera F, Rodriguez Lescure A, Lorenzo A, Martin M. *Situation, challenges, and SEOM recommendations for the future of undergraduate education in Oncology in Spain.* **Clin Transl Oncol. 22,** 1049 – 1058. 2020.

106. Trilla-Fuertes L, Ghanem I, Maurel J, G-Pastrián L, Mendiola M, Peña C, López-Vacas R, Prado-Vázquez G, López-Camacho E, Zapater-Moros A, Heredia V, Cuatrecasas M, García-Alfonso P, Capdevila J, Conill C, García-Carbonero R, Heath KE, Ramos-Ruiz R, Llorens C, Campos-Barros Á, Gámez-Pozo A, Feliu J, Vara JÁF. *Comprehensive Characterization of the Mutational Landscape in Localized Anal Squamous Cell Carcinoma.* **Transl Oncol. 13,** 100778. 2020.

107. Gallego A, Ramon-Patino J, Brenes J, Mendiola M, Berjon A, Casado G, Castelo B, Espinosa E, Hernandez A, Hardisson D, Feliu J, Redondo A. *Bevacizumab in recurrent ovarian cancer: could it be particularly effective in patients with clear cell carcinoma?* **Clin Transl Oncol**. 2020.

108. Moran T, Taus A, Arriola E, Aguado C, Dómine M, Rueda AG, Calles A, Cedrés S, Viñolas N, Isla D, Palmero R, Sereno M, Diaz V, Juan O, Marsé R, Martorell PM, Sánchez Torres JM; Study Group for the Uncommon EGFR Mutations in Spain. *Clinical Activity of Afatinib in Patients With Non-Small-Cell Lung Cancer Harboring Uncommon EGFR Mutations: A Spanish Retrospective Multicenter Study.* **Clin Lung Cancer 21**, 428 - 436.e2. 2020.

109. **Visioli F**, Rodríguez-Pérez M, Gómez-Torres Ó, Pintado-Losa C, Burgos-Ramos E. *Hydroxytyrosol improves mitochondrial energetics of a cellular model of Alzheimer›s disease***. Nutr Neurosci.** 2020.

110. **Visioli F**, Panaite SA, Tomé-Carneiro J. *Wine's Phenolic Compounds and Health: A Pythagorean View.* **Molecules 25**, E4105. 2020.

111. Bockorny B, Semenisty V, Macarulla T, Borazanci E, Wolpin BM, Stemmer SM, Golan T, Geva R, Borad MJ, Pedersen KS, Park JO, **Ramirez RA,** Abad DG, Feliu J, Muñoz A, Ponz-Sarvise M, Peled A, Lustig TM, Bohana-Kashtan O, Shaw SM, Sorani E, Chaney M, Kadosh S, Vainstein Haras A, Von Hoff DD, Hidalgo M. *Supplementation with alpha-linolenic acid and inflammation: a feasibility trial.* **Int J Food Sci Nutr**. 2020.

112. Ruiz-Roso María Belén, **Gil-Zamorano Judit, López de las Hazas María Carmen, Tomé-Carneiro Joao, Crespo María Carmen, Latasa María Jesús**, Briand Olivier, Sánchez-López Daniel, Ortiz Ana I., **Visioli Francesco, Martínez J. Alfredo, Dávalos Alberto.** *Intestinal Lipid Metabolism Genes Regulated by miRNAs.* **Frontiers in Genetics 11**, 707. 2020.

113. Becerra-Tomás N, Mena-Sánchez G, Díaz-López A, Martínez-González MÁ, Babio N, Corella D, Freixer G, Romaguera D, Vioque J, Alonso-Gómez ÁM, Wärnberg J, Martínez JA, Serra-Majem L, Estruch R, Fernández-García JC, Lapetra J, Pintó X, Tur JA, López-Miranda J, Bueno-Cavanillas A, Gaforio JJ, Matía-Martín P, Daimiel L, Martín-Sánchez V, Vidal J, Vázquez C, Ros E, Razquin C, Abellán Cano I, Sorli JV, Torres L, Morey M, Navarrete-Muñoz EM, Tojal Sierra L, Crespo-Oliva E, Zulet MÁ, Sanchez-Villegas A, Casas R, Bernal-Lopez MR, Santos-Lozano JM, Corbella E, Del Mar Bibiloni M, Ruiz-Canela M, Fernández-Carrión R, Quifer M, Prieto RM, Fernandez-Brufal N, Salaverria Lete I, Cenoz JC, Llimona R, Salas-Salvadó J. *Cross-sectional association between non-soy legume consumption, serum uric acid and hyperuricemia: the PREDIMED-Plus study.* **Eur J Nutr. 59**, 2195 – 2206. 2020.

114. Cano-Ibáñez N, Bueno-Cavanillas A, Martínez-González MÁ, Salas-Salvadó J, Corella D, Freixer GL, Romaguera D, Vioque J, Alonso-Gómez ÁM, Wärnberg J, Martínez JA, Serra-Majem L, Estruch R, Tinahones FJ, Lapetra J, Pintó X, Tur JA, García-Ríos A, García-Molina L, Delgado-Rodríguez M, Matía-Martín P, Daimiel L, Martín-Sánchez V, Vidal J, Vázquez C, Ros E, Bartolomé-Resano J, Palau-Galindo A, Portoles O, Torres L, Miquel-Fiol, Sánchez MTC, Sorto-Sánchez C, Moreno-Morales N, Abete I, Álvarez-Pérez J, Sacanella E, Bernal-López MR, Santos-Lozano JM, Fanlo-Maresma M, Bouzas C, Razquin C, Becerra-Tomás N, Ortega-Azorin C, LLimona R, Morey M, Román-Maciá J, Goicolea-Güemez L, Vázquez-Ruiz Z, Barrubés L, Fitó M, Gea A. *Effect of changes in adherence to Mediterranean diet on nutrient density after 1-year of follow-up: results from the PREDIMED-Plus Study.* **Eur J Nutr.59**, 2395 – 2409. 2020.

115. Navarrete-Muñoz EM, Vioque J, Toledo E, Oncina-Canovas A, Martínez-González MÁ, Salas-Salvadó J, Corella D, Fitó M, Romaguera D, Alonso-Gómez ÁM, Wärnberg J, Martínez JA, Serra-Majem L, Estruch R, Tinahones FJ, Lapetra J, Pintó X, Tur JA, López-Miranda J, Bueno-Cavanillas A, Matía-Martín P, Daimiel L, Sánchez VM, Vidal J, de Cos Blanco AI, Ros E, Diez-Espino J, Babio N, Fernandez-Carrion R, Castañer O, Colom A, Compañ-Gabucio L, Lete IS, Crespo-Oliva E, Abete I, Tomaino L, Casas R, Fernandez-Garcia JC, Santos-Lozano JM, Sarasa I, Garcia-Rios JMA, Martín-Pelaez S, Ruiz-Canela M, Díaz-López A, Martinez-Lacruz R, Zomeño MD, Rayó E, Sellés CG, Canudas S, Goday A, García-de-la-Hera M. *Dietary folate intake and metabolic syndrome in participants of PREDIMED-Plus study: a cross-sectional study***. Eur J Nutr.** 2020.

116. Bullón-Vela V, Abete I, Zulet MA, Xu Y, Martínez-González MA, Sayón-Orea C, Ruiz-Canela M, Toledo E, Sánchez VM, Estruch R, Lamuela-Raventós RM, Almanza-Aguilera E, Fitó M, Salas-Salvadó J, Díaz-López A, Tinahones FJ, Tur JA, Romaguera D, Konieczna J, Pintó X, Daimiel L, Rodriguez-Mateos A, Alfredo Martínez J. *Urinary Resveratrol Metabolites Output: Differential Associations with Cardiometabolic Markers and Liver Enzymes in House-Dwelling Subjects Featuring Metabolic Syndrome.* **Molecules. 25,** E4340. 2020.

117. Bouzas C, Bibiloni MDM, Julibert A, Ruiz-Canela M, Salas-Salvadó J, Corella D, Zomeño MD, Romaguera D, Vioque J, Alonso-Gómez ÁM, Wärnberg J, Martínez JA, Serra-Majem L, Estruch R, Tinahones FJ, Lapetra J, Pintó X, García Ríos A, Bueno-Cavanillas A, Gaforio JJ, Matía-Martín P, Daimiel L, Martín-Sánchez V, Vidal J, Vázquez C, Ros E, Fernandez-Lázaro CI, Becerra-Tomás N, Gimenez-Alba IM, Muñoz J, Morey M, Oncina-Canovas A, Tojal-Sierra L, Pérez-López J, Abete I, Casañas-Quintana T, Castro-Barquero S, Bernal-López MR, Santos-Lozano JM, Galera A, Angullo-Martinez E, Basterra-Gortari FJ, Basora J, Saiz C, Castañer O, Martín M, Notario-Barandiarán L, Belló-Mora MC, Sayón-Orea C, García-Gavilán J, Goday A, Tur JA. *Adherence to the Mediterranean Lifestyle and Desired Body Weight Loss in a Mediterranean Adult Population with Overweight: A PREDIMED-Plus Study.* **Nutrients 12**, 2114. 2020.

118. Fernandez, L.P.; Merino, M.; **Colmenarejo, G.**; Moreno-Rubio, J.; Sánchez-Martínez, R.; Quijada-Freire, A.; Gómez de Cedrón, M.; Reglero, G.; Casado, E.; Sereno, M.; Ramírez de Molina, A. *Metabolic enzyme ACSL3 is a prognostic biomarker and correlates with anticancer effectiveness of statins in non-small cell lung cancer.* **Molecular Oncology**. 2020.

119. Hermenegildo-López Y, Sandoval-Insausti H, Donat-Vargas C, Banegas JR, Rodríguez-Artalejo F, Guallar-Castillón P. *General and central obesity operate differently as predictors of falls requiring medical care in older women: a population-based cohort study in Spain.* **Age Ageing. 2020 Aug 25:afaa164**. 2020.

120. Arias-Fernández L, Smith-Plaza AM, Barrera-Castillo M, Prado-Suárez J, Lopez-Garcia E, Rodríguez-Artalejo F, Lana A. *Sleep patterns and physical function in older adults attending primary health care.* **Fam Pract. 2020 Aug 21:cmaa085.** 2020.

121. Sandoval-Insausti H, Jiménez-Onsurbe M, Donat-Vargas C, Rey-García J, Banegas JR, Rodríguez-Artalejo F, Guallar-Castillón P. *Ultra-Processed Food Consumption Is Associated with Abdominal Obesity: A Prospective Cohort Study in Older Adults.* **Nutrients. 2020 Aug 7;12(8):2368**. 2020.

122. Caballero FF, Struijk EA, Buño A, Rodríguez-Artalejo F, Lopez-Garcia E. *Plasma ceramides and risk of impaired lower-extremity function in older adults: a nested case-control study.* **J Gerontol A Biol Sci Med Sci. 2020 Aug 6:glaa188**. 2020.

123. André P, Proctor G, Driollet B, Garcia-Esquinas E, Lopez-Garcia E, Gomez-Cabrero D, Neyraud E, Rodriguez-Artalejo F, Morzel M, Féart C. *The role of overweight in the association between the Mediterranean diet and the risk of type 2 diabetes mellitus: a mediation analysis among 21 585 UK biobank participants.* **Int J Epidemiol. 2020 Aug 4:dyaa103.** 2020.

124. Ortolá R, García-Esquinas E, Cabanas-Sánchez V, Migueles JH, Martínez-Gómez D, Rodríguez-Artalejo F. *Association of physical activity, sedentary behavior and sleep with unhealthy aging: consistent results for device-measured and self-reported behaviors using isotemporal substitution models.* **J Gerontol A Biol Sci Med Sci. 2020 Jul 23:glaa177.** 2020.

125. Cabanas-Sánchez V, Artero EG, Lavie CJ, Higueras-Fresnillo S, García-Esquinas E, Sadarangani KP, Ortolá R, Rodríguez-Artalejo F, Martínez-Gómez D. *Prediction of cardiovascular health by non-exercise estimated cardiorespiratory fitness.* **Heart. 2020 Jul 2:heartjnl-2020-316871.** 2020.

126. Wu YT, Daskalopoulou C, Muniz Terrera G, Sanchez Niubo A, Rodríguez-Artalejo F, Ayuso-Mateos JL, Bobak M, Caballero FF, de la Fuente J, de la Torre-Luque A, García-Esquinas E, Haro JM, Koskinen S, Koupil I, Leonardi M, Pajak A, Panagiotakos D, Stefler D, Tobias-Adamczyk B, Prince M, Prina AM; ATHLOS consortium. *Education and wealth inequalities in healthy ageing in eight harmonised cohorts in the ATHLOS consortium: a population-based study.* **Lancet Public Health. 2020 Jul;5(7):e386-e394**. 2020.

127. Ortolá R, Carballo-Casla A, García-Esquinas E, Lopez-Garcia E, Banegas JR, Rodríguez-Artalejo F. J Nutr. 2020 Jul 1;150(7):1916-1923. *Health Decline Is Associated with Reports of No Coffee Consumption Years After Reporting Coffee Consumption Among Older Adults in Spain.* **J Nutr. 2020 Jul 1;150(7):1916-1923**. 2020.

128. Sánchez-Herrero H, Pastor-Bravo MDM, Donat-Vargas C, Dávila-Batista V, Perales-Puchalt J, Zhao G, García-Quinto M, Briones-Vozmediano E. *[Young Spanish epidemiologists and public health professionals: job insecurity as way of life?].* **Gac Sanit. 2020 Sep 16:S0213-9111(20)30198-9**. 2020.

129. Rey-García J, Guallar-Castillón P, Donat-Vargas C, Moreno-Iribas C, Barricarte A, Rodriguez-Barranco M, Colorado-Yohar S, Huerta JM, Chirlaque MD, Lasheras C, Amiano P, Imaz L, Agudo A, Sánchez MJ. *Fried-Food Consumption Does Not Increase the Risk of Stroke in the Spanish Cohort of the European Prospective Investigation into Cancer and Nutrition (EPIC) Study.* **J Nutr. 2020 Sep 16:nxaa272**. 2020.

130. Montero-Salazar H, Donat-Vargas C, Moreno-Franco B, Sandoval-Insausti H, Civeira F, Laclaustra M, Guallar-Castillón P. *High consumption of ultra-processed food may double the risk of subclinical coronary atherosclerosis: the Aragon Workers' Health Study (AWHS).* **BMC Med. 2020 Aug 13;18(1):235**. 2020.

131. Raffetti E, Donat-Vargas C, Mentasti S, Chinotti A, Donato F. *Association between exposure to polychlorinated biphenyls and risk of hypertension:*

*A systematic review and meta-analysis.* **Chemosphere. 2020 Sep;255:126984**. 2020.

132. Guallar MP, Meiriño R, Donat-Vargas C, Corral O, Jouvé N, Soriano V. *Inoculum at the time of SARS-CoV-2 exposure and risk of disease severity.* **Int J Infect Dis. 2020 Aug;97:290-292**. 2020.

133. Izquierdo-Gomez R, Esteban-Cornejo I, Cabanas-Sánchez V, Villagra A, Veiga ÓL, Martinez-Gómez D; UP, DOWN study group. *Bidirectional longitudinal associations of fatness with physical fitness in adolescents with Down syndrome. The UP&DOWN Longitudinal study.* **J Appl Res Intellect Disabil. 2020 Aug 12**. 2020.

134. García-Hermoso A, Martinez-Gomez D, Del Rosario Fernández-Santos J, Ortega FB, Castro-Piñero J, Hillman CH, Veiga OL, Esteban-Cornejo I. *Longitudinal associations of physical fitness and body mass index with academic performance.* **Scand J Med Sci Sports. 2020 Sep 2**. 2020.

135. Ramírez CM.*, Torrecilla-Parra M., Fernández-de Frutos M., Pardo-Marqués V., Pérez-García A.,Tabraue C., de la Rosa JV., Martin-Rodriguez P., Díaz-Sarmiento M., Traves PG., Boscá L., Castrillo A*. " (Corresponding authors). *Crosstalk between LXR and Caveolin-1 signaling is important for cholesterol and inflammatory pathways in macrophages."* **Front Endocrinol**. 2020.

136. Nuevo-Tapioles C, Santacatterina F, Stamatakis K, Núñez de Arenas C, **Gómez de Cedrón M**, Formentini L, Cuezva JM. *Coordinate βadrenergic inhibition of mitochondrial activity and angiogenesis arrest tumor growth.* **Nat Commun 11**, 3606. 2020.

137. Salazar-Roa M, Trakala M, Álvarez-Fernández M, Valdés-Mora F, Zhong C, Muñoz J, Yu Y, Peters TJ, Graña-Castro O, Serrano R, Zapatero-Solana E, Abad M, Bueno MJ, **Gómez de Cedrón M**, Fernández-Piqueras J, Serrano M, Blasco MA, Wang DZ, Clark SJ, Izpisua-Belmonte JC, Ortega S, Malumbres M. *Transient exposure to miR-203 enhances the differentiation capacity of established pluripotent stem cells.* **EMBO J. 39**. 2020.

138. Marin-Alejandre BA, Abete I, Monreal JI, Elorz M, Benito-Boillos A, Herrero JI, Navarro-Blasco I, Tur JA, Bandarra NM, Zulet MA, **Martinez JA.** *Effects of a 6-month dietary-induced weight loss on erythrocyte membrane omega-3 fatty acids and hepatic status of subjects with nonalcoholic fatty liver disease: The Fatty Liver in Obesity study.* **J Clin Lipidol 27:S1933-2874(20)30252-X**. 2020.

139. Santos JL, Krause BJ, Cataldo LR, Vega J, Salas-Pérez F, Mennickent P, Gallegos R, Milagro FI, Prieto-Hontoria P, Riezu-Boj JI, Bravo C, Salas-Huetos A, Arpón A, Galgani JE, **Martínez JA**. *PPARGC1A Gene Promoter Methylation as a Biomarker of Insulin Secretion and Sensitivity in Response to Glucose Challenges.* **Nutrients 12(9):2790**. 2020.

140. Galarregui C, Cantero I, Marin-Alejandre BA, Monreal JI, Elorz M, Benito-Boillos A, Herrero JI, de la O V, Ruiz-Canela M, Hermsdorff HHM, Bressan J, Tur JA, **Martínez JA**, Zulet MA, Abete I. *Dietary intake of specific amino acids and liver status in subjects with nonalcoholic fatty liver disease: fatty liver in obesity (FLiO) study.* **Eur J Nutr**. 2020.

141. Monserrat-Mesquida M, Quetglas-Llabrés M, Abbate M, Montemayor S, Mascaró CM, Casares M, Tejada S, Abete I, Zulet MA, Tur JA, **Martínez JA**, Sureda A. *Oxidative Stress and Pro-Inflammatory Status in Patients with Non-Alcoholic Fatty Liver Disease.* **Antioxidants (Basel) 9(8):759**. 2020.

142. Gómez-Donoso C, Martínez-González MÁ, Perez-Cornago A, Sayón-Orea C, **Martínez JA**, Bes-Rastrollo M. *Association between the nutrient profile system underpinning the Nutri-Score front-of-pack nutrition label and mortality in the SUN project: A prospective cohort study.* **Clin Nutr S0261-5614(20)30359-9**. 2020.

143. Ruíz-Roso MB, de Carvalho Padilha P, Matilla-Escalante DC, Brun P, Ulloa N, Acevedo-Correa D, Arantes Ferreira Peres W, Martorell M, Rangel Bousquet Carrilho T, de Oliveira Cardoso L, Carrasco-Marín F, Paternina-Sierra K, Lopez de Las Hazas MC, Rodriguez-Meza JE, Villalba-Montero LF, Bernabè G, Pauletto A, Taci X, Cárcamo-Regla R, Martínez JA, **Dávalos A**. *Changes of Physical Activity and Ultra-Processed Food Consumption in Adolescents from Different Countries during Covid-19 Pandemic: An Observational Study.* **Nutrients 12(8):2289**. 2020.

144. Todendi PF, Martínez JA, Reuter CP, Klinger EI, Fiegenbaum M, Rosane de Moura Valim A.J. *Influence of FTO (Fat mass and obesity) gene and parental obesity on Brazilian children and adolescents adiposity.* **Pediatr Endocrinol Metab 2019-0594**. 2020.

145. Dorenbos E, Drummen M, Adam T, Rijks J, Winkens B, Martínez JA, Navas-Carretero S, Stratton G, Swindell N, Stouthart P, Mackintosh K, Mcnarry M, Tremblay A, Fogelholm M, Raben A, Westerterp-Plantenga M, Vreugdenhil A. *Effect of a high protein/low glycaemic index diet on insulin resistance in adolescents with overweight/obesity-A PREVIEW randomized clinical trial.* **Pediatr Obes e12702**. 2020.

146. Assmann TS, Cuevas-Sierra A, Salas-Pérez F, Riezu-Boj JI, Milagro FI, Martínez JA. *Crosstalk between circulating microRNAs and chronotypical features in subjects with metabolic syndrome.* **Chronobiol Int 37(7):1048-1058**. 2020.

147. Lai CQ, Parnell LD, Smith CE, Guo T, Sayols-Baixeras S, Aslibekyan S, Tiwari HK, Irvin MR, Bender C, Fei D, Hidalgo B, Hopkins PN, Absher DM, Province MA, Elosua R, Arnett DK, Ordovas JM. *Carbohydrate and fat intake associated with risk of metabolic diseases through epigenetics of CPT1A.* **Am J Clin Nutr**. 2020.

148. Yubero-Serrano EM, Fernandez-Gandara C, Garcia-Rios A, Rangel-Zuñiga OA, Gutierrez-Mariscal FM, Torres-Peña JD, Marin C, Lopez-Moreno J, Castaño JP, Delgado-Lista J, **Ordovas JM**, Perez-Martinez P, Lopez-Miranda J. *Mediterranean diet and endothelial function in patients with coronary heart disease: An analysis of the CORDIOPREV randomized controlled trial.* **PLoS Med. 17, e100282**. 2020.

149. Alegria-Lertxundi I, Aguirre C, Bujanda L, Fernández FJ, Polo F, **Ordovás JM**, Etxezarraga MC, Zabalza I, Larzabal M, Portillo I, de Pancorbo MM, Garcia-Etxebarria K, Rocandio AM, Arroyo-Izaga M. *Food groups, diet quality and colorectal cancer risk in the Basque Country.* **World J Gastroenterol 26**, 4108 – 4125. 2020.

150. Alegria-Lertxundi I, Aguirre C, Bujanda L, Fernández FJ, Polo F, **Ordovás JM**, Etxezarraga MC, Zabalza I, Larzabal M, Portillo I, M de Pancorbo M, Palencia-Madrid L, Garcia-Etxebarria K, Rocandio AM, Arroyo-Izaga M. *Gene-Diet Interactions in Colorectal Cancer: Survey Design, Instruments, Participants and Descriptive Data of a Case-Control Study in the Basque Country.* **Nutrients 12**, 2362. 2020.

151. Jimenez-Lucena R, Alcala-Diaz JF, Roncero-Ramos I, Lopez-Moreno J, Camargo A, Gomez-Delgado F, Quintana-Navarro GM, Vals-Delgado C, Rodriguez-Cantalejo F, Luque RM, Delgado-Lista J, **Ordovas JM**, Perez-Martinez P, Rangel-Zuñiga OA, Lopez-Miranda J. *MiRNAs profile as biomarkers of nutritional therapy for the prevention of type 2 diabetes mellitus: From the CORDIOPREV study.* **2021, epub Jul**. 2020.

152. Astrup A, Magkos F, Bier DM, Brenna JT, de Oliveira Otto MC, Hill JO, King JC, Mente A, **Ordovas JM**, Volek JS, Yusuf S, Krauss RM. *Saturated Fats and Health: A Reassessment and Proposal for Food-Based Recommendations: JACC State-of-the-Art Review.* **J Am Coll Cardiol 76**, 844 – 857. 2020.

153. Westerman KE, **Ordovás JM**. *DNA methylation and incident cardiovascular disease.* **Curr Opin Clin Nutr Metab Care 23**, 236 – 240. 2020.

154. Westerman K, Kelly JM, Ordovás JM, Booth SL, DeMeo DL. *Epigenome-wide association study reveals a molecular signature of response to phylloquinone (vitamin K1) supplementation.* **Epigenetics 15**, 869 – 870. 2020.

155. Quintana-Navarro GM, Alcala-Diaz JF, Lopez-Moreno J, Perez-Corral I, Leon-Acuña A, Torres-Peña JD, Rangel-Zuñiga OA, Arenas de Larriva AP, Corina A, Camargo A, Yubero-Serrano EM, Rodriguez-Cantalejo F, Garcia-Rios A, Luque RM, **Ordovas JM**, Perez-Martinez P, Lopez-Miranda J, Delgado-Lista J. *Long-term dietary adherence and changes in dietary intake in coronary patients after intervention with a Mediterranean diet or a low-fat diet: the CORDIOPREV randomized trial.* **Eur J Nutr. 59**, 2099 – 2110. 2020.

156. Raquel Selma-Gracia 1,2, **José Moisés Laparra Llopis** 2 and Claudia Monika Haros. *Development of New Starch Formulations for Inclusion in the Dietotherapeutic Treatment of Glycogen Storage Disease.* **Proceedings 53**. 2020.

157. Bartosz Fotschki 1,* , Jerzy Ju´skiewicz 1, Adam Jurgo ´nski 1, Ryszard Amarowicz 1 ,Paulina Opyd 1, Jürgen Bez 2, Isabel Muranyi 2, Iben Lykke Petersen 3 and **Moisés Laparra Llopis.** *Protein-Rich Flours from Quinoa and Buckwheat Favourably Affect the Growth Parameters, Intestinal Microbial Activity and Plasma Lipid Profile of Rats.* **Nutrients 12**, 2781. 2020.

158. Selma-Gracia, R., Haros, C.M. & **Laparra, J.M.** *Kinetic Approach to the Influence of Chia Flour on Glucose Bioaccessibility from Hydrothermally Treated Maize and Quinoa Starch.* **Plant Foods for Human Nutrition**. 2020.

159. Raquel Selma-Gracia 1,2, Claudia Monika Haros 2 and **José Moisés Laparra** 1. *Potential Beneficial Effects of Chenopodium quinoa and Salvia hispanica L. in Glucose Homeostasis in Hyperglycemic Mice Model.* **Proceedings 53**. 2020.

160. Ruiz-Roso MB, Knott-Torcal C, Matilla-Escalante DC, Garcimartín A, Sampedro-Nuñez MA, **Dávalos A**, Marazuela M. *COVID-19 Lockdown and Changes of the Dietary Pattern and Physical Activity Habits in a Cohort of Patients with Type 2 Diabetes Mellitus.* **Nutrients 12**, 2327. 2020.

161. Arola-Arnal A, López de Las Hazas MC, Iglesias-Carres L, Mantilla-Escalante DC, Suárez M, Busto R, Visioli F, Bladé C, **Dávalos A**. ***Exosomes transport trace amounts of (poly)phenols.*** **Food Funct. 11**, 7784 – 7792. 2020.

162. Lara P Fernández; Marta Gómez de Cedrón; Ana Ramírez de Molina. *Alterations of Lipid Metabolism in Cancer: Implications in Prognosis and Treatment.* **Frontiers in oncology 10**, 577420 – 577420, 2020.

163. Alie de Boer, Lisette Krul, Markus Fehr, Lucie Geurts, Nynke Kramer, Maria Tabernero Urbieta, Johanneke van der Harst, Bob van de Water, Koen Venema, Katrin Schütte, Paul A. Hepburn. *Animal-free strategies in food safety & nutrition: What are we*

*waiting for? Part I: Food safety.* **Trends in Food Science & Technology 106**, 469 – 484, 2020.

164. Pelaz SG, Jaraíz-Rodríguez M, Álvarez-Vázquez A, Talaverón R, García-Vicente L, Flores-Hernández R, Gómez de Cedrón M, Tabernero M, Ramírez de Molina A, Lillo C, Medina JM, Tabernero A. *Targeting metabolic plasticity in glioma stem cells in vitro and in vivo through specific inhibition of c-Src by TAT-Cx43266-283.* **EBioMedicine 62**, 103134, 2020.

165. Gómez de Cedrón M, Navarro Del Hierro J, Reguero M, Wagner S, Bouzas A, Quijada-Freire A, Reglero G, Martín D, Molina AR. *Saponin-Rich Extracts and Their Acid Hydrolysates Differentially Target Colorectal Cancer Metabolism in the Frame of Precision Nutrition.* **Cancers 13**, 3399, 2020.

166. Cruz-Gil S, Fernández LP, Sánchez-Martínez R, Gómez de Cedrón M, Ramírez de Molina A. *Non-Coding and Regulatory RNAs as Epigenetic Remodelers of Fatty Acid Homeostasis in Cancer.* **Cancers 12**, 2890, 2020.

167. Omar Ramos-Lopez, Lidia Daimiel, Ana Ramírez de Molina, Diego Martínez-Urbistondo, Juan A. Vargas, J. Alfredo Martínez. *Exploring Host Genetic Polymorphisms Involved in SARS-CoV Infection Outcomes: Implications for Personalized Medicine in COVID-19.* **Int J Genomics 2020**, 2020.

168. Gil-Zamorano J, Tomé-Carneiro J, Lopez de Las Hazas MC, Del Pozo-Acebo L, Crespo MC, Gómez-Coronado D, Chapado LA, Herrera E, Latasa MJ, Ruiz-Roso MB, Castro-Camarero M, Briand O, Dávalos A. *Intestinal miRNAs regulated in response to dietary lipids.* **Sci Rep 10**, 18921, 2020.

169. Laura Judith Marcos-Zambrano[1*], Kanita Karaduzovic-Hadziabdic[2], Tatjana Loncar Turukalo[3], Piotr Przymus[4], Vladimir Trajkovik[5], Oliver Aasmets[6,7], Magali Berland[8], Aleksandra Gruca[9], Jasminka Hasic[10], Hron Karel[11], Thomas Klammsteiner[12], Mikhail Kolev[13], Leo Lahti[14], Marta Lopes[15,16], Victor Moreno[17], Irina Naskinova[13], Elin Org[7], Inês Paciência[18], Georgios Papoutsoglou[19], Rajesh Shigdel[20], Blaz Stres[21,22,23], Baiba Vilne[24], Malik Yousef[25,26], Enrique Carrillo de Santa Pau1 ,Marcus Claesson[27], Isabel Moreno-Indias[28,29], Jaak Truu[30*] on behalf of ML4Microbiome. *Applications of machine learning in human microbiome studies: a review on feature selection, biomarker identification, disease prediction and treatment.* **Frontiers in Microbiology**, 2020.

170. ISABEL MORENO-INDIAS, Leo Lahti, Miroslava Nedyalkova, Ilze Elbere,Gennady V. Roshchupkin, Muhamed Adilovic,Onder Aydemir,Burcu Bakir-Gungor,Enrique Carrillo-de Santa Pau,Domenica D'Elia,Magesh S. Desai,Laurent Falquet,Aycan Gundogdu,Karel Hron,Thomas Klammsteiner,Marta B. Lopes,Laura Judith Marcos Zambrano,Cláudia Marques,Michael Mason,Patrick May,Lejla Pašić, Gianvito Pio,Sándor Pongor,Vasilis J. Promponas,Piotr Przymus,Julio Sáez-Rodríguez,Alexia Sampri,Rajesh Shigdel,Blaz Stres,Ramona Suharoschi,Jaak Truu,Ciprian-Octavian Truică,Baiba Vilne,Dimitrios P Vlachakis,Ercüment Yılmaz,Georg Zeller,Aldert Zomer,David Gómez-Cabrero andMarcus Claesson. *Statistical and machine learning techniques in human microbiome studies: contemporary challenges and solutions.* **Frontiers in Microbiology**, 2020.

171. Laia Richart[1,2,3,*],Eleonora Lapi[1,4,*],Vera Pancaldi[5,6,7],Mirabai Cuenca[1],Enrique Carrillo-de-Santa[3] Pau[1,8], Miguel Madrid-Mencía[5,6,7],Hélène Neyret-Kahn[8,9],François Radvanyi[8,9],Juan A. Rodríguez[10,4]Yasmina Cuartero[10],François Serra[5],Alfonso Valencia[5,11],Marc A. Marti-Renom[10,11,12,13,5] Francisco X. Real[1,4,13]. *STAG2 loss-of-function affects short-range genomic contacts and modulates urothelial differentiation in bladder cancer cells.* **Genome Biology**, 2020.

172. Julibert A, Del Mar Bibiloni M, Gallardo-Alfaro L, Abbate M, Martínez-González MÁ, Salas-Salvadó J, Corella D, Fitó M, Martínez JA, Alonso-Gómez ÁM, Wärnberg J, Vioque J, Romaguera D, Lopez-Miranda J, Estruch R, Tinahones FJ, Lapetra J, Serra-Majem L, Cano-Ibañez N, Martín-Sánchez V, Pintó X, Gaforio JJ, Matía-Martín P, Vidal J, Vázquez C, **Daimiel L**, Ros E, Sayon-Orea C, Becerra-Tomás N, Gimenez-Alba IM, Castañer O, Abete I, Tojal-Sierra L, Pérez-López J, Notario-Barandiaran L, Colom A, Garcia-Rios A, Castro-Barquero S, Bernal R, Santos-Lozano JM, Fernández-Lázaro CI, Hernández-Alonso P, Saiz C, Zomeño MD, Zulet MA, Belló-Mora MC, Basterra-Gortari J, Canudas S, Goday A, Tur JA; PREDIMED-PLUS investigators. *Metabolic Syndrome Features and Excess Weight Were Inversely Associated with Nut Consumption after 1-Year Follow-Up in the PREDIMED-Plus Study.* **J Nutr. 150**, 3161 – 3170, 2020.

173. Martinez-Urbistondo M, Mora-Vargas A, Expósito-Palomo E, Castejón R, Citores MJ, Rosado S, de Mendoza C, Baños I, Fernández-Cruz A, **Daimiel L**, San-Cristóbal R, Vargas JA, Martinez JA. *Inflammatory-Related Clinical and Metabolic Outcomes in COVID-19 Patients.* **Mediators Inflamm 25**, 2914275, 2020.

174. Sánchez-Quesada C, Toledo E, González-Mata G, Ramos-Ballesta MI, Peis JI, Martínez-González MÁ, Salas-Salvadó J, Corella D, Fitó M, Romaguera D, Vioque J, Alonso-Gómez ÁM, Wärnberg J, Martínez JA, Serra-Majem L, Estruch R, Tinahones FJ, Lapetra J, Pintó X, Tur JA, Garcia-Rios A, Cano-Ibáñez N, Matía-Martín P, **Daimiel L**, Sánchez-Rodríguez R, Vidal J, Vázquez C, Ros E, Hernández-Alonso P, Barragan R, Muñoz-Martínez J, López M, González-Palacios S, Vaquero-Luna J, Crespo-Oliva E, Zulet MA, Díaz-González V, Casas R, Fernandez-Garcia JC, Santos-Lozano JM, Galera A, Ripoll-Vera T, Buil-Cosiales P, Canudas S, Martinez-Lacruz R, Pérez-Vega KA, Rios Á, Lloret-Macián R, Moreno-Rodriguez A, Ruiz-Canela M, Babio N, Zomeño Fajardo MD, Gaforio JJ. *Relationship between olive oil consumption and ankle-brachial pressure index in a population at high cardiovascular risk.* **Atherosclerosis 314**, 48 – 57, 2020.

175. Bullón-Vela V, Abete I, Tur JA, Konieczna J, Romaguera D, Pintó X, Corbella E, Martínez-González MA, Sayón-Orea C, Toledo E, Corella D, Macías-Gonzalez M, Tinahones FJ, Fitó M, Estruch R, Ros E, Salas-Salvadó J, **Daimiel L**, Mascaró CM, Zulet MA, Martínez JA. *Relationship of visceral adipose tissue with surrogate insulin resistance and liver markers in individuals with metabolic syndrome chronic complications.* **Ther Adv Endocrinol Metab. 11**, 20420188 – 20958290, 2020.

176. López M, Ríos A, Romaguera D, Martínez-González MÁ, Fernández-Aranda F, Salas-Salvadó J, Corella D, Fitó M, Vioque J, Alonso-Gómez ÁM, Crespo-Oliva E, Martínez JA, Serra-Majem L, Estruch R, Tinahones FJ, Lapetra J, Pintó X, Tur JA, García-Ríos A, Bueno-Cavanillas A, Gaforio JJ, Matía-Martín P, **Daimiel L**, Sánchez-Rodríguez R, Vidal J, Sanz-Martínez E, Ros E, Toledo E, Barrubés L, Barragán R, de la Torre R, Fiol M, González-Palacios S, Sorto-Sánchez C, Martín-Ruiz MV, Zulet MÁ, Díaz-Collado F, Casas R, Fernández-García JC, Santos-Lozano JM, Mallorqui-Bagué N, Argelich E, Lecea Ó, Paz-Graniel I, Sorlí JV, Cuenca A, Munuera S, Hernándis-Marsán MV, Vaquero-Luna J, Ruiz-Canela M, Camacho-Barcia L, Jiménez-Murcia S, Castañer O, Yáñez AM. *Association between ankle-brachial index and cognitive function in participants in the PREDIMED-Plus study: cross-sectional assessment.* **Rev Esp Cardiol S1885-5857**, 30427 – 30428, 2020.

177. Paz-Graniel I, Babio N, Becerra-Tomás N, Toledo E, Camacho-Barcia L, Corella D, Castañer-Niño O, Romaguera D, Vioque J, Alonso-Gómez ÁM, Wärnberg J, Martínez JA, Serra-Majem L, Estruch R, Tinahones FJ, Fernandez-Aranda F, Lapetra J, Pintó X, Tur JA, García-Rios A, Bueno-Cavanillas A, Gaforio JJ, Matía-Martín P, **Daimiel L**, Sánchez VM, Vidal J, Prieto-Sanchez L, Ros E, Razquin C, Mestres C, Sorli JV, Cuenca-Royo AM, Rios A, Torres-Collado L, Vaquero-Luna J, Pérez-Farinós N, Zulet MA, Sanchez-Villegas A, Casas R, Bernal-Lopez MR, Santos-Lozano JM, Corbella X, Mateos D, Buil-Cosiales P, Jiménez-Murcia S, Fernandez-Carrion R, Forcano-Gamazo L, López M, Sempere-Pascual MÁ, Moreno-Rodriguez A, Gea A, de la Torre-Fornell R, Salas-Salvadó J; PREDIMED-Plus Investigators. *Association between coffee consumption and total dietary caffeine intake with cognitive functioning: cross-sectional assessment in an elderly Mediterranean population.* **Eur J Nutr.**, 2020.

178. Martinez-Urbistondo D, Suarez Del Villar R, Argemí J, **Daimiel L**, Ramos-López O, San-Cristobal R, Villares P, Martinez JA. Antioxidant Lifestyle. *Antioxidant Lifestyle, Co-Morbidities and Quality of Life Empowerment Concerning Liver Fibrosis.* **Antioxidants 9**, 2020.

179. Di Francesco A, Choi Y, Bernier M, Zhang Y, Diaz-Ruiz A, Aon MA, Kalafut K, Ehrlich MR, Murt K, Ali A, Pearson KJ, Levan S, Preston JD, Martin-Montalvo A, Martindale JL, Abdelmohsen K, Michel CR, Willmes DM, Henke C, Navas P, Villalba JM, Siegel D, Gorospe M, Fritz K, Biswal S, Ross D, de Cabo R. *NQO1 protects obese mice through improvements in glucose and lipid metabolism.* **NPJ Aging Mech Dis**. 6(1):13. 2020.

180. Benito-Vicente A. , Uribe KB., Rotllan N., **Ramírez CM.**, Jebari-Benslaiman S., Goedeke L., Canfrán-Duque A., Galicia-García U., Saenz De Urturi D., Aspichueta P., Suárez Y., Fernández-Hernando C. and Martín C., "miR-27b Modulates Insulin Signaling in Hepatocytes by Regulating Insulin Receptor Expression". **Int. J. Mol. Sci. 2020, 21, 8675**. 2020.

181. Tao B., Kraehling JR., Ghaffari S., **Ramírez CM.**, Lee S., Fowler JW., Lee WL., Fernandez-Hernando C., Eichmann A., Sessa WC. "BMP-9 and LDL crosstalk regulates ALK-1 endocytosis and LDL transcytosis in endothelial cells. **J Biol Chem**, 295(52):18179-18188. 2020.

182. Estrada-deLeón DB, Struijk EA, Caballero FF, Sotos Prieto M, Rodríguez-Artalejo F, Lopez-Garcia E. *Prolonged nightly fasting and lower-extremity functioning in community-dwelling older adult*s. **Br J Nutr. 2020 Dec 29:1-26.**, 2020.

183. Jeronimo Dos Santos T, de Mata Donado Campos J, Argente J, Rodríguez-Artalejo F. *Effectiveness and equity of continuous subcutaneous insulin infusions in pediatric type 1 diabetes: a systematic review and meta-analysis of the literature.* **Diabetes Res Clin Pract. 2020 Dec 23;108643.**, 2020.

184. García-Esquinas E, Carrasco-Rios M, Ortolá R, Sotos Prieto M, Pérez-Gómez B, Gutiérrez-González E, Banegas JR, Queipo R, Olmedo P, Gil F, Tellez-Plaza M, Navas-Acien A, Pastor-Barriuso R, Rodríguez-Artalejo F. *Selenium and impaired physical function in US and Spanish older adults.* **Redox Biol. 2020 Nov 28;38:101819**, 2020.

185. Machado-Fragua MD, Struijk EA, Yévenes-Briones H, Caballero FF, Rodríguez-Artalejo F, Lopez-Garcia E. *Coffee consumption and risk of hearing impairment in men and women.* **Clin Nutr. 2020 Nov 29:S0261-5614(20)30642-7**. 2020.

186. Struijk EA, Rodríguez-Artalejo F, Fung TT, Willett WC, Hu FB, Lopez-Garcia E. *Sweetened beverages and risk of frailty among older women in the Nurses' Health Study: A cohort study.* **PLoS Med. 2020 Dec 8;17(12):e1003453.** 2020.

187. Sotos-Prieto M, Ruiz-Canela M, Song Y, Christophi C, Mofatt S, Rodriguez-Artalejo F, Kales SN, *The Effects of a Mediterranean Diet Intervention on Targeted Plasma Metabolic Biomarkers among US Firefighters: A Pilot Cluster-Randomized Trial*, **Nutrients. 2020 Nov 24;12(12):3610.** 2020.

188. El Assar M, Angulo J, Carnicero JA, Walter S, García-García FJ, Rodríguez-Artalejo F, Rodríguez-Mañas L., *Association between telomere length, frailty and death in older adults*, **Geroscience. 2020 Nov 15.** 2020.

189. Laosa O, Pedraza L, Álvarez-Bustos A, Carnicero JA, Rodriguez-Artalejo F, Rodriguez-Mañas L. *Rapid Assessment at Hospital Admission of Mortality Risk From COVID-19: The Role of Functional Status*, **J Am Med Dir Assoc. 2020 Dec;21(12):1798-1802.e2.** 2020.

190. Sotos-Prieto M, Ortolá R, López-García E, Rodríguez-Artalejo F, García-Esquinas E., *Adherence to the Mediterranean diet and physical resilience in older adults: The Seniors-ENRICA Cohort.* **J Gerontol A Biol Sci Med Sci. 2020 Nov 6;glaa277**. 2020.

191. García-Esquinas E, Ortolá R, Martínez-Gómez D, Damián J, Prina M, Rodríguez-Artalejo F, Pastor-Barriuso R. *Causal effects of physical activity and sedentary behaviour on health deficits accumulation in older adults.* **Int J Epidemiol. 2020 Nov 5:dyaa228**. 2020.

192. Díaz-Alonso J, Bueno-Pérez A, Toraño-Ladero L, Caballero FF, López-García E, Rodríguez-Artalejo F, Lana A. *Hearing loss and social frailty in older*

*men and women.* **Gac Sanit. 2020 Oct 13:S0213-9111(20)30204-1**. 2020.

193. Fung TT, Struijk EA, Rodriguez-Artalejo F, Willett WC, Lopez-Garcia E., *Fruit and vegetable intake and risk of frailty in women 60 years old or older.* **Am J Clin Nutr. 2020 Dec 10;112(6):1540-1546.** 2020.

194. Schillemans T, Shi L, Donat-Vargas C, Hanhineva K, Tornevi A, Johansson I, Koponen J, Kiviranta H, Rolandsson O, Bergdahl IA, Landberg R, Åkesson A, Brunius C. *Plasma metabolites associated with exposure to perfluoroalkyl substances and risk of type 2 diabetes - A nested case-control study*, **2021, epub Oct.** 2020.

195. Mangano KM, Noel SE, Lai CQ, Christensen JJ, **Ordovas JM**, Dawson-Hughes B, Tucker KL, Parnell LD. *Diet-derived fruit and vegetable metabolites show sex- specific inverse relationships to osteoporosis status.* **Bone 144**, 115780. 2020.

196. Sorlí JV, Barragán R, Coltell O, Portolés O, Pascual EC, Ortega-Azorín C, González JI, Estruch R, Saiz C, Pérez-Fidalgo A, **Ordovas JM**, Corella D. *Chronological Age Interacts with the Circadian Melatonin Receptor 1B Gene Variation, Determining Fasting Glucose Concentrations in Mediterranean Populations. Additional Analyses on Type-2 Diabetes Risk.* **Nutrients 12**, 3323. 2020.

197. Camargo A, Vals-Delgado C, Alcala-Diaz JF, Villasanta-Gonzalez A, Gomez-Delgado F, Haro C, Leon-Acuña A, Cardelo MP, Torres-Peña JD, Guler I, Malagon MM, **Ordovas JM**, Perez-Martinez P, Delgado-Lista J, Lopez-Miranda J. *A Diet-Dependent Microbiota Profile Associated with Incident Type 2 Diabetes: From the CORDIOPREV Study.* **Mol Nutr Food Res**, e2000730. 2020.

198. **Ordovas JM**, Berciano S. *Personalized nutrition and healthy aging.* **Nutr Rev 78**, 58 – 65. 2020.

199. Valenzuela PL, Carrera-Bastos P, Gálvez BG, Ruiz-Hurtado G, **Ordovas JM**, Ruilope LM, Lucia A. *Lifestyle interventions for the prevention and treatment of hypertension*, **Nat Rev Cardiol**. 18(4):251-275. 2020.

200. Sánchez-Cabo F, Rossello X, Fuster V, Benito F, Manzano JP, Silla JC, Fernández-Alvira JM, Oliva B, Fernández-Friera L, López-Melgar B, Mendiguren JM, Sanz J, **Ordovás JM**, Andrés V, Fernández-Ortiz A, Bueno H, Ibáñez B, García-Ruiz JM, Lara-Pezzi E. *Machine Learning Improves Cardiovascular Risk Definition for Young, Asymptomatic Individuals.* **J Am Coll Cardiol 76**, 1674 – 1685. 2020.

201. Rossello X, Fuster V, Oliva B, Sanz J, Fernández Friera LA, López-Melgar B, Mendiguren JM, Lara-Pezzi E, Bueno H, Fernández-Ortiz A, Ibanez B, **Ordovás JM**. *Association Between Body Size Phenotypes and Subclinical Atherosclerosis.* **J Clin Endocrinol Metab. 105**, 3734 – 3744. 2020.

202. X Gallart-Palau**; A Serra***; SK Sze* (*co-corresponding authors). *System-wide molecular dynamics of endothelial dysfunction in Gram-negative sepsis.* **BMC Biology 18**, 175. 2020.

203. López de Las Hazas MC, Gil-Zamorano J, Cofán M, Mantilla-Escalante DC, Garcia-Ruiz A, Del Pozo-Acebo L, Pastor O, Yañez-Mo M, Mazzeo C, Serra-Mir M, Doménech M, Valls-Pedret C, Rajaram S, Sabaté J, Ros E, Sala-Vila A, **Dávalos A.** *One-year dietary supplementation with walnuts modifies exosomal miRNA in elderly subjects.* **Eur J Nutr.** 2020.

204. Dávalos A, Pinilla L, López de Las Hazas MC, Pinto-Hernández P, Barbé F, Iglesias-Gutiérrez E, de Gonzalo-Calvo D. *Dietary microRNAs and cancer: A new therapeutic approach?* **Semin Cancer Biol.** 2020.

205. Cansanção K, Citelli M, Carvalho Leite N, López de Las Hazas MC, **Dávalos A**, Tavares do Carmo MDG, Peres WAF. *Impact of Long-Term Supplementation with Fish Oil in Individuals with Non-Alcoholic Fatty Liver Disease: A Double Blind Randomized Placebo Controlled Clinical Trial.* **Nutrients 12**, 3372. 2020.

206. Fernández-Sanjurjo M, Díaz-Martínez ÁE, Díez-Robles S, González-González F, de Gonzalo-Calvo D, Rabadán M, **Dávalos A**, Fernández-García B, Iglesias-Gutiérrez E. J. *Circulating MicroRNA Profiling Reveals Specific Subsignatures in Response to a Maximal Incremental Exercise Test.* **J Strength Cond Res.** 2020.

207. Seraphim CE, Canton APM, Montenegro L, Piovesan MR, Macedo DB, Cunha M, Guimaraes A, Ramos CO, Benedetti AFF, de Castro Leal A, Gagliardi PC, Antonini S, Gryngarten M, Arcari AJ, Abreu AP, Kaiser UB, Soriano-Guillén L, Escribano-Muñoz A, Corripio R, Labarta JI, Travieso-Suárez L, Ortiz-Cabrera NV, **Argente J**, Mendonca BB, Brito VN, Latronico AC. *Genotype-phenotype correlations in central precocious puberty caused by MKRN3 mutations.* **J Clin Endocrinol Metab**. 2020.

208. Elizabeth MSM, Verkerk AJMH, Hokken-Koelega ACS, Verlouw JAM, **Argente J**, Pfaeffle R, Neggers SJCMM, Visser JA, de Graaff LCG. *Congenital hypopituitarism in two brothers with a duplication of the 'acrogigantism gene' GPR101: clinical findings and review of the literature.* **Pituitary**. 2020.

209. Holmgren A, Martos-Moreno GÁ, Niklasson A, Martínez-Villanueva J, **Argente J**, Albertsson-Wikland K*, The pubertal growth spurt is diminished in children with severe obesity*, **Pediatr Res**. 2020.

210. Guerra-Cantera S, Frago LM, Jiménez-Hernaiz M, Ros P, Freire-Regatillo A, Barrios V, **Argente J**, Chowen JA. *Impact of Long-Term HFD Intake on the Peripheral and Central IGF System in Male and Female Mice.* **Metabolites 10**, 462. 2020.

211. Martos-Moreno GÁ, Martínez-Villanueva J, González-Leal R, Barrios V, Sirvent S, Hawkins F, Chowen JA, **Argente J.** *Ethnicity Strongly Influences Body Fat Distribution Determining Serum Adipokine Profile and Metabolic Derangement in Childhood Obesity.* **Front Pediatr. 8**, 551103. 2020.

212. Güemes M, Storch-de-Gracia P, Enriquez SV, Martín-Rivada Á, Brabin AG, **Argente J.** *Severity in pediatric type 1 diabetes mellitus debut during the COVID-19 pandemic.* **J Pediatr Endocrinol Metab.** 2020.

213. Rupérez FJ, Martos-Moreno GÁ, Chamoso-Sánchez D, Barbas C, **Argente J.** *Insulin Resistance in Obese Children: What Can Metabolomics and Adipokine Modelling Contribute?* **Nutrients 12**, 3310. 2020.

214. Clément K, van den Akker E, **Argente J**, Bahm A, Chung WK, Connors H, De Waele K, Farooqi IS, Gonneau-Lejeune J, Gordon G, Kohlsdorf K, Poitou C, Puder L, Swain J, Stewart M, Yuan G, Wabitsch M, Kühnen P; Setmelanotide POMC and LEPR Phase 3 Trial Investigators. *Efficacy and safety of setmelanotide, an MC4R agonist, in individuals with severe obesity due to LEPR or POMC deficiency: single-arm, open-label, multicentre, phase 3 trials.* **Lancet Diabetes Endocrinol 8**, 960 – 970. 2020.

215. Cantarín-Extremera V, Jiménez-Legido M, Martín-Rivada Á, Güemes M, Peña-Segura JL, Martínez-González M, **Argente J**, Ruiz-Falcó-Rojas ML. *Rasmussen's encephalitis and central precocious puberty. Neuroendocrinological characterization of three cases.* **Seizures 83**, 139 – 142. 2020.

216. Karvela A, Kostopoulou E, Rojas Gil AP, Avgeri A, Pappa A, Barrios V, Lambrinidis G, Dimopoulos I, Georgiou G, **Argente J**, Spiliotis B. *Adiponectin Signaling and Impaired GTPase Rab5 Expression in Adipocytes of Adolescents with Obesity.* **Horm Res Paediatr. 93**. 2020.

217. Martín-Rivada Á, **Argente J**, Martos-Moreno GÁ. *Aldosterone deficiency with a hormone profile mimicking pseudohypoaldosteronism.* **J Pediatr Endocrinol Metab. 33**, 1501 – 1505. 2020.

218. Montenegro L, Labarta JI, Piovesan M, Canton APM, Corripio R, Soriano-Guillén L, Travieso-Suárez L, Martín-Rivada Á, Barrios V, Seraphim CE, Brito VN, Latronico AC, **Argente J.** *Novel Genetic and Biochemical Findings of DLK1 in Children with Central Precocious Puberty: A Brazilian-Spanish Study.* **J Clin Endocrinol Metab. 105**, dgaa461. 2020.

219. **Visioli F.** and Poli A. *Fatty acids and cardiovascular risk. Evidence, lack of evidence, and diligence.* **Nutrients 12**, 3782. 2020.

220. Marsetti PS, Milagro FI, Zulet MÁ, Martínez JA, Lorente-Cebrián S. *Changes in miRNA expression with two weight-loss dietary strategies in a population with metabolic síndrome.* **Nutrition 83:111085**. 2020.

221. O›Connor D, Pang M, Castelnuovo G, Finlayson G, Blaak E, Gibbons C, Navas-Carretero S, Almiron-Roig E, Harrold J, Raben A, Martinez JA. *A rational review on the effects of sweeteners and sweetness enhancers on appetite, food reward and metabolic/adiposity outcomes in adults.* **Food Funct.** 2020.

222. Assmann TS, Cuevas-Sierra A, Riezu-Boj JI, Milagro FI, Martínez JA. *Comprehensive Analysis Reveals Novel Interactions between Circulating MicroRNAs and Gut Microbiota Composition in Human Obesity.* **Int J Mol Sci. 21(24):9509**. 2020.

223. Suarez-Villar R, Martinez-Urbistondo D, Fernandez MA, Lopez-Cano M, Fernandez E, Dominguez A, Prosper L, Rodriguez-Cobo A, Tinoco MEC, Nadal P, Risco CR, Fernández PV, Martínez JA. *Cross-sectional evaluation of the interaction between activity relative-time expenditure and comorbidity concerning physical quality of life.* **Medicine (Baltimore) 99(48): e22552**. 2020.

224. Galarregui C, Marin-Alejandre BA, Perez-Diaz-Del-Campo N, Cantero I, Monreal JI, Elorz M, Benito-Boillos A, Herrero JI, Tur JA, Martínez JA, Zulet MA, Abete I. *Predictive Value of Serum Ferritin in Combination with Alanine Aminotransferase and Glucose Levels for Noninvasive Assessment of NAFLD: Fatty Liver in Obesity (FLiO) Study.* **Diagnostics (Basel) 10(11):917**. 2020.

225. Martínez-Fernández L, González-Muniesa P, Sáinz N, Escoté X, Martínez JA, Arbones-Mainar JM, Moreno-Aliaga MJ. *Maresin 1 regulates insulin signaling in human adipocytes as well as in adipose tissue and muscle of lean and obese mice.* **J Physiol Biochem**. 2020.

226. Torres-Valadez R, Ramos-Lopez O, Frías Delgadillo KJ, Flores-García A, Rojas Carrillo E, Aguiar-García P, Bernal Pérez JA, Martinez-Lopez E, Martínez JA, Zepeda-Carrillo EA. *Impact of APOE Alleles-by-Diet Interactions on Glycemic and Lipid Features- A Cross-Sectional Study of a Cohort of Type 2 Diabetes Patients from Western Mexico: Implications for Personalized Medicine.* **Pharmgenomics Pers Med. 13:655-663**. 2020.

227. Raben A, Vestentoft PS, Brand-Miller J, Jalo E, Drummen M, Simpson L, Martinez JA, Handjieva-Darlenska T, Stratton G, Huttunen-Lenz M, Lam T, Sundvall J, Muirhead R, Poppitt S, Ritz C, Pietiläinen KH, Westerterp-Plantenga M, Taylor MA, Navas-Carretero S, Handjiev S, McNarry MA, Hansen S, Råman L, Brodie S, Silvestre MP, Adam TC, Macdonald IA, San-Cristobal R, Boyadjieva N, Mackintosh KA, Schlicht W, Liu A, Larsen TM, Fogelholm M. *The PREVIEW intervention study: Results from a 3-year randomized 2 x 2 factorial multinational trial investigating the role of protein, glycaemic index and physical activity for prevention of type 2 diabetes.* **2021, epub Nov**. 2020.

228. Bouzas C, Bibiloni MDM, Garcia S, Mateos D, Martínez-González MÁ, Salas-Salvadó J, Corella D, Schröder H, Martínez JA, Alonso-Gómez ÁM, Wärnberg J, Vioque J, Romaguera D, Lopez-Miranda J, Estruch R, Tinahones FJ, Lapetra J, Serra-Majem L, Bueno-Cavanillas A, Micó-Pérez RM, Pintó X, Delgado-Rodríguez M, Ortíz-Ramos M, Altés-Boronat A, Luca BL, Daimiel L, Ros E, Sayon-Orea C, Becerra-Tomás N, Gimenez-Alba IM, Castañer O, Abete I, Tojal-Sierra L, Pérez-López J, Bernabé-Casanova A, Martin-Padillo M, Garcia-Rios A, Castro-Barquero S, Fernández-García JC, Santos-Lozano JM, Fernandez-Lazaro CI, Hernández-Alonso P, Saiz C, Zomeño MD, Zulet MA, Belló-Mora MC, Basterra-Gortari FJ, Canudas S, Goday A, Tur JA. *Dietary Quality Changes According to the Preceding Maximum Weight: A Longitudinal Analysis in the PREDIMED-Plus Randomized Trial.* **Nutrients 12(10):3023**. 2020.

## 3.2. Book chapters

1. Rodrigo San-Cristobal, Santiago Navas-Carretero, MartinKohlmeier, J. AlfredoMartínez. *Precision Nutrition Interventions Based on Personalized Genetic Advice*. **Principles of Nutrigenetics and Nutrigenomics Fundamentals of Individualized Nutrition**, 499 – 508, 2020.

2. Lydia L. DonCarlos, Julie A. Chowen. *Astrocytes and Development of Neuroendocrine Circuits,* **Development of Neuroendocrine Circuits, IN Masterclass in Neuroendocrinology Series**. 367 – 391, 2020.

3. Ibanez, C; **de Molina, AR.** *Carbohydrates and Nutrigenetics,* **Principles Of Nutrigenetics And Nutrigenomics: Fundamentals Of Individualized Nutrition**. 203 – 209, 2020.

4. Giménez-Bastida JA, García-Tejedor A, Morante M, **Laparra J.M**. *Microbiota y enfermedad celiaca.* **Sociedad Española de Microbiota, Probióticos y Prebióticos**, 2020.

## 3.3. Invited & plenary talks and conferences

### Invited and Plenary Talks

1. *IUNS Mission, Vision and Objectives: Task Forces and Education.* J Alfredo Martínez. **Nutrition 2020 Live Online of the American Society for Nutrition (ASN).** 01/06/2020 – 04/06/2020. USA.

2. *Precision Nutrition: Nutritypes and Nutritional Wellbeing*. J Alfredo Martínez. **Personalised nutrition, a key tool for public health prevention in times of pandemics**. 28/05/2020 – 28/05/2020. Spain.

3. *Data Science and Precision Healthcare*, Jose M Ordovas. **ILSI 2020**. 17/01/2020 – 20/01/2020. San José (Costa Rica).

4. *Precision nutriton and Saturated fats*. Jose M Ordovas. **Expert Workshop "Saturated Fat and Health: A Nutrient or Food Approach?"**. 10/02/2020 – 11/02/2020. Washington (USA).

5. *Nutrigenomics and food: an update*. Jose M Ordovas. **35th National Congress of the Spanish Society of Aesthetic Medicine**. 20/02/2020 – 22/02/2020. Málaga (Spain).

6. *Intake, Calorie Restriction and Ageing*. Alberto Díaz – Ruíz. **XVI SEEDO´s National Congress**. March 2020.

7. *Invited Seminar - Research Centre Príncipe Felipe*. Pablo José Fernández Marcos. **Molecular perspectives on short-term fasting as a nutritional strategy against aging-related diseases.** 31/01/2020. Valencia (Spain).

8. *CBMSO: Seminar Programme Physiological and Pathological Processes*. Cristina M. Ramírez Hidalgo. **Role of Cav-1 on Atherosclerosis**. 11/01/2020. Madrid (Spain).

9. *IMDEA Food: Scientific Seminar*. Cristina M. Ramírez Hidalgo**. Role of Cav-1 on Atherosclerosis**. 26/01/2020. Madrid (Spain).

10. *Colegio Oficial de Médicos*. Jesus Argente. **Chilhood Obesity**. 10/01/2020. Madrid (Spain).

11. *ELITE V: Precision Medicine in Endocrinology: bringing innovative techniques for improved patient care in the Gulf Cooperation Countries (GCC)*. Jesus Argente. **"Integrating genetics as a precision tool into clinical practice and clinical support systems. Genetic investigation which give precision and certainty of pathogenesis to the clinician"**. 31/01/2020. Dubai (United Arabs Emirates).

12. *Arabic Society of Endocrinology and Diabetes*. Jesus Argente. **Genetic Causes of Short Stature**. 13/02/2020. Abu Dhabi (United Arabs Emirates).

13. *Arabic Society of Endocrinology and Diabetes*. Jesus Argente. **Genetic basis of síndromes**. 14/02/2020.

14. *Cajal -SEEP International Symposium*. Julie Chowen. **Astrocyte involvment in metabolic control**. 10/02/2020.

15. *Invited Lecture Colegio La Salle*. Enrique Carrillo de Santa Pau**. Meeting with Researcher**. 15/01/2020. Madrid (Spain).

16. *Invited Lecture Colegio La Salle*. Enrique Carrillo de Santa Pau. **Meeting with Researcher**. 21/01/2020. Madrid (Spain).

17. *Women and Science Day (school visit)*. Laura J Marcos- Zambrano. **Meeting with Researcher**. 14/02/2020. Madrid (Spain).

18. *Women and Science Day (school visit)*. Teresa Laguna Lobo. **Meeting with Researcher**. 11/02/2020. Madrid (Spain).

19. *National Day of Nutrition. FESNAD-genotipia*. Ana Ramirez de Molina. **Precision nutrition, a key public health prevention tool in times of pandemic**. 01/05/2020. Online.

20. *Nutrition 2020 Live Online*. José Mª Ordovás. **The Future of Precision Nutrition**. 01/06/2020 - 04/06/2020. Boston (USA).

21. *XXXI National Congress of the Spanish Diabetes Society (SED)*. José Mª Ordovás. **Risk attributable to modifiable factors**. 21/06/2020 - 23/06/2020. Madrid (Spain).

22. *Master in Food Systems, asignatura "Nutrición personalizada y enfermedades crónicas"*. Susana Molina Arranz. **Analysis of Single Nucleotide Polymorphisms (SNP) from human simples**. 20/04/2020. Online.

23. *Master in Food Sciences - EIT Food*. Lidia Daimiel. **Personalized Nutrution**. 15/04/2020 - 21/04/2020. Madrid (Spain).

24. *Master's Degree in Management of Biotechnology Companies in the Health Sector*. Lidia Daimiel. **Omics technologies and the food-health nexus: nutrigenomics and nutrigenetics**. Nutritional genomics. 14/05/2020. Madrid (Spain).

25. *Guest lecture*. Pablo José Fernández Marcos. **Molecular perspectives on short-term fasting as a nutritional strategy against aging-related diseases**. 05/05/2020. Madrid (Spain).

26. *Journal club*. Pablo José Fernández Marcos. **Journal Club IMDEA Food**. 10/06/2020. Madrid (Spain).

27. *Food Nutrition & Security Cloud Meeting*. Enrique Carrillo de Santa Pau. **Alert classification system for food/diet drug interactions**. 03/06/2020 - 04/06/2020. Online.

28. *Master's Degree in Advanced Nutritional Science (VIU)*. José Moisés Laparra Llopis. **Immunonutritional Strategies Shaping lipid homeostasis and Gut microbiota**. Valencia (Spain).

29. *New Lifestyle Intervention Strategies for Healthy Ageing - III Congress CIISE*. Lidia Daimiel. **The Mediterranean Diet as a great ally in healthy ageing**. 24/09/2020 - 25/09/2020. Madrid (Spain).

30. *Gastro-omics and Precision Nutrition*. Diaz-Ruiz, Alberto. **The multifactorial problem of aging**. 20/08/2020 - 21/08/2020. Spain.

31. *VII CIISE (https://ciise.es/)*. Diaz-Ruiz, Alberto. **Energy Restriction: Benefits And Alternatives**. 24/09/2020 - 25/09/2020. Spain.

32. *INJOY / EIT-FOOD*. José Mª Ordovás. **Nutrimetabolomics**. 21/09/2020 - 30/09/2020. Madrid (Spain).

33. *Seminario VIU*. Laparra JM. **Immunonutrition**. 06/09/2020.

34. *Genotyping. The role of dietary supplements in the prevention and reduction of SARS-COV-2 infections in at-risk populations*.. M Gómez de CedrónNutritional strategies in the control of viral infections. Success stories. 10/12/2020. Online.

35. *IMDEA Food Institute with the International Union of Nutrition Sciences (IUNS) within the framework of the #AnnualFoodAgenda EIT Food Project*. Ana Ramirez de Molina. **"Can we ensure healthy and sustainable nutrition?"**. 16/10/2020. Online.

36. *Master in Food Systems, asignatura "Nutrición personalizada y enfermedades crónicas"*. Susana Molina Arranz. **Analysis of Single Nucleotide Polymorphisms (SNP) from human simples**. 19/11/2020. Madrid (Spain).

37. *IV Virtual Congress FESNAD 2020*. Enrique Carrillo de Santa Pau. **Application Of Omics In Precision Nutrition.** 03/11/2020 - 06/11/2020. Online.

38. *IMDEA Seminars*. Enrique Carrillo de Santa Pau. **A data mining journey to explore molecular interactions between food biocompounds & drugs**. 28/10/2020. Online.

39. *Food Nutrition & Security Cloud Meeting*. Enrique Carrillo de Santa Pau. **Alert classification system for food/diet drug interactions: Task 5.4.3**. 19/10/2020 - 21/10/2020. Online.

40. *Food Nutrition & Security Cloud Meeting*. Teresa Laguna Lobo. **Alert classification system for food/diet drug interactions: Task 4.5.3**. 19/10/2020 - 21/10/2020. Online.

41. *III Food, Nutrition and Dietetics Congress*. Lidia Daimiel. **Nutrition and Inflammation: epigenetic mediators**. 23/11/2020 - 27/11/2020. Madrid (Spain).

42. *V Young Scientists Meeting ULL*. Cristina M. Ramírez. **"Science with an accent. Experiences and advice for the development of a research career outside Spain."**. 17/12/2020. Tenerife (Spain).

43. *III Congress on Food, Nutrition and Dietetics*. Pablo J. Fernández-Marcos. **Biology of periodic fasting as a nutritional strategy: mechanisms and applications**. 23/11/2020 - 27/11/2020. Madrid (Spain).

44. *V Forum: International Health Challenges - Silver Economy: Food and Quality of Life*. José Mª Ordovás. **Nutrition and Genomics**. 21/10/2020 - 04/11/2020. Galicia (Spain).

45. *42nd Congress of the Spanish Society of Paediatric Endocrinology*. José Mª Ordovás. **Nutrition, genomics and personalised medicine**. 14/10/2020 - 16/10/2020. Zaragoza (Spain).

46. *61st Congress of the Spanish Society of Endocrinology and Nutrition*. José Mª Ordovás. **Healthy Diet And Sustainability Of The Planet**. 14/10/2020 - 17/10/2020. Spain.

47. *Mediterranean Dieta Virtual Webinar: Emerging Topics of Mediterranean Diet*. José Mª Ordovás. **The nutrigenomic effects of the Mediterranean diet**. 16/11/2020. Italy.

48. *SPIN EIT Food*. Alberto Dávalos. **The importance of prevention of SARS-CoV-2 infection**. 10/12/2021. Madrid (Online). Spain.

49. *Annual Food Agenda EIT Food*. Alberto Dávalos. **Lifestyle modification during confinement by Covid-19 and hacking cellular WhatsApp to search for biomarkers**. 14/12/2021. Madrid (Online). Spain.

50. *Science Week 2020*. Alberto Dávalos. **Lifestyle modification during Covid-19 confinement in adolescents**. 11/11/2020. Madrid (Online). Spain.

51. *Congress of the Argentinean Society of Paediatric Endocrinology*. Jesus Argente. **New genetic causes of short stature**. 06/11/2020. Buenos Aires (virtual). Argentina.

52. *European Society for Paediatric Endocrinology (ESPE) Connect online*. Jesus Argente. **Evolution of**

**Growth Hormone Therapy in Paediatric Patients**. 10/11/2020. New York (virtual). USA.

53. *Arab Society for Paediatric Endocrinology & Diabetes (ASPED)-Webminar-*. Jesus Argente. **The importance of Genetics in syndromic patients with short stature**. 20/11/2020. El Cairo (virtual). Egypt.

54. *XXIX Congress of the Latin American Society of Paediatric Endocrinology (SLEP) y XXI Congress of the Mexican Society of Paediatric Endocrinology (SMEP).* Jesus Argente. **Genetic underpinnings of childhood obesities: diagnostic and therapeutic interest**. 30/11/2020. Mérida (virtual). México.

55. *XXIX Congress of the Latin American Society of Paediatric Endocrinology (SLEP) y XXI Congress of the Mexican Society of Paediatric Endocrinology (SMEP)-*. Jesus Argente. **Clinico-molecular approach to the genetic basis of short stature**. 01/12/2020. Mérida (virtual). México.

## Conferences

1. *Integration of dietary, behavioral, phenotypic and nutrigenetic information in precision nutrition.* Rodrigo San Cristóbal. **I Congreso de Jóvenes Investigadoras e Investigadores en Nutrición (CoJIIN)**. 20/02/2020 - 22/02/2020. Madrid (España).

2. *Precision Nutrition to target lipid metabolism in Cancer.* Marta Gómez de Cedrón. **COST Action CA1711.** 05/03/2020 - 07/03/2020. Belgrade (Serbia).

3. *Deciphering the functional role of hydroxytyrosol discovery of common ht gene targets.* María del Carmen Lopez de las Hazas. **EVOO Research's Got Talent 2020**. 19/01/2020 - 22/01/2020. Bari (Italy).

4. *Rare biallelic variants in Obesity-related genes in the Madrid Pediatric Obesity Cohort.* Martos -Moreno GÁ. Moeller IH, Martín-Ricada Á, Pérez-Jurado LA, Argente J. **Endocrine society 2020**. 29/03/2020 - 31/03/2020. San Francisco (USA).

5. *Clinical and hormonal features of patients with central precocious puberty due to MKRN3 mutations.* Carlos E. Seraphim, Ana PM Canton, Luciana Montenegro, Maiara Ribeiro Piovesan, Tabata Bohlen, Renata Frazao, Marina Cunha, Delanie B. Macedo, Aline Guimarães, Carolina Ramos, Priscila C. Gagliardi, Ana Paula Abreu, Andrea Leal, Margaret de Castro, Sonir RR Antonini, Leandro Soriano-Guillén, Jesús Argente, Berenice B. Mendonca, Ursula B. Kaiser, Vinicius N. Brito, Ana Claudia Latronico. **Endocrine society 2020.** 29/03/2020 - 31/03/2020. San Francisco (USA).

6. *Novel Genetic and Biochemical Findings of DLK1 Deficiency in Children with Central Precocious Puberty – a Collaborative Brazilian-Spanish Study.* Montenegro L, Labarta JI, Piovesan M, Machado Cantón A, Corripio R, Doriano-Guillén L, Barrios V, Seraphim C, Brito VN, Latronico Ac, Argente J. **Endocrine society 2020.** 29/03/2020 - 31/03/2020. San Francisco (USA).

7. *Analysis of sex-specific modifications in miRNAs contained in exosomes of astrocytes in response to palmitic acid.* Chowen JA, Guerra-Canteras S, Collado R, Argente J, Frago LM. **Endocrine society 2020.** 29/03/2020 - 31/03/2020. San Francisco (USA).

8. *Proteomics Characterization of brain extracellular vesicles in the progression of Alzheimer´s Disease.* Xavier Gallart-Palau, Aida Serra. **68th American Society for Mass Spectrometry (ASMS) Conference on Mass Spectrometry and Allied Topics.** 29/05/2020. Online.

9. *Vascular beds proteome dynamics in vascular dysfunction induced by an acute inflammatory response.* Aida Serra; Xavier Gallart-Palau. **68th American Society for Mass Spectrometry (ASMS) Conference on Mass Spectrometry and Allied Topics.** 29/05/2020. Online.

10. *Analysis of Nuisance Substructures and Aggregators in FooDB, a Comprehensive Database of Food Molecules.* Kaya, I.; Colmenarejo, G. **UK QSAR Autumn 2020 Meeting**. 15/10/2020. Online.

11. *Presence of the CLOCK rs3749474 polymorphism as a modulator of the effect of evening carbohydrate intake on nutritional status.*. **Loria-Kohen V**, Marina Camblor Murube, Aguilar-Aguilar E, Marcos-Pasero H, Colmenarejo G, **Ramírez De Molina A, Reglero G. IV Fesnad Congress**. 03/11/2020 - 06/11/2020. Online.

12. *The LEPR rs1137101 polymorphism as an indicator of risk of weight gain at an early age.* Helena Marcos-Pasero, Elena Aguilar-Aguilar, Gonzalo Colmenarejo, **Viviana Loria-Kohen. IV Fesnad Congress**. 03/11/2020 - 06/11/2020. Online.

13. *Physical activity as a possible modulator of weight gain in school children carrying the rs1137101 polymorphism of the LEPR gene*. Elena Aguilar Aguilar, Helena Marcos Pasero, Gonzalo Colmenarejo, **Ana Ramírez de Molina, Guillermo Reglero, Viviana Loria-Kohen. IV Fesnad Congress**. 03/11/2020 - 06/11/2020. Online.

14. *Effect of selenium intake on glycosylated haemoglobin values in the elderly population*. **Espinosa-Salinas, I**., Marcos-Pasero, H., Aguilar-Aguilar, E., **Molina, S**., San-Cristobal, R., **Reglero, G., Ramírez de Molina, A., Loria-Kohen, V. IV Fesnad Congress**. 03/11/2020 - 06/11/2020. Online.

15. *New senolytics against obesity and diabetes*. Aranzazu Sierra Ramírez**. 1st Annual Meeting of the Spanish Network on Cell Senescence, SENESTHERAPY-III**. 21/12/2020. Madrid (Spain).

16. *Stable Isotope Labelling in Mammals (SILAM) and proteomics characterization of individual vascular layers in sepsis-induced acute inflammatory response*. C Lorca ;X Gallart-Palau ;**A Serra. HUPO Connect 2020**. 19/10/2020 - 22/10/2020. Online.

17. *Bovine milk-derived exosomes as drug delivery vehicle for miRNA-based therapy*. del Pozo-Acebo L., **Lopez de las Hazas MC., Davalos A**. **IV National Congress of Young Researchers in Biomedicine**. 04/11/2021 - 06/11/2021. Online.

18. *Mir-29a, a new plasma biomarker in exercise*. Fernandez-Sanjurjo, M., Caravia, X.M., Roiz-Valle, D., Tomas-Zapico, C., Diaz-Martinez, A.E., Fre!e, J.M.P., **Davalos, A**., Fernandez-Garcia, B., Iglesias-Gutierrez, E. **European College of Sport Science 25th Congress.** 28/10/2021 - 30/10/2021. Online.

19. *A small octopus peptide targets BRAF melanoma via blockage of PI3K/AKT/mTOR and other metabolic pathways*. Maria P. Ikonomopoulou. **Oxford Venoms & Toxins Conference**, Virtual (16-17 September 2020).

20. *A small octopus peptide targets BRAF melanoma via blockage of PI3K/AKT/mTOR and other metabolic pathways*. Manuel A. Fernandez-Rojo, Javier Moral-Sanz, Jeremy Potriquet, Joshua Daley, Yaiza A. López, Pamela Mukhopadhyay, Andreas Brust, Patrick Wilhelm, Taylor Smallwood, Richard Clark, Nic Waddell, Bryan Fry, Paul Alewood, Jason Mulvenna, John Miles & Maria P. Ikonomopoulou. **Oxford Venoms & Toxins Conference**, Virtual (16-17 September Poster Presentation 2020).

21. *Identification of a novel octopus-derived peptide with antiproliferative properties and its therapeutic potential against BRAF-mutated melanoma*. Javier Moral-Sanz, Yaiza A. López, Andreas Brust, Patrick Wilhelm, Glen Boyle, Bryan Fry, Paul Alewood, John Miles, Manuel A. Fernandez-Rojo & Maria P. Ikonomopoulou. **Oxford Venoms & Toxins Conference**, Virtual (16-17 September Poster Presentation 2020).

## 3.4. Memberships in organizing comittes

1. **International Union of Nutritional Sciences (IUNS).** J. A. Martinez (President).

2. **International Society of Nutrigenetics/Nutrigenomics (ISNN)**. J. A. Martinez (Member).

3. **Agencia Española de Seguridad Alimentaria y Nutrición (AESAN)**. J. A. Martinez (Member of the scientific committee of the report on Nutritional Reference Intakes for the Spanish population).

4. **Agencia Española de Seguridad Alimentaria y Nutrición (AESAN).** J. A. Martinez (Member of the scientific committee of the report on the impact of the consumption of "ultra-processed" foods on consumers' health).

5. **Spanish Nutrition Society (SEÑ)**. J. A. Martinez (Member).

6. **Spanish Federation of Societies of Nutrition, Food and Dietetics (FESNAD)**. J. A. Martinez (Member).

7. **Centre for Networked Biomedical Research on the Physiopathology of Obesity and Nutrition (CIBER-Obn).** J. A. Martinez (Member).

8. **Spanish Nutrition Society (SEÑ).** R. San Cristobal (Member).

9. **Spanish Agency for Food Safety and Nutrition (AESAN).** R. San Cristobal (External contributor to the report on Nutritional Reference Intakes for the Spanish population).

10. **Scientific and Technical Committee of the State Research Agency**. José Mº Ordovás (Member). Madrid (España).

11. **International Society of Nutrigentics/Nutrigenomics**. Lidia Daimiel (Board of directors).

12. **Spanish Society of Arteriosclerosis**. Lidia Daimiel. Barcelona (España).

13. **Spanish Society of Community Nutrition**. Lidia Daimiel. Barcelona (España).

14. **Official College of Nutritionists of Madrid**. Laura Berninches (Communication Vowel). Madrid (España).

15. **Journal: Frontiers in Cardiovascular Medicine**. Cristina M. Ramírez Hidalgo (Review Editor). Suiza.

16. **BMC Cardiovascular Disorders (Springer nature).** Cristina M. Ramírez Hidalgo (Reviewer Evaluator). Berlín (Alemania).

17. **Brain Research Bulletin (Elsevier)**. Cristina M. Ramírez Hidalgo (Reviewer Evaluator). Amsterdam (Holanda).

18. **Doctoral thesis evaluation committee for the UAM del Dra. Marta Celorio, called "LXR transcription factors in the specialization on tissue resident macrophages and their role in iron homeostasis".** Cristina M. Ra-

mírez Hidalgo (Member of the Theses Evaluation). Madrid (Spain).

19. **European Society of Clinical Microbiology and Infectious Diseases**. Laura J Marcos- Zambrano (Member). EU.

20. **CA18131-Statistical and machine learning techniques in human microbiome studies**. Enrique Carrillo de Santa Pau (MC Substitute). EU.

21. **TransBIoNet**. Enrique Carrillo de Santa Pau (Member). España.

22. **Madiabetes.** Enrique Carrillo de Santa Pau (Member). Madrid (Spain).

23. **DFG-Network Epigenomic Profilling in paediatric lymphoid leukaemias-perspectives fordiagnostics, prognosis and therapy**. Enrique Carrillo de Santa Pau (Member). Germany).

24. **LifeTime**. Enrique Carrillo de Santa Pau (Individual Supporter). EU.

25. **Biostatnet**. Gonzalo Colmenarejo (Member). Spain.

26. **CA18131-Statistical and machine learning techniques in human microbiome studies**. Laura J Marcos- Zambrano (WG Member). EU.

27. **EIT Food**. Sara Castillo, Lorena Carrillo, Carolina Rodríguez, Ana Ramírrez, Maria Jesús Latasa. (EIT Food Call 2021 Matchmaking event). Budapest (Hungary).

28. **MFS Steering Board**. Maria Jesus Latasa (Master in Food Systems).

29. **Global Food Venture Programme**. Maria Jesús Latasa (Global Food Venture Programme 2020 kick off). Budapest (Hungary).

30. **WeValueFood**. Maria Jesús Latasa (WeValueFood 2020 annual meeting). Reading (UK).

31. **XKIC Human Capital WP4**. Maria Jesús Latasa (XKIC- Human Capital annual meeting). Copenhaguen (Denmark).

32. **Shareholders assembly**. Ana Ramírez, Sara Castillo (EIT Food South CLC).

33. **ISSN 2076-393X**. Equipo editorial (Vaccines). Basel (Switzerland).

## 3.5. Awards

1. European Society of Clinical Microbiology and Infectious Diseases (ESCMID). ESCMID Delegate Attendance Grant. January 2020. **Laura J Marcos-Zambrano.**

2. Open Life Science (sponsored by EMBL, ELIXIR, Mozilla ...). Grant for a mentoring & training program for Open Science ambassadors. July 2020. **Teresa Laguna.**

3. Asociación gastrónomos del Yumay. "Jamón de pata Negra Grande Covián". August 2020. **José Mª Ordovás**.

4. Community of Madrid. Premio Fermina Orduña 2020 a la trayectoria profesional. December 2020. **Guillermo Reglero Rada**.

5. Royal Academy of Medicine and Surgery of the Principado de Asturias. XVI International Hippocrates Award for Medical Research on Human Nutrition. November 2020. **Jesús Argente**.

6. Spanish Society of Internal Medicine (SEMI). Research Project PROF. DR. MIGUEL VILARDELL 2020. November 2020. Juan Antonio Vargas Núñez, Susana Teresa Mellor Pita, Pablo Tutor de Ureta, Pedro Durán del Campo, Víctor Moreno-Torres Concha, Raquel Castejón Diaz, Silvia, Rosado García, María Cruz Carreño Hernández, Rodrigo San Cristóbal Blanco, **José Alfredo Martínez Hernández.**

## 3.6. Seminars

1. *"Effect of an intervention based on lifestyle on cardiometabolic and cognitive health: PREDIMED - Plus Study"*. **Dr. Lidia A. Daimiel Ruiz**, from IMDEA Food Institute. January 2020.

2. *"How we evaluate food safety"*. **Prof. Francesco Visioli**, from IMDEA Food Institute. January 2020.

3. *"Impact of cancer cell plasticity on carcinoma progression and therapy response"*. **Dr. Purificación Muñoz**, from IDIBELL. February 2020.

4. *"Histone variants link metabolism and chromatin architecture"*. **Dr. Marcus Buschbeck**, from Carrera´s Foundation. February 2020.

5. *"Role of Caveolin-1 in Atherosclerosis"*. **Dr. Cristina Ramírez Hidalgo**, from IMDEA Food Institute. February 2020.

6. *"A data mining journey to explore molecular interactions between food biocompounds & drugs"*. **Dr. Enrique Carrillo de Santa Pau**, from IMDEA Food Institute. October 2020.

7. *"Senescence intercellular communication in ageing and related diseases"*. **Dr. Ana O'Loghlen**, from *Queen Mary University of London*. December 2020.

# 4. technology offer

The Institute has a portfolio of five patents, four of which have been granted and two have been internationally licensed. Two patents have been also transferred to the company CANAAN through the granting of an exclusive license with the right to sublicense, develop, use and market the international patent PCT/ ES2017/070263 and the Spanish priority patent number P201131733. Two products derived from the invention P201830740 have been licensed to the company YNSADIET. Also, IMDEA Food, participates in two EBT (technology - based company) PRECISION FORHEALTH, S.L. (P4H) and FORCHRONIC S.L..

## 4.1. Patents

**Publication number:** ES24087301B1
**Title:** Supercritical Rosemary extract for cancer treatment
**Owners:** IMDEA Food, Universidad Autónoma de Madrid
**Inventors:** Ana Ramírez de Molina, Susana Molina Arranz, Margarita González-Vallinas Garrachón, Tiziana Fornari Reale, Mónica Rodríguez García-Risco, Guillermo Reglero Rada

**Publication number:** ES2475366B1
**Title:** Methods and kits for prognosis of colorectal cancer
**Owners:** IMDEA Food, Hospital La Paz Institute for Health Research
**Inventors:** Ana Ramírez de Molina, Guillermo Reglero Rada, Teodoro Vargas Alonso, Susana Molina Arranz, Margarita González-Vallinas Garrachón, Juan Moreno Rubio, Paloma Cejas Guerrero, Jaime Feliú Batlle Application number: PCT/ES2017/070263 (Licensed to Canaan)

**Publication number:** EP3453399
**Title:** Formulations Comprising Lipid Systems Carrying Bioactive Compounds, for Use as Immunotherapy Potentiators Or Adjuvants For Patients With Cancer or Immunological Disorders
**Owners:** IMDEA Food, Universidad Autónoma de Madrid and Hospital Universitario Infanta Sofía. Licensed to Forchronic SL
**Inventors:** Ana Ramírez de Molina, Guillermo Reglero Rada, Carlos Torres Olivares, Luis Vázquez de Frutos, Marta Corzo, Pablo Arranz, Viviana Loria Kohen, Marta Gómez de Cedrón, Juan Moreno Rubio, Moisés Laparra Llopis, Enrique Casado Sáenz

**Publication Number:** ES2739133B2
**Title:** Composición para la reducción del declive metabólico asociado al envejecimiento y/o el metabolismo lipídico
**Owners:** IMDEA Food, Universidad Autónoma de Madrid, Fundación Hospital Universitario La Paz, Igenfarma
**Inventors:** Maria Tabernero, Ana Ramírez de Molina, Carlos Torres Olivares, Enrique de Miguel del Campo, Ignacio Alvarez Gómez de Segura, Carlota Largo Aramburu, Mónica Santamaría Ramiro, Gonzalo Polo Paredes, Daniel Ruíz Pérez

**Application number:** P201730304
**Title:** Uso de la apolipoproteína A1 como inhibidor de proliferación, migración e invasión celular en cáncer
**Owners:** IMDEA Food
**Inventors:** Cristina Aguirre Portolés, Ana Ramírez de Molina, Guillermo Reglero

## 4.2. Spin-offs (technology-based companies)

Technology- Based Companies promoted by IMDEA Food and the Autonomous University (UAM) of Madrid (UAM) for the the industrial and commercial exploitation of innovations derived from the IMDEA Food and UAM in the field of precision nutrition, that is to say in the design and application of effective nutritional strategies in the improvement of health, adapted to the genetic profile of people and their lifestyle or physiological situation.

**Precision ForHealth S.L. (P4H)**
Technology- Based Company recognized by Agreement of the Delegate Committee of the IMDEA Food's Board of Trustees on December 11, 2017, and Knowledge Based Company of the Autonomous University of Madrid, recognized by agreement of the Government Council of the UAM dated on November 17, 2017 and constituted on February 2018.

**Forchronic S.L.**
Technology-Based Company promoted by IMDEA Food and the Autonomous University of Madrid constituted on March 2019.

# 5. training, communication and outreach

## 5.1. Defended Theses

1. *"Role of Non-coding RNAs on Intestinal Lipid Metabolism".*
**Student:** Judit Gil Zamorano
**Advisors:** Dr. Alberto Dávalos Herrera
**Date of defense:** September 2020.

2. *"New metabolism targeting strategies against diabetes, lung cancer and aging".*
**Student:** Luis Filipe Costa Machado
**Advisors:** Dr. Pablo José Fernández Marcos
**Date of defense:** November 2020.

## 5.2. Internships/visiting students

**Student:** Anastasia – Areti Kyriazopoulou Korovesi
**Advisor:** Viviana Loria Kohen
**Visiting student from:** Harokopio University of Athens
**Period:** 01/03/2020 – 01/06/2020

**Student:** Molinero Moreno, Inés María
**Advisor:** Viviana Loria Kohen
**Visiting student from:** UAM
**Period:** 03/02/2020 - 30/04/2020

**Student:** Jennyfer Coello Sánchez
**Advisor:** Viviana Loria Kohen
**Visiting student from:** UAM
**Period:** 01/02/2020 - 01/04/2020

**Student:** Mª Juana Gómez Alonso Delgado
**Advisor:** Viviana Loria Kohen
**Visiting student from:** Alcalá de Henares/ CUNIMAD
**Period:** 20/01/2020 - 15/05/2020

**Title:** Practicum of the Official Master's Degree in Nutrition and Health
**Student:** Albert Vila
**Advisor:** Aida Serra
**Visiting student from:** Universitat Oberta de Catalunya
**Period:** March – June 2020

**Title:** Practicum of the Official Master's Degree in Nutrition and Health
**Student:** Victoria Lorca
**Advisor:** Aida Serra
**Visiting student from:** Universitat Oberta de Catalunya
**Period:** March – June 2020

**Title:** Evaluation of the activity and molecular mechanism of action of bioactive compounds or natural extracts obtained from plants that may be effective in the treatment of cancer, alone or in combination with existing chemotherapy.
**Student:** Andrea García Fernández
**Advisor:** Marta Gómez de Cedrón
**Visiting student from:** Universidad Complutense de Madrid
**Period:** 01/01/2020 - 01/07/2020

**Title:** Induction of the HNRNPK/MIR7-1 posttranscriptional axis expression by the insulin and LXR signal transduction pathways
**Student:** Daniel Margarido Galán
**Advisor:** Cristina M. Ramírez Hidalgo
**Visiting student from:** UAM
**Period:** 01/10/2019 - 01/06/2020

**Title:** Professional internships for the degree in nutrition and dietetics
**Student:** Natalia Mohino
**Advisor:** Cristina M. Ramírez Hidalgo
**Visiting student from:** UAM
**Period:** 30/03/2020 - 17/05/2020

**Title:** Study of mitochondrial biogenesis and function
**Student:** Sara Manso de la Viuda
**Advisor:** Manuel Alejandro Fernandez Rojo
**Visiting student from:** UAM
**Period:** 03/02/2020 - 30/04/2020

**Title:** Youth Employment Programme. Consejería de Educación, Juventud y Deporte de la Comunidad de Madrid Ref# PEJD-2019-PRE/ BMD-14499
**Student:** Yolanda Martín Martin
**Advisor:** Cristina M. Ramírez Hidalgo
**Visiting student from:** UAM
**Period:** 01/10/2019 - 01/06/2020

**Title:** Extracurricular Internships - Nutritional and pharmacological synergies: application in preclinical cancer models.
**Student:** Silvia Costa
**Advisor:** Alberto Diaz-Ruiz
**Visiting student from:** UAM
**Period:** 10/01/2020 - 31/01/21

**Title:** Physiological effects of a moringa plant extract on healthy ageing in preclinical modelsa
**Student:** Paula Ostos
**Advisor:** Alberto Diaz-Ruiz
**Visiting student from:** UFV
**Period:** 11/09/2020 - 16-07-21

## 5.3. Teaching in masters and other courses

### Masters

1. *"Module: Personal Nutrition and Chronic Diseases, Block: Molecular Ooncology* in the Master's in food systems. EIT Food. Ana Ramirez de Molina, Marta Gómez de Cedrón y Silvia Cruz Gil.

2. *"Module: Personal Nutrition and Chronic Diseases, Block:Nutritional interventions* in the Master's in food systems. EIT Food. Isabel Espinosa Salinas.

3. *"Molecular Oncology"* in the Master´s in Molecular. Rey Juan Carlos University of Madrid. Ana Ramirez de Molina.

4. *"Personalized Functional Foods"* in the Master's in food systems. EIT Food. Alberto Diaz-Ruiz.

5. *"Master in Bioinformatics and Computational Biology"*. UAM. Enrique Carrillo de Santa Pau.

6. *"Master in Food Sciences"*. EIT Food. Pablo José Fernández Marcos.

7. *"Personalized Functional Foods "* in the Master's in food systems. EIT Food. Cristina M. Ramírez Hidalgo.

8. *"Epigenomics for Food Sciences"* in the Master's in food systems. EIT Food. Teresa Laguna.

9. *"Effect of the microbiome over CRC onset and progression. Hands-on: Metagenomics approaches for studying microbiota"* in the Master's in food systems. EIT Food. Laura J Marcos Zambrano.

10. *"Personalized Nutrition"* in the Master's in food systems. EIT Food. Enrique Carrillo de Santa Pau.

11. *"Nutrigenetics and women's health promotion"* in the Master´s in Nutrition, Health and Woman. UCM. Viviana Loria Kohen.

12. *"Nutrigenetics and women's health promotion"* in the Master´s in Nutrition, Health and Woman. UCM. Elena Aguilar Aguilar.

13. *"Nutrigenetics and women's health promotion mujer"* in the Master´s in Nutrition, Health and Woman. UCM. Helena Marcos Pasero.

14. *"Personalized Nutrition is coming"* in the Master's in food systems. EIT Food. Enrique Carrillo de Santa Pau.

15. *"Epigenomics for Food Sciences"* in the Master's in food systems. EIT Food. Teresa Laguna.

16. *"Physiology of exercise"* in the Master´s in Physiology. Alberto Diaz-Ruiz.

17. *"Precision nutrition: From "omic" sciences to molecular precision nutrition"* in the Master in Biomedical Engineering. UPM. Maria Jesús Latasa.

18. *"Personalized Functional Foods"* in the Master's in food systems. EIT Food. Cristina M. Ramírez Hidalgo.

19. *"Immonutrition"* in the Master in Advanced Nutrition Sciences. José Moisés Laparra Llopis.

20. *"Understanding the tumor microenvironment and nutritional impact on reprogramming immunometabolism"* in the Master's in food systems. EIT Food. José Moisés Laparra Llopis.

### Courses

1. *"Precision Nutrition"* in Personal Nutrition and Chronic Diseases Course. MFS and EIT Food. Maria Jesús Latasa.

2. *"Summer School - Global Food Venture Programme"* in EIT Food Global Food Venture Programme. Enrique Carrillo de Santa Pau.

3. *"Role of fatty acids in personalized nutrition"* in XXXIX Summer Course: Gastro-onimics and personalized nutrition. Francesco Visioli.

4. *"Personalized Nutrition"* in Gastro-omics and Precision NutritionSummer Course. UPV. Lidia Daimiel.

5. *"Precision Nutrition"* in Gastro-omics and Precision NutritionSummer Course. UPV. José Mª Ordovás.

6. *"Summer School"*. EIT Food. Maria Jesús Latasa.

7. *"Summer School"*. EIT Food. Ana Ramírez, Maria Jesús Latasa.

## 5.4. Outreach

1. *GFVP Summer School.* June 2020. Enrique Carrillo, Carolina Rodríguez and Maria Jesús Latasa.

2. *EFSET Summer School.* EIT Food. June-July 2020.

3. **C***itizen Engagement: Food solutions for future generations.* EIT Food. November 27th-29th 2020. Maria Jesús Latasa.

4. *Venture Summit 2020*. EIT Food. November 2020. Maria Jesús Latasa.

5. *Food Champions Weekend.* WeValueFood, EIT Food. November 2020. Maria Jesús Latasa.

6. *MFS Final Event*. EIT Food. December 2020. Maria Jesús Latasa.

7. Webinar: *Personalized Nutrition, a prevention strategy in public health in times of pandemic.* The AnnualFoodAgenda, EIT Food. May 28th 2020. Guillermo Reglero, Ana Ramírez de Molina y Alfredo Martínez.

8. Webinar *#AFAWorldFoodDay,* The AnnualFoodAgenda, EIT Food. October 16th, 2020. Alfredo Martínez y Ana Ramírez de Molina.

9. *Bichindario: COVID-19 Edition.* The AnnualFoodAgenda, EIT Food, November 4th, 2020. Semana de la Ciencia, 2020. Laura Judith Marcos and Sonia Wagner.

10. *Precision nutrition to cope with the COVID-19.* Vision of the new generations of consumers. The AnnualFoodAgenda, EIT Food, November 11th, 2020. Semana de la Ciencia, 2020. Ana Ramírez de Molina, Alfredo Martínez, Alberto Dávalos, Diana Matilla and Rodrigo San Cristóbal and María Isabel Espinosa.

11. *Should you include your genes in the shopping cart.* The AnnualFoodAgenda, EIT Food. November 26th, 2020. Ana Ramírez de Molina

12. *Feed Your Genes and Balance Your Bacteria by Playing.* The AnnualFoodAgenda, EIT Food. 2020 European Researchers Night. November 27th, 2020. Ildefonso Rodríguez, Almudena García, Esther Cuadrado, Laura Judith. Marcos.

13. *Sustainability for the planet, sustainability for your body.* The AnnualFoodAgenda, EIT Food. December 14th. Esther Cuadrado, Alberto Dávalos, Diana Mantilla, Maria Isabel Espinosa.

14. *The role of dietary supplements in the prevention and reduction of sars-cov-2 infections in at-risk populations.* SPIN, EIT Food. December 10th. Ana Ramírez de Molina, Alberto Dávalos, Mª Isabel Espinosa, Cristina Fernández y Sara Castillo.

15. *The Gastroteca.* Esencia radio (94.5FM). September to December 2020. Regular participation of Sonia Wagner, IMDEA Food researcher, as an expert for assessing the *Bioactives* topic.

16. *#LaNaveMeeting.* Future Kitchen, EIT Food. June 30th 2020. Lorena Carrillo.

17. *#FutureKitchen Experience - Focus Groups.* Future Kitchen, EIT Food. December 4th 2020. Lorena Carrillo.

18. *Makeathon around sustainability in the bread and bakery industry.* MAKE it! Food Project. 21-23 October 2020. María Pérez Fernández.

19. *Entrepreneurship Education Academy.* EIT Food. November-December 2020. María Pérez Fernández.

20. *Maker Faire Rome.* MAKE it! Food Project, 11-13 December 2020. María Pérez Fernández.

## 5.5. IMDEA Food in the media

geriatricarea

*Zaragoza acogerá el IV Congreso FESNAD bajo el lema «Una alimentación sostenible para una nutrición adecuada».*
**Geriatricarea.com**

LA RAZÓN

*La Comunidad impulsa los Institutos de Estudios Avanzados.*
**Larazón.es**

EL PAÍS

*Por qué comer poco alarga la vida.*
**Elpais.com**

genotipia

*Ana Ramírez de Molina: "Hay ejemplos muy sencillos de nutrición de precisión que ya se pueden aplicar".*
**Genotipia**

ABC

*Dime qué genes tienes y te diré lo que debes comer para mejorar tu salud.*
**ABC Salud**

EL PAÍS

*La carrera contra reloj para probar la eficacia de fármacos alternativos para el coronavirus.*
**El País**

Alimente

*Párate y huele las rosas', un gesto que puede salvar tu vida.*
**Alimente**

EL ESPAÑOL

*El bioquímico J.M. Ordovás: "Esto no ha acabado ni acabará en un futuro próximo".*
**El Español**

EL MUNDO

*Padre e hijo contra la Covid-19: Así son los Ordovás, la saga española que lucha frente al virus.*
**El Mundo**

EL DÍA
LA OPINIÓN DE TENERIFE

*José María Ordovás: "Este virus que nos asuela es una obra de arte genética".*
**El Día**

eldiario.es

*Entrevista*
**elDiario.es**

NIUS
nueva información útil sencilla

*José María Ordovás, asesor científico del Gobierno: "Nos podemos encontrar ante la tormenta perfecta".*
**NIUS**

HERALDO
DE ARAGON

*José María Ordovás: "Este virus tiene una inteligencia increíble".*
**El Heraldo de Aragón**

cyltv

*Entrevista: La carrera por la vacuna.*
**Castilla y León Televisión**

Ya es mediodía

*entrevista: COVID*
**TV5, Ya es mediodía**

El Digital de Albacete

*Identifican el mecanismo clave para la regeneración del hígado y que podría mejorar los trasplantes.*
**El digital de Albacete**

Listín Diario

*Descubren un mecanismo que favorece la regeneración del hígado trasplantado.*
**Listin Diario**

EL COMERCIO

*Descubren un mecanismo que favorece la regeneración del hígado trasplantado.*
**El Comercio**

teleprensa

*Identifican el mecanismo clave para el progreso de la regeneración hepática y que podría mejorar los trasplantes.*
**Teleprensa**

revista alimentaria

*Nutrición personalizada: una herramienta de prevención en tiempos de pandemia.*
**Revista Alimentaria**

europa press

*Un investigador de IMDEA Alimentación identifica un mecanismo para el progreso de la regeneración hepática.*
**Europa Press**

El Confidencial
EL DIARIO DE LOS LECTORES INFLUYENTES

*Dime qué nutritipo tienes y te diré qué debes comer para no enfermar.*
**El confidencial**

ABC

*Dime qué nutritipo tienes y te diré qué debes comer para no enfermar.*
**ABC**

revista alimentaria

*IMDEA Alimentación: "La nutrición de precisión es una herramienta de salud".*
**Revista Alimentaria**

LA VANGUARDIA

*Descubren un mecanismo que favorece la regeneración del hígado trasplantado.*
**La Vanguardia**

LA VANGUARDIA

*Un estudio trata de identificar grupos de riesgo según el estado nutricional.*
**La Vanguardia**

eldiario.es

*José María Ordovás, bioquímico: "Todos los días se habla de la 'inminencia' de la vacuna, pero no solo es descubrirla, hay que fabricarla".*
**Eldiario.es**

N I U S
nueva información útil sencilla

*José María Ordovás, asesor científico del Gobierno: "Nos podemos encontrar ante la tormenta perfecta".*
**Niusdiario.es**

EL ESPAÑOL

*El bioquímico J.M. Ordovás: "Esto no ha acabado ni acabará en un futuro próximo".*
**Elespanol.com**

europa press

*Alimentacion.- El consorcio europeo EIT Food, Ausolan y el Banco de Alimentos entregan 60.000 menús infantiles saludables.*
**europress.es**

ABC

*El ayuno, la última receta hacia el éxito de Djokovic.*
**abc.es**

El Confidencial
EL DIARIO DE LOS LECTORES INFLUYENTES

*La dieta que recomienda Harvard para bajar un 21% el riesgo cardiovascular.*
**Elconfidencial.es**

El Confidencial
EL DIARIO DE LOS LECTORES INFLUYENTES

*Huele que alimenta, pero ¿también engorda?*
**Elconfidencial.es**

Nueva Revista

*Iniciativas de la administración para transferir conocimiento e innovación a la universidad.*
**nuevarevista.net**

sinc
La ciencia es noticia

*"Los científicos somos el blanco de quienes buscan culpables en lugar de soluciones a la COVID-19".*
**agenciasinc.es**

infosalus.com

*Identifican el mecanismo clave para el progreso de la regeneración hepática y que podría mejorar los trasplantes.*
**infosalus.com**

madrid+d

*Identifican un mecanismo para el progreso de la regeneración hepática.*
**madrimasd.com**

EFE: Agencia EFE

*Descubren un mecanismo que favorece la regeneración del hígado trasplantado*
**agenciaefe.com**

EFE: Agencia EFE

*Descubren un mecanismo que favorece la regeneración del hígado trasplantado.*
**agenciaefe.com**

asscat
Associació Catalana de Pacients Hepàtics

*Un investigador de IMDEA Alimentación identifica un mecanismo para el progreso de la regeneración hepática.*
**asscat-hepatitis.org**

teleprensa

*Identifican el mecanismo clave para el progreso de la regeneración hepática y que podría mejorar los trasplantes.*
**teleprensa.com**

EL COMERCIO

*Descubren un mecanismo que favorece la regeneración del hígado trasplantado.*
**elcomercio.es**

Listín Diario

*Descubren un mecanismo que favorece la regeneración del hígado trasplantado.*
**listindiario.com**

El Digital de Albacete

*Identifican el mecanismo clave para la regeneración del hígado y que podría mejorar los trasplantes.*
**eldigitaldealbacete.com**

El Confidencial
EL DIARIO DE LOS LECTORES INFLUYENTES

*Dime qué nutritipo tienes y te diré qué debes comer para no enfermar.*
**elconfidencial.com**

rtve

*Obesidad Infantil.*
**La Aventura del Saber. RTVE**

IB Televisió de les Illes Balears

*La relación entre la alimentación y el Covid-19.*
**Ib3.org**

Noticias UdeC

*Estudio advierte que hábitos de alimentación en adolescentes podrían empeorar.*
**noticias.udec.cl**

Noticias UdeC

*Obesidad infanto-juvenil: una asignatura pendiente que no debemos despreocupar durante la etapa de confinamento por COVID-19.*
**vidasaludable.udec.cl**

iNNOVASPAiN
EL PORTAL LÍDER DE LA INNOVACIÓN EN ESPAÑOL

*Ana Ramírez de Molina: "La industria agroalimentaria ha de inspirarse más en la ciencia".*
**InnovaSpain**

ALCALAHOY

*La Comunidad de Madrid avala el ayuno de corta duración en pacientes con cáncer.*
**Alcalahoy**

CADENA SER

*Los Salvacomidas´ reparten 700 menús infantiles al día en Gipuzkoa.*
**Cadena Ser**

65YMÁS.COM

*Los alimentos ultraprocesados triplican el riesgo de fragilidad en los mayores.*
**65 y más**

eldiario.es

*«Garantizar la salud de nuestros conciudadanos».*
**El diario**

65YMÁS.COM

*El riesgo de los alimentos ultraprocesados para las personas mayores.*
**65 y más**

LA RAZÓN

*Los ultraprocesados aceleran el envejecimiento y triplican el riesgo de fragilidad en ancianos.*
**La Razón**

Cuidate Plus

*Los ultraprocesados envejecen más.*
**Cuidate plus**

sanjuan8.com

*La dieta que Harvard recomienda para bajar el riesgo cardiovascular.*
**San Juan 8**

geriatricarea
El portal para los profesionales del sector geriátrico

*Consumir alimentos ultra-procesados multiplican por tres el riesgo de fragilidad en los ancianos.*
**Geriatricarea**

ABC

*Los alimentos ultraprocesados pueden triplicar el riesgo de fragilidad en los ancianos.*
**ABC**

Webconsultas
Revista de salud y bienestar

*Los ultraprocesados multiplican por tres la fragilidad en los mayores.*
**Web consulta**

*El consumo de alimentos ultra-procesados podría multiplicar por tres el riesgo de fragilidad en los ancianos.*
**Aula Magna**

*El consumo de alimentos ultra-procesados multiplica el riesgo de fragilidad en los ancianos.*
**Onda Cero**

*Hoy por Hoy Madrid.*
**Cadena Ser**

*Un vecindario de bacterias para que los pequeños aprendan nutrición.*
**ABC**

*Así se aprende a jugar con la Microbiota.*
**Alimente. El Confidencial**

*Un vecindario de bacterias para que los pequeños aprendan nutrición.*
**ABC**

*Así se aprende a ‹jugar con la microbiota›.*
**Alimente**

*16 octubre: Webinar «¿Podemos asegurar una nutrición saludable y sostenible?»*
**Revista Alimentaria**

*FTF La Comida del Futuro*
**Fundación Bankinter**

*Webinar del Instituto de Alimentación del IMDEA y la Unión Internacional de Ciencias de la Nutrición. (IUNS) por el Día Mundial de la Alimentación.*
**Genotipia**

*AFA World Food Day.*
**IUNS**

*¿Piensas que ya sabes comer bien? Esta encuesta te dice en qué deberías mejorar | Nutrición | BuenaVida | EL PAÍS (elpais.com)*
**elpais.com**

*16 octubre: Webinar «¿Podemos asegurar una nutrición saludable y sostenible?».*
**Revista Alimentaria**

*¿Qué ocurrirá en 2050 cuando diez mil millones de personas quieran alimentarse de forma saludable y además sostenible?*
**Madrimasd**

*#AnnualFoodAgenda reúne a líderes mundiales en Nutrición y Salud por el Día Mundial de la Alimentación.*
**Marketing Directo**

*¿Qué ocurrirá en 2050 cuando diez mil millones de personas quieran alimentarse de forma saludable y además sostenible?*
**Alibird**

*¿Podemos asegurar una nutrición sostenible y saludable?*
**Basque Culinary Innovation**

*Día Mundial de la Alimentación: hacia un sistema alimentario saludable y sostenible.*
**Pensamiento Eco**

*«Podemos y debemos reforzar el sistema inmunitario con lo que comemos».*
**ABC**

LA VANGUARDIA

*La UAM relaciona los supuestos beneficios del café con una buena salud previa.*
**La Vanguardia**

Comunidad de Madrid ****

*El jefe de Endocrinología del Niño Jesús, galardonado por la American Human Growth Foundation.*
**Comunidad de Madrid**

madrid

*Bichindario Edicion Covid19- Semana de la Ciencia.*
**Madridmasd**

Guía del Ocio

*Bichindario Edicion Covid19- Semana de la Ciencia.*
**Guía del Ocio**

UAM Universidad Autónoma de Madrid

*Bichindario Edicion Covid19- Semana de la Ciencia.*
**UAM**

el Periódico de Aragón

*«Desconocemos en un 95% los compuestos que comemos».*
**El Periódico de Aragón**

madrid

*Alimenta tus Genes y Equilibra tus bacterias.*
**Madrimasd**

LA VANGUARDIA

*IMDEA Alimentación forma a influencers.*
**La Vanguardia**

madrid

*Alimenta tus Genes y Equilibra tus bacterias.*
**Madrimasd**

UAM Universidad Autónoma de Madrid

*Alimenta tus Genes y Equilibra tus bacterias.*
**UAM**

revista alimentaria

*Descubre más sobre alimentación en la Noche Europea de los Investigadores.*
**Revista Alimentaria**

El Confidencial
EL DIARIO DE LOS LECTORES INFLUYENTES

*Así se aprende a 'jugar con la microbiota'.*
**El Confidencial**

infosalus.com

*La dieta mediterránea reduce el deterioro de la función renal en las personas mayores de 60 años.*
**Infosalus**

ALIBIRD

*Alimenta tus Genes y Equilibra tus bacterias.*
**Alibird**

Radio Sol XXI 90.6 FM

*Entrevista Radio Sol XXI- La Noche de los Investigadores.*
**Radio Sol XXI**

UAM Universidad Autónoma de Madrid

*Alimenta tus Genes y Equilibra tus bacterias.*
**UAM**

Edición Impresa PDF
*¿Ayunar potencia la quimioterapia?*

ecoticias.com el periódico verde

*Vida saludable. Más beneficios de la dieta mediterránea.*
**Ecoticias**

ABC

*Un vecindario de bacterias para que los pequeños aprendan nutrición.*
**ABC**

CADENA SER

*Bichindario HoyxHoyMadrid Cadena Ser*
**Cadena Ser**

madrid

*Un vecindario de bacterias para que los pequeños aprendan nutrición.*
**Madrimasd**

europa press

*La innovación tiene cara de vacuna.*
**Europa Press**

LA VANGUARDIA

*Guillermo Reglero, director de IMDEA Alimentación, recibe el premio 'Fermina Orduña 2020' a la Trayectoria Profesional.*
**La Vanguardia**

eit Food

*El deseo de consumir azúcar.*
**La Alimentación del Futuro**

revista alimentaria

*Emprendimiento y liderazgo femenino en el sector agroalimentario.*
**Revista Alimentaria**

ABC

*Los 7 Magníficos de la Innovación.*
**ABC**

SPANISH STARTUPS

*Entrena tus Impulsos aprende a consumir azúcar.*
**Spanish Startups**

Yareth Hernández Nutrición

*Entrena tus Impulsos aprende a consumir azúcar.*
**Yareth Nutrición**

europa press

*El IMDEA alcanzó los 41,4 millones de euros en volumen de actividad en 2019.*
**Europa press**

LA RAZÓN

*Estudian la capacidad del ayuno para potenciar la quimioterapia.*
**La Razón**

El Confidencial
EL DIARIO DE LOS LECTORES INFLUYENTES

*El suplemento que fortalece la inmunidad hasta que llegue la vacuna para el covid-19.*
**El Confidencial**

Jantour

*Dieta sana y ejercicio, dos escudos para protegerse del Covid.*
**JanTour**

ABC

*Un vecindario de bacterias para que los pequeños aprendan nutrición.*
**ABC**

el Periódico de Aragón

*Entrevista: «Desconocemos en un 95% los compuestos que comemos».*
**El Periódico de Aragón**

ABC

*Entrevista: «Podemos y debemos reforzar el sistema inmunitario con lo que comemos».*
**ABC**

HERALDO DE ARAGÓN

*Nutrición personalizada: cómo la alimentación puede contribuir a la salud.*
**El Heraldo de Aragón**

CatalunyaPRESS TE INFORMA

*Los efectos del Covid son más severos en pacientes con obesidad.*
**Cantalunya Press**

El Confidencial
EL DIARIO DE LOS LECTORES INFLUYENTES

*Así se aprende a 'jugar con la microbiota'.*
**El Confidencial**

2020