



precision
NUTRITION
and **HEALTH**



food
2023

annual report



Dr. Ricardo Ramos Ruiz

Director, IMDEA Food Institute
June 2024

words from the director...

This is the first time that I welcome you to these pages, where we try to capture the work of a whole year: the achievements, milestones, its successes and, why not, its misfortunes.

The Annual Report is the Institute's official letter of introduction and, as such, its main recipients are all the collaborators who come to the Centre: interested students, the companies that rely on our experience every year, the Universities and their Departments and the Community of Madrid itself, but also a whole universe of curious people interested in learning more about Precision Nutrition, and in finding out how research is progressing and where it is heading in this field.

Allow me, if only this once, that although there will be many people, even strangers, who will be interested in the contents of this publication, I would like to address first of all the employees of the IMDEA Food Research Institute, as it is a special occasion.

I began my approach to the Institute in mid-2023 and it was in October when I formally assumed, with a mixture of enthusiasm and respect, the functions of IMDEA Alimentación's director. But let's not speak in the first person; what I want to express is simply the vision of the Centre that I found, now that my view is still somehow external and I can describe it more objectively.

It would not be fair to say that the year 2023 has been a quiet one, with a double transition and different changes accumulated in a very short time. The IMDEA Institutes are still young centers that have not yet come at the age of 18 and, in many ways, have tasks "under

construction". All IMDEAs are monographic centers focused on a fundamental work topic - Precision Nutrition in our case - and are sometimes defined as centers where a figure who acts as director directs all the work teams and defines the strategic lines to which all the researchers are dedicated, unlike other more universal or generalist state centers.

The IMDEA Alimentación that I found in 2023 is located

at an intermediate point, which in my opinion is ideal. There is an unquestionable common theme of work, but each researcher has a defined line where he or she exploits his or her talent and experience with almost complete autonomy.

In my opinion, this structure favours collaborations that are otherwise made very difficult by competitiveness and access to limited resources on a recurring basis. What I could observe on my arrival at the Centre in 2023 is that the will to form an active IMDEA Food where we can all fit in and develop all our capabilities is well and alive.

I HAVE FOUND A WELCOMING WITH AN INCREDIBLE TRAINING THAT CONTRASTS WITH ITS YOUTH AND WITH AN ENORMOUS DESIRE TO CREATE FRONTIER SCIENCE

I would like to expressly add that I have found a welcoming, very professional center, with an incredible training that contrasts with its enormous youth and with an enormous desire to create Frontier Science and an equally enormous desire to take our Science abroad, be it fairs, schools, centers or even bars. We are not going to fall into the illusion of thinking that all this work can be done without effort, or that there are no difficulties. We are in 2024 and there is still time for everything that has been sown in the last year to begin to bear fruit, which is undoubtedly a lot: new incorporations, millions of euros for research requested in regional, state and international projects, offices and internal committees that help us to efficiently and swiftly manage all the talent that strives to emerge from each laboratory and each unit of the Institute.

I would like to end this open letter with a few words of thanks and excitement. Gratitude for the welcome that has made it much easier to take on such a great responsibility as representing such a complex and important Centre in the Community of Madrid (and beyond), and hope for the future. Because the ingredients are there: we have the people, the structure and the talent. All we need is the determination to continue as we have been doing, working hard and well, until we convince the world of the essential value of Precision Nutrition and of the work we carry out at IMDEA Alimentación.

Finally, for all those outside the Centre who see this Report as a *proxy* of what our Institute is like, what we are working on and how the future of research in our field is looking, I would also like to welcome you with this message. I hope that browsing through this document will help you to make a 360° rotation of our activity, that it will encourage you to get to know us, that it will awaken in the younger ones a vocation to enter this discipline, and that it will serve as a gateway to IMDEA Alimentación, where, in all sincerity, the "physical" doors are open to you to come and see us, find out what we do and how we do it and, of course, to come and tell us about your projects. You will always find a coffee (without sugar) ready to share.

Es la primera vez que doy la bienvenida desde estas páginas, donde intentamos plasmar el trabajo de todo un año: los logros, hitos, sus aciertos y, por qué no, también sus desventajas.

La Memoria Anual no deja de ser la carta de presentación oficial del Instituto y, como tal, tiene como destinatarios principales a todos los colaboradores que acuden al Centro: a los estudiantes interesados, a las empresas que cuentan cada año con nuestra experiencia, a las universidades y sus departamentos y a la propia Comunidad de Madrid, pero también a todo un universo de curiosos interesados en conocer más sobre la Nutrición de Precisión, y saber cómo la investigación avanza y hacia dónde se dirige en este ámbito.

Aunque solo sea por esta vez, permitidme que, a pesar de que habrá muchas personas ajenas a la organización que se adentrarán en los contenidos de esta publicación, en primer lugar me dirija a los trabajadores del Instituto de Investigación IMDEA Alimentación.

Inicié mi aproximación al Instituto a mediados del año 2023 y fue en octubre cuando formalmente asumí las funciones de dirección de IMDEA Alimentación, con una mezcla de ilusión y respeto. Pero no quiero hablar en primera persona, lo que quiero expresar es sencillamente la visión del Centro que encontré, ahora que mi mirada es aún un 20% externa y puedo describirla con mayor objetividad.

No sería justo decir que el año 2023 ha sido tranquilo, con una transición doble y diferentes cambios acumulados en muy poco tiempo. Los Institutos IMDEA son aún centros jóvenes que no han alcanzado la mayoría de edad de los 18 años y, en muchos sentidos, les quedan tareas "en construcción". Todos los IMDEA son centros monográficos centrados en un tema fundamental de trabajo –la Nutrición de Precisión en nuestro caso– y, en ocasiones, están definidos como centros donde una figura que actúa de director dirige todos los equipos de trabajo y define las líneas estratégicas a las que se dedican todos los investigadores, a diferencia de otros centros estatales más universales o generalistas. El IMDEA

**LOS MIMBRES
ESTÁN: TENEMOS
LAS PERSONAS, LA
ESTRUCTURA Y EL
TALENTO. SOLO FALTA
EL EMPEÑO DE SEGUIR
COMO HASTA AHORA
HASTA CONVENCER
AL MUNDO DEL VALOR
IMPRESINDIBLE DE
LA NUTRICIÓN DE
PRECISIÓN**

Alimentación que yo encontré en 2023 está situado en un punto intermedio que, desde mi punto de vista, es el idóneo. Existe un tema común de trabajo indudable, pero cada investigador tiene una línea definida donde explota su talento y experiencia con una autonomía prácticamente plena.

Esta estructura favorece las colaboraciones que, de otra parte, la competitividad y el acceso a recursos limitados de forma recurrente dificultan enormemente. Lo que pude observar a mi llegada es que la voluntad de formar un IMDEA Alimentación activo donde quepamos todos y podamos desarrollar todas nuestras capacidades estaba viva y bien activa.

Quiero añadir de forma expresa que me he encontrado un centro acogedor, muy profesional, con una formación increíble que contrasta con su enorme juventud y con unas ganas enormes de crear ciencia de frontera y, al mismo tiempo, de llevar nuestra Ciencia al exterior, sean ferias, colegios, centros e incluso bares. No vamos a caer en la ilusión de pensar que todo este trabajo se hace sin esfuerzo, ni que no hay dificultades. Estamos en 2024 y queda tiempo para que empiece a fructificar todo lo sembrado en el último año, que es mucho, sin duda: nuevas incorporaciones, millones de euros para investigación solicitados en proyectos regionales, estatales e internacionales, oficinas y comités internos que nos ayuden a gestionar eficientemente y de forma ágil todo el talento que pugna por salir de cada laboratorio y unidad del Instituto.

Quiero finalizar esta carta abierta con unas palabras de agradecimiento por la acogida, que ha hecho mucho más fácil

asumir una responsabilidad como es la de representar a un Centro tan complejo y de tanta relevancia en la Comunidad de Madrid (y fuera de ella), y de ilusión para el futuro. Porque los mimbres están: tenemos las personas, la estructura y el talento. Solo falta el empeño de seguir como hasta ahora, trabajando duro y bien, hasta convencer al mundo del valor imprescindible de la Nutrición de Precisión y del trabajo que desarrollamos en IMDEA Alimentación.

También quiero dar la bienvenida a todas las personas ajenas al Centro que vean esta Memoria en forma de *proxy* de cómo es

nuestro Instituto, en qué estamos trabajando y cómo asoma el futuro de la investigación en nuestro campo. Confío en que este publicación sirva para hacer una rotación 360° sobre nuestra actividad, que anime a conocernos, que a los más jóvenes os despierte la vocación de adentraros en esta disciplina, y que os sirva como puerta de entrada a IMDEA Alimentación, donde dicho sea con total sinceridad, tenéis las puertas físicas abiertas para venir a vernos, conocer lo que hacemos y cómo lo hacemos y, por supuesto, para contarnos vuestros proyectos. Siempre encontraréis un café (sin azúcar) preparado para poder compartirlo.





cor

editor

IMDEA Food Institute

graphic design

www.loveodesign.es

main photographer

Álvaro Antón

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about us

The IMDEA Food Institute, one of the eight 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

Generating scientific knowledge of excellence in the fields of food and nutrition, 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.

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 areas of food and health, with a special focus on the prevention of chronic diseases.

industry



Powering the economic development and competitiveness of the food industry via the design and validation of nutritional strategies and food products to prevent and to treat chronic diseases.

society



Reducing of healthcare costs and improving the wellbeing of the population through the study of link between the diet and health, and the execution of communication and dissemination programmes.





The core strength of the Institute is its international **research team**, **consisting of talented researchers from 11 different countries**, which carries out new scientific discoveries in Food Science, and foster the development of emerging technologies.

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.

79 people

4.595 m² area

11 different countries

2 symmetrical areas
of 5 floors each

16 research groups

7 research labs



research programmes



research platforms



Clinical Platform
of Clinical Trials.
GENYAL



Innovation,
Communication
and Education Unit

organization structure





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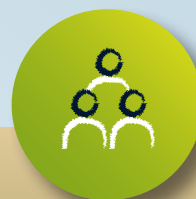
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Ph.D.

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Alejandro Arranz Calvo

in figures

human RESOURCES



79 People

16 Research Groups



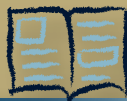
51

researchers



13

associate
researchers



95

Ph.D. students
& students



6

lab
technicians



9

staff
management



scientific RESULTS



166

Scientific
Papers

40

Invited
Talks

28

Theses
since 2008

22

Ongoing
Theses

+75%

Cumulative
growth of impact
factor since 2018

80%

%Q1
JRC



technology TRANSFER



The Institute has a portfolio of eight patents, seven of which have been granted and three 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:

8

**Contracts with
Companies**

10

Patents
7 granted · 1 applied

2

Spin-Off-EBT

14

**Clinical
Nutrigenomics
Interventions**



Public institutions



Private institutions



Clusters



projects &
FELLOWSHIPS



+2,500 Clinical
Nutrigenomic
Volunteers
Cohort

34 R&D Grants

11

International
projects

16

National
Projects

11

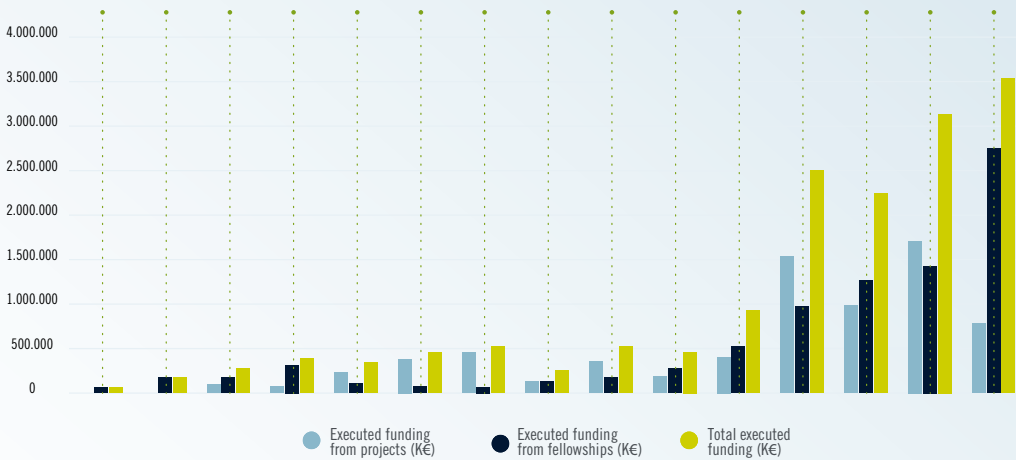
Regional
Projects

7

Contracts
with industry

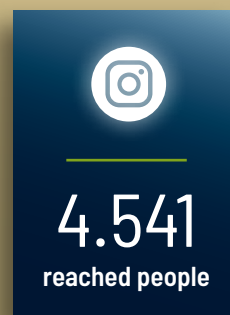
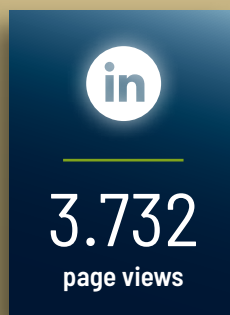
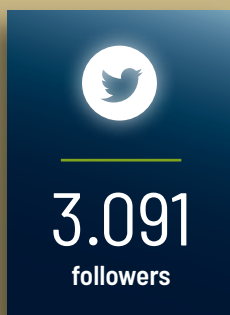
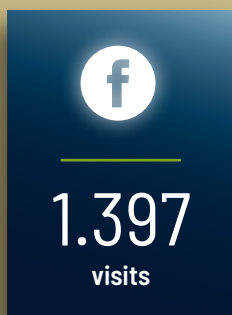
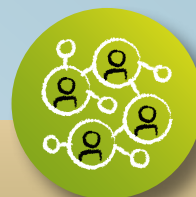
34

R&D
researchers



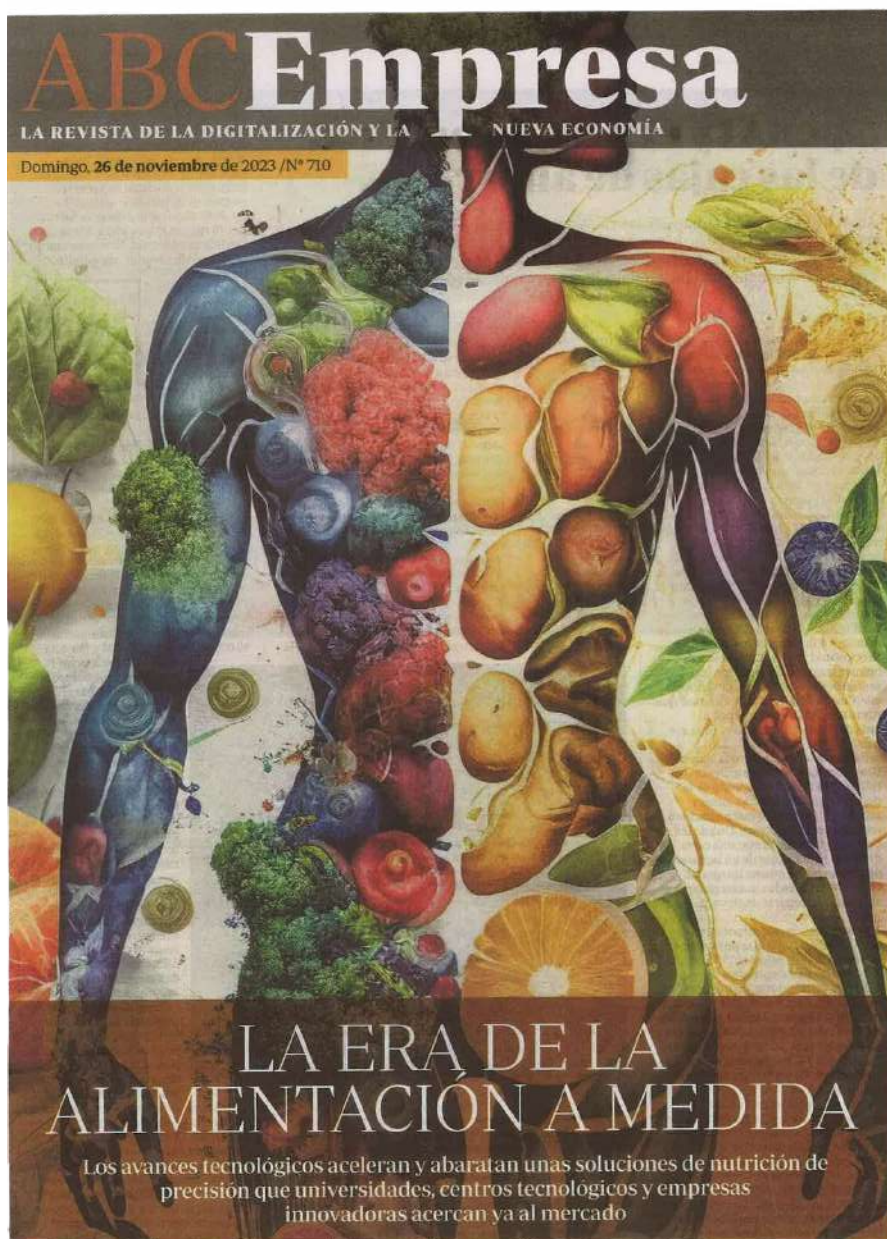


social NETWORKS



in the MEDIA

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Media
impacts



EL MUNDO  Menú

SALUD

Nueva promesa antiedad: un estudio muestra los beneficios del harmol, un compuesto del café

Esta molécula genera un estado moderado de estrés a nivel celular, similar al del ejercicio y la restricción calórica, que supone que el organismo sea más fuerte y saludable



“UN ESTUDIO SOBRE EL EFECTO DEL HIDROXITIROSOL PRESENTE EN EL ACEITE DE OLIVA VIRGEN EXTRA EN EL ALZHEIMER Y SUS RESULTADOS PRELIMINARES SUGIEREN QUE ESTE POLIFENOL PODRÍA TANTO PREVENIR COMO RETRASAR LA APARICIÓN DE ESTA ENFERMEDAD”

Mercacei
información | aove | olivar

QUIÉNES SOMOS PUBLICACIONES ACTUALIDAD REPORTAJES OPINIÓN EMPRESAS SALUD AGENCIA

Aceite de Oliva y Salud

Un estudio analiza los beneficios del AOVE en la prevención de la enfermedad de Alzheimer

Viernes 15 de abril de 2016, 09:31h  05:01

CRISTINA REVENGA PALADIOS

30/03/2016 - Científicos del Instituto Madrileño de Estudios Avanzados (IMDEA) Alimentación están realizando un estudio sobre el efecto del hidroxitirosol presente en el aceite de oliva virgen extra en el Alzheimer y sus resultados preliminares sugieren que este polifenol podría tanto prevenir como retrasar la aparición de esta enfermedad, tal y como avanza en una entrevista con Mercacei Emma Burgos, investigadora del

Infosalus

[En noticia](#) [Ganglios inflamados](#) [Beneficio del pomelo](#) [5 alimentos para bajar el colesterol](#) [Tónicos saludables](#) [Enfoques en el uso del omega3](#) [Gargado en las heces](#)

infosalus / investigación

El estilo de vida mediterráneo, asociado a la reducción del dolor en mayores



Archivos - Mujer embarazada en bicicleta - [IMAGEN: AOTVIA](#)

Infosalus    Newsletter

Publicado: viernes, 29 abril 2012 13:49 [@infosalus.com](#)

MADRID, 29 Abr. (EUROPA PRESS) - Un nuevo estudio de la Universidad Autónoma de Madrid en el CIBERESP y el IMDEA de Alimentación ha evidenciado que seguir un estilo de vida mediterráneo se asocia con una reducción del dolor en adultos mayores.

El trabajo, publicado en la revista científica 'Mayo Clinic Proceedings', sugiere que una intervención en el conjunto del estilo de vida podría disminuir la necesidad de tratamientos analgésicos, pero sobre todo, la carga de discapacidad asociada al dolor persistente en estas personas.

Lleva el Sur a lo más alto





laSexta Beneficios cerveza POCO X6 5G I

TecnoXplora

CAMBIOS EN EL ADN /

Un estudio revela los efectos del aceite de oliva virgen extra en la lucha contra el cáncer de colon

La investigación abre paso a la posibilidad de investigar, y al mismo tiempo, incorporar nuevos componentes dietéticos a nuestra dieta para mejorar nuestra salud y prevenir enfermedades.

“SEGUIR UN ESTILO DE VIDA MEDITERRÁNEO SE ASOCIA CON UNA REDUCCIÓN DEL DOLOR EN ADULTOS MAYORES”

LARAZON 28

MADRID VIVA PLANES EN MADRID

Madrid investiga una molécula del café que podría ralentizar el envejecimiento

La vejez se asocia a la pérdida de la capacidad de las células de producir energía de forma eficiente, provocando pérdida de masa y potencia muscular; algo contra lo que un compuesto denominado harmol podría luchar con éxito



LA VANGUARDIA

Sociedad

NATURAL / BIG VANG / TECNOLOGÍA / SALUD / QUÉ ESTUDIAR / UNIVERSO JR / FORMACIÓN / VIVO SEG

UNIVERSIDAD INVESTIGACIÓN

Hallan un modelo quimiinformático para el desarrollo de fármacos para la salud intestinal

• Madrid, 8 nov (EFE).- El instituto madrileño Imdea Alimentación ha desarrollado un modelo que facilita el diseño de fármacos y nutracéuticos para la salud intestinal, abriendo vías nuevas para el tratamiento para enfermedades como el cáncer de colon o las infecciones gastrointestinales.

f t i

AGENCIAS

08/11/2023 13:30

Madrid, 8 nov (EFE).- El instituto madrileño Imdea Alimentación ha desarrollado un modelo que facilita el diseño de fármacos y nutracéuticos para la salud intestinal, abriendo vías nuevas para el tratamiento para enfermedades como el cáncer de colon o las infecciones gastrointestinales.

Clarín

En vivo Elecciones 2023 el durísimo cruce entre dos dirigentes del PRO por el balotaje Argentina vs Uruguay: previa, formaciones y horario del par

Internacional

La sustancia que suma años de vida y pocos conocen: en qué alimentos se encuentra

Una investigación revela que este compuesto podría influir en el metabolismo y envejecimiento.



research areas

precision nutrition
and aging

30

precision nutrition
and cancer

32

precision nutrition
and obesity

35

precision nutrition
and cardiometabolic
health

38

childhood precision
nutrition

41

WHAT WE DO?

The Madrid Institute for Advanced Food Studies focuses on developing scientific research of excellence in the field of nutrition and precision nutrition to promote solutions that benefit society and its health, and thus contribute to a knowledge-based economic model that can generate high added value.



Precision Nutrition and Aging Programme

**RAFAEL
DE CABO Ph.D.**

Nutritional Interventions
Research Group

Rafael de Cabo Ph.D.

Metabolic Syndrome
Research Group

Pablo Fernández Ph.D.

Posttranscriptional regulation
of metabolic diseases
Research Group

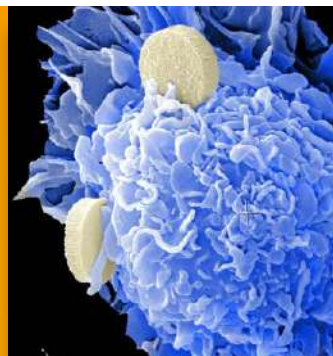
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Cellular and Molecular
Gerontology Research Group

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Translational Venomics

Maria Ikonomopoulou Ph.D.



Precision Nutrition and Cancer Programme

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Childhood Precision Nutrition Programme

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RESEARCH PROGRAM

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.

Nutritional Interventions

- 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.

Metabolic Syndrome



- 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.

Posttranscriptional Regulation of Metabolic Diseases



- 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.

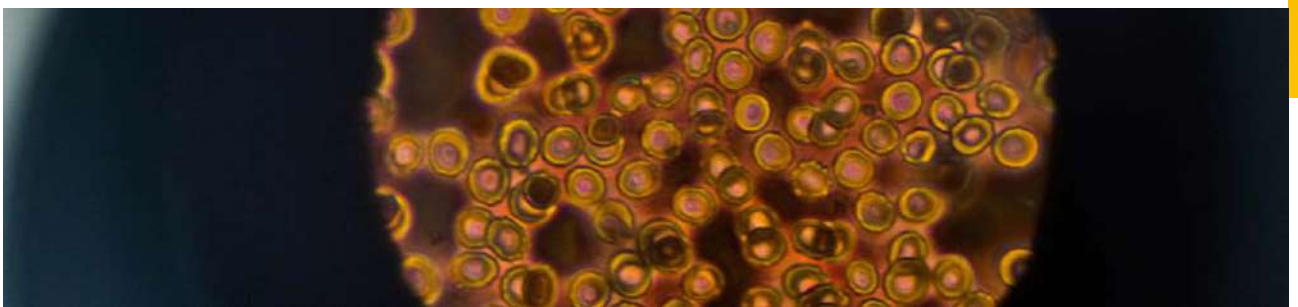
Cellular and Molecular Gerontology



- Approaches based on microbiota and artificial intelligence to promote healthy aging.
- Anti-aging interventions in obesity context.
- Aging and Cancer as Interrelated processes
- Molecular Signatures of Premature Aging Models
- Dissemination of innovative research to elderly population.

Transactional Venomics

Our group's 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 cancer and metabolic disorders as well as medicinal chemistry and Structural Relationship Activity, aiming to discover new & safe venom-based anti-aging therapies.





RESEARCH PROGRAM

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.

Molecular Oncology

- 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.
- 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.
- 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 signaling pathways.



Clinical Oncology

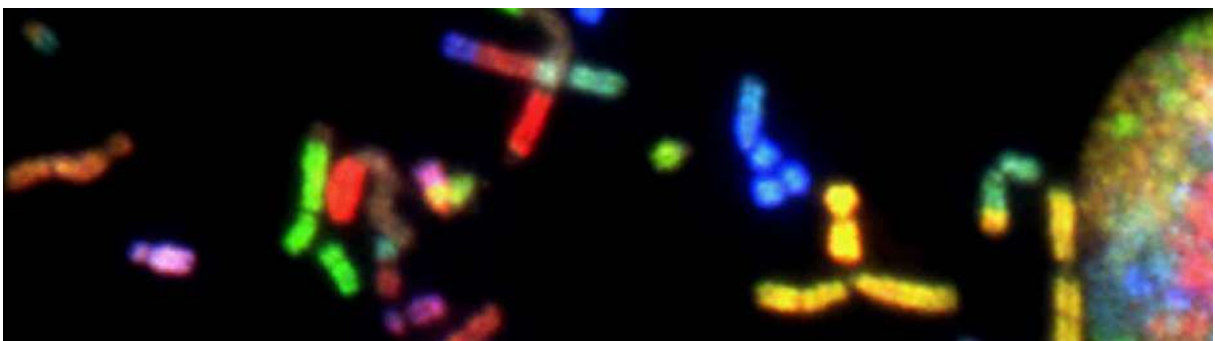
Our Clinical Oncology Group, with the Precision Oncology Laboratory (POL) in Hospital Universitario Infanta Sofia, is focused on translational research in lifestyle habits and related targeted interventions that can impact on cancer outcome, and on patients and survivors quality of life. In 2021 an structured pathway to engage cancer patients in physical activity and exercise programs has been set up with these goals, with a multidisciplinary team -including qualified exercise professionals, rehabilitation, oncologists, psychologists nurses and nutrition experts- and a net of local community exercise and sport resources. Main tumors of interest are lung, breast, and gastrointestinal cancer, with an anticipated new specific focus on neuroendocrine tumors based on center experience that has resulted in the second national center gaining european certificate as Center of Excellence (ENETs-CoE). Also to these objectives, engineers have been incorporated to build Real World Data and clinical management resources.

- Clinical trials and application of molecular nutrition strategies for improvement of response to treatments and quality of life of cancer patients.
- Identification of molecular biomarkers of cancer prognosis and treatment response.
- Development of electronic tools for clinical management and research.

THYROID CANCER RESEARCH LINE

Study the role of HIPPO pathway in thyroid tumorigenesis and progression.

- Study mechanisms of drug resistance.
- Determine the players and their role in tumor microenvironment.



Molecular Immunonutrition



- Identify innate immune signals that stem at intestinal level and enable a selective functional differentiation of immune effector cells such as monocyte-derived macrophages.
- Metabolic reprogramming to generate lipid metabolites that exert key functions in controlling the response.
- Immunonutritional-based precision intervention strategies to a selective and driven modulation of innate immune responses preventing/treating the risk for severity of liver-related diseases and antitumoral response(s).

Computational Biology



- Develop computational strategies to aggregate different sources of information on food consumption, biochemistry, phenotypic data, digital and omic data, with the aim of understanding the complex molecular relationships between food and disease.
- Understanding microbiome-host interactions, focusing on the characterization of microbiome alterations in complex diseases such as colorectal cancer, obesity or celiac disease, and on the study of the effects of food-derived bioactive compounds on the modulation of the microbiome. Application of automatic learning methods and systems biology for the classification of patients based on the characteristics of the intestinal microbiota.
- Understanding the variability of human metabolism using epigenomic and transcriptomic data to assess the benefits of nutrients and dietary supplements in cancer patients to establish personalized nutrition strategies.
- Develop web services to facilitate the access to complex and high volumes of data to researchers.





RESEARCH PROGRAM

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. On the basis of the n-equal-to-one approach, we evaluate the individual response to diet and physical activity interventions by gathering genetic, epigenetic and metabolomic knowledge at individual level following systems biology approaches in large populations.

Nutritional Genomics and Epigenomics



Our group aims to provide genomic tools and knowledge to manage obesity and related co-morbidities 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 researchers 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 systems 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.

Cardiovascular Nutritional Epidemiology



Our strategic objective is to produce relevant information to support clinical and population-based policies aimed at controlling cardiovascular diseases and the main geriatric syndromes in the older adult population. Specifically, we work on the following research areas:

- Nutritional and omic determinants of frailty, sarcopenia, malnutrition, and functional status in older adults.
- 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 Cardiovascular Health, 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.

INFLUENCE OF DIET ON THE DEVELOPMENT OF CARDIOMETABOLIC DISEASES RESEARCH LINE

- Influence of ultra-processed food consumption on cardiovascular health, frailty, and cardiovascular health.
- Cooking methods and their association with inflammatory and cardio-metabolic biomarkers.
- Influence of phthalate and phosphate consumption on cardiovascular health and subclinical atherosclerosis.

NUTRITION AND OMIC DETERMINANTS OF FRAILTY, MULTIMORBIDITY AND UNHEALTHY AGING RESEARCH LINE

- The impact of lifestyles in the development of multimorbidity in older adults. A longitudinal approach.
- Identification of pathways of the aging process, and their dietary, social and metabolomics determinants. The AGE_path study.

RESEARCH LINE

- The study of the association between different dietary patterns and healthy lifestyles adherence (including the Mediterranean lifestyle (MEDLIFE index)) and chronic diseases in large cohort populations (including cardiovascular disease, cardiometabolic risk factors, and healthy aging, frailty).
- The development of new Healthy Lifestyle Scores to study its association with main chronic diseases. (Grant PI20/00896).
- The development of interactive web and mobile applications based on the Healthy Lifestyle Scores for its implementation in the clinical practice and occupational settings. (Grant PI20/00896).
- The study of Mediterranean diets intervention in occupational health (Funding grants by the Federal Emergency Management Agency, USA)(Grant: EMW-2020-FP-00063; EMW-2014-FP00612X).
- Precision nutrition: Mediterranean diet metabolic signatures(Grant: PMP21/00093).
- Sustainable plant-based diets and lifestyles and chronic diseases in several cohorts (Nurses' Health Study, Health Professionals Follow-up, UK biobank, ENRICA).

PHYSICAL ACTIVITY AND SEDENTARY BEHAVIORS AS DETERMINANTS OF OBESITY AND CARDIOVASCULAR AND DEATH RISK IN THE GENERAL POPULATION RESEARCH LINE

- 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.

Nutritional Control of the Epigenome



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.





RESEARCH PROGRAM

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 physiopathological 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 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.

Cardiometabolic Nutrition



- 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.
- 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 dys-

functions and unhealthy conditions involved in the development of obesity and associated cardiometabolic complications.

- 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, which allows an action directed to each person through individual characterization.
- 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 influence in body weight homeostasis/maintenance, type 2 diabetes, cardiovascular or liver diseases.

Bioactive Ingredients Food



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.



Epigenetics of Lipid Metabolism



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 trying to personalize the health of individuals using epigenetics (DNA Methylation and ncRNAs) for the development of Precision Nutrition.
- Pharmacological or dietary modulation of the activity of non-coding RNAs that, ultimately, regulate the metabolism of lipids leading to the prevention or treatment of cardiometabolic diseases.
- Understand the possible regulatory role of dietary miRNAs on genome modulation via cross kingdom communication.





RESEARCH PROGRAM

Childhood Precision Nutrition

Goal and vision

Our overall goal is to understand the different causes of obesity during childhood and improve treatment options, as well as growth disorders and normal and pathological pubertal development in relationship to nutrition.

Childhood Obesity

- 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 longterm metabolic health and how the brain, especially glial cells, responds to specific nutrients that affect metabolism and neuroinflammation.
- To understand the interaction between nutrition and pubertal development as well as the underlying causes of early and precocious puberty.





ilities

ilities

Nutritional studies
laboratory

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Genetic and genomic
analysis laboratory

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Laboratory for
analytical and
immunometabolic
techniques

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Data analysis
laboratory

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Nutritional studies

LABORATORY

This is a laboratory for interaction with people ("volunteers") who come to the Centre to participate in Precision Nutrition studies. The experimental design consists of the application of a specific food or type of food to study its health, metabolic, immunological, genetic, etc. effects. The volunteers who participate in these analyses provide information by analogue or digital means, which is completed with anthropometric, genetic, microbiological, metabolic, etc. studies.

Main equipment:

- Horizon DXA system¹, which includes a set of high-resolution digital detectors as well as a high-frequency X-ray generator equivalent to CT scanners. It allows images to be captured in great detail, even in large or obese patients. All members of IMDEA Alimentación who are listed as operators are accredited to operate radiological equipment. Attached is documentation regarding its status as a radiological facility subject to external control.
- Echosens FibroScan elastograph², which uses ultrasound technology to measure liver stiffness. It is a fast, easy and reliable non-invasive scan that provides a quantitative value proportional to the degree of liver fibrosis.
- Ergospirometer with electrocardiogram³ for gas exchange analysis and resting electrocardiograms, together with a treadmill for these measurements during exercise. The system also monitors blood pressure. Together, this platform allows assessment of cardiopulmonary function at rest and during exercise.





Genetic and genomic analysis

LABORATORY

It is an advanced laboratory with the capacity to develop different categories of genetic analysis: hereditary genetic material (DNA genotyping), RNA gene expression (real-time and digital PCR) and genome regulation (epigenetics). The study of DNA from complex multi-organism samples (metagenomics) has been

incorporated as the first approach to *Next Generation Sequencing* (NGS) technologies that are expected to be implemented by 2024.

The typical experimental design of such studies consists of obtaining the appropriate genetic material for each experiment and using specific reagents to develop qualitative or quantitative assays on a series of genes under study or universal sets of genes to investigate the mechanisms responsible for different pathologies.

The activity of genetic analysis is recognised by the Community of Madrid with the U87 Certificate of Integrated Health Service in a non-health organisation.

Main equipment:

- Promega's Maxwell® RSC 48 Instrument⁴ nucleic acid extractor, capable of purifying different nucleic acids, such as genomic DNA, plasmid DNA, RNA or high quality total nucleic acids, from different types of samples. It allows starting from different biofluids (blood, saliva, plasma, urine) or matrices (cells, tissues, FFPE, swabs), environmental samples (faeces, soil, water) and microorganisms or viruses.
- QuantStudio™ 12K Flex Real-Time PCR System⁵, which allows absolute and relative quantification of nucleic acids, allelic discrimination of single nucleotide genetic variants (SNPs), detection of nucleic acid sequences of interest (*plus/minus* assays) and generation of dissociation curves.
- The equipment integrates a module for polymerase chain reaction (PCR), which allows to amplify and quantify in real time specific sequences of nucleic acids and to analyse a large number of samples. It incorporates specific programmes for assay configuration and data analysis. It can work with 384-well plate formats, 96-well plates, TaqMan® Array (TLDA) cards and OpenArray® chips.

- Applied Biosystems™ QuantStudio™ AbsoluteQ™ Digital PCR Kit⁶ is a system that enables target quantification with high precision and sensitivity. It is based on microfluidic array plates (MAP) that allow digital PCR reactions to be performed in nanolitre volumes (20,480 physically defined microinjection moulded microchambers). It incorporates integrated analysis software that coordinates sample partitioning, amplification and results. It allows copy number variation (CNV) analysis in DNA samples, detection of circulating tumour DNA in liquid biopsies, mutation analysis, gene expression analysis, absolute quantification of viral titres and in general any PCR-based determination.
- The Illumina iScan system⁷ is a scanner that enables fast, sensitive, and accurate imaging of Infinium BeadArray™ products. It enables the analysis of millions of single nucleotide reads through the use of lasers, optics and an advanced detection system. Enables *Genome-wide* Genotyping (*Genome-wide*), Copy Number Variation (CNVs) and Epigenetics (genome-wide Cytosine Methylation) studies.

LABORATORY

for analytical and immunometabolic techniques

In addition to the genetic analysis laboratory, GENYAL has been equipping itself with a battery of additional analytical tools, which complement and extend the Institute's core genetic studies. Some of the technologies are in the implementation phase and are expected to be completed in the coming months. The main analytical techniques developed and already implemented are as follows:

- Millipore's MAGPIX system together with Beckman's Access-2 autoanalyser⁸, which are versatile immunoassay platforms capable of qualitative and quantitative multiplex analysis (up to 50/100 tests in a single well). They have panel-based applications applicable for cancer, cardiovascular disease, immunology, metabolism or endocrinology, with the possibility to apply specific customised panels as well.
- Agilent's Seahorse XFe96 and Seahorse XF HS⁹ measure changes in cell metabolism in real time. They quantify the oxygen consumption rate (OCR) and extracellular acidification rate (ECAR) of living cells, allowing assessment of mitochondrial respiration and glycolysis, as well as ATP production. These measurements provide insight into cellular metabolic function and





can be used to assess metabolic changes resulting from different treatments or different physiological or pathological situations.

- The AU480 ISE chemistry autoanalyser¹⁰ is a basic clinical chemistry analyser used to determine and quantify a large number of blood and urine markers and metabolites. It can analyse more than 120 types of compounds and has a throughput of up to 800 photometric tests per hour. It is combined with the DxH520 autoanalyser¹¹ which is a haematological autoanalysis system.
- Thermo Fisher's TSQ Fortis Plus MS¹¹ mass spectrometry equipment is used for molecular identification, lipidomics and metabolomics studies. Its technology allows the identification of compounds in a wide range of mass-to-charge ratios (i.e., 5-3000 m/z), which enables the analysis of biomarkers of different nature (i.e., glyco/lipoproteins and lipids).
- BD FACSCelesta™ analyser from Becton Dickinson¹² is a flow cytometry device that can detect and analyse up to 14 parameters in a single sample. It allows to characterise phenotypically each cell by its surface markers, to know the intracellular state (cell metabolism, enzymes, mitochondrial function...), or to determine the stage of the cell cycle in which it is located.
- Organ-chip system (EMULATE)¹³ allows the creation of test systems that resemble the physical and physiological functions of a specific (human) organ in three dimensions, without the need to work with disaggregated cells. It allows, among many other applications, the cultivation of the microbiome with intestinal cells and host-microbiome interactions in a situation very close to in vivo conditions.

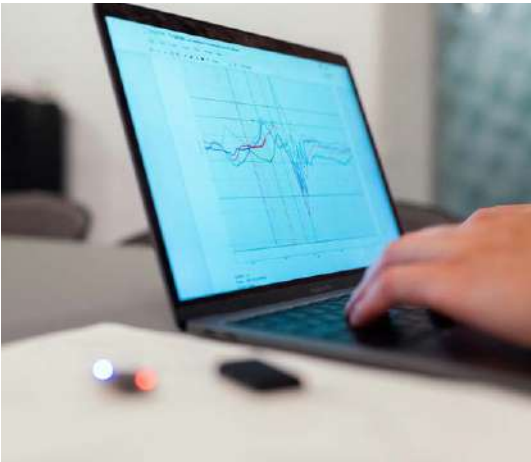
Data analysis

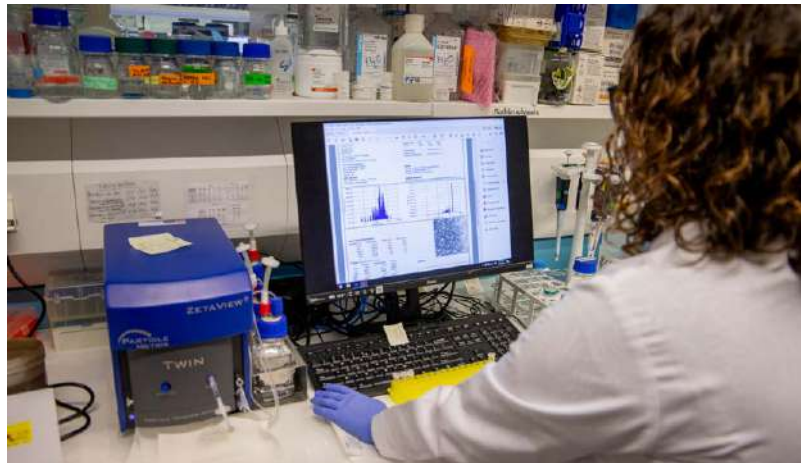
LABORATORY

IMDEA has as an essential part of its workflows the capacity to interpret the results obtained and the association between the experimental results and the clinical or nutritional parameters corresponding to each individual. The platform combines bioinformatics and biostatistics tools and is making use of a high-capacity computer server¹⁴ (> 50 TB of storage capacity, > 256 Gb of RAM memory) capable of handling the platform's current data and of dealing with the "big data" that are beginning to be generated in the laboratory due to the ongoing implementation of Massive Sequencing (NGS) technologies.

Summary of available techniques and main applications

EQUIPO	TÉCNICA	APLICACIONES
Sistema DXA Horizon	Análisis corporal	Estudios de intervención nutricional
Elastógrafo FibroScan	Fibrosis hepática	Estudios de intervención nutricional
Ergoespirómetro y electrocardiograma	Actividad respiratoria y ritmo cardíaco	Estudios de actividad metabólica
Extractor de ácidos nucleicos	Purificación de ácidos nucleicos	Estudios genéticos (todos)
Equipo de PCR a tiempo real	Amplificación por PCR	Estudios genéticos cuantitativos
Equipo de PCR digital	Amplificación por PCR de reparto	Cuantificación absoluta de ácidos nucleicos
Sistema iScan	Hibridación de sondas	Estudios de epigenética y genotipado de genoma completo
Autoanalizador Access-2 y sistema MAGPIX	Inmunoensayos	Cuantificación de moléculas basada en anticuerpos
Seahorse XFe 96 / HS	Actividad respiratoria celular	Estudios de consumo de O2 y metabolismo celular
Autoanalizadores químicos	Cuantificación de metabolitos	Análisis bioquímicos personalizados
Equipo de Espectrometría de Masas	Separación cromatográfica de biomoléculas	Análisis de peptidómica, lipidómica y metabolómica
Citómetro de flujo	roaje, identificación y separación de células individuo	Estudios basados en marcadores de superficie celular
Sistema de organ-on-a-chip	Cultivos e interacciones celulares en 3D	Simulación de las condiciones celulares in vivo
Servidores bioinformáticos	Procesamientos informáticos de alta capacidad	Análisis bioinformáticos y bioestadísticos







ser

Services

services

Platform of Clinical
Trials: GENYAL

52

Clinical trials
carried out

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Platform of Clinical Trials: GENYAL

The Platform for Clinical Trials 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, dyslipidemias, etc..).



UNIT

Nutrition and Clinical Trials

The Nutritional and Clinical Trials Unit undertakes nutritional intervention studies designed to assess the biological activity and health properties of functional foods/bioactive compounds and diets in humans. Both observational and clinical intervention studies involving healthy subjects and those with pathologies can be performed.

The Unit has an intervention/extraction room, two nutritional consultation offices, a room for short-term monitoring, and a room for discussions and conferences on nutritional education. An independent ethics committee ensures that the rights, safety and wellbeing of trial participants are upheld, by taking into account the methodology of proposed trials, their ethical and legal aspects, and the balance between risks and benefits. This committee is formed by professionals of recognized prestige and experience in research.

The Nutrition and Clinical Trials Unit is registered in the Community of Madrid with number CS13175 (13/05/2015).

UNIT

Nutritional Genomics and Health

The nutritional genomics and health unit aims to give a precision approach to classic nutritional strategies, based on the effect that genetics has on each person. The objective consists in evaluating and improving precision nutritional strategies to achieve greater adherence and effects of dietary treatments.

Precision nutrition strategies for patients with chronic diseases.

Application of nutrigenetic interventions in patients with chronic diseases including obesity, metabolic syndrome and cancer, in order to improve their nutritional and health status. This is carried out through the design and analysis of specific genotyping panels, as is the case of a nutrigenetic panel for oncological patients that has been developed within ALIBIRD2020 project, which association to clinical outcome, microbiome status, and the presence of molecular and biochemical biomarkers is determined. Personalization of nutritional recommendations according to their clinical conditions, phenotypic and genotypic results is performed, and applied in different clinical trials in collaboration with the endocrinological and oncological medical services of different hospitals.



Personalized nutritional advice for health promotion throughout the different stages of life.

Design and clinical validation of genotyping panels with genetic variants related to obesity, energy balance, carbohydrate and lipid metabolism, metabolic response to exercise, food intolerances, biorhythm, etc., in order to generate personalized nutritional recommendations to improve health throughout life. Specific physiological conditions, objectives and life stages are considered.

PROJECTS IN FOCUS

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

Principal Investigator: Dr. Enrique Carrillo de Santa Pau

Funded by: Horizon 2020

Duration: 2019-2023

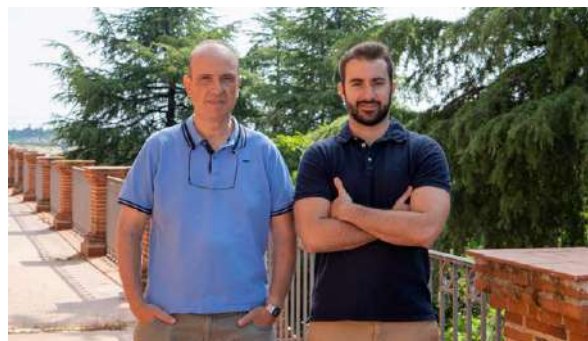
Call: H2020-EU.3.2.2.3 Ref: GA No. 863059.

Web: <https://www.fns-cloud.eu/>

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.

UNIT

Biostatistics and Bioinformatics



The Biostatistics & Bioinformatics Unit collaborates with the different groups in IMDEA Food and external groups in order to perform:

- Biostatistical & Data Science analyses: multivariate analyses, design of experiments, longitudinal analyses, survival analyses, Machine Learning and Deep Learning, etc.
- Bioinformatic analyses: phenotype/genotype associations, identification of biomarkers, the analysis of microarray data, RT-qPCR analysis, next-generation sequencing (NGS), etc.
- Cheminformatics analyses: virtual screening, QSAR, hit expansion, pharmacophore generation, etc.

In addition, their members develop their own research lines, on Artificial Intelligence in Molecular Design, and on new bioinformatics tools for Nutritional Genomics research. Their members are part of the **Biostatnet Spanish Network in Biostatistics** and the Unit is a member of the **ES-OPENSREEN Observatory of Drug Discovery Capabilities** in Spain



PROJECTS IN FOCUS

AI-METMI: Artificial Intelligence boosted computational platform for the development of human microbial METabolite-Mimics as drugs and nutraceuticals.**Principal Investigator:** Dr. Gonzalo Colmenarejo (IMDEA Food)**Funded by:** Spanish Ministry of Science and Innovation.**Duration:** 01/09/2022-31/08/2026**Call:** PID 2021. Ref: PID2021-1273180B-I00

This Project aims at using a combination of three computational methodologies, namely cheminformatics, bioinformatics, and artificial intelligence, to set up a platform useful for speeding up the design of drugs and nutraceuticals mimicking microbiome metabolites. The platform will assist in characterizing the physicochemical properties, structures, and biodistribution of metabolites, as well as identifying protein-metabolite interactions of relevance to diseases. Generative artificial intelligence models will be developed for the in silico design of metabolite-mimicking molecules with curative (drugs) or preventive (nutraceuticals) functionality.

GENYAL Lab



The Genomics Laboratory has the necessary infrastructure for providing genetic and genomic services, as well as metabolomic analysis, providing technical and scientific support to researchers and private companies.

This Laboratory is equipped with appropriate devices for sample processing and nucleic acid extraction and quantification, as well as the latest hardware for gene expression and high performance genotyping analysis, such as the latest generation QuantStudio™ 12K Flex System apparatus. Other equipments for genomic analysis include qPCR 7900HT and conventional PCRs.

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.

In addition, the laboratory has specific equipment for analyzing metabolites with different techniques such as chromatography (Agilent 1260 HPLC system), cellular metabolism measurement (Seahorse XFe96), or simultaneous detection and quantitation of several secreted proteins (Luminex MAGPIX® System). These techniques provide a high value added tool in nutrigenomic and nutrigenetic studies, to achieve effective Precision Nutrition.

The Genomic Laboratory GENYALab has the accreditation as Genetics Unit U.78 and is member of REDLAB, the laboratories network of the Community of Madrid, under the **registration number 440**.

GENYAL LAB participates in **ALIBIRD2020-CM project (S2018/ BAA-4343)**: "Therapeutic formulas of precision nutrition for cancer" supported by program call of R&D Activities among Research Groups of the Community of Madrid (Technologies 2018) and co-financed with European Union Structural Funds.



Clinical trials carried out



ALIBIRD2020-CM

S2018/BAA-4343



Unión Europea

Fondo Europeo
de Desarrollo Regional
"Una manera de hacer Europa"

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

ALIBIRD® mHealth

Web Link: <https://alibird.org/2020-CM/>

Funded Project: ALIBIRD2020-CM (S2018/BAA-4343)

Population Addressed: Lung cancer patients

The aim of the ALIBIRD® mHealth platform is to facilitate clinical decision-making during cancer treatment with a two-fold objective: to empower and motivate patients to follow personalised recommendations and prescribed strategies for their treatment, and to support the remote follow-up of patients by medical professionals through the telemedicine system.



Descriptive study of molecular markers of immunosenescence with nutritional intervention to evaluate the implementation of digital tools in the capture of nutritional data.

AI4FOOD

Web Link: <https://www.ai4food.org/>

Clinical Trials Reference: NCT05807243

Funded Project: "Y2020/TCS-6654 AI4Food-CM. Artificial Intelligence for the Prevention of Chronic Diseases through Personalised Nutrition" (funding of the nutritional intervention protocol followed with specific sensors for the application of AI).
Population Addressed: Overweight and obese men and women

The main goal of AI4Food is to integrate all the aforementioned information and develop new machine learning algorithms to generate a paradigm shift in the field of nutritional counseling. Preliminary results are promising as both data collection methodologies have been successfully compared and all information on the variables obtained has been integrated. It will allow improving and personalising the lifestyle recommendations given to the population.



Effect of an energy-restricted mediterranean diet, physical activity and behavioral treatment on the primary prevention of cardiovascular disease

Co-Or: Jordi Salas Salvadó (Universitat Rovira I Virgili)

IP: Lidia Daimiel

Period: October 2015 to December 2024

Participating entities: C.S. Aquitania; C.S. Buenos Aires; C.S. Bustarviejo; C.S. Ibiza; C.S. Fuencarral; C.S. Colmenar Viejo; Hospital de La Paz

Web Link: <https://www.predimedplus.com/>

Clinical Trials Reference: ISRCTN89898870

Funded Project: This work was supported by a project grant from the Fundación Francisco Soria Melguizo. The project also received support from the Community of Madrid and the European Union, through the European Regional Development Fund (ERDF)-REACT-EU resources of the Madrid Operational Program 2014–2020, in the action line of R + D + i projects in response to COVID-19, FACING COVID-CM. The PREDIMED-Plus trial was supported by the official Spanish Institutions for funding scientific biomedical research, CIBER Fisiopatología de la Obesidad y Nutrición (CIBEROBN) and Instituto de Salud Carlos III (ISCIII), through the Fondo de Investigación para la Salud (FIS), which is co-funded by the European Regional Development Fund.

Population Addressed: Men and women; 55–70 years old; BMI: 27–40 Kg/m²; With metabolic syndrome

The main objective of PREDIMED-PLUS is to evaluate, in comparison with a control group given non-intensive, energy-unrestricted dietary advice (also Mediterranean type), the effect of an intensive lifestyle intervention comprising an energy-restricted Mediterranean diet, increased physical activity and behavioral support on:

1. The incidence of cardiovascular events (non-fatal myocardial infarction, non-fatal stroke, or cardiovascular death).
2. Weight loss and long-term maintenance of weight-loss.



ENDONAFLD: Relationship between non-alcoholic fatty liver disease and endothelial damage in patients at high cardiovascular disease risk.

IP: Lidia Daimiel Ruiz

Co-IP: Diego Martínez Urbistondo

Period: January 2024 to December 2024

Participating entities: Hospital Clínica Universidad de Navarra; Hospital HM Montepíncipe; Hospital 12 de Octubre; Hospital Central de la Defensa Gómez Ulla

Funded Project: Sociedad Española de Arteriosclerosis

Population Addressed: Men and women; 50–69 years old; Cardiovascular disease risk with or without NAFLD

The main objective is to describe the relationship between endothelial damage and non-alcoholic fatty liver disease using biomarkers clinically available in a population at high risk of cardiovascular disease.

Estudio piloto aleatorizado, doble ciego, controlado con placebo, para la evaluación de un suplemento nutricional potenciador del sistema inmune (rosmalip) en la prevención de infecciones durante la pandemia de covid-19 en pacientes oncológicos que reciben tratamiento antitumoral (oncovinf)

Imdea Alimentación/ Hospital Universitario Infanta Sofía /FORCHRONIC

Web Link: <https://alibird.org/2020-CM/formulas-terapeuticas-de-nutricion-de-precision-para-el-cancer/>

Clinical Trials Reference: NCT05080920

Funded Project: Convocatoria de Programas de I+D en Tecnología 2018 de la Comunidad de Madrid y cofinanciado con Fondos Estructurales de la Unión Europea. ALIBIRD2020 _S2018/BAA-4343

Population Addressed: Patients of both sexes aged between 18 and 85 years, with a diagnosis of solid tumor in active antitumor treatment (including chemotherapy, antitarget treatments, immunotherapy, hormone therapy), either for disseminated disease or perioperatively for localized disease. No history of having had COVID-19

The main objective of the study was to analyze the effectiveness of a nutritional supplement that enhances the immune system (Lipchronic) against infections, including COVID19, compared to placebo in cancer patients receiving antitumor treatment. The secondary objectives were exploratory and included evaluating possible effects of Lipchronic on the patients' quality of life, symptoms (especially focused on those symptoms associated with COVID19), nutritional status, clinical and analytical tolerance, antitumor, immune and anti-inflammatory effects.

The ONCOVIN study closed early as the number of infectious events expected was not reached, being negative in its main objective of demonstrating a decrease in the number of infections - including COVID19. This fact is explained since the trial was designed at the beginning of the pandemic and, due to the strong isolation and hygiene measures, the number of infections. However, interesting effects of the experimental treatment are observed Lipchronic when compared to the group of patients administered a placebo in the exploratory secondary objectives of the study. More specifically, our results identified an activation of the immune system associated to the experimental treatment Lipchronic compared to the control, with peculiarities among the different groups of patients. Importantly, the RECIST score was improved in the Lipchronic group of patients, suggesting a better clinical response. Moreover, metastatic lung cancer patients improved the quality of life score (SF-36), which seemed to be associated to a better nutritional status and a reduction of inflammatory biomarkers (decrease in the positive acute phase reactants ferritin and C-reactive protein, as well as the inflammatory index Neutrophils/Lymphocytes ratio, and an increase in transferrin negative reactant). These results encourage further research to apply precision nutrition as a complementary tool in the clinical management of cancer patients.



Healthy aging through time- restricted eating in adults with overweight/obesity and incipient liver disease: the ENSATI study.

IP: Lidia Daimiel

Co-IP: José M^a Ordovás

Period: June 2023 to December 2024

Participating entities: Clínica Universidad de Navarra; C.S. Fuencarral; C.S. Núñez Morgado; C.S. Colmenar Viejo Sur

Web Link: <https://ensati.wixsite.com/ensati>

Clinical Trials Reference: NCT05880095

Funded Project: Proyecto PID2021-1258990B-I00 financiado por MCIN/AEI /10.13039/501100011033/ y por FEDER Una manera de hacer Europa

Population Addressed: Men and women; 55-70 years old; BMI 27-25 Kg/m²; With fatty liver disease; With a time window greater than 14 h

The main aim is to investigate the effects of a time-restricted eating protocol, without caloric restriction on hallmarks of the healthy aging, including the metabolism, body composition, circadian rhythm, sleep quality, life quality, cognitive function and molecular hallmarks of aging.



Increasing multicomponent physical activity in older adults with a exercise-based toolkit and specialized virtual support: activeKIT Randomized Controlled Trial

Funded Project: AES 2020

Population Addressed: Older adults aged 65 years and older

The general objective of this project is to test whether the activeKIT intervention is effective in helping inactive older people to increase multicomponent physical activity at 3-months (short-term) and at 12 months (long-term). The activeKIT intervention is a 3-month complex intervention that includes a low-cost and easy-to-use exercise-based toolkit delivered at home with or without support by exercise specialists using virtual settings (e.g. video and audio calls, messaging apps, social networks). A total of 450 participants randomly selected, aged 65+ years, will participate in this parallel three-arm randomized controlled trial (1:1:1 allocation). Primary outcomes include: aerobic physical activity by time spent in wrist worn moderate-to-vigorous physical activity and a field-based aerobic fitness test; muscle-strengthening by self-reported days/week and upper and lower body muscle strength tests; and balance training by self-reported days/week and the Timed Up & Go and the Four Square Step balance tests. Effect modifiers include: age, gender, sociodemographic variables, health status and intensity of the additional support/consultations to the exercise specialist. Other health outcomes are: fatness, blood pressure, self-efficacy, depression, chronic pain, health-related quality of life, sleep quality)

at 3- and 12-month and. The same outcomes measured at baseline, with potential changes during the intervention, will be assessed after the 3 and 12 months. In addition, the activity monitor will be worn during at the 3-month intervention. The activeKIT intervention aims to be a generalizable cost-effective intervention, with potential to be implemented in the SNS, to increase physical activity and promote healthy aging in the older adult population.

Influence of LiFEstyle Behaviors and Cellular Hallmarks of AGING on age-related health problems associated with dementia and fragility (InLiFE-AGING).

IP: David Jiménez Pavón / Ana Carbonell Ona (Universidad de Cádiz)

Co-IP: Lidia Daimiel Ruiz

Period: November 2022 to December 2023

Participating entities: C.S. Dr. Trueta; C.S. Dr. Cirajas; C.S. San Andrés; C.S. Fuencarral; C.S. Ensanche de Vallecas; C.S. Valdebernardo; C.S. Galapagar

Funded Project: Junta de Andalucía

Population Addressed: Men and women; 50-79 years old

To investigate the relationship between the lifestyle and the molecular hallmarks of aging and their impact on physical and cognitive decline

Nutrición de precisión para el mantenimiento y mejora de la función cognitiva natak/p4h/imdea alimentación

Web Link: <https://nutritionprecision.com/>

Funded Project: MINISTERIO DE CIENCIA E INNOVACIÓN _ RETOS DE COLABORACIÓN 2019 (HEALTH4BRAIN_RTC2019-007294-1)

Population Addressed: • Men and women > 55 years old. Two visits: initial visit and intervention visit (3 bioactive compounds in 3 subgroups).

The general objective of the project is to contribute to the personalization of the diet to improve the health and quality of life of

the population, helping to maintain their cognitive function, through the design of personalized functional foods and through the design of a validated nutrigenetic test, which allows us to offer personalized recommendations based on the genetic profile of each individual.

Initially, an in vitro nutrigenomic study was carried out to determine the mechanism of action of the different NATAC products, and their effectiveness according to the targets identified for the different genetic profiles of the population previously identified by P4H. This nutrigenomic study provided molecular knowledge about the components that contribute to the prevention of cognitive deterioration, by altering the expression and/or functionality of different genes and signaling pathways, depending on the individual genetic constitution.

Once the most suitable compounds for each genetic profile were selected by the in vitro tests, a clinical validation trial was carried out in humans, in which to validate the usefulness of the P4H genetic test to identify the different needs of the different population groups according to their genetic profile, as well as the effectiveness of NATAC products to modulate the most relevant genes in each case determining the cognitive capacity.

NutriSi-ON: Precision nutritional strategies to reactivate the immune system impaired as a consequence of age, obesity or chemotherapy (Y2020/BIO-6350).

LABORATORIO DE NUTRICIÓN DE PRECISIÓN. IMDEA Alimentación.

IP: Dra. Ana Ramírez de Molina/ Dra. Cristina María Fernández

LABORATORIO DE INMUNOMETABOLISMO E INFLAMACIÓN. CMSO.

IP: Dra. María Mittelbrunn/ Dra. Elisa Carrasco

Web Link: <https://nutritionprecision.com/>

Funded Project: PROYECTO FINANCIADO POR LA CONVOCATORIA DE PROYECTOS SINÉRGICOS DE I+D EN NUEVAS Y EMERGENTES ÁREAS CIENTÍFICAS (2020). NutriSION-CM Ref: Y2020/BIO6350



Population Addressed:

General objective: Analysis of immunosenescence marks in 3 target populations.

Populations:

- Young people between 18 and 25 years old without illnesses.
- People with obesity/overweight, over 18 years of age, who do not suffer from serious illnesses. Two visits: initial visit and intervention visit (low-calorie diet in the entire group).
- Men and women > 55 years old. Two visits: initial visit and intervention visit (3 bioactive compounds in 3 subgroups).

Age related deterioration of the immune system is responsible for a high susceptibility to autoimmune diseases, infections and cancer, as well as a decrease in vaccination efficacy. In addition to age, there are various environmental factors that accelerate the decline of the immune system and compromise its function. Exposure to chemotherapy, chronic infections, or obesity play a predominant role among these factors. Thus, elderly and obese individuals, and cancer patients, become highly vulnerable to the development of infection diseases, which has been evident in COVID-19 pandemic. With NutriSI-ON, we propose to design Precision Nutritional strategies to slow down the decline of the immune system as a consequence of age, obesity or chemotherapeutic treatments. We propose a translational project between Molecular Immunology and Personalized Nutrition, with the broad objective of developing nutritional strategies with geroprotective and immunomodulatory activity that can boost the immune system in vulnerable population groups.

Nutritional intervention study to evaluate the efficacy of a food supplement on physical and psychological variables in women with menopause.

Funded Project: Universidad de la Laguna (España).

Population Addressed: Perimenopausal women

To determine the effect of the daily consumption of a combination of different compounds on the evolution of physical and psychological disorders that can appear during the menopause, in women



Sampling and analysis pertaining to the clinical trial entitled "HEALTHY EATING ON THE UAM CAMPUS. UAM COHORT"

Web Link: <https://ods.uam.es/cohorte-uam/>

Funded Project: Universidad Autónoma de Madrid

Population Addressed: General population (university students)

Collaboration for the performance of anthropometric assessment, sample collection and biochemical analysis of the population recruited in the cohort in 2023.

Study of the replacement of critical ingredients in biscuits on immunocompetence in a healthy population for the prevention of the risk and development of obesity/metabolic syndrome. FOOD4INMUT

Funded Project: 0215-Food4ImNut_MCIU-PDI2019-10765RB-C22_ML (state programme for knowledge generation)

Population Addressed: General population

To investigate the effect of replacing critical ingredients in biscuit formulation on immunocompetence to prevent the risk and development of obesity/metabolic syndrome'.

Study to evaluate the efficacy of the consumption of probiotic-enriched cereal products on the modification of the oral microbiome and nutritional status in school-aged children. PROBIOMIC

Funded Project: Empresa Vida (Vértice de Innovación y Desarrollo de Alimentos, S.A.U.)

Population Addressed: Primary school children

Randomised, parallel, double-blind study to evaluate the effect of consumption of probiotic-enriched cereal products on modification of the oral microbiome.





innoc

Innovation & society

Technology transfer
& Entrepreneurship

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Innovation
& Education

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Citizen
Science

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Technology transfer & Entrepreneurship

INNOVATION

Immunonutritional control of chronic metabolic diseases

Food, pharma and biotech

Implementing the **multifunctional character** of a **protein fraction** using preclinical in vivo models, as well as a nutritional intervention in humans. The main advantages derived from the inclusion of this fraction in food matrices are its immunomodulatory capacity on inflammatory processes and cellular effectors of the innate immune branch, which appear to be maintained over time.

This product is obtained from subparts of grains and seeds that could be described as immunonutritional agonists and, therefore, modulators of innate immune physiology and metabolic processes associated with glucose and lipid homeostasis.

Naturally occurring compounds, lack of side-effects, control metabolic effects by influence on immune system.



Gut-Finder®

Science-Based solutions to promote Healthy Aging

By 2050, the population over 80 years of age is expected to triple. The steady increase in longevity is a challenge that encompasses economic, social, structural, political, medical and scientific factors. **Whether we want or not, we all age.**

Development of an **AI-based technology** that integrates information from micro-organisms from faeces with metabolites from blood. This information is transformed into In silico, modelling that allows to predict changes in your microbiota by modifying some of single components. The specific treatments are selected to modulate your microbiota in a personalised way, which is considered the **new era of therapies for Precision Medicine**.

What we know your microbiota:

- Changes with diet, lifestyle, and aging.
- Changes with aging, and can be used to identify biological age.
- Influences our mood, make as exercise, and modulates our metabolism or immunology.

B2C SERVICE - SOLUTIONS

- Sequence your microbiome.
- Identify your Biological Age.
- Rejuvenate your microbiome.
- Restore your age & holistic health.

SPIN OFFS



Precision for Health P4H

Nutritional genomics for personalized nutritional strategies

www.p4h.es

P4H is constituted for the use and exploitation, industrial and commercial, of the innovations derived from the results obtained by IMDEA Alimentación and the UAM in the field of Precision Nutrition, that is, in the **design and application of effective nutritional strategies** in the improvement of health, adapted to the genetic profile of individuals and their lifestyle or physiological situation.

- Genetic testing and personalized nutritional counseling.
- Personalized precision nutritional counseling reports based on the analysis of genetic profiles and lifestyle conditions in areas such as sports or aging.
- Food products for Precision Nutrition.



Forchronic (4Chronic)

www.forchronic.com

Patent WO/2017/187000

It offers innovative solutions based on the development of a **new generation of precision and highly bioavailable nutraceuticals**, with a patented technology of lipidic vehiculization (TVL). It allows improving the bioavailability of natural extracts, with **therapeutic activity in chronic diseases** such as cancer and various autoimmune pathologies.

- Products for the relief, treatment and prevention of highly prevalent diseases. Capabilities validated scientifically and in clinical trials in patients.



PATENTS

Rosemary-extract compositions for treating cancer

Pub No.: ES2408730 B1
Application No.: P201131733

- Use of a **rosemary extract** in the preparation of a composition for **treating cancer**, in which there is a change in oestrogen signalling or lipid metabolism, to a composition comprising rosemary extract and a chemotherapeutic agent, and also to an in-vitro method for predicting the clinical response to an anti-tumour therapy using said composition.
- The present invention provides a new use of a rosemary extract in the treatment of certain cancers, specifically those in which there is an alteration in **lipid metabolism** or in the **oestrogen signalling pathway**.
- Furthermore, this composition can be combined with a conventional anti-tumour agent to obtain a synergistic effect.
- Products for the prevention and relief of diseases with beneficial results for people's health, which have been scientifically and clinically endorsed. Our company has developed and patented its TVL Technology (Technology of Lipid Vehiculization) that allows improving the bioavailability, solubility and accessibility of the natural extracts incorporated in nutraceuticals.
- Efficient release of the compounds in the organism and optimal absorption of the same, thanks to the incorporation of TVL technology.

A biotechnology company promoted by Canaan Research & Investment, the Autonomous University of Madrid (UAM) and researchers from the IMDEA Food Institute and the Infanta Sofia University Hospital, whose **technological innovation** lies in its **lipid vehicles**, which increase the bioavailability and biological function of bioactive phytochemicals.

Procedure for obtaining exosomes from buttermilk, exosomes obtained and their applications

Application No.: P202330029

- Procedure for isolating exosomes from buttermilk, as a **byproduct of the dairy industry** for large scale production.
- Describes the applications of exosomes obtained by the process in **medicine, cosmetics and nutraceuticals**.
- Highly purified exosomes from buttermilk can be used as nano-carriers of **extracellular RNAs or food bioactive compounds** for therapeutic usage.

Translational Venomics

Octo-PROTech

Venom-derived proteins from a marine source for use as a senolytic and senomorphic agent

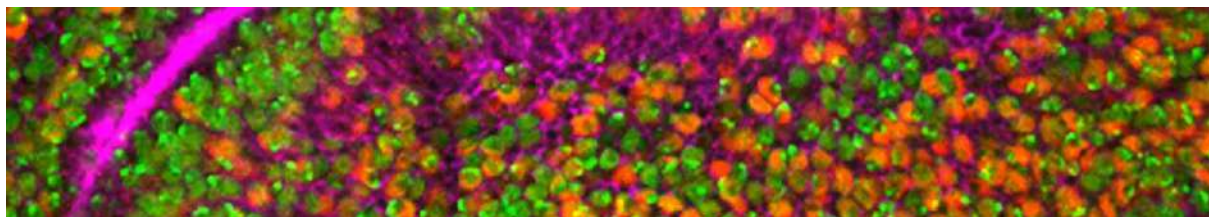
Application No: EP23382726.0

Small proteins with **therapeutic potential in aging** and aging-related diseases, including cancer and fibrosis. These proteins target senescent aka "zombie" cells that accumulate in the body and contribute to organ dysfunction.

Therefore, proteins are geared towards **rejuvenation physiological functions**. It could also help diminish inflammation and thus have potential application in chronic diseases.

- Biocosmetic special ingredient.
- Peptide isolated from Australian octopus.
- Successful chemical synthesis and recombinant production.

The invention relates to **pharmaceutical and cosmetic compositions** comprising these proteins, as well as to a method for identifying compounds effective for the treatment or prevention of ageing and age-related diseases



Methods and kits for the prognosis of colorectal cancer

Pub No.: ES2475366 B1

- Methods for predicting the risk of relapse in patients with colorectal cancer, as well as patients with colorectal cancer, as well as methods for providing personalized medicine to such patients, based on the expression levels of the ACSL1, ACSL4 and ACSL1, ACSL4 and, optionally, GCNT3, LPL, APOC1, SCD, whose expression products are involved in cellular energy metabolism.
- The invention also relates to kits for carrying out the predictive medicine and other methods.

Composition for the reduction of metabolic decline associated with aging

Treatment of disorders related to lipid metabolism

Pub No.: ES 2739133 B2

Application No.: P201830740

- Compositions comprising extract of *Rosmarinus officinalis* and other plants, as well as to nutritional supplements comprising such compositions
- Use of such compositions for the **reduction of metabolic decline** and of pathologies resulting from such decline.

Medical uses of Apolipoprotein A and activators thereof

Pub No.: US 2020/0378993 A1

Application No.: 16/491.948

Medical uses of **apolipoprotein A** and **activators** for the preparation of a medicinal product for the treatment or **prevention of cancer**. The invention also relates to a method for **determining the stage of a colorectal tumor** in a patient.

Apolipoprotein A, a mimetic peptide thereof, or an activator thereof are capable of **inhibiting the proliferation, migration, and invasion of cancer** cells, particularly cancer cells having an overexpression of ABCA1.

Patients diagnosed with tumors in advanced stages of the disease have decreased ApoA1 expression levels in a tumor sample with respect to patients diagnosed with tumors in earlier stages. Patients suffering from metastasis have decreased plasma ApoA1 levels with respect to patients diagnosed with a primary tumor.

In vitro method for screening, diagnosis and prognosis of colorectal cancer

Application No.: EP22382471.5

- Plasma expression profile analysis of metabolic health related genes in EOCRC patients showing sex intrinsic disparities.

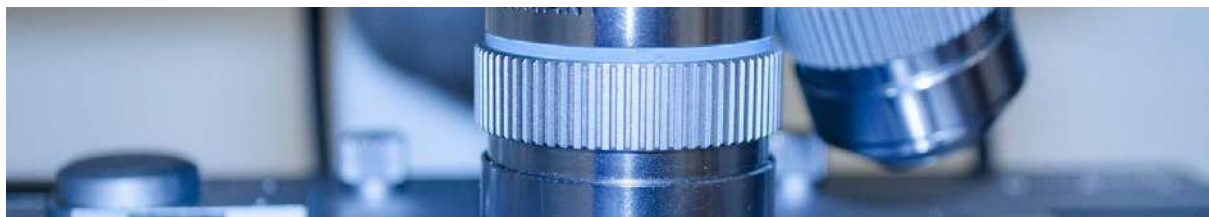
Formulations comprising lipid systems carrying bioactive compounds

Immunotherapy potentiators or adjuvants for patients with cancer or immunological disorders

Pub No.: US 11478008

Application No.: 16/065.639

- The lipid system of the present invention is a self-emulsifying system that forms microemulsions during digestion together with bile salts and phospholipids, forming mixed micelles that **stabilize the bioactive** components during digestion.
- Prevents their precipitation or interaction with absorption inhibitors and thus **increasing their bioaccessibility, bioavailability** and, consequently, their **bioactivity**.





Innovation & Education

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

1. EIT Food Projects

IMDEA Food role within EIT Food guides and accelerates the innovation process that will transform the food system. We are committed to overcome low consumer trust, create consumer-valued food for healthier nutrition through Precision Nutrition, build a consumer-centric connected food system and enhance sustainability through promotion of a circular Bioeconomy.

2. Food Systems Master of Science Programme (MFS)

Participants in this two-year Master develop in-depth knowledge about food systems through studying consecutively at three distinct European academic institutions and use their newly acquired 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 effective innovators, and key technical skills that are tailored to their career ambition in the sector.

3. RIS Professional Development: 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 many supply chain challenges. The WE Lead Food Programme is designed to equip the participants with the tools to make that difference and achieve results. Since 2021, WE Lead Food is part of the endeavor to support talent and leadership within the RIS-Regional

Innovation Scheme(RIS)countries. The network is open to all discipline backgrounds; research, business, policy, civil society members.

4. Food Solutions: Develop Healthy Food

Food Solutions brings together multi-disciplinary teams to tackle real-life industry challenges and develop innovative new solutions for the food system. Participant teams are mentored by industry experts and lessons delivered by the academic partners to equip them with the specialist knowledge they need to tackle their challenge. This is paired with a thorough course on innovation and entrepreneurship, led by world experts, to take students through their entrepreneurial journey from scoping out a potential market to pitching their final concept to industry at the end of the programme.

The actual food challenge relates to developing new products for healthier lives. These products have to be functional foods not in liquid form, and they have to be designed to target an specific segment of the population and its nutritional needs, following EU healthy nutritional regulations.

5. HEI Initiative: Innovation Capacity Building for Higher Education

This initiative is a key objective for EIT as part of its new strategy, the EIT Strategic Innovation Agenda (SIA) 2021-2027. The initiative aims to support higher education institutions with expertise and coaching, access to the EIT innovation ecosystem, and funding, enabling them to develop innovation action plans complementing the needs of individual higher education institutions. The initiative is a joint EIT Community activity coordinated by EIT Raw Materials. The Pilot Call for

Proposals 2021 invited European higher education institutions to design institution-wide action plans that will improve their entrepreneurial and innovation capacity across all institutional levels. By supporting such activities, this new EIT initiative aims to create systemic impact, empowering HEIs to become regional engines of innovation and foster sustainable growth and jobs across Europe. The activities can focus on several themes, including:

- Fostering institutional engagement and change.
- Strengthening partnerships between higher education, business and research organizations.
- Developing innovation and business support services.
- Enhancing the quality of entrepreneurial education.
- Creating and disseminating knowledge.

IMDEA Food is part of the HEADLINES (Higher Education Accelerating Directed Learning in Nurturing Entrepreneurship)consortium within the HEI Initiative along with Universidad de Burgos, Universidad Autonoma de Madrid, Munster Technological University, Centria (Universityof Applied Sciences) and Mashauri. The partnership develops and implements different activities promoting entrepreneurship among students, academics and researchers along the Food and Health sectors. IMDEA Food has designed and delivered various activities during 2022, including mentoring programmes for start-ups in the Food and Health sectors, courses on Entrepreneurship for researchers, and it contributed to the implementation of the first hackathon organized in UAM campus, along with UAM Emprende. As a contributing institution to the regional food ecosystem, IMDEA Food also led the mapping of the Community of Madrid agrifood ecosystem.





Citizen Science

IMDEA Food aims to disseminate the Institute research results, leading to changes in society's behavior 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 Citizen Science area aims to catalyze the interaction between the IMDEA Food research community and relevant stakeholders.

- The IMDEA Food 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 citizen science activities are designed to engage with people to become agents of change in the food system to achieve our main objectives:
- Bringing Precision Nutrition science closer to society. The Institute will act as a knowledge broker to provide citizens with knowledge-based information that will enable them to make critical and informed decisions about their food and health.
- To raise awareness in society, through the new generations, of the importance of adopting healthy and sustainable lifestyles and their individual and societal impact.

PROJECTS IN FOCUS

Con|CIENCIA|Acción&Alimentación Program

"Filling the Gaps in Precision Nutrition for healthy and sustainable food"

With this institutional program, launched in 2022, IMDEA Food aims to raise awareness in society, through the new generations, of the importance of adopting healthy and sustainable lifestyles and their personal and social impact. Lifestyle habits are developed at an early age, mainly at school, and are crucial to prevent the development of diseases throughout life.

The complete sequencing of the Human Genome in 2022 has meant a step forward in Precision Nutrition. Although this new area of knowledge has been the hallmark of IMDEA Food since its origins in 2006, it is now when we are in the best position to make Precision Nutrition known to society as a health tool. According to the Institute's strategic lines of action, which is to bring science closer to society, IMDEA Food acts as a knowledge agent to provide citizens with scientifically based information to make informed and critical decisions about their diet and health.

In line with Citizen Science models, the new generations are in charge of communicating and educating families, friends and their social environment to bridge the current gap in scientific advances in the food field for the planet's health and sustainability. This citizen participation

program, peers-to-peers, turn the new generations into ambassadors of change.

The plan involves primary and secondary schools, educational communities, families, and social agents committed to training and disseminating healthy and sustainable food.

The program is aligned with European projects such as EIT Food. It promotes the search for collaborations through patronage and sponsorship of those partners interested in promoting knowledge about Precision Nutrition and healthy and sustainable food in various fields.

This program includes two lines of action.

1. Precision Nutrition as a tool to prevent or treat pathologies linked to nutrition and lifestyle. The complete sequencing of the Human Genome in 2022 has meant a step forward in Precision Nutrition. Although this new area of knowledge has been the hallmark of IMDEA Food since its origins in 2006, it is now when we are in the best position to make Precision Nutrition known to society as a health tool. This action revolves around realising informative activities and workshops in the Hospitals collaborating with the Institute.
2. Precision Nutrition for the younger generations. The plan involves primary and secondary schools, educational communities, families, and social agents committed to training and disseminating healthy and sustainable nutrition.

The activities developed are aligned with European strategic initiatives such as those carried out by EIT Food, of which IMDEA Food is a founding partner, and promote public-private collaboration of partners interested in promoting knowledge about Precision Nutrition and healthy and sustainable food in its various fields.





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Projects in focus

precision nutrition
and aging

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precision nutrition
and cancer

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precision nutrition
and obesity

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precision nutrition
and cardiometabolic
health

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childhood precision
nutrition

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PRECISION NUTRITION AND AGING PROGRAMME

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Metabolic Syndrome

Characterization of the molecular mechanisms of short-term fasting against cancer and metabolic syndrome (FASTMET).

Principal Investigator: Dr. Pablo J. Fernández-Marcos

Funded by: Spanish Ministry of Science and Innovation.

Duration: 01/09/2021 - 31/08/2024

Call: 2019 R&D&I Projects. Social Research Challenges.

Ref: PID2020-114077RB-I00.



Nutritional Interventions

Gut Finder, an AI-based technology for Healthy Aging.

Principal Investigator: Alberto Díaz-Ruiz

Research Member: Rafael de Cabo

Funded by: Fundación Ramon Areces

Call: XXI Convocatoria Ciencias de la Vida y la Materia

Duration: 2023-2026

IDEAS222846DIAZ, Boosting the therapeutic potential of fasting in combination with mitochondrial inhibitors: re-shaping tumor metabolism to a cell death-end route. Principal Investigator: Alberto Diaz-Ruiz

Research Member: Rafael de Cabo

Funded by: Asociación Española Contra el Cáncer - AECC

Duration: 2022-2024.

PID-2019-106893RA-100, From Aging Biology to Sustainable Interventions: a microbiome-based approach.

Principal Investigator: Alberto Díaz-Ruiz

Research Member: Rafael de Cabo

Funded by: Ministry of Science and Innovation.

Duration: 2020-2024.



Transactional Venomics

Molecular characterization of a novel senolytic marine protein as a potential therapy for the Hutchinson-Gilford progeria syndrome.

Principal Investigator: Dr. Maria Ikonomopoulou

Funded by: Regional Government of Madrid/Grant for research talent attraction. Modality 1.

Duration: 2023-2024.

5th Year Extension Talento Award mod 1 (#2022-5A/BIO-24228).

Molecular characterization of the therapeutic potential of an octopus-venom peptide against melanoma.

Principal Investigator: Dr. Maria Ikonomopoulou

Funded by: Spanish Ministry of Science

Call: National Plan Grant (#PID2021-1266910B-I00).

Duration: 2022-2025.

Preclinical testing of venom-derived compounds

Principal Investigator: Dr. Maria Ikonomopoulou

Funded by: Czech Centre for Phenogenomics Call

Duration: 2023

European Venom Network (EUVEN)

Principal Investigator: Dr. Maria Ikonomopoulou (Stakeholder Engagement Coordinator & Core Management Committee)

Duration: 2020-2024

The overarching aim of the EUVEN COST Action is to foster venom investigation at the European level. The Action will identify priority targets and promising innovative approaches, develop best practice pipelines ensuring consistency across Europe and providing international standards in venom research.

“TALENTO” modality 1 Award (Fellowship & Project Grant) #2018-T1/BIO-11262

Principal Investigator: Dr. Maria Ikonomopoulou

Funded by: Regional Government of Madrid/Grant for research talent attraction. Modality 1

Duration: 2019-2023

Venom-compounds with senolytic activity for the treatment of aging- and metabolic-related disorders



Youth Funding Program. # PEJ-2020-AI/BIO-17904

Principal Investigator: Dr. Maria Ikonomopoulou

Funded by: Regional Government of Madrid

Duration: 2021-2023

New diagnostic and therapeutic tools against multidrug resistant tumours (STRATAGEM)

Principal Investigator: Dr. Maria Ikonomopoulou

Duration: 11/09/2018-10/09/2022

Funded by: H2020 (COST)

Call: COST Actions Ref. CA17104 Web: <https://stratagem-cost.eu/>

Funded by: H2020 (COST)

Call: COST Actions Ref. CA19144

STRATAGEM will build the first multidisciplinary network – to include academic laboratories, research institutes, and small and medium enterprises (SMEs), with a wide range of high-level and non-overlapping expertise – that will aim to improve both the diagnosis and therapy of multidrug resistant (MDR) solid tumours.



Posttranscriptional Regulation of Metabolic Diseases

Role of RBPs in the regulation of cholesterol metabolism and associated diseases.

Principal Investigator: Dr. Cristina M. Ramírez

Funded by: Ministerio de Ciencia e Innovación. Spanish Ministry of Science, Innovation and Universities

Duration: 2022-2025

Call: RTI 2021

Ref: PID2021-128264OB-I00

Study the role of miR-7/hnRNPK in the regulation of cholesterol homeostasis and their implication in dysregulated metabolic states associated with human diseases.

Principal Investigator: Dr. Cristina M. Ramírez

Funded by: Community of Madrid

Duration: 2022-2023

Call: Grants for the implementation of contracts "Talent Attraction" Modality 1; 5^o year.

Ref: 2021-5A/BMD-20964

New posttranscriptional regulators as a molecular link between diabetes, obesity and Alzheimer's disease.

Principal Investigator: Dr. Cristina M. Ramírez

Funded by: Spanish Ministry of Science, Innovation and Universities

Duration: 2019-2022.

Call: RTI 2018

Ref: RTI2018-095061-B-I00.

Role of Neuroendocrine miR-7 in the regulation of insulin signaling brain: Implications in diabetes and Alzheimer's Disease.

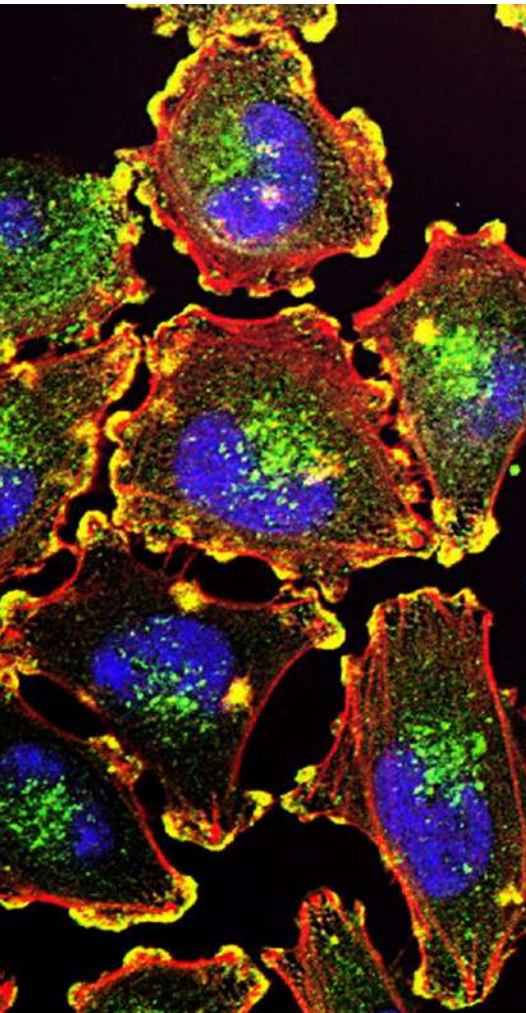
Principal Investigator: Dr. Cristina M. Ramírez

Funded by: Community of Madrid

Duration: 2018- 2022

Call: Grants for the implementation of contracts "Talent Attraction" Modality 1.

Ref: 2017-T1/BMD-5333



Cellular and Molecular Gerontology

Gut Finder, an AI-based technology for Healthy Aging.

Principal Investigator: Alberto Diaz-Ruiz.

Funded by: Fundación Ramon Areces.

Duration: 2023-2026.

Call: XXI Convocatoria Ciencias de la Vida y la Materia.

RYC2021-033751-I, Biology of Aging: Mechanisms and Interventions to promote Healthy Aging and Longevity.

Principal Investigator: Alberto Diaz-Ruiz.

Funded by: Ministry of Science and Innovation (RYC2021 Program).

Duration: 2023-2028.

IDEAS222846DIAZ, Boosting the therapeutic potential of fasting in combination with mitochondrial inhibitors: re-shaping tumor metabolism to a cell death-end route. Principal Investigator: Alberto Diaz-Ruiz.

Funded by: Asociación Española Contra el Cáncer - AECC

Duration: 2022-2024.

PID-2019-106893RA-100, From Aging Biology to Sustainable Interventions: a microbiome-based approach.

Principal Investigator: Alberto Díaz-Ruiz.

Funded by: Ministry of Science and Innovation.

Duration: 2020-2024.

2018-T1/BMD-11966, Estrategias alternativas para extender la longevidad mejorar la calidad de vida: ciclos de ayuno 4:10.

Principal Investigator: Alberto Díaz-Ruiz.

Funded by: Community of Madrid.

Duration: 2019-2023

PEJD-2019-PRE/BMD-1704.

Principal Investigator: Alberto Díaz-Ruiz.

Funded by: Consejería de Educación, Juventud y Deporte de la Comunidad de Madrid.

Duration: 2020 - 2022.

Call: Garantía Juvenil PhD Recruitment Program.

PEJ-2019-TL/BMD-15706.

Principal Investigator: Alberto Díaz-Ruiz.

Funded by: Consejería de Educación, Juventud y Deporte de la Comunidad de Madrid.

Duration: 2020 - 2022.

Call: Garantía Juvenil Lab technician Recruitment Program.

2022/UC0146/039655.

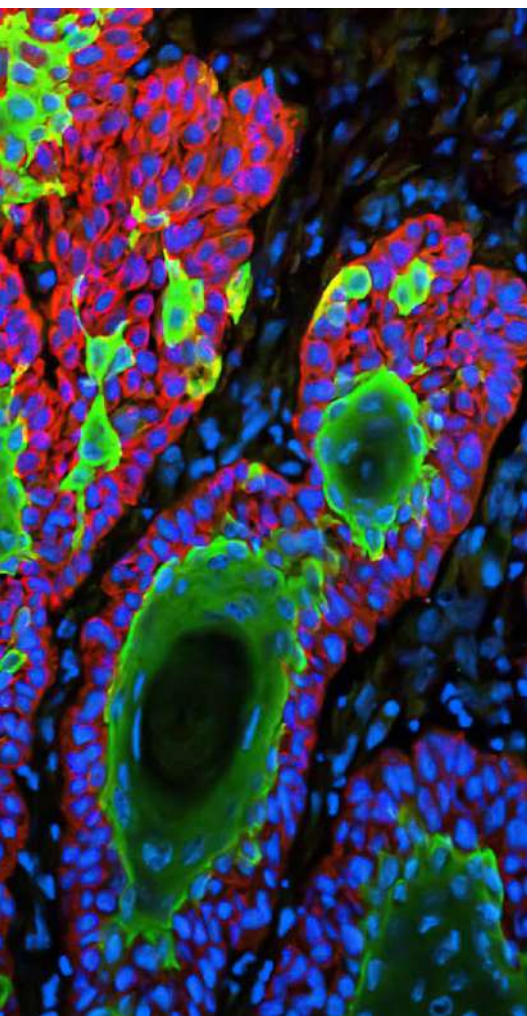
Principal Investigator: Alberto Díaz-Ruiz.

Funded by: Ministerio de Universidades, University of Cordoba.

Duration: 2023-2024.

Call: Margarita Salas.





PRECISION NUTRITION AND CANCER PROGRAMME

Molecular Oncology

NUTRISION-CM. Precision nutritional strategies to reactivate the impaired immune system as a result of age, obesity or chemotherapy.

Coordinator Group Principal Investigator: Dr. Ana Ramírez de Molina (IMDEA Food)

No coordinator Group Principal Investigators: Dr. Elisa Carrasco and Dr. Maria Mittelbrum (CBM_UAM_CSIC)

Funded by: Community of Madrid Call: 2020 R&D Sinergy Grants

Duration: 01/07/2021-30/06/2024

Ref: Y2020/BIO-6350

This project aims to design Precision Nutritional strategies to slow down the decline of the immune system as a consequence of age, obesity or chemotherapeutic treatments in collaboration with the Immunometabolism and Inflammation Lab at CBM.

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

Principal Investigator: Dr. Ana Ramírez de Molina

Funded by: Ramon Areces Foundation

Duration: 03/04/2019 – 31/12/2022

Partner: Infanta Sofía University Hospital

Call: 2018 Research in Life and Matter Sciences

Ref: CIVP19A5937

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.

FORDISCOVERY. Development of precision food formulations for colon cancer treatment.

Principal Investigator: Dr. Ana M^a Ramírez de Molina

Funded by: Spanish Ministry of Science, Innovation and Universities

Duration: 01/06/2020 – 31/05/2023

Partner: Infanta Sofía University Hospital

Call: PID 2019

Ref: PID2019-110183RB-C21

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.

OnCOVinf Project - ALIBIRD2020-CM

Principal Investigators: Dr. Ana Ramírez de Molina (ONCOGENOM) and Dr. Enrique Casado (HUIS)

Funded by: Community of Madrid and co-funded by EU Structural Funds ERDF/ ESF, "A way to make Europe"/"Investing in your future".

Duration: 01/01/2019-30/04/2023

Partner: Infanta Sofía University Hospital

Call: Technologies 2018, R&D Activities among Research Groups of Comunidad de Madrid

Ref: S2018/BAA-4343

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.

Early Onset Colorectal Cancer (EOCRC): Nutri-metabolic score biomarker of cancer development and progression

Principal Investigator: Dr. Ana Ramírez de Molina

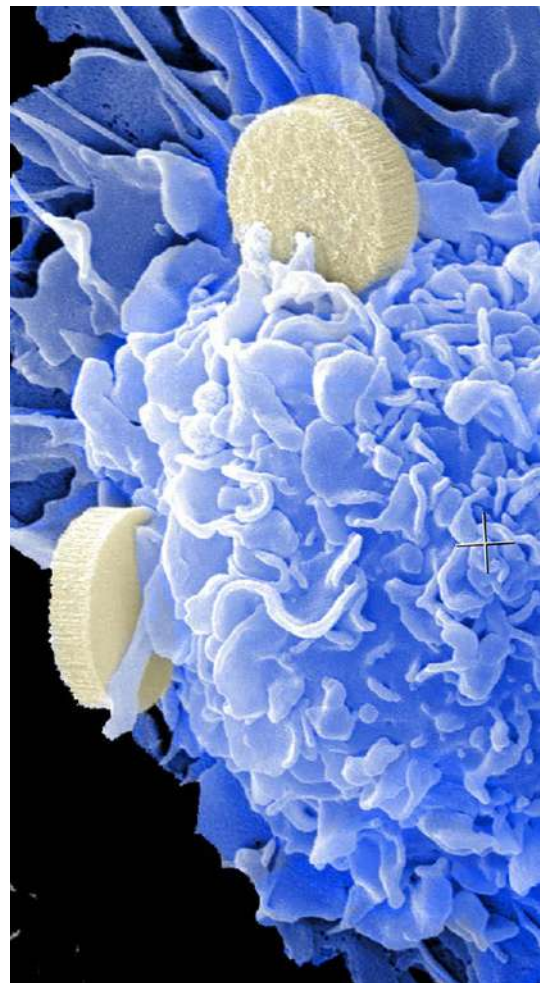
Main collaborator EOCRC: Dr. José Perea (IBSAL)

Funded by: Community of Madrid

Partners: HUIS, HULP, IBSAL

Ref: S2018/BAA-4343 & H2020 COST Action Ref. CA17118

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, with special focus on early onset CRC (population under 50). 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 colorectal cancer, lung and pancreatic cancer.





Evaluation of non-invasive markers of thermogenesis as predictive factors for the development of cachexia in cancer patients

Principal Investigator: Dr. Ana Ramírez de Molina

Main collaborators: Dr. Jaime Feliú, Dr. Enrique Casado

Partners: Infanta Sofía University Hospital, La Paz University Hospital

Previous results from our laboratory highlight that the evaluation of thermogenesis activation markers in plasma cancer patients has great potential as an effective tool for the stratification of patients at high risk of developing cachexia during the tumoral process. In this future project, the application of selected non-invasive molecular biomarkers associated with the development of cachexia will promote the application of early precision nutritional interventions, which would delay and avoid the patient's functional impairment and mortality associated with cancer cachexia.

Health4Brain Precision nutrition for the maintenance and improvement of cognitive function

Principal Investigators: Dr. Ana M^a Ramírez, Dr. Carolina Maestre, Dr. Isabel Espinosa, Dr. Guillermo Reglero

Funded by: Spanish Ministry of Science, Innovation and Universities

Duration: 01/04/2020-31/03/2023

Partners: P4H S.L, Natac Biotech S.L and IMDEA Food.

Call: Collaboration Challenges Programme. RTC 2019 Ref: RTC2019-007294-1

HEALTH4BRAIN is an innovative project that is developing 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 and improve their cognitive function. The project is designing personalized genetic tests and associated nutritional recommendations and functional foods to improve cognitive function and inhibit cognitive decline, which will be validated in a nutritional intervention study developed by IMDEA Food.

THYROID CANCER RESEARCH LINE

YAP in thyroid cancer: role in tumorigenesis and progression of the disease and its implication in drug response

Principal Investigator: Dr. María E. Rodríguez García-Rendueles

Funded by: Community of Madrid

Duration: 01/09/2020 -31/08/2024

Call: Grants for the implementation of contracts "Talent Attraction" Modality

Ref. 2019-T1-BMD-13039

Clinical Oncology

OnCOVinf Project - ALIBIRD2020-CM

Principal Investigators: Dr. Enrique Casado (HUIS) and Dr. Ana Ramirez de Molina (IMDEA Food).
Funded by: Community of Madrid and co-funded by EU Structural Funds ERDF/ ESF, "A way to make Europe"/"Investing in your future").

Duration: 01/01/2020-31/12/2022.

Call: Technologies 2018, R&D Activities among Research Groups of Comunidad de Madrid

Partner: Infanta Sofia University Hospital (HUIS).

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. As secondary objectives effects on metabolic, inflammatory and immune axis are being evaluated.

mHealth platform for the personalized follow up of cancer patients - ALIBIRD2020-CM Project.

Principal Investigators: Dr. Enrique Casado (HUIS) and Dr. Maria Sereno (HUIS)

Funded by: Community of Madrid and co-funded by EU Structural Funds ERDF/ ESF, "A way to make Europe"/"Investing in your future").

Duration: 01/01/2020-31/12/2022

Call: Technologies 2018, R&D Activities among Research Groups of Comunidad de Madrid

Partners: Infanta Sofia University Hospital (HUIS), GBT (UPM), ALIMENTA (CSIC), ONCOGENOM & GENYAL LAB (IMDEA Food), INGREEN (UAM).

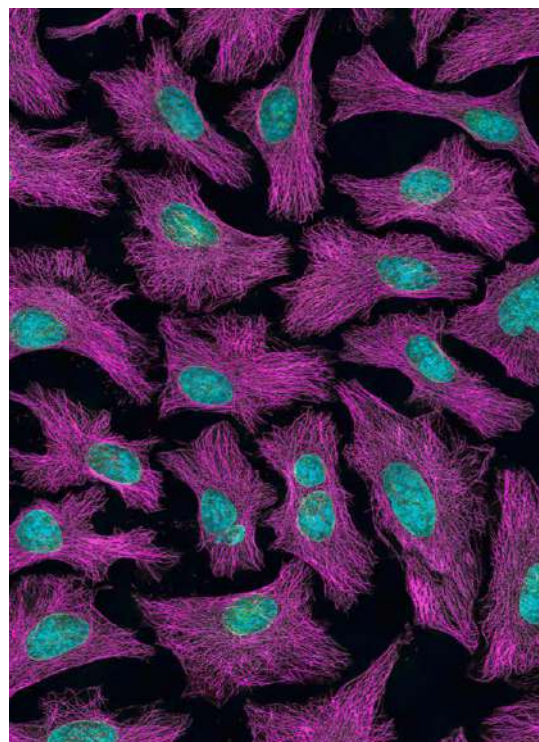
Within the frame of ALIBIRD2020-CM (Precision nutrition approaches for cancer patients), we are developing a platform with a dual application to cancer patients and oncologists to monitor patient reported outcomes, treatment response and lifestyle of cancer patients, as well as automatic customized clinical advice based on inputs and specific disease, with a special focus on nutrigenetics, diet, physical activity and microbiome.

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

Principal Investigator: Dr. Maria Sereno

Duration: 2019-2023

Partners: Infanta Sofia University Hospital, Ramon y Cajal University Hospital, San Carlos University Hospital, Gregorio Maranon University Hospital, 12 de Octubre University Hospital,



Alcorcon Foundation Hospital, Principe de Asturias University Hospital, La Paz University Hospital and Torrejon University Hospital

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.

Study for the evaluation of a short fast on chemotherapy toxicity and efficacy.

Principal Investigator: Dr. Francisco Zambrana and Dr. Pablo J Fernandez

Funded by: Community of Madrid and EU Funds (S2018/BAA4343)

Duration: 2020-2022

Partner: Infanta Sofia University Hospital, La Paz University Hospital, IMDEA Food

This is an open randomized clinical trial comparing a short duration fast of 48 hours around chemotherapy prescription, versus no fast, in colorectal cancer patients, evaluating clinical toxicity and quality of life, as well as p21 induction -together other target genes- and immune cell populations.

Molecular Immunonutrition

Understanding the dynamic interplay of improved food formulations with immunonutritional benefits in the prevention and onset of liver (FOOD4IMNUT) (PID2019-107650RB-C22)

Principal Investigator: Dr. Moisés Laparra

Funded by MICINN. Partners: Agrochemistry and Food Technology Institute (IATA-CSIC).

Duration: 2020 - 2023

Dysfunction aims to provide further clarification of the dynamic interplay and consequences of replacement of critical ingredients in food formulations on cellular innate immune signaling and biology. The production of foods with an added value to shape lipid homeostasis through an adequate innate immune control will pave the way towards the development of nutritional intervention strategies with preventive and/or therapeutic potential in NCCD that should be preferable to the classical pharmacological approach. To this end, Subproject_2 takes advantage of preclinical models to determine the influence of food ingredients on immune function and the onset and severity of NCCD. Human intervention studies, as gold standard in nutrition, will be used to define the immunonutritional pattern in normal weight and in obese.



Desarrollo de ingredientes alimentarios a partir de cultivos ancestrales iberoamericanos (IA VALSE-FOOD) (119RT0S67)

Principal Investigator: Dr. Moisés Laparra

Funded by: CYTED.

Duration: 2021 – 2024

Partners: 50 groups between companies, industrial/consumer associations and researchers from Argentina, Brazil, Chile, Colombia, Cuba, Ecuador, Spain, Guatemala, Mexico, Paraguay, Peru and Portugal.

Focuses on the design, preparation, and evaluation of healthy foods for vulnerable groups of populations, using validated ingredients and treatments improving the functional properties of foods.

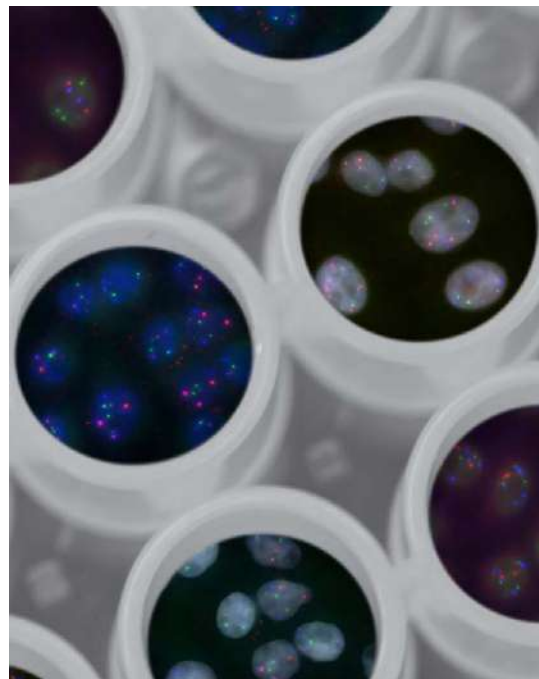
Consortium for the study of renal failure and its impact on cardiovascular pathology (CIFRA-COR-CM) (P2022/BMD-7223)

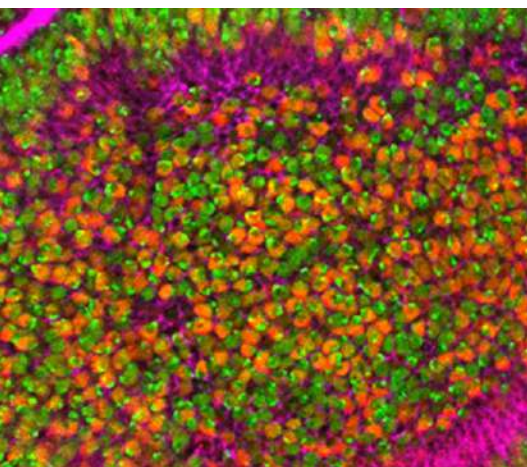
Funded by: Comunidad de Madrid

Duration: 2023 – 2027

Partners: Institute of Biomedicine 'Alberto Sols' (CSIC), Hosp. 12 de Octubre (Madrid), Hosp Ramón y Cajal (Madrid), Hosp Gragorio MArañón (Madrid), Complutense University of Madrid, Autonomous University of Madrid.

Search for nephroprotective strategies to prevent acute renal failure from different causes and origins. It is a serious syndrome due to its high prevalence and mortality; especially when complicated by dysfunction of other organs, such as the heart. Thus, heart failure can appear both in the short and long term after acute renal failure. "For this reason, both clinical situations should not be considered as different entities, but as phases of a common and continuous process in which nephroprotective intervention is possible to prevent the adverse effects of this renal pathology."





Computational Biology

Ai4food-CM (Artificial Intelligence for the Prevention of Chronic Diseases Through a Personalized Nutrition)

Principal Investigator: Dr. Enrique Carrillo de Santa Pau

Funded by: Regional Government of Madrid Y2020/TCS-6654. 2021-2024

Duration: 01/07/2021-30/06/2024

Partners: GENYAL Platform (IMDEA Food) and BiDA Lab (UAM)

The AI4Food project aims to break the limits of current personalized nutrition, to give rise to a new generation of technologies focused on modeling users' habits, molecular biology, and the expert knowledge of nutritionists. AI4Food will develop a series of enabling technologies to process, analyze and exploit a large number of biometric signals indicative of individuals' habits, phenotypic and molecular data. The main objective of AI4Food is to integrate all this information and develop new machine learning algorithms to generate a paradigm shift in the field of nutritional counselling. It seeks to develop a new generation of digital tools to assist in personalized decision making in the field of nutrition. These tools will allow a more objective and effective assessment of people's nutritional status, helping experts to propose changes towards healthier eating habits from general solutions to personalized solutions that are more effective and sustained over time for the prevention of chronic diseases.

FORDISCOVERY. (Chronic DISease COntrol through VERY effective nutritional FORMulae)

Researchers involved: Dra. Teresa Laguna & Dr. Enrique Carrillo de Santa Pau

Funded by: Proyectos I+D+i 2019 - Retos Investigación. (PID2019-107650RB-C22). Ministerio de Ciencia, Innovación y Universidades

Duration: 01/06/2020-31/05/2023

Our current work in this project, leaded by Dra. Ana Ramírez de Molina (Molecular Oncology Group), is focused on apply computational resources to suggest specific bioactives supplementation strategies for subgroups of cancer patients. It is widely known that specific DNA methylation profiles show more variable levels of methylation in several cancer types, which allows the identification of cancer subtypes. Currently, we are studying the variability in CpG methylation of TCGA colon adenocarcinoma samples (COAD)(Fig.1), classifying them according to meta-clustering techniques (Fig. 2). Furthermore, we characterize the subgroups by analysing their transcriptional profiles, which are compared to transcriptomic data of bioactive studies to find biocompounds with an opposite profile to the specific COAD subgroups, which may have a beneficial effect on patients by counteracting their cancer expression profile.

PRECISION NUTRITION AND OBESITY PROGRAMME

Nutritional Genomics and Epigenomics

DIMENSION

Principal Investigator: José M^a Ordovás

Duration: 01/01/2019 – 31/12/2022

Funded by: Proyectos De I+D+I, <<Programación Conjunta Internacional Pci2018-093009

DIMENSION is a European project developed in collaboration with 5 groups from international excellent research institutions. The DIMENSION consortium studies dynamically the causal impacts of dietary intake on epigenetic regulation of gene function across tissues, and their impact on subsequent cardio-metabolic health outcomes. Within the proposal, we focused on postprandial changes in DNA methylation marks after a meal tolerance test combining data from PREDICT and CORDIOPREV cohorts. The aim is to tackle the causal relationships between diet, epigenetic modifications, and gene function. DNA methylation marks are supposed to be stable, and it has been traditionally stated that a long-term exposure is needed to change DNA methylation marks. In this study, we demonstrate that DNA methylation marks change in a few hours after a food intake, suggesting that DNA methylation is a dynamic epigenetic mechanism able to modulate gene expression in response to food intake in the short term. We found changes in methylation marks related to adipogenesis and inflammation that corresponded with changes in the expression of target genes.

CIBERobn: Big data, Artificial Intelligence, Obesity and Nutrition

Principal Investigator: José M^a Ordovás

Duration: 01/01/2022 –

Funded by: CIBERobn, which is an initiative of Instituto de Salud Carlos III.

The research group has been incorporated to CIBERobn consortium. Within the consortium, the research group will i) promote the integration of artificial intelligence in ongoing and new nutritional intervention studies to better characterize the individual phenotype and response to lifestyle interventions; ii) develop new scores based on omics data and with high specificity and sensitivity to predict disease progression and response to intervention and iii) integrate epigenetic data as biomarkers and outputs in nutritional intervention studies. These objectives will be reached through the incorporation of “deep phenotyping” and “advanced computational biology” to large dataset including cohort and interventional studies.





Cardiovascular and Nutritional Epidemiology

Olive oil is the predominant fat source in the Mediterranean countries and plays a major role in explaining the associations of the Mediterranean diet with the reduction of chronic diseases risk.

The purpose of this study was to examine, in a relatively large population of older adults from Spain, the prospective association of consumption of olive oil, and its main types, with the risk of frailty. Data were obtained from the Seniors-ENRICA I cohort study. A total of 1,896 older adults aged 60 and over were recruited in 2008-10 and follow-up through 2013. At baseline, olive oil and other food consumption was collected using a validated dietary history. Incident frailty was defined as having at least three of the following five Fried-based criteria: low physical activity, fatigue, slow walking, muscle weakness and unintentional weight loss.

Over a mean follow-up of 3.5 years, 135 incident frailty cases were identified. The odds ratio OR (95% confidence interval) of frailty risk when compared extreme tertiles of total olive oil consumption was OR 0.47 (0.29, 0.78), P trend 0.003. When differentiating by olive oil types, the results held for virgin olive oil was OR 0.52 (0.30-0.88), P trend 0.013. For common oil consumption, statistical significance was not achieved.

In conclusion, the highest total olive oil consumption (23 tablespoons), especially if virgin, was associated with half the risk of frailty as the lowest consumption (1 tablespoon) among older adults. This study suggests that virgin olive oil should be the preferential culinary olive oil type for frailty prevention. If confirmed in other settings, small doses of virgin olive oil could be added as a simple geriatric nutritional advice on the prevention of frailty.

INFLUENCE OF DIET ON THE DEVELOPMENT OF CARDIOMETABOLIC DISEASES RESEARCH LINE

Raw, boiling, roasting, and pan-frying are the cooking methods associated with a healthier cardiometabolic profile in an older adult population from Spain.

The aim of this study was to evaluate, in a large population of older adults from Spain, the association between cooking methods and anthropometrics, cardiovascular risk factors, and cardiac damage biomarkers. Data were taken from 2476 individuals aged ≥ 65 from the Seniors-ENRICA 2 cohort in Spain and recruited between 2015 and 2017. Eight cooking methods (raw, boiling, roasting, pan-frying, frying, toasting, sautéing, and stewing) were assessed using a face-to-face validated dietary history. Participants were categorized according to sex-specific quintiles of food consumed with each cooking method. The associations were summarized



as adjusted percentage differences (PDs) in anthropometrics, cardiovascular risk factors, and cardiac damage biomarkers, by using marginal effects from generalized linear models.

In this large population of older adults from Spain, the most frequently cooking methods were raw, followed by boiling, roasting, and pan-frying. The PDs corresponding to raw food consumption were -13.4% (p-trend: <0.001) for weight, -12.9% (p-trend: <0.001) for body mass index (BMI), -14.8% (p-trend: <0.001) for triglycerides, and -13.6% (p-trend: <0.115) for insulin. PDs for boiled food consumption were -13.3% (p-trend: <0.001) for weight, -10.0% (p-trend: <0.001) for BMI, and -20.5% (p-trend: <0.001) for insulin. PDs for roasted food consumption were -11.1 (p-trend: <0.001) for weight and -23.3% (p-trend: <0.001) for insulin. PDs for pan-fried food consumption were -18.7% (p-trend: <0.019) for insulin, -15.3% (p-trend: <0.094) for pro-B-type natriuretic peptide amino-terminal, and -10.9% (p-trend: <0.295) for troponin T. No relevant differences were observed for blood pressure nor for other cooking methods.

In conclusion, raw, boiling, roasting, and pan-frying were associated with a healthier cardiometabolic profile. These results highlight the importance of cooking methods and their potential benefits in cardiovascular prevention. More studies are needed to establish causality and to fully understand the impact of cooking methods on health.

NUTRITION AND OMIC DETERMINANTS OF FRAILTY, MULTIMORBIDITY AND UNHEALTHY AGING RESEARCH LINE

Leucine intake and risk of impaired physical function and frailty in older adults

Background: Leucine is suggested to play a central role in age-related physical decline, but the effect of dietary leucine intake on physical functioning is uncertain. We examined the prospective association between dietary leucine intake and impaired lower-extremity function (ILEF) and frailty in older adults.

Methods: We used data from 2956 adults aged ≥ 60 years from the Seniors-ENRICA cohort. At baseline (2008–2010) and in 2012, dietary information was obtained with a validated computerized face-to-face diet history, from which energy-adjusted cumulative leucine intake per body weight was calculated. Participants were followed up through 2017 to assess incident ILEF, ascertained with the Short Physical Performance Battery, and incident frailty, according to the Fried phenotype criteria. Statistical analysis was performed with Cox models adjusted for the main potential confounders.

Results: During follow-up, we identified 515 incident cases of ILEF and 241 of frailty. Compared to participants in the lowest tertile of leucine intake (35.5–89.0 mg/kg/d), those in the highest tertile (107.4–372.5 mg/kg/d) had a lower risk of ILEF [fully-adjusted hazard ratio (95% confidence interval): 0.70 (0.53–0.93), p trend: 0.01] and of frailty [0.63 (0.41–0.96), p trend: 0.03]. A higher





consumption of important sources of leucine in this population, including unprocessed beef, oily and white fish, and bread were also associated with a lower risk of incident ILEF and frailty.

Conclusions: Higher leucine intake was associated with reduced risk of ILEF and frailty. Dietary leucine, obtained from foods rich in high-quality protein, could be a key nutrient to prevent age-related physical function decline in older adults

Nutritional Control of the Epigenome

PREDIMED-Plus

PREDIMED-Plus is a multicentre, randomized, controlled, parallel groups intervention trial conducted in 23 research centres from Spain. Research centres include hospitals, universities and research institutions that join more than 200 professionals from medicine, nutrition, psychology, pharmacy, biology, and nurse to carry out a long-lasting lifestyle intervention to lose weight. The aim is to compare an intensive lifestyle intervention, based on energy-reduced

Mediterranean diet, physical activity, and behavioural support, with a control intervention, based on primary care, on the incidence of primary cardiovascular events (cardiovascular mortality, acute myocardial infarction, or stroke). PREDIMED-Plus study has recruited 6.874 participants, men (55-75 years) and women (60-75 years) with overweight/obesity and metabolic syndrome. For 6 years participants have followed specific intervention protocols, according to the allocation group. Intervention finished last December 31. Currently, the study is within the two additional years of follow-up without intervention.

The consortium has published more than 100 scientific papers, highlighting the cohort profile and the interim analyses. The prestigious journal Nature Medicine has exalted PREDIMED Plus as one of the 11 clinical trials that will shape the medicine in 2023.

ENSATI: reaching healthy aging through time-restricted eating

Principal Investigator: Lidia Daimiel

Funded by: MCIN/AEI/ 10.13039/501100011033 through Programa «Proyectos de Generación de Conocimiento», within the frame of Programa Estatal para Impulsar la Investigación Científico-Técnica y su Transferencia, del Plan Estatal de Investigación Científica, Técnica y de Innovación 2021-2023 in the call of 2021 (PID2021-1258990B-I00). Project also funded by CIBER Fisiopatología de la Obesidad y la Nutrición, an initiative of Instituto de Salud Carlos III.

Duration: 01/09/2022 – 31/08/2025

Healthy aging refers to developing and maintaining functional abilities to enable the well-being of the elderly. Promoting healthy aging strategies in the population would result in people living in a healthy state for most of their lifespan. Healthy lifestyle habits could attenuate the progression

of aging-related diseases and ameliorate age-related decline. Among the lifestyle interventions that could improve healthspan, time restricted eating (TRE) is a promising candidate. TRE is a type of intermittent fasting that involves time-limited consumption of food during a specific time window. This dietary intervention has a demonstrated positive impact on some aspects of health both in pre-clinical models and clinical trials. Autophagy is one of the main proteolytic systems implicated in protein quality control and this crucial activity for cellular homeostasis decreases with age. Therefore, the effects of TRE on different aspects of aging may be mediated by autophagic processes. Epigenetic mechanisms and immune senescence may also be influenced by TRE. We hypothesize that an intervention with TRE in overweight/obese individuals has a positive impact on their aging determinants. To test this hypothesis, we propose an intervention trial to compare the effect of a Mediterranean diet with or without caloric restriction and a TRE protocol based on a Mediterranean diet on molecular markers of aging. Details on TRE study can be found on its website: <https://ensati.wixsite.com/ensati> and through this QR code:



PRECISION NUTRITION AND CARDIOMETABOLIC HEALTH

Cardiometabolic Nutrition

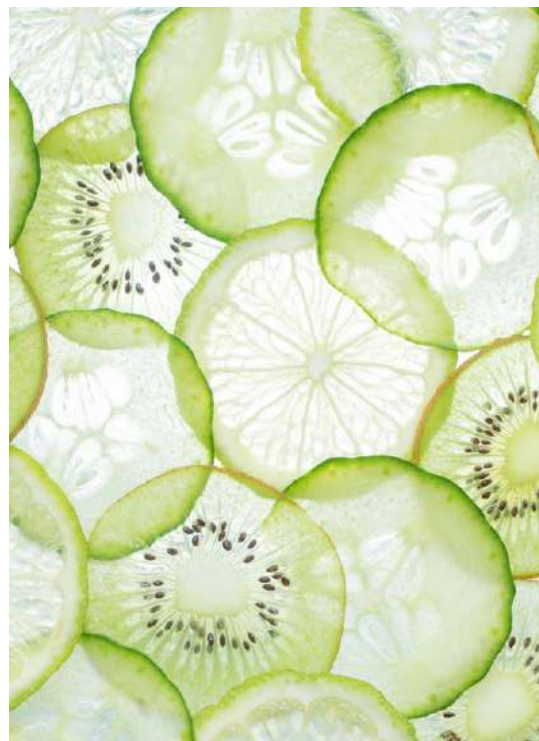
METAINFLAMACION-CM

Principal Investigator: Dr. Alfredo J. Martínez

Funded by: Community of Madrid Call: 2020 Synergy Projects

Duration: 01/07/2021-30/06/2024

The objective of METAINFLAMACION project is the identification of new precision tools in patients with Lupus Erythematosus, COVID19, Obesity and Metabolic Syndrome, that will allow a better control of these inflammatory diseases favoring their clinical/ metabolic stratification and the prevention of associated complications through the use of early biomarkers and the personalization of the therapeutic management and the design of precision therapeutic interventions. In collaboration with Puerta de Hierro Majadahonda University Hospital and the Autonomous University of Madrid a total of 560 patients will be recruited for the 1) Phenotypically characterization of Lupus Erythematosus, COVID19, Obesity and Metabolic Syndrome patients and 2) Antiinflammatory precision nutritional intervention 32 weeks in patients with overweight to improve the health status of these patients.





NutriIMDEA study

Principal Investigator: Dr. Alfredo J. Martínez

Funded by: IMDEA Food and FINUT

Duration: 2020-2023

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. A total of 15000 participants have accessed to the questionnaire available in an online platform where the volunteers can send the survey data. 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.

PLENUFAR 7

Principal Investigator: Dr. Alfredo J. Martínez

Funded by: Spanish General Council of Pharmaceuticals

Duration: 2022

The PLENUFAR 7 project's main objective is the development of tools that help in a precision nutritional approach through the integration of a set of personal factors that allow the qualitative definition of certain individual nutritional profiles or groups of people (Nutritypes). In addition, bioinformatic analysis techniques of personalized information will allow the development of computations or "scores" (Nutrindex) for the objective quantification of the sum of exposure factors that influence the nutritional status of everyone. A questionnaire will be carried out in pharmacies to analyze some health variables in all Spanish communities. These strategies could finally serve to define personalized metabolic and nutritional action guides for your advice through nutritional decision algorithms.

Dietary Deal

Principal Investigator: Dr. Alfredo J. Martínez

Funded by: Instituto de Salud Carlos III

Duration: 2021-2024

The main objective is to develop and open sources dietary assessment tools with machine learning capabilities for automatic classification for harmonization of dietary data across Europe and to advance on the ongoing biomarkers research in the area of nutritional status and health, specifically, this Project Will develop and open dietary assessment tools with addresses the needs for research related to epidemiology, clinical practice and for dietary surveillance with regards to both nutrition and Food safety aspect. This project Will also investigate factors potentially

influencing the validity of dietary biomarkers (genetics, lifestyle, phenotype, other dietary factors) using existing cohort studies and estimate the impact of biomarkers correction on estimation of Food/ nutrient intake.

Bioactive Ingredients

Impact of milk fat globule membrane-enriched supplement on health in both in-vitro and in-vivo trials and its potential mechanisms of action (MFGM4HEALTH).

Principal investigator: Javier Fontecha Alonso

Funded by: Spanish Ministry of Science and innovation

Duration: 01/09/2021-02/09/2024

Partners: CIAL, IMDEA-Food, IGS

The multidisciplinary activities of the project will provide scientific evidence on the mechanisms of action of a MFGM-enriched product and potentially ascertain how MFGM function goes beyond its nutritional role. Hopefully, this research will provide data to build the bases for future human trials with appropriate MFGM formulations emphasizing both infant development and healthy ageing as well as confirmation of the anti-inflammatory and pyroptosis-preventive actions of MFGM. The core of the research team comprises tenured scientists from CSIC and IMDEA-Food. The groups have developed research lines in different but complementary issues within the Food Science and Technology and Molecular Nutrition fields, with a high level of knowledge and experience in food lipids, particularly in lipids from dairy products and human milk, and the evaluation of the physio-modulatory actions of micro-nutrients and their metabolism.

Epigenetics of Lipid Metabolism

Search and validation of plant microRNA from the diet with an atheroprotective effect.

Principal Investigator: Dr. Maria-Carmen López de las Hazas

Funded by: Spanish Society of Arteriosclerosis

Duration: 2022-2023

Epidemiological evidence suggests that adherence to diets rich in vegetables, especially from the brassica family, shows an atheroprotective effect, reducing the risk of suffering from associated cardiovascular pathologies. This effect has traditionally been associated with the bioactive components contained in said foods. It has recently been shown that microRNAs (miRNAs) from edible vegetables could influence consumer gene expression and cause a





biological effect (cross-kingdom regulation). This project evaluates the impact of plant miRNAs on the regulation of lipid metabolism and its possible involvement in cardiovascular health. Advances in the knowledge of how plant miRNAs could modify lipid metabolism will increase the possibility of developing new dietary, therapeutic, and pharmacological approaches to combat the development of CVD.

Dairy industry by-products as a sustainable source of extracellular vesicles: nanocarriers for enhancing the bioavailability and bioactivity of (poly)phenols (DairyPhenosome).

Principal Investigator: Dr. Alberto Dávalos

Funded by: Spanish AEI

Duration: 2022-2024

Partner: CEBAS-CSIC (Murcia)

DairyPhenosome will allow the use of by-products (whey from different milk processes) to obtain innovative products with high added value for the industry (i.e. extracellular vesicles). In addition, the subproject will develop a method to scale-up the production of EVs, and evaluate the advantages of nanoencapsulation of dietary phenolic compounds into EVs in terms of increase bioavailability, stability as native compound and bioefficacy compared vs. free (non-encapsulated) polyphenols which are highly metabolized limiting their bioactivity.

In general the project will impact the development of more effective strategies to obtain EVs from byproducts and save costs, focusing on improving health and relieve pressure on the health system.

The journey of edible plants-derived extracellular vesicles through the mammalian body: extracellular ncRNAs as potential bioactive components of foods (FoodVesicleTherapy)

Principal Investigator: Dr. Alberto Dávalos

Funded by: Spanish Ministry of Science, Innovation and Universities

Duration: 01/06/2020 – 31/05/2023

Call: PID 2019

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.

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 plantbased ncRNA therapeutic approaches.

CHILDHOOD PRECISION NUTRITION PROGRAMME

Childhood Obesity

CIBEROBN National Network for the study of Obesity and Nutrition

Principal Investigator: Dr. Jesús Argente

CoPrincipal Investigator: Dr. Julie Chowen

Funded by: Institute of Health Carlos III (ISCIII) Ref.CB06/03/0022

Dr. Argente is coordinator of the pediatric obesity program.

Duration: 01/01/2006-present

Crosstalk between hypothalamic astrocytes and perivascular adipose tissue in metabolism and cardiovascular function: Impact of diet

Principal Investigator: Dr. Julie Ann Chowen King

Duration: 01/01/2018 - 30/09/2022

Funded by: Ministry of Economy and Competitiveness

Call: 2017 R&D+I Project

Astrocytes, exosomes and miRNAs in the differential response of males and females to specific fatty acids.

Principal Investigator: Dr. Julie Ann Chowen King

Duration: 01/09/2022 - 30/09/2026

Funded by: Ministry of Economy and Competitiveness

Call: 2021 R&D+I; Project Ref: PID2021-1226530B-I00

These two consecutive projects are focused on understanding the response of hypothalamic astrocytes to nutritional signals and how they communicate this information to the surrounding neuronal metabolic circuits. In addition, there is a special focus on how these systems differ between males and females.





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: Dr. Jesús Argente Oliver

Duration: 01/01/2020 -31/12/2022

Funded by: Institute of Health Carlos III (ISCIII)

Call: Health Research Projects Ref. PI19/00166.

This project is focused on the response of the GH/IGF system, with special emphasis on new members of the system, to different metabolic conditions and diseases.





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HEAD OF programmes



Jesús Argente Ph.D.

Childhood Precision Nutrition
Programme Co-Director

Full Professor and Director of the Department of Pediatrics at the Universidad Autónoma de Madrid, Director of the Department of Pediatrics and Chairman of the Department of Pediatrics and Pediatric Endocrinology and Director of the Laboratory of Research at the Niño Jesús University Children's Hospital. Associate researcher of IMDEA Food. Director of the Childhood Precision Nutrition Program.

Dr. Argente is IP in the CIBER of Obesity and Nutrition, being the leader of the childhood obesity program. He obtained his medical degree at the University of Zaragoza and completed his pediatric residency at the Hospital Ramón y Cajal in Madrid and has worked at the Hospital Saint Vincent de Paul in Paris, France, the University of Virginia in Charlottesville, VA, USA and at the University of Washington in Seattle, WA, USA. His main research interests include childhood obesity, pathophysiology of human growth, puberty, eating disorders and diabetes. He has published more than 300 original articles and has lectured in more than 30 countries. He is past president of the European Society for Pediatric Endocrinology (ESPE) and past president of the Spanish Society for Pediatric Endocrinology (SEEP). He has obtained multiple national and international awards for his research.



Julie Chowen Ph.D.

Childhood Precision Nutrition
Programme Co-Director

Investigator of the Community of Madrid Category A in the Department of Pediatrics and laboratory of Research at the Niño Jesús University Children's Hospital in Madrid. Associate researcher of IMDEA Food. Co-Director of the Childhood Precision Nutrition Program. Dr. Chowen received her PhD in Physiology and Biophysics at the University of Washington in Seattle, Washington, USA. She obtained a postdoctoral position and later as a research associate at the Cajal Institute, CSIC, Madrid, Spain. She is currently President of the Scientific Committee of the Foundation for Biomedical Investigation of the Niño Jesús University Children's Hospital in Madrid. Co-IP in the CIBER of Obesity and Nutrition. Her main interests include the neuroendocrine control of metabolism and appetite, with a special emphasis on the participation of astrocytes in the physiological and pathophysiological control of metabolism and the development of comorbidities associated to obesity. Her research also includes the neuroendocrine response to specific nutrients, long-term effects of the early nutritional environment and sex differences in response to nutritional/ metabolic challenges. She has published over 200 original articles and has given lectures at the most important international meetings of endocrinology, neuroendocrinology and obesity.



Rafael de Cabo Ph.D.

Precision Nutrition And Aging Programme Programme Director / Nutritional Interventions Research Group Leader

Rafael de Cabo, PhD is currently the chief of the Translational Gerontology Branch at the National Institute on Aging in Baltimore, Maryland. A native of Cordoba, Spain, he received his B.S. from the University of Cordoba, and his Ph.D. in 2000 from the Department of Foods and Nutrition at Purdue University. Upon completion of his graduate education, he trained as a postdoctoral fellow in the Laboratory of Neurosciences at the National Institute on Aging in Baltimore, Maryland. In 2004, he was appointed as a tenure track investigator in the Laboratory of Experimental Gerontology. His group applies both physiological and tissue-specific molecular approaches to investigate effects of nutritional interventions on basic mechanisms of aging and age-related diseases. Research within his unit strives to identify protective mechanisms invoked by caloric restriction and to evaluate the consequences of dietary interventions on lifespan, pathology, and behavioral function. Dr. de Cabo's research balances the exploration of in vivo rodent, as well as in vitro, paradigms of caloric restriction.

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José María Ordovás Ph.D.

Precision Nutrition And Obesity Programme Director / Nutritional Genomics And Epigenomics Research Group Leader

José M. Ordovás, PhD, is Professor of Nutrition and Genetics and a Senior Scientist at the USDA-HNRCA at Tufts in Boston, and Director of the Nutrition and Genomics Laboratory. Dr. Ordovás graduated from the University of Zaragoza and did postdoctoral work at the MIT, Harvard and Tufts. He has published over 700 scientific articles in peer review journals (h-index 92) and written numerous reviews and books. In this regard, he is considered one of the most distinguished world experts in gene-diet interactions related to cardiovascular traits. Throughout his career, Dr. Ordovás has received multiple honors for his scientific achievements. He has been awarded an honorary degree in Medicine from the University of Córdoba in Spain and he is Member of the Royal Academies of Sciences, Medicine, Nutrition and Pharmacy.

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Alfredo Martínez Ph.D.

Precision Nutrition And Cardiometabolic Health Programme Director / Cardiometabolic Nutrition Research Group Leader

Prof. Alfredo J. Martínez holds a PhD Nutrition being also PharmD and MD. He is colP and has been involved in several landmark intervention trials such as DIOGENES, SEAFOODplus, NUGENOB, FOOD4ME and PREDIMED whose results have been published in the most relevant medical and nutritional journals including NEJM, Lancet, Nature, BMJ, AJCN, Obesity, IJO, JCEM, Diabetology, Trends in Immunology, TIPS, IJO, Cell Metabolism Circulation, etc producing so far more than 20.000 citations. Prof. Martínez has supervised more than seventy PhD students and published more than 600 peer review papers in the areas of Obesity and Nutrition, including precision nutritional omics (H Factor > 60); He has been president of FESNAD and is currently president of ISNN as well as president elect of the International Union of Nutritional Sciences (IUNS) and has been recipient of several important awards including ipocrates and Dupont prizes. During his scientific career, Prof. Alfredo J. Martínez has enjoyed training or invited stays at Nottingham, Berkeley, MIT, Harvard, Oxford and King College London as well as being reviewer for different EU Committees and Spanish Organizations such as AECOSAN.

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**Ana Ramírez de Molina
Ph.D.**

**Head of the Precision Nutrition
and Cancer Programme. Molecular
Oncology Group Leader**

Ph.D. in Molecular Biology (UAM, 2002). Coordinator at IMDEA Food and Universidad Autónoma de Madrid (UAM) of the European program EIT Food, a consortium of 70 European partners developed to promote healthy and sustainable food in Europe based on scientific knowledge. Promoter of P4H (Precision ForHealth, 2018) and FORCHRONIC (2019), knowledge-based start-ups of IMDEA Alimentación and UAM. She has received the Young Researchers MSD Award, the International John Kinney Award and the distinction on March 8 of the Community of Madrid as an outstanding woman in Science.



Ricardo Ramos Ph.D.
Director of IMDEA Food Institute

Ricardo Ramos Ruiz is Director of Institute IMDEA Food and directs the Institute's Nutritional Genomics and Food and Food Genomics Platform (GENYAL) at the institute. He holds a PhD in Molecular Biology from the Autonomous University of Madrid and his research work has been carried out at the at the Spanish National Research Council (CSIC) and the Scientific Research Council (CSIC) and the Autonomous Universidad Autónoma de Madrid, specialising in the mechanisms of specialising in the mechanisms of gene expression. Ricardo Ramos is one of the leading experts in experts in real-time PCR and massive sequencing and massive sequencing technologies and has been responsible for the creation and development of the Genomics Unit of the Fundación Parque Científico de Madrid, one of the most important of the Autonomous Community of Madrid. He is also a member of the executive committee of the Cluster of Innovation Technological Innovation and Talent in Biomedical Biomedical Technologies and Biotechnology of the Autonomous of Madrid (CITT Tecnologías Biomedicales Technologies and Biotechnology). Ricardo Ramos is currently collaborating in teaching activities Master's degree teaching activities at the Complutense University of Madrid and other institutions as part of his scientific and scientific and educational activity.



group LEADERS



Enrique Carrillo de Santa Pau Ph.D.

Computational Biology Research Group Leader

PhD. in Molecular Biology and Biochemistry, Complutense University of Madrid (2007); MSc in Bioinformatics and Computational Biology (2010), Complutense University of Madrid; MSc in Applied Statistics, UNED university (2014); Executive Education Program: "Accelerate: Building Business from Science and Technology", IE Business school (2017). His work is focused in developing and applying integrative bioinformatic and computational approaches to study the variability and individual responses to food or bioactives, and its relationship to complex diseases like cancer, obesity, and other metabolic disorders. The main research interest is establishing precision personalized nutrition strategies based on individual molecular backgrounds with particular emphasis in genetic, epigenetic, metabolic and microbiota profiles. Since 2021, he is member of the board of directors in the Spanish Society for Bioinformatics and Computational Biology.

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Enrique Casado Ph.D.

Clinical Oncology Research Group Leader

Head of Medical Oncology Service and Precision Oncology Laboratory, Infanta Sofía University Hospital. Dr. Enrique Casado finished his undergraduated studies in Medicine and Surgery (1992) and Biohealth Sciences (1993) in Complutense University of Madrid (Universidad Complutense de Madrid) (UCM). He obtained the Degree of Doctor of Medicine (1994) with Extraordinary Prize granted by UCM. He did his medical residency in La Paz University Hospital (Hospital Universitario de la Paz) (1993-97) and Master's Degree in Palliative Care (1997) in Universidad Autónoma de Madrid (UAM), in combination with extended postdoctoral internships in University of Alabama (Birmingham) and University of California (San Francisco). He was the attending physician of Medical Oncology in gastrointestinal and thoracic cancer and laboratory coordinator for the Translational Oncology Group of Hospital Universitario de la Paz (Madrid). He is an associate professor of UAM and visiting professor of UCM. He is currently the Director of the Medical Oncology Department at the Hospital Universitario Infanta Sofía (HUIS) de Madrid, Coordinating Professor of Oncology in the Universidad Europea de Madrid and Precision Oncology Laboratory (HUIS) Director. He has received 7 awards in recognition of his research work from institutions as prestigious as the American Society of Clinical Oncology.



Gonzalo Colmenarejo Sánchez Ph.D.

Head Of Biostatistics And
Bioinformatics Unit. Senior
Biostatistician

Gonzalo Colmenarejo got his PhD in the Biophysics area in the Complutense University of Madrid. Then was a post-doctoral researcher in the Chemistry Department of University of California at Berkeley. He joined GlaxoSmithKline's (later GlaxoSmithKline) R&D center in Tres Cantos, Spain, where he stayed more than 17 years. There he developed multiple statistical and machine learning models to predict biological activity from molecular structure, and was a statistical and data analysis support for a multidisciplinary and international group of biologists, biochemists, medicinal chemists and pharmacologists. He specialized in the massive data analysis of cellular and biochemical high-throughput screens (HTS), and processed more than 100 campaigns of multiple target classes, screening technologies and therapeutic areas, where he increased the number and quality of hits there obtained. He developed new theoretical methods for the prioritization of compounds in HTS campaigns, as well as for the automated chemical pattern extraction from sets of molecules. He co-lead the Screening Analytics Investment Area of GlaxoSmithKline, an international team devoted to finding new approaches for the analysis of HTS.

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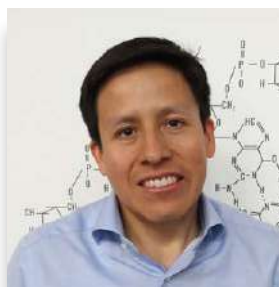


Lidia Daimiel Ruiz Ph.D.

Nutritional Control Of The
Epigenome Research Group
Leader

Dr. Lidia Daimiel Ruiz graduated in Biology at Universidad Autónoma de Madrid where she carried out post-graduate studies about the genetic and epigenetics alterations associated with colorectal cancer onset and progression, under the supervision of Prof. Juan José González Aguilera and Prof. M^a Antonia Fernandez. She started her PhD in 2006 at Hospital Ramón y Cajal and was focused on the study of cholesterol-mediated gene regulation, under the supervision of Dr. Javier Martínez-Botas and Dr. Diego Gómez-Coronado. She joined IMDEA Food in 2011 as postdoctoral researcher to study the dietary modulation of microRNAs under the supervision of Dr. Alberto Dávalos and Prof. José M^a Ordovás. In 2015, she was promoted to Junior Investigation and started to build her own research group to study how diet modulate the epigenome with a focus on microRNAs and methylation marks. She specialized in human nutrition intervention trials and joined to the prestigious consortium PREDIMED-PLUS as Principal Investigator, where she conducts her epigenetic studies. In 2016, she stayed at Carlos Fernández-Hernando's laboratory at Vascular Biology and Therapeutics program at Yale University for 6 months.

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Alberto Dávalos Ph.D.

Epigenetics Of Lipid Metabolism
Research Group Leader

Dr. Alberto Dávalos holds a degree in Pharmacy and Biochemistry by San Marcos University (Lima) and a PhD in Pharmacy by Universidad Complutense de Madrid (Madrid). He has conducted postdoctoral research at the Hospital Ramón y Cajal (Madrid), at Yale University School of Medicine, (New Haven), and at New York University School of Medicine (New York). Dr. Dávalos's research program focuses in identifying and characterizing new noncoding RNAs (miRNAs, lncRNAs and other type of regulatory RNAs) that regulate lipid metabolism and the effects of minor dietary components (micronutrients) on their expression.

Noncoding RNAs have been recognized as critical modulators of cardiovascular system in health and disease. He hopes to: (i) identify new therapeutic strategies through modulating noncoding RNAs levels by the diet or other lifestyle factors to treat dyslipidemia and to prevent atherosclerosis and cardiovascular diseases; and (ii) understand lifestyle modification of the epigenome and personalize the health of individuals using epigenetics (particularly noncoding RNAs) for the development of Precision Nutrition.

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Alberto Díaz-Ruiz Ph.D.

Cellular And Molecular Gerontology
Research Group Leader

PhD in Science by the University of Cordoba, I am specialized in the fields of metabolism, cancer and aging. I have been awarded with the Ramon y Cajal Program (2021), and the Talento Program (2018, Madrid). My academic and research education was carried out in Spain and United States. My research focuses on the characterization of cellular and molecular events that drive the aging process and interrelated metabolic pathologies. My group integrates nutritional and pharmacological interventions directly targeting nutrient sensing pathways. We implement sustainable interventions and energy-restriction based strategies to enhance and promote healthspan & lifespan, and to reduce the burden of cancer in mice and humans.

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María Isabel Espinosa Ph.D.

Head of the Nutritional Genomics and Health Unit. Senior Nutritionist

Isabel Espinosa Salinas holds PhD in Biology and Food Sciences, a Human Nutrition and Diet degree and a Food Science and Technology degree, by Universidad Autónoma de Madrid. She has been involved in Endocrinology and Nutrition Department of "La Paz" and "Puerta de Hierro" Hospitals. She collaborated with Mahou-San Miguel Group for the development of a health and nutrition program in several cities around Spain. In 2010, she joined IMDEA Food and worked on the set up and development of the Platform for Clinical Trials in Nutrition and Health GENYAL. At present, she has more than seven years of experience as nutritionist in the development of more than 15 clinical trials funded by National Projects grantee and in nutritional intervention studies for companies as Biosearch Life or Capsa Food among others. She has teaching experience in nutrition courses and workshops. She has co-authored several publications, classroom books for Fundación Universitaria Iberoamericana and she has also presented different communications in national and international congresses.

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Jaime Feliú Ph.D.

Clinical Oncology Research Group Leader

Head of Medical Oncology Service, La Paz University Hospital. Dr. Jaime Feliú Battle holds a Degree in Medicine and Surgery from Universidad Complutense de Madrid issued in 1982. He specialized in Medical Oncology in Hospital Universitario de la Paz, where he is currently the Director of Medical Oncology Department. He is a professor of Oncology in the Medicine Area of Universidad Autónoma de Madrid (UAM) and Director of Master's Degree in Palliative Care and Treatments for Cancer Patient Support of UAM. Furthermore, he is the current president of the Multidisciplinary Spanish Group of Digestive Cancer (GEMCAD). He has participated as a principal investigator or co-investigator in more than 70 phase I, II and III trials. He has written or co-written more than 200 articles for national and international journals, more than 60 book chapters and has presented a large number of communications in national and international congresses.



Pablo Fernández Ph.D.

Metabolic Syndrome Group Leader

Ph.D. in Molecular Biology in the Autonomous University of Madrid. My work is focused on 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 responses, 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 other age-associated diseases.



Maria Ikonomopoulou Ph.D.

Head Of Transactional Venomics Research Line

Biomedical Sciences, The University of Queensland, Australia. Dr. Maria Ikonomopoulou is a Senior Research TALENTO Fellow (Program of excellence in research by the Madrid Government) and Head of the Translational Venomics Group at IMDEA-Food Institute in Madrid. She is an Honorary Associate Professor in the Institute for Molecular Bioscience at the University of Queensland, Co-ordinator of the Stakeholder Engagement Committee and in the Core Management of the COST Action CA19144 EUVEN - European Venom Network as well as supporter of STEMM WOMEN in Australia. She is a Longevity Biotech Fellow, belonging to a community of ambitious founders, operators, and investors looking to build, join, and invest in revolutionary longevity biotechnology startups and also member of the Australia Spain Business Association. She has international research experience in biology and biotechnology in Australia, Spain, Greece, Ireland and Malaysia and has been successfully collaborating with the industry for over ten years. Dr. Ikonomopoulou is a former Marie Curie "AMAROUT" Fellow. She holds a BSc(Hons) in Agricultural Technology from the Technological Educational Institute in Western Macedonia in Greece and part of her degree was conducted in the Biotechnology Department at the Teagasc-Moorepark Research Centre in Ireland (Leonardo Da Vinci EU Fellowship).

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Moisés Laparra Ph.D.

**Molecular Immunonutrition
Research Group Leader**

José Moisés Laparra Llopis holds a PhD in Pharmacy gained during his stay at the High Research Council of the Spanish Government. His scientific career is focused on the field of intestinal homeostasis and the cross-talk within gut-liver axis. The novelty and scientific and social impact of his studies was used by the European Food Safety Authority to establish recommendations concerning staple foods. A continuous contact and interaction with internationally renowned research groups constitutes a constant in Dr. Laparra's career. He held a leading position on prebiotic research awarded by The Fulbright Commission to conduct postdoctoral research in the Food Science Department at Cornell University. Additionally, he participated in teaching activities that end up in a renowned honor thesis awarded by the professional organization for food science and technology professionals in the U.S. This experience favored his incorporation to the Institute of Translational Immunology at the University Medical Center of Mainz University as independent researcher. Dr. Laparra has published over 70 scientific articles and book chapters. He has overseen several precompetitive public funded projects. As senior researcher at IMDEA Food he develops immunonutritional-based precision strategies to tumor suppression.

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Cristina Ramírez Ph.D.

**Posttranscriptional Regulation
Of Metabolic Diseases Research
Group Leader**

Ph.D. in Molecular Biology and Cellular. Her work is focused in the Molecular Basis of the of metabolic and age-related diseases, in which the novel role of miRNAs and other post-transcriptional regulators remains incomplete. Her work in this area has demonstrated the contribution of miRNAs and RNA Binding Proteins (RBPs) to hepatic lipoprotein production, HDL modulation, hepatic metabolism and glucose homeostasis, etc. Aging, which characterizes by the loss of physiological integrity, represent the main risk factor for major human metabolic diseases. In this line, an important component of our research interest rely on uncovering the novel role of posttranscriptional networks, with special interest in the posttranscriptional pair composed of hnRNPK/miR-7, and their potential use for diagnosis and future therapies.

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Fernando Rodríguez Artalejo Ph.D.

**Cardiovascular And Nutritional
Epidemiology Research Group
Leader**

Fernando Rodríguez Artalejo, MD, PhD, is Professor of Preventive Medicine and Public Health at the Medical School of the Universidad Autónoma de Madrid. Dr. Rodríguez Artalejo graduated from the Universidad Autónoma de Madrid and received postgraduate training in the La Paz University Hospital, the Institute of Health Carlos III and the Spanish Ministry of Health in Madrid, as well as in the London School of Hygiene and Tropical Medicine and the Johns Hopkins Bloomberg of Public Health in Baltimore. He has published over 400 scientific articles in peer-reviewed journals (h-index 51) and contributed to many policy documents on health planning and evaluation and on prevention and control of obesity and cardiovascular disease.

He has received the Carles Martí Henneberg award to a scientific career on Nutrition Research, the Ciril Rozman award of the Spanish Society of Internal Medicine, the Silver Medal of the National Plan on Drug Addiction, and the Encomienda de la Orden Civil de Sanidad. Dr. Rodríguez Artalejo has been a member of the Scientific Committee of the Spanish Agency of Foods Safety and Nutrition, and currently serves in the European Advisory Committee of Health Research of the World Health Organization and in the Expert Panel of the European Joint Action on Prevention of Frailty (ADVANTAGE).



Francesco Visioli Ph.D.

**Bioactive Ingredients Food
Research Group Leader**

Francesco Visioli earned a degree in Pharmacy and Pharmaceutical Chemistry from the University of Milan and a PhD in Biotechnology from the University of Brescia (based on work performed at the Louisiana State University Neuroscience Center). After being Full Professor of physiopathology at the Université Paris 6 "Pierre et Marie Curie", where he directed the "Micronutrients and cardiovascular disease" unit, he is now Professor of human nutrition at the University of Padua, Italy and Senior Investigator at the Madrid Institute for Advanced Studies (IMDEA)-Food. Formerly involved in neurochemistry, Dr. Visioli's research currently concerns essential fatty acids, namely those of the omega 3 series, and natural antioxidants, as related to atherosclerosis and cardiovascular disease. In particular, Dr. Visioli's group discovered the biological and pharmacological properties of olive oil phenolics, including hydroxytyrosol. In addition, Dr. Visioli is being studying some bioactive components of plant foods, including lycopene from tomato and biophenols from wild greens. His research ranges from in vitro studies of bioactivity (test tubes, cell cultures) to in vivo tests, performed on laboratory animals and/or humans. Dr Visioli has a publication record of approximately 250 papers and book chapters, which have been cited over 10,000 times.

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LAB technicians



Susana Molina Ph.D.

Lab Manager and Technical Responsible of the Genomic Laboratory

Susana Molina Arranz, performed her PhD studies in the group of Prof. Luis Carrasco at the "Centro de Biología Molecular Severo Ochoa" (CSIC-UAM). In 2007 she joined Dr. Juan M. Torres group at "Centro de Investigación en Salud Animal" (INIA), a research group about prion diseases and its strain barriers. Between 2008 and 2009 she joined the group of Fernando Valdivieso at the "Centro de Biología Molecular Severo Ochoa" (CSIC-UAM), working as a technician generating biological tools for the therapeutic investigation of Alzheimer Disease. During all these years she acquired experience in cell culture, as well as different techniques in molecular biology as western blotting, cloning, and nucleic acid and protein purifications. In 2009 started in IMDEA Food as the Technical responsible of the Genomic Laboratory, working both in the investigation line about nutritional genomics of cancer, as well as in GENYAL Nutrigenomic Laboratory. Her work in the GENYAL Platform includes processing and analyzing samples from the different intervention studies that are developing in IMDEA Food, but also from external companies and research centers interested in genotyping studies.

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Carmen Crespo Ph.D.

Technician Doctor of the Laboratory

M^a del Carmen Crespo Lorenzo has a first degree in Molecular and Cellular Biology from the IE University of Segovia (2010). In 2013 she obtained a master's degree in Pharmacological Research from the Universidad Autónoma de Madrid (UAM). As part of her research activity, she joined the research project team "Genetic and genomic analysis in patients affected by Gorham-Stout Disease and General Lymphatic Anomalies" at the Hospital Universitario La Paz (Supervisor: Dr. Pablo Lapunzina). In June 2014, she started her Ph.D. program at IMDEA's Bioactive Ingredients Food Group (Supervisors: Prof. Francesco Visioli and Dr. Alberto Dávalos). Her thesis is focused on the protective function of specific micronutrients (soy isoflavones, hydroxytyrosol, and bioactive polar lipids) performing in vitro, in vivo and placebo-controlled, randomized trials in healthy volunteers to evaluate the possible beneficial effect that these molecules play on cardiovascular and neurodegenerative diseases. In March of 2018, she obtained a doctoral degree, marked outstanding, Cum Laude. The title of the doctoral thesis is: "Protective function of specific micronutrients against cardiovascular and neurodegenerative diseases".

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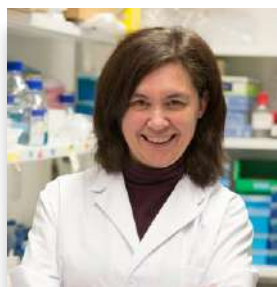
Mónica Gómez

Biosafety and Occupational Risk Prevention Manager. Senior Lab Technician

Monica Gómez Patiño is Expert in Biosafety in laboratories and is a Senior Lab Technician. Specialist in Chemical and Microbiological Analysis. In addition, she holds a certificate of higher education in Instrumental Analysis Techniques. She has professional experience in the field of pharmaceuticals working in private companies gaining experience in the field of biochemistry by applying a wide range of techniques to identify, quantify and detect specific proteins. Moreover, she worked in Public Research Organizations such as INIA, CIB-CSIC acquiring wide experience in Chromatographic techniques and in Genomic and Molecular biology area. Now, in IMDEA Food Institute, she is the Head of the Biosecurity and Biohazardous, Chemical and Cytotoxic waste Management and supports the management of the laboratories. She is also responsible of the Biosafety Laboratory Level P2, processes and manages the international Import and Export of biological samples and is in charge of managing the official accreditations and permits for the laboratories and she is the Responsible of the Occupational Risks Prevention.

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researchers



Dr. Marta Barradas Solas
Postdoctoral Researcher

Marta Barradas joined Manuel Serrano's lab at Centro Nacional de Biotecnología (Madrid) in 1997, where she obtained her PhD in the characterization of Ras-induced senescence in primary cells. In 2003 she moved to UK, where she was working as a postdoctoral researcher in several laboratories. First, in Fiona Watt's lab at London Research and Cambridge Research Institutes, studying the role of catenin signalling in skin cancer. Then in 2008, she moved to Jesús Gil's lab at the MRC-CSC (London), where she studied the interplay between epigenetics and cancer. In 2011 she moved back to Spain to work in the Cell Signalling Therapies lab of Eli Lilly at Centro Nacional de Investigaciones Oncológicas, CNIO (Madrid), where she focused on the validation of new metabolic targets for cancer therapy. After a brief stay in the Brain Metastasis Group at CNIO, in December 2015 she joined the Metabolic Syndrome Group at IMDEA Food Institute.

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Amanda Cuevas Sierra
Postdoctoral researcher

She was graduated in Biology and master's degree in Food, Nutrition and Metabolism. From 2017 to 2021 she carried out her PhD project focusing on gut microbiota and obesity and defending on December 2021 (Extraordinary Award Thesis). Her investigations dealt with gut microbiota differences between subject with obesity and normal weight, host interactions between gut microbiota and genetic background, the effects of dietary components on gut microbiota compositions, the study of changes in gut microbiome composition and functions after a weight loss intervention and searching metagenomic biomarkers to personalize the prescription of weight loss diets according to gut microbiota composition. Her investigations has obtained more than 400 cites.

Moreover, she did a predoctoral stay in Weizmann Institute of Science (Israel) where she participated in projects on modulation of gut microbiota. She was working as postdoctoral researcher in Navarrabiomed-Miguel Servet Foundation trying to apply metagenomic approaches for uncultured microorganisms involved in undiagnosed infections. She joined IMDEA Food Institute in April 2022 as postdoctoral researcher in Precision Nutrition and Cardiometabolic Health group lead by Prof. Alfredo J. Martínez. Currently, she holds a postdoctoral Sara Borrell grant.

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Dr. Cristina María Fernández

Postdoctoral researcher

Cristina M^a Fernández Díaz obtained her PhD in Biomedical Research from the University of Valladolid and the Institute of Biology and Molecular Genetics (IBGM) in 2019. She also holds a degree in Human Nutrition and Dietetics and two master's degrees in Biomedical Research and Nutrition. Her thesis focused on the targeting of proteolytic enzymes in the course of diabetes mellitus and other metabolic diseases. In 2018 she was awarded with an European Molecular Biology Organization (EMBO) Short-Term Fellowship to learn new metabolic analysis techniques at the Oxford Center for Diabetes, Endocrinology and Metabolism, University of Oxford (Oxford, UK) under the supervision of Dr. Patrik Rorsman. She has published several peer-review manuscripts in high impact international journals in the area of metabolism and nutrition. In June 2020 she joined the Molecular Oncology and Nutritional Genomics of Cancer Group (Precision Nutrition and Cancer) at IMDEA Food Institute, where she focuses her research on the study of metabolic alterations in chronic diseases such as obesity and cancer. Additionally, she explores gene-nutrient interactions applied to the prevention of pathologies and health promotion.

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Dr. Lara Fernández Álvarez

Postdoctoral researcher

Lara P. Fernández Álvarez, obtained her PhD in Biochemistry, Molecular Biology and Biomedicine from the Autonomous University of Madrid (UAM) and the Spanish National Cancer Research Centre (CNIO), Spain, in 2009. Her thesis focused on the characterization of genetic susceptibility to malignant melanoma. Since 2010, she had conducted postdoctoral research at the Molecular and Cell Biology of the Thyroid group in the Biomedical Research Institute (IIBm-CSIC-UAM), in Madrid. In December 2014 she joined IMDEA Molecular Oncology Cancer Group where her research is focused on the study of molecular biomarkers of cancer risk, prognostic factors and resistance to treatment. She has a solid and multidisciplinary professional experience in Cancer biology, Cancer Susceptibility, Oncology, Melanoma, Human Genetics and Molecular Endocrinology. Additionally, she has published more than twenty research articles in international journals, thirteen of them as first author.

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Edwin Fernández Cruz

Postdoctoral researcher. Precision Nutrition and Cardiometabolic Health Programme

Edwin Fernández received his doctorate in 2018 from the University of Seville, specializing in the analysis of bioactive compounds. Between 2019 and 2022, he carried out research work related to the design of clinical trials of nutritional intervention at the Food, Nutrition and Health Platform of the La Paz University Hospital in Madrid. In addition, he has carried out numerous teaching collaborations with the International University of La Rioja (UNIR), being director and academic coordinator of an Official Master's Degree and with the CUNIMAD higher education center. Between 2022 and 2023 he acquired a position as Associate Professor in the Department of Biomedical Sciences of the Alcala de Henares University. Currently, he works in the Precision Nutrition and Cardiometabolic Health group, led by Dr. Alfredo J. Martínez, on projects related to the characterization of biomarkers of dietary intake.

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Dr. María Elena García-Rendueles

Head Of The Research Line Thyroid Cancer

Dr. Maria ER Garcia-Rendueles' career has been devoted to investigating 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. She has been focused on identifying potential targets and new approaches based on this dependency on new therapies. She obtained her Ph.D. with honors in 2011 by Universidad de Santiago de Compostela, Spain. In 2012, she received a Postdoctoral Fellowship from the Ministry of Education of Spain and joined Memorial Sloan Kettering Cancer Center (MSKCC) in New York, where she was promoted to Research Associate in 2016. She has published in highest impact journals, including Cancer Discovery, JCI, Oncogene, or Clinical Cancer Research. She joined IMDEA in June 2020 as an independent investigator where she continues investigating the pathogenesis and the biology of thyroid cancers to identify new molecular-based therapies, under the funding of a Talento's Fellowship.

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Dr. César Gómez Raposo
Postdoctoral Researcher

César Gómez Raposo obtained his Medicine Degree at Universidad Autónoma de Madrid in 2002 and later his Medical Oncology speciality at Hospital Universitario La Paz in 2007. He performed his doctoral thesis (Excellent Cum Laude) in 2012 focused on ovarian cancer. Since 2008 he worked as medical oncologist at Hospital Universitario Infanta Sofía in San Sebastián de los Reyes, mainly in breast and gynecological cancer. As a result of this activity has participated in more than 25 papers published in peer reviewed medical or scientific journals and has taken part in international clinical trials in breast and gynecological cancer. Currently, her line of research focuses on breast cancer and gynecological cancer and leads several clinical trials that relate diet with prognostic and predictive factors of response to cancer treatment.



Dr. Pilar Guallar
Head of The Research Line
Influence of Diet on the
Development of Cardiometabolic
Diseases

Dr. Pilar Guallar-Castillon MD, MPH, PhD is an associate professor in the Department of Preventive Medicine and Public Health in the Universidad Autónoma de Madrid. An specialist in Preventive Medicine and Public Health via MIR (La Paz Hospital). Has spent more than 20 years teaching Public Health by participating in graduate and postgraduate programs. She is also responsible for courses on nutritional epidemiology. Her research activity has focused on the study of healthy behaviours and habits (HBH) especially in the field of cardiovascular and nutritional epidemiology. The author of more than 180 publications that are mainly in the first quartile of impact factor in their categories. Currently interested in the influence of cooking methods and chronobiology in the process of suffering from cardiometabolic diseases. Research collaborator in IMDEA Food Institute. Dr. Guallar's web page: <https://mpilar-guallar.wixsite.com/mpilarguallar>
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Dr. Ana María Jiménez Gordo
Postdoctoral Researcher

Graduated in Surgery and Medicine at Universidad Autónoma Madrid (1994). Specialty in Medical Oncology at Hospital Universitario La Paz (1998). PhD in Medicine at Universidad Autónoma Madrid (2004). Master in Palliative Care of Neoplastic Patient at Hospital La Paz (1998). Master's in molecular Oncology at CNIO (2009). Associate Profesor in Oncology at Universidad Europea Madrid from 2013. She has worked as Medical Oncologist in Hospital La Paz (1990-2000), Hospital Alcorcón (2000-2005), Hospital Getafe (2005-2013) and Hospital Infanta Sofía from 2013. Pfeizer Foundation Prize of Clinical Investigation in 2012. She has more than 80 national and international publications, congress communications and book chapters. She is member of Spanish Society of Clinical Oncology and has collaborated in several work groups of lung cancer survivors, translational investigation, geriatric Oncology and doing some Clinical Guidelines. Currently his line of research focuses on colorectal cancer and collaborates in several clinical trials promoted by IMDEA Food.



Dr. Teresa Laguna Lobo
Postdoctoral researcher

Dr. Teresa Laguna obtained her BSc in Biochemistry in 2005 and her PhD in Immunology in 2013 at the Complutense University of Madrid. In 2015 she finished a MSc in Omics Data Analysis at the University of Vic, when she carried out a project in finding relevant signatures in the different Neuroblastoma stages in the group of Dr. Manel Esteller at IDIBELL (Hospitalet de Llobregat). After finishing her MSc, she worked there in different projects in epigenomics analysis in cancer as a postdoctoral researcher. In 2016, she started as a postdoctoral bioinformatician at the Institute of Molecular Biology in Mainz (Germany) where she participated in proteomics pipeline development and data analysis, and led the bioinformatic efforts in gene annotation improvement in vertebrate species by integration of proteomics and RNA-seq data. In 2019, she moved to IMDEA where she is focused in applying human epi-genome inter-variability for effective personalized nutrition strategies.

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Dr. Juan Luis López-Canovas
Postdoctoral researcher

Juan Luis López Cánovas is graduated in Biology from the University of Córdoba (UCO) (2013-2017). Since 2014, he has been involved in research work with the OncObesity & Metabolism group (PI: Prof. Luque), which is part of the Department of Cellular Biology, Physiology, and Immunology at UCO and the Maimónides Institute for Biomedical Research of Córdoba (IMBIC) as a student collaborator/research assistant. In this group, he completed his Bachelor's thesis, receiving the second prize for the Best Bachelor's Thesis from the Official College of Biologists of Andalusia and earning honors. He also completed his Master's thesis in Translational Biomedical Research. Juan Luis holds a Ph.D. in Biomedicine from UCO (2018-2021) with international distinction and an outstanding Cum Laude qualification. During his doctoral studies, he spent three months at the "Villanueva Lab" led by Prof. Dr. Augusto Villanueva at the Icahn School of Medicine at Mount Sinai in New York City, USA, supported by a scholarship from the Junta de Andalucía. From October 2021 to December 2023, he has been a Postdoctoral Researcher at IMDEA Alimentación in the Cellular and Molecular Gerontology Laboratory (PI: Dr. Diaz-Ruiz).

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Dr. María-Carmen López de las Hazas
Postdoctoral researcher

Dr. M. Carmen López de las Hazas studied Human Nutrition and Dietetics, and Food Science and Technology in Autonomous University of Madrid. She obtained her Master Degree in Agricultural Chemistry and Novel Foods in Autonomous University of Madrid. Her PhD (international mention) has been obtained in the University of Lleida. Her research career starts in CIAL institute (2010-2013), focus on the extraction, characterization and evaluation of the biological properties of bioactive compounds of different food matrices. In 2013, she joined the group of Dr. María José Motilva at the University of Lleida where she gained expertise in the in vivo metabolism of olive oil phenolic compounds and their tissue disposition. Also, she studied the cardioprotective bioactivity of hydroxytyrosol and their metabolites using in vitro and in vivo models. Furthermore, she studied the colonic metabolism of different phenolic compounds structures and evaluate their anticarcinogenic activity in colonic cells. Nowadays, she is working in IMDEA Food Institute (Epigenetics of Lipid Metabolism Group) evaluating the microRNAs and long non-coding RNAs involved in postprandial lipemia and their relationship in the lipid metabolism. Her scientific activity is being reflected in a total of 14 research publications, being 6 of them as first author. Furthermore, her research work has been published in 3 international congress and has been worked in 3 research projects.

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Dr. Esther López-García
Head Of The Research Line
Nutrition And Omic Determinants
Of Frailty, Multimorbidity And
Unhealthy Aging

Esther Lopez-Garcia, PhD, MPH, MPharm is an Associate Professor of Epidemiology at the Department of Preventive Medicine and Public Health, in the Universidad Autónoma de Madrid. She has been a Fulbright fellow in the Department of Nutrition at the Harvard T. Chan School of Public Health and a Ramón y Cajal researcher at the Universidad Autónoma de Madrid.

Dr Lopez-Garcia research interests include:

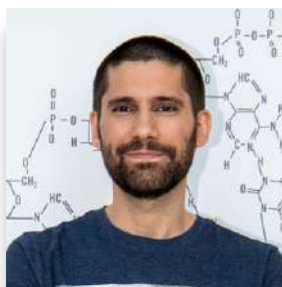
- Epidemiology and prevention of obesity and cardiovascular disease through diet and lifestyle.
 - Diet and the risk of physical function impairment, frailty and disability in the older population.
 - Metabolomics in frailty and disability.
- Dr Lopez-Garcia has assessed in detail the effect of the Mediterranean dietary patterns, coffee, meat and dairy consumption, in 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, markers of glucose metabolism and leptin, and more recently metabolomics profiles of physical impairment and functional disability.



Dr. Laura J. Marcos Zambrano
Postdoctoral researcher

Dr. Laura Judith Marcos Zambrano is a bioanalyst specialized in clinical microbiology, bioinformatics, and metagenomics. She obtained her BSc in Bioanalysis at the Central University of Venezuela (UCV). She has a master degree in Cellular Signaling, she received her Ph.D. at the Universidad Complutense de Madrid in 2017, her doctoral investigations were carried out in Hospital Gregorio Marañón (FIB-HGM), and her work was focused on the characterization of yeasts causing fungemia: identification of species and antifungal susceptibility, molecular epidemiology, virulence factors, and molecular characterization of strains (genotyping). She has also worked in the invertebrate model of *Galleria mellonella* in a pre-doctoral stay at the Università degli Studi di Milano (Milan, Italy). She has been in an internship on the Bioinformatics Unit of the Hospital Ramón y Cajal (2019) and participated in the EMBO Practical Course of Microbial Metagenomics, held in the EMBL Heidelberg, Germany (2019). She joined the Computational Biology group at IMDEA Food in 2018 and currently has a Juan de la Cierva Incorporación Research Grant. Her research is focused on leading the area of microbiome modulation by bioactive compounds with 'in silico' developments for the prevention and treatment of complex diseases.

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Adrián Martín Segura
Postdoctoral Researcher at
Computational Biology Group

Adrian Martin obtained his Biochemistry Degree at Universidad Autónoma de Madrid (UAM) in 2011. The same year, he was awarded with La Caixa's fellowship to pursue Master's degree studies. He performed the Master in Biomedical Research at Universidad Pompeu Fabra in Barcelona between 2011 and 2012. He returned to Madrid in 2013, where he was awarded with a PhD fellowship FPU from the Education Ministry. He conducted his PhD studies between 2013 and 2017 in the Centro de Biología Molecular (CBM) at UAM, under Dr. Carlos Dottí's direction, working in insulin signaling in the hippocampus and its role in neuronal aging. In 2017 he obtained his PhD degree in Biochemistry at UAM and in 2018 he started a postdoctoral period at Dr. Ana Maria Cuervo's laboratory in New York, working in the relationship between chaperone mediated autophagy (CMA) and the Parkinson's neurodegenerative disease. In 2023 he was awarded with a Marie Curie Postdoctoral Fellowship from the European Commission to conduct studies related to aging and microbiome at IMDEA food institute.

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Dr. David Martínez
Head Of The Research Line
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.



Dr. Javier Moral Sanz
Associate Researcher.
Translational Venomics

Dr. Moral-Sanz received his bachelor's in pharmacy from the University Complutense of Madrid in 2007. In 2012, he completed his Ph.D. studies with Honours in the laboratory of Prof. Perez-Vizcaino at the University Complutense of Madrid, where he focused on studying the relationship between metabolic diseases and pulmonary hypertension. Dr. Moral-Sanz completed his scientific training as a visiting researcher at The Medical University of Graz (Austria, Prof. A. Olschewski) and The University of Manchester (United Kingdom, Prof. A.M. Gurney) in projects funded by the CIBERES and Ministry of Science and Innovation. The further pursuit of the link between metabolic alterations and pulmonary vascular disease took Dr. Moral-Sanz to his postdoctoral studies at The University of Edinburgh in 2013, where he joined Prof. A. M. Evans' group to lead a project funded by the British Heart Foundation into the study of an essential regulator of energy balance and metabolism, the AMP-activated protein kinase (AMPK), in the pulmonary vascular physiology and pathophysiology. During his postdoctoral period, he developed an increasing interest in cellular senescence that took him to the IMDEA Food Institute in 2019, where he joined the Translational Venomics Research Line led by Dr. M. Ikonomopoulou to better understand cellular senescence in health and disease and to explore a new generation of venom-derived senolytics.

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Dr. Juan Moreno Rubio
Postdoctoral Researcher

Senior researcher in the Clinical Oncology Group ("Precision Nutrition and Cancer" Program) of IMDEA food. Coordinator of the Laboratory of Precision Oncology (POL) of the Infanta Sofia University Hospital (HUIS). Degree in Molecular Biology and Biochemistry from the Autonomous University of Madrid in 2004, and Doctorate in Biochemistry, Molecular Biology and Biomedicine (Excellent Cum Laude) by the Autonomous University of Madrid in 2010 with award for the best doctoral thesis (IISFJD). Formerly coordinator of the Laboratory of Translational Oncology at the La Paz University Hospital (HULP, IdiPaz, group 32). Author or co-author in more than 27 articles in international journals, registered 3 patents and researcher in multiple studies and competitive clinical and translational projects. Currently focused on efficiently and quickly transform the knowledge obtained from basic research in clinical applications that result in health benefits.

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Victor de la O Pascual

Postdoctoral researcher.
Precision Nutrition and
Cardiometabolic Health

Victor de la O Pascual is a postdoctoral researcher who obtained his Dietetics and Nutrition Degree from the University of Navarra in Pamplona in 2017. During the last five years, he has actively contributed to the field of preventive medicine and public health as part of the School of Medicine at the University of Navarra in Pamplona, working under the guidance of Prof. Miguel Ángel Martínez-González. His research during this period has been dedicated to the investigation of the impact of dietary patterns rich in protein and protein/amino acid sources on cardiometabolic health. In 2022, Victor successfully completed advanced studies and earned a doctoral degree in Applied Biomedicine, specializing in Preventive Medicine, Public Health and Biostatistics in the University of Navarra. His doctoral research was conducted under the supervision of Prof. Miguel Ruiz-Canela, chair of the department. Currently, Victor's primary research focus revolves around the cutting-edge fields of biostatistics, Big Data analytics, and the development of machine learning models within the realm of precision nutrition and medicine. He is a key member of the Precision Nutrition and Cardiometabolic Health program at IMDEA Food, where he works closely with Professor Alfredo J. Martinez.

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Dr. Cristina Pantoja Castro

Postdoctoral Researcher

Cristina Pantoja obtained her PhD in 2002 in the laboratory of Dr. Manuel Serrano at the Spanish National Center of Biotechnology (Madrid), where she was working on the molecular mechanisms implicated in the cellular senescence in mouse embryo fibroblasts. In 2003, she joined the group of Dr. Daniel Peeper at the Netherlands Cancer Institute (Amsterdam) as a postdoctoral fellow, working on the identification of novel genes involved in breast cancer by using functional screens with a retroviral RNA interference (RNAi) library. At the end of 2004, she came back to Manuel Serrano's lab at Spanish National Cancer Research Center (CNIO) where she has been involved in several projects aimed to understand the relationship between cellular senescence, tumor suppression, damage and reprogramming. In May 2017, she moved to IRB Barcelona as a Research Associate, where the group of Dr. Manuel Serrano was relocated. In May 2018, she joined the Metabolic Syndrome group at IMDEA Food Institute.

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Dra. Virginia Pardo Marqués

Postdoctoral researcher

PhD in Biology. Virginia Pardo Marqués studied Biology at the Alcalá de Henares University and a Master in Cell Signaling and Therapeutic Targets in the same university (2009). Then, she obtained her PhD in 2014 in the laboratory of Dra. Ángela M. Martínez Valverde at the Institute of Biomedical Research "Alberto Sols" (IIBM-CSIC) in Madrid, where she was working on the molecular mechanisms of insulin resistance associated to inflammation in obesity and non-alcoholic liver disease states. In 2016, she joined the group of Dra. Rocio García Carbonero at the Hospital 12 de Octubre (Madrid), working on development of new drugs or therapeutic strategies in the field of gastrointestinal tumours, particularly pancreatic and colorectal cancer, and the development of biomarkers of diagnostic. In 2017, she moved to Laboratory of Clinical Translational Oncology at the Hospital 12 de Octubre, where she focused on several projects aimed to study of new biomarkers for the diagnosis of lung and breast cancer. In January 2019 she joined the Posttranscriptional Regulation of Metabolic Diseases Group at IMDEA Food Institute where her research is focus on the role of novel posttranscriptional regulators of insulin signaling and metabolism.

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Dr. Silvia Pérez Cruz

Postdoctoral researcher.
Precision Nutrition and Cancer
Programme Coordinator

Silvia Cruz Gil obtained her Biochemistry Degree at Universidad Complutense de Madrid in 2013. During the last two years of her degree she collaborated with the Biochemistry II Department at Pharmacy School in Universidad Complutense de Madrid studying the molecular biology of hepatocellular carcinoma. Later, she continued her training by obtaining a Master in Molecular Biosciences at Universidad Autónoma de Madrid in 2014. Meanwhile, Silvia joined ALGENEX (Alternative Gene Expression S.L.) in association with I.N.I.A. (National Institute of Agricultural and Food Research and Technology) for an internship. During this period she worked in the development of vectored vaccines. In October 2014, she started studies conductive to her PhD Degree at IMDEA Food Institute in the Molecular Oncology Group. Her research primarily focuses on the role of the lipid metabolism in tumor progression. In April 2016 she obtained a Boehringer Ingelheim Travel Grant to perform a short research stage in the University Hospital Carl Gustav Carus (Dresden, Germany) to learn organoids technique under the supervision of Dr. Daniel Stange. Her thesis oral defense was entitled "Lipid metabolism alterations in colorectal cancer: potential clinical relevance in the prognosis of the disease".

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**Dr. Adrián Plaza
de la Fuente**

Postdoctoral Researcher

Adrian Plaza's research has been devoted to the evaluation of the effect of CCK-8 on adipose tissue metabolism, providing new strategies against obesity and type II diabetes. In his first postdoctoral phase, he evaluated the effect of different types of high fat diets (high content of unsaturated or saturated fatty acids) on cardiac and adipose tissue metabolism. The work performed during these years resulted in several articles in high/medium impact journals, and awakened in him the interest on the role played by adipose tissue in the physiopatho-cardiometabolic processes in obesity. He joined the Metabolic Syndrome Group at IMDEA Food in 2018, where he is studying the role of Sirt1 in lung tumor development, and the protective effects of fasting from chemotherapy toxicity.

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Dr. María Sereno Moyano
Postdoctoral Researcher

María Sereno finished her undergraduate studies in Medicine and Surgery (1999) in Universidad Autónoma de Madrid (UAM). She did her medical residency in La Paz University Hospital (2000-2003) and a Master's Degree in Palliative Care (1997) in Universidad Autónoma de Madrid (UAM). She obtained the Degree of Doctor of Medicine (2005). She did a postdoctoral internship in Thoracic Program with Prof. S. Antonia in Moffitt Comprehensive Cancer Center in South Florida University (Tampa, Florida). She did a Master's Degree in Molecular Oncology in the Oncology Research National Cancer Institute (2007-2009) in Madrid and another Master's Degree in Immunooncology in Medical Department in Alcalá University (2017). She was the attending physician of Medical Oncology in Gastrointestinal and Thoracic Cancer unit from 2004-2008 and then, she moved to Infanta Sofia University Hospital (San Sebastian de Los Reyes, Madrid), where she is working in Thoracic and Genito-urinary Tumors section. She is associate professor in European University of Madrid (UEM). She had published several papers and has participated in different traslational oncology projects, some of them with public support, as FIS and Plan Nacional. Currently his line of research focuses on lung cancer.



**Dr. Mercedes
Sotos Prieto**
Head of the Research Line

Mercedes Sotos-Prieto, PhD is a nutritional epidemiologist. She completed her European PhD (2012) about the role of Mediterranean diet, genetic risk, and metabolic traits at the University of Valencia with research visits Harvard Chan School of Public Health, University College in London, and Cambridge University. She was a postdoctoral fellow in the Department of Nutrition in Harvard Chan School of Public Health (2013/2016) and got a position as an Assistant Professor at Ohio University. She is currently a Ramon y Cajal Scientist at the University Autonoma of Madrid and an adjunct Professor at Harvard Chan School of Public Health. Her current research focuses on dietary patterns, lifestyle, cardiovascular diseases and healthy aging, with special interest in translational nutritional epidemiology. Additionally, during the last years she got funding to evaluate the effect of a Mediterranean diet intervention on metabolites. She had a strong record of publications in high impact journals as first author such as *Circulation* or the *New England Journal of Medicine*, and several honors and awards (first national BSc Award for achieving excellent, best doctoral dissertation award, Outstanding Postdoctoral Researcher Award of the year (HSPH), Jeremiah and Rose Stamler Research Award for New Investigators (American Heart Association), etc.



**Dr. João Tiago Estevao
Tomé Carneiro**
Postdoctoral researcher

The research carried out by Dr. Joao Tiago Estevao Tomé Carneiro has been focusing on the biological activity of food constituents in chronic pathologies. He has a degree in biochemistry and he obtained his PhD at the University of Murcia working at CEBAS-CSIC (2013). He is the co-author of 30 peer-reviewed papers in relevant international journals. In 2014, he joined the Bioactive Ingredients Food Group at IMDEA Food, where he contributes to the assessment of the potential health effects of bioactive food components in vitro, in vivo and through placebo-controlled randomized clinical trials. He is currently participating in a research project focused on evaluating if the consumption of bioactive phospholipids, as part of a nutritional supplement, contributes to the improvement or delaying of mild cognitive impairment and its correlation with different biological, clinical or neuropsychological biomarkers.

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Ph.D researchers & students



Livia Balaguer Bañeras

Assistant researcher
PhD student | Epigenetics
of Lipid Metabolism

Livia Balaguer Bañeras obtained her Biotechnology degree at the Universitat Rovira i Virgili (Tarragona) in 2021. During the last year of her degree, she collaborated in the ProFuture project developed at IRTA Fruitcentre (Lleida) studying the incorporation of microalgae in new food matrices. Later, she continued her training by obtaining a master's degree in *Novel Foods* at the Universidad Autónoma de Madrid in 2022. Meanwhile, Livia joined IMDEA Alimentación in the group led by Alberto Dávalos. During this period, she investigated about plant Extracellular Vesicles (EVs) as a therapeutic vehicle of miRNAs. In 2023, she began PhD studies at the IMDEA Food Institute in the Epigenetics Group of Lipid Metabolism. His research focuses on evaluating the use of by-products of the food industry (dairy and agricultural) as possible sources of extracellular vesicles as a therapeutic vehicle of bioactive molecules for large-scale biomedical applications, promoting the use of industry co-products and the transition to a circular economy. Furthermore, she is evaluating the microRNAs and long non-coding RNAs involved in postprandial lipemia and their relationship in the lipid metabolism.

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Guadalupe Ximena Bazán

Predoctoral researcher

Guadalupe Ximena Bazán, a graduate of the Catholic University of Cuyo in Argentina, obtained her Bachelor's Degree in Human Nutrition in 2014. She worked as a nutritionist specializing in child malnutrition until 2018, when she decided to continue her studies in Spain through a Master's Degree in Human Nutrition and Applied Dietetics from the Complutense University of Madrid. In the same institution, she collaborated for three years as a clinical nutritionist in the Department of Physical Activity and Sport of the Faculty of Medicine.

In January 2023, she joined the IMDEA Molecular Oncology Group as an Industrial PhD student. Her research focuses on the analysis of bioactives, especially rosemary extract, and the validation of a nutraceutical product derived from it, as a potential protector of metabolic health in breast cancer. The main objective is to achieve a product that improves the symptoms secondary to chemotherapy and hormonal treatments, and thus provide a better quality of life for women affected by this disease.

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Sofia Gutiérrez Rodríguez
Predoctoral Researcher Industrial
Doctorate Project

Sofia Gutiérrez Rodríguez, graduada en Biología por la Universidad Autónoma de Madrid en 2020. Su estancia de grado fue en el grupo especializado en la función del genoma de mamíferos bajo la tutela de la Dra. María Gómez en el CBMSO, donde realizó la validación de la herramienta, MapR, para la detección in vivo de estructuras R-loops asociados a inestabilidad genómica. Posteriormente obtuvo el título de Máster en Biomoléculas y Dinámica Celular por la Universidad Autónoma de Madrid en 2021. Realizó sus prácticas en el grupo de plasticidad celular y cáncer con el Dr. César Cobaleda en el CBMSO, donde estudió el papel in vivo del estado mitocondrial durante la reacción del centro germinal en ausencia de Whc1. En diciembre de 2022 se incorporó al grupo de Oncología Molecular de IMDEA Alimentación como estudiante predoctoral gracias a una beca de doctorado industrial con la empresa PRECISIONFORHEALTH SL. Su investigación se basa en el desarrollo de un test nutrigenético, como biomarcador de la salud metabólica y estrategias de nutrición de precisión para el paciente oncológico.

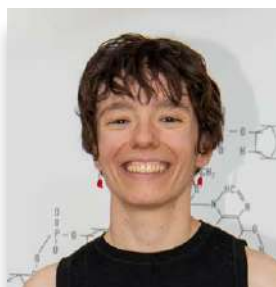
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Andrea Higuera Gómez
Predoctoral researcher

Graduated in Human Nutrition and Dietetics at Universidad Complutense of Madrid. Master in Nutrigenomics and Personalized Nutrition at the Universidad de las Islas Baleares. She obtained University Expert in Sports Nutrition from the Universidad Isabel I and the International Institute of Physical Exercise and Health Sciences. She is a doctoral student in the Food Sciences Program of the Universidad Autónoma de Madrid with a research contract at IMDEA Food in the Precision Nutrition and Cardiometabolic Health group. She has experience in nutrition and dietetics consultation since 2015. She has collaborated in different work projects related to nutrigenomics and personalized nutrition focused on improving the patient's nutrition and health. She has also received a 2-year scholarship from the Agencia Española de Protección de la Salud en el Deporte (AEPSAD) at the Centro de Alto Rendimiento de Madrid (CAR Madrid) in the Department of Endocrinology and Nutrition. At the same time, she has tutored the practices of the Human Nutrition and Dietetics degrees to students from the Complutense University of Madrid and the University of Navarra. Currently, she combines her work in the nutrition practice with the METAINFLAMACIÓN project at Hospital Universitario Puerta de Hierro and her doctoral thesis in the NUTRIMDEA personalized and precision nutrition project.

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Blanca Lacruz Pleguezuelos
Predoctoral researcher

Blanca Lacruz Pleguezuelos obtained her Biochemistry Degree at Universidad Autónoma de Madrid (UAM) in 2020. During her degree, she had the opportunity to spend a semester at Boston University (BU) thanks to a scholarship funded by UAM and BU in 2018, and in 2019 she joined María Yáñez's group at CBMSO for her Bachelor Thesis. In 2020 she started the Master Degree in Bioinformatics and Computational Biology at UAM, and in 2021 she joined the Computational Biology Group in IMDEA Food Institute for her Master Thesis on the influence of the gut microbiome on metabolically healthy obesity. As a predoctoral researcher, her research focuses on the application of computational techniques to understand the interactions between the gut microbiota and the host, under the supervision of Enrique Carrillo de Santa Pau and Laura Judith Marcos Zambrano. During her PhD, she has spent three months in the Cancer Research Center in Toulouse under the supervision of Vera Pancaldi thanks to a STSM Grant from the COST Action CA18131 ML4Microbiome.

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Carmen Mazaríos Gárgoles
Predoctoral Researcher |
Molecular Oncology Group

I graduated in the Degree in Biomedicine at the Francisco de Vitoria University of Madrid in 2021 and obtained a Degree in Innovation and Entrepreneurship Project Management at the Francisco de Vitoria University of Madrid in 2020. I did my final thesis at IMDEA Food Institute in the Molecular Oncology Group, which focused on identifying the mechanism of the YAP oncogene in the regulation of resistance to the chemotherapeutic vemurafenib in colorectal cancer and melanoma. I continued my training by obtaining a Master in Clinical and Applied Research in Oncology in 2022. In November 2021, I joined the Molecular Oncology Group at IMDEA as a Research Assistant to discover the role of YAP in thyroid cancer, in tumorigenesis and disease progression and its implication in drug response.

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Rocío Moreno

Predocctoral researcher

Rocío Moreno has a degree in Biology from the Universidad Autónoma de Madrid (2020). In 2021, she obtained a Master's degree in Molecular Biomedicine from the Universidad Autónoma de Madrid. During this year, she carried out her final master thesis in the UK on the interaction between SARS-COV2 and autophagy.

In 2022 she worked at the Centro de Biología Molecular Severo Ochoa (CBMSO) as a research assistant in a REACT-EU project (Supervisor: Professor José Manuel Cuezva). In this project she studied the role of mitochondria in the infection and pathogenicity of the HCoV-229E virus. She joined the Molecular Oncology group at IMDEA-Food in 2023. She is currently working on her thesis, which aims to use precision nutritional strategies to counteract immunosenescence in chronic diseases and ageing.

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Andrea del Saz Lara

Predocctoral researcher

Andrea del Saz Lara completed her degree in Biochemistry at the University of Castilla-La Mancha (UCLM) in 2017, at the Faculty of Environmental Sciences in Toledo. In 2020 she got the master's degree in Experimental Biomedicine at the Faculty of Medicine of Albacete of the UCLM. Since 2021 she is doing her doctoral thesis at the Instituto Madrileño De Estudios Avanzados (IMDEA Alimentación) in Madrid, where she studies the possible epigenetic effects of extra virgin olive oil or any of its components *in vitro*, in animal models and in healthy volunteers (enrolled in the Doctoral Program in Health and Physical Activity Research at the UCLM). She is currently studying for a Master's degree in Social and Health Research at the Faculty of Nursing in Cuenca. In addition, she is an associate professor in the subject of Fundamentals of Cell and Tissue Biology of the new degree in Biomedical Engineering at the Polytechnic School of Cuenca during the academic year 2023-2024.

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Andrés Sánchez Ruiz

Research Assistant

Andrés Sánchez-Ruiz graduated in biotechnology in Tarragona at Rovira I Virgili University. He has also a M.Sc. in Translational Medicine (Barcelona University) plus a M.Sc. in Bioinformatics and Biostatistics (Universitat Oberta de Catalunya). He started his career at IMDEA Food Institute in April 2021 where he is working as a research assistant.

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Sofía Gutierrez. University of
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Sokratis Gkpalis. Universidad
"South China"

Xingyi Cui Ye. Universidade
Federal do Rio de Janeiro

Yao Zhenyu. Universidade
Federal do Rio de Janeiro

Yolanda Jiménez Pérez.
Universidad Francisco de Vitoria

innovation & society



Dr. María Jesús Latasa
Head of Education

Ph.D. in Pharmacy, specialty on 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.



Sara Castillo
Head of Citizen Science

Bachelor's 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.



Lourdes Castán Toro
Project Manager Innovation,
Education and Entrepreneurship

Bachelor's degree in Information Sciences (Journalism), with master's and postgraduate studies in Digital Business, Management and Planning, and Strategy and Creativity Digital, in addition to a wealth of specialised training. Her professional experience has been mainly in management positions in the public sector, while in the private as a consultant, teacher or in digital transformation. At IMDEA, his work is focused on innovation, communication and management of scientific dissemination, education and entrepreneurship projects, mostly related with the EIT Food Programme.





Alejandro Arranz Calvo
General Manager



**Inmaculada Galindo
Fernández**
Programme Coordinator



Antonio Verde
Legal and transfer coordinator



Leyre Soler Castelló
R&D Talent Project Management
Technician



Gema Alegre
Accounting Manager



management



r
publ

most relevant publications

BIOCHEMISTRY & MOLECULAR BIOLOGY



- Costa-Machado LF**, Garcia-Dominguez E, McIntyre RL, **Lopez-Aceituno JL**, Ballesteros-Gonzalez Á, Tapia-Gonzalez A, et al. Peripheral modulation of antidepressant targets MAO-B and GABAAR by harmol induces mitohormesis and delays aging in preclinical models. *Nat Commun.* 2023;14(1):2779. Epub 20230515. doi: 10.1038/s41467-023-38410-y. PubMed PMID: 37188705; PubMed Central PMCID: PMC10185515.
- Martín A, Epífano C, Vilaplana-Martí B, Hernández I, Macías RIR, Ángel Martínez-Ramírez A, Cerezo A, Cabezas-Sainz P, Garranzo-Asensio M, Amarilla-Quintana S, Gómez-Domínguez D, Caleiras E, Camps J, Gómez-López G, **Gómez de Cedrón M**, **Ramírez de Molina A**, Barderas R, Sánchez L, Velasco-Miguel S, Pérez de Castro I. Mitochondrial RNA methyltransferase TRMT61B is a new, potential biomarker and therapeutic target for highly aneuploid cancers. *Cell Death Differ.* 2023;30(1):37-53. Epub 20220722. doi: 10.1038/s41418-022-01044-6. PubMed PMID: 35869285; PubMed Central PMCID: PMC9883398.
- Lee SM, Muratalla J, Karimi S, **Díaz-Ruiz A**, Frutos MD, Guzman G, et al. Hepatocyte PPAR α contributes to the progression of non-alcoholic steatohepatitis in male and female obese mice. *Cell Mol Life Sci.* 2023;80(2):39. Epub 20230111. doi: 10.1007/s00018-022-04629-z. PubMed PMID: 36629912; PubMed Central PMCID: PMC10082675.
- Montenegro L, Seraphim C, Tinano F, Piovesan M, Canton APM, McElreavey K, Brabant S, Boris NP, Magnuson M, Carroll RS, Kaiser UB, **Argente J**, **Barrios V**, Brito VN, Brauner R, Latronico AC. Familial central precocious puberty due to DLK1 deficiency: novel genetic findings and relevance of serum DLK1 levels. *Eur J Endocrinol.* 2023;189(3):422-8. doi: 10.1093/ajend/129. PubMed PMID: 37703313; PubMed Central PMCID: PMC10519858.
- Roy R, **Lorca C**, **Mulet M**, Sánchez Milán JA, Baratas A, de la Casa M, et al. Altered ureido protein modification profiles in seminal plasma extracellular vesicles of non-normozoospermic men. *Front Endocrinol (Lausanne).* 2023;14:1113824. Epub 20230322. doi: 10.3389/fendo.2023.1113824. PubMed PMID: 37033249; PubMed Central PMCID: PMC10073716.
- Abou El Qassim L, Martínez B, Rodríguez A, **Dávalos A**, **López de Las Hazas MC**, Menéndez Miranda M, et al. Effects of Cow's Milk Processing on MicroRNA Levels. *Foods.* 2023;12(15). Epub 20230804. doi: 10.3390/foods12152950. PubMed PMID: 37569218; PubMed Central PMCID: PMC10419269.

- Argente J**, Tena-Sempere M. Clinical and molecular features of patients with leptin and leptin receptor deficiency: Lessons of twenty-five years of research. *J Clin Endocrinol Metab.* 2023. Epub 20230613. doi: 10.1210/clinem/dgad353. PubMed PMID: 37310322.
- Barrios V, Martín-Rivada Á, Guerra-Cantera S, Campillo-Calatayud A, Camarero RA, Graell M, **Chowen JA**, **Argente J**. Reduction in pappalysin-2 levels and lower IGF-I bioavailability in female adolescents with anorexia nervosa. *J Clin Endocrinol Metab.* 2023 Dec 8:dgad713.
- Frutos MF**, **Pardo-Marqués V**, **Torrecilla-Parra M**, Rada P, **Pérez-García A**, **Martín-Martín Y**, et al. "MiR-7 controls cholesterol biosynthesis through posttranscriptional regulation of DHCR24 expression". *Biochim Biophys Acta Gene Regul Mech.* 2023;1866(2):194938. Epub 20230421. doi: 10.1016/j.bbagr.2023.194938. PubMed PMID: 37086967.

CANCER RESEARCH



- Plaza A**, **Pastor-Fernández A**, **López-Aceituno JL**, **Barradas M**, **Pantoja C**, **Fernandez-Marcos PJ**. p21 is necessary for the beneficial effects of fasting during chemotherapy. *Cancer Commun (Lond).* 43. United States 2023 Jan;43(1):164-168. doi: 10.1002/cac2.12384. Epub 2022 Nov 4.
- Romo-González M, Ijurko C, Alonso MT, **Gómez de Cedrón M**, **Ramírez de Molina A**, Soriano ME, et al. NOX2 and NOX4 control mitochondrial function in chronic myeloid leukaemia. *Free Radic Biol Med.* 2023;198:92-108. Epub 20230209. doi: 10.1016/j.freeradbiomed.2023.02.005. PubMed PMID: 36764627.
- Merino Salvador M, Fernández LP, **Moreno-Rubio J**, **Colmenarejo G**, **Casado E**, **Ramírez de Molina A**, et al. Clinical features and lipid metabolism genes as potential biomarkers in advanced lung cancer. *BMC Cancer.* 2023;23(1):36. Epub 20230109. doi: 10.1186/s12885-023-10509-x. PubMed PMID: 36624406; PubMed Central PMCID: PMC9830782.

COVID-19 PANDEMICS



13. López-Martínez C, Martín-Vicente P, Gómez de Oña J, López-Alonso I, Gil-Peña H, Cuesta-Llavona E,.... **Dávalos A, Chapado LA**, Eliecer Coto E, Albaiceta GM, Amado-Rodríguez L. Transcriptomic clustering of critically ill COVID-19 patients. *Eur Respir J*. 2023;61(1). Epub 20230127. doi: 10.1183/13993003.00592-2022. PubMed PMID: 36104291; PubMed Central PMCID: PMC9478362.
14. **Pastor-Fernández A**, Bertos AR, **Sierra-Ramírez A, Del Moral-Salmoral J**, Merino J, de Ávila AI, et al. Treatment with the senolytics dasatinib/quercentin reduces SARS-CoV-2-related mortality in mice. *Aging Cell*. 2023;22(3):e13771. Epub 20230126. doi: 10.1111/ace1.13771. PubMed PMID: 36704839; PubMed Central PMCID: PMC10014049.
15. **Alonso-Bernáldez M, Cuevas-Sierra A, Micó V, Higuera-Gómez A**, Ramos-Lopez O, **Daimiel L**, et al. An Interplay between Oxidative Stress (Lactate Dehydrogenase) and Inflammation (Anisocytosis) Mediates COVID-19 Severity Defined by Routine Clinical Markers. *Antioxidants (Basel)*. 2023;12(2). Epub 20230120. doi: 10.3390/antiox12020234. PubMed PMID: 36829793; PubMed Central PMCID: PMC9951932.
16. Shyam S, García-Gavilán JF, Paz-Graniel I, Gaforio JJ, Martínez-González MÁ, Corella D, **Martínez JA**, Alonso-Gómez ÁM, Wärnberg J, Vioque J, Romaguera D, López-Miranda J, Estruch R, Tinahones FJ, Lapetra J, Serra-Majem JL, Bueno-Cavanillas A, Tur JA, Sánchez VM, Pintó X, Matia-Martín P, Vidal J, Vázquez C, **Daimiel L**, Ros E,.... Fernandez-Aranda F, Nishi SK, García-Regata O, Toledo E, Asensio EM, Uncina-Canovas A, Perez-Araluce R, Zomeño MD, Chaplin A, Delgado-Rodríguez M, Babio N, Fitó M, Salas-Salvadó J. Association of adiposity and its changes over time with COVID-19 risk in older adults with overweight/obesity and metabolic syndrome: a longitudinal evaluation in the PREDIMED-Plus cohort. *BMC Med*. 2023 Oct 13;21(1):390. doi: 10.1186/s12916-023-03079-z. PMID: 37833678; PMCID: PMC10576302.

PRECISION NUTRITION & DIETETICAL INTERVENTIONS



17. **López de Las Hazas MC, Del Saz-Lara A**, Cedó L, **Crespo MC, Tomé-Carneiro J, Chapado LA**, Macià A, **Visioli F**, Escola-Gil JC, **Dávalos A**. Hydroxytyrosol Induces Dyslipidemia in an ApoB100 Humanized Mouse Model. *Mol Nutr Food Res*. 2023 Nov 7:e2300508.
18. Konieczna J, Ruiz-Canela M, Galmes-Panades AM, Abete I, Babio N, Fiol M, Martín-Sánchez V, Estruch R, Vidal J, Buil-Cosiales P, García-Gavilán JF, Moñino M, Marcos-Delgado A, Casas R, Olbeyra R, Fitó M, Hu FB, Martínez-Gonzalez MÁ, **Martínez JA**, Romaguera D, Salas-Salvadó J. An Energy-Reduced Mediterranean Diet, Physical Activity, and Body Composition: An Interim Subgroup Analysis of the PREDIMED-Plus Randomized Clinical Trial. *JAMA Netw Open*. 2023 Oct 2;6(10):e2337994.
19. Rundblad A, Sandoval V, Holven KB, **Ordovás JM**, Ulven SM. Omega-3 fatty acids and individual variability in plasma triglyceride response: A mini-review. *Redox Biol*. 2023;63:102730. Epub 20230503. doi: 10.1016/j.redox.2023.102730. PubMed PMID: 37150150; PubMed Central PMCID: PMC10184047.
20. Carballo-Casla A, Stefler D, Ortola R, Chen Y, Knuppel A, Ruiz M, ... **Rodríguez-Artalejo F**, et al. The Southern European Atlantic diet and depression risk: a European multicohort study. *Mol Psychiatry*. 2023. Epub 20230623. doi: 10.1038/s41380-023-02125-9. PubMed PMID: 37353584.
21. **De la OV**, Zazpe I, de la Fuente-Arrillaga C, Santiago S, Goni L, Martínez-González M, et al. Association between a new dietary protein quality index and micronutrient intake adequacy: a cross-sectional study in a young adult Spanish Mediterranean cohort. *Eur J Nutr*. 2023;62(1):419-32. Epub 20220910. doi: 10.1007/s00394-022-02991-z. PubMed PMID: 36085527; PubMed Central PMCID: PMC9899725.
22. Nishi SK, Babio N, Paz-Graniel I, Serra-Majem L, Vioque J, Fitó M, ...**Daimiel L**, et al. Water intake, hydration status and 2-year changes in cognitive performance: a prospective cohort study. *BMC Med*. 2023;21(1):82. Epub 20230308. doi: 10.1186/s12916-023-02771-4. PubMed PMID: 36882739; PubMed Central PMCID: PMC993798.
23. López-Gil JF, García-Hermoso A, **Sotos-Prieto M**, Caverro-Redondo I, Martínez-Vizcaino V, Kales SN. Mediterranean Diet-Based Interventions to Improve Anthropometric and Obesity Indicators in Children and Adolescents: A Systematic Review with Meta-Analysis of Randomized Controlled Trials. *Adv Nutr*. 2023;14(4):858-69. Epub 20230429. doi: 10.1016/j.advnut.2023.04.011. PubMed PMID: 37127186; PubMed Central PMCID: PMC10334150.

24. Boonpor J, Parra-Soto S, Petermann-Rocha F, Lynskey N, **Cabanas-Sánchez V**, Sattar N, et al. Dose-response relationship between device-measured physical activity and incident type 2 diabetes: findings from the UK Biobank prospective cohort study. *BMC Med.* 2023;21(1):191. Epub 20230524. doi: 10.1186/s12916-023-02851-5. PubMed PMID: 37226202; PubMed Central PMCID: PMC10210409.
25. Maroto-Rodríguez J, Ortolá R, Carballo-Casla A, Iriarte-Campo V, Salinero-Fort M, **Rodríguez-Artalejo F**, et al. Association between a mediterranean lifestyle and Type 2 diabetes incidence: a prospective UK biobank study. *Cardiovasc Diabetol.* 2023;22(1):271. Epub 20231004. doi: 10.1186/s12933-023-01999-x. PubMed PMID: 37794451; PubMed Central PMCID: PMC10552305.
26. Khoury N, Martínez M, Paz-Graniell I, Martínez-González M, Corella D, Castañer O, **Martínez JA**, et al. Dietary intake of polychlorinated dibenzo-p-dioxins and furans, adiposity and obesity status. *Environ Res.* 2023;227:115697. Epub 20230325. doi: 10.1016/j.envres.2023.115697. PubMed PMID: 36972775.
27. Ribot-Rodríguez R, **Higuera-Gómez A**, **San-Cristobal R**, **Micó V**, **Martínez JA**. Comparison of Seven Healthy Lifestyle Scores Cardiometabolic Health: Age, Sex, and Lifestyle Interactions in the NutriMDEA Web-Based Study. *J Epidemiol Glob Health.* 2023. Epub 20230827. doi: 10.1007/s44197-023-00140-1. PubMed PMID: 37634195.
28. **Díaz-Ruiz A**, Price NL, Ferrucci L, **de Cabo R**. Obesity and lifespan, a complex tango. *Sci Transl Med.* 2023 Nov 22;15(723):eadh1175. doi: 10.1126/scitranslmed.adh1175. Epub 2023 Nov 22. PMID: 37992154.
29. Coltell O, Asensio EM, Sorlí JV, Ortega-Azorín C, Fernández-Carrión R, Pascual EC, Barragán R, González JI, Estruch R, Alzate JF, Pérez-Fidalgo A, Portolés O, **Ordovas JM**, Corella D. Associations between the New DNA-Methylation-Based Telomere Length Estimator, the Mediterranean Diet and Genetics in a Spanish Population at High Cardiovascular Risk. *Antioxidants (Basel).* 2023 Nov 15;12(11):2004. doi: 10.3390/antiox12112004. PMID: 38001857; PMCID: PMC10669035.
30. María Mérida D, Vitelli-Storelli F, Moreno-Franco B, Rodríguez-Ayala M, **López-García E**, Banegas JR, et al. Polyphenol intake and mortality: A nationwide cohort study in the adult population of Spain. *Clin Nutr.* 2023;42(7):1076-85. Epub 20230529. doi: 10.1016/j.clnu.2023.05.020. PubMed PMID: 37290979.
31. González-Blázquez R, Gil-Ortega M, Alcalá M, González-Moreno D, Viana M, **Chowen JA**, et al. Short-term dietary intervention improves endothelial dysfunction induced by high-fat feeding in mice through upregulation of the AMPK-CREB signaling pathway. *Acta Physiol (Oxf).* 2023:e14023. Epub 20230808. doi: 10.1111/apha.14023. PubMed PMID: 37553856.
32. Bermingham KM, Mazidi M, Franks PW, Maher T, Valdes AM, Linenberg I, .. **Ordovas JM**, et al. Characterisation of Fasting and Postprandial NMR Metabolites: Insights from the ZOE PREDICT 1 Study. *Nutrients.* 2023;15(11). Epub 20230605. doi: 10.3390/nu15112638. PubMed PMID: 37299601; PubMed Central PMCID: PMC10255657.
33. Domper J, Gayoso L, Goni L, **de la OV**, Etcheberria U, Ruiz-Canela M. Culinary medicine and healthy ageing: a comprehensive review. *Nutr Res Rev.* 2023;1-15. Epub 20230822. doi: 10.1017/s0954422423000148. PubMed PMID: 37605999.
34. Poli A, Agostoni C, **Visioli F**. Dietary Fatty Acids and Inflammation: Focus on the n-6 Series. *Int J Mol Sci.* 2023;24(5). Epub 20230226. doi: 10.3390/ijms24054567. PubMed PMID: 36901998; PubMed Central PMCID: PMC10003459.
35. María V. Calvo, Viviana Loria Kohen, Carmen Díaz-Mardomingo, Sara García-Herranz, Shishir Baliyan, **João Tomé-Carneiro**, **Gonzalo Colmenarejo**, **Francesco Visioli**, César Venero, Javier Fontecha. Milk fat globule membrane-enriched milk improves episodic memory: A randomized, parallel, double-blind, placebo-controlled trial in older adults. *Journal of Functional Foods*, Volume 111, 2023, 105849.
36. Ojeda-Rodríguez A, Alcalá-Díaz JF, Rangel-Zuñiga OA, Arenas-de Larriva AP, Gutierrez-Mariscal FM, Gómez-Luna P, Torres-Peña JD, García-Ríos A, Romero-Cabrera JL, Malagon MM, Perez-Martínez P, **Ordovas JM**, Delgado-Lista J, Yubero-Serrano EM, Lopez-Miranda J. Association between telomere length and intima-media thickness of both common carotid arteries in patients with coronary heart disease: From the CORDIOPREV randomized controlled trial. *Atherosclerosis.* 2023;380:117193. Epub 20230728. doi: 10.1016/j.atherosclerosis.2023.117193. PubMed PMID: 37549582.
37. García Tejedor A, Haros CM, **Laparra Llopis JM**. Chenopodium quinoa's Ingredients Improve Control of the Hepatic Lipid Disturbances Derived from a High-Fat Diet. *Foods.* 2023;12(17). Epub 20230904. doi: 10.3390/foods12173321. PubMed PMID: 37685253; PubMed Central PMCID: PMC10487113.
38. Muñoz-Cabrejas A, Laclaustra M, **Guallar-Castillón P**, Casasnovas JA, Marco-Benedí V, Calvo-Galiano N, Moreno-Franco B. Low-Quality Carbohydrate Intake Is Associated With a Higher Prevalence of Metabolic Syndrome: The AWHs Study. *J Clin Endocrinol Metab.* 2023 Dec 23;dgad706.
39. Fernández-Felipe J, Valencia-Avezuela M, Merino B, Somoza B, Cano V, Sanz-Martos AB, Frago LM, Fernández-Alfonso MS, Ruiz-Gayo M, **Chowen JA**. Effects of saturated versus unsaturated fatty acids on metabolism, gliosis, and hypothalamic leptin sensitivity in male mice. *Nutr Neurosci.* 2023;26(2):173-86. Epub 20220206. doi: 10.1080/1028415x.2022.2029294. PubMed PMID: 35125071.

EPIGENETICS



40. Sánchez-Cabo F, Fuster V, Silla-Castro JC, González G, Lorenzo-Vivas E, Alvarez R, ... Orдовás JM, et al. Subclinical atherosclerosis and accelerated epigenetic age mediated by inflammation: a multi-omics study. *Eur Heart J*. 2023;44(29):2698-709. doi: 10.1093/eurheartj/ehad361. PubMed PMID: 37339167; PubMed Central PMCID: PMC10393076. Baccarelli AA, **Orдовás J**. Epigenetics of Early Cardiometabolic Disease: Mechanisms and Precision Medicine. *Circ Res*. 2023;132(12):1648-62. Epub 20230608. doi: 10.1161/circresaha.123.322135. PubMed PMID: 37289899.

41. **Gómez de Cedón M**, Moreno Palomares R, **Ramírez de Molina A**. Metabolo-epigenetic interplay provides targeted nutritional interventions in chronic diseases and ageing. *Front Oncol*. 2023;13:1169168. Epub 20230619. doi: 10.3389/fonc.2023.1169168. PubMed PMID: 37404756; PubMed Central PMCID: PMC10315663.

FOOD SCIENCE

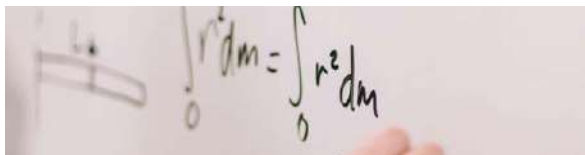


42. Baliyan S, Calvo MV, Piquera D, Montero O, **Visioli F**, Venero C, et al. Milk fat globule membrane concentrate as a nutritional supplement prevents age-related cognitive decline in old rats: A lipidomic study of synaptosomes. *Food Res Int*. 2023;163:112163. Epub 20221119. doi: 10.1016/j.foodres.2022.112163. PubMed PMID: 36596112.
43. Bañares C, Carballada-Sangiao N, Chabni A, García-Cordero J, **Reglero G**, de Pascual-Teresa S, et al. Anti-inflammatory effect of two pomegranate seed oils obtained by green technologies in Caco-2 cells using the bio-accessible fraction from in vitro gastrointestinal digestion. *Food Res Int*. 2023;165:112475. Epub 20230109. doi: 10.1016/j.foodres.2023.112475. PubMed PMID: 36869488.
44. **Wagner S**, **Gómez de Cedón M**, Navarro Del Hierro J, Martín-Hernández D, Siles MLN, Santoyo S, et al. Biological Activities of Miracle Berry Super-critical Extracts as Metabolic Regulators in Chronic Diseases. *Int J Mol Sci*. 2023;24(8). Epub 20230409. doi: 10.3390/ijms24086957. PubMed PMID: 37108121; PubMed Central PMCID: PMC10138767.

2023;24(8). Epub 20230409. doi: 10.3390/ijms24086957. PubMed PMID: 37108121; PubMed Central PMCID: PMC10138767.

45. **Lorca C**, **Mulet M**, Arévalo-Caro C, Sanchez M, Perez A, Perrino M, et al. Plant-derived nootropics and human cognition: A systematic review. *Crit Rev Food Sci Nutr*. 2023;63(22):5521-45. Epub 20220103. doi: 10.1080/10408398.2021.2021137. PubMed PMID: 34978226.

MATHEMATICAL & COMPUTATIONAL BIOLOGY



46. **Marcos-Zambrano LJ**, López-Molina VM, Bakir-Gungor B, Frohme M, Karaduzovic-Hadziabdic K, Klammssteiner T, Ibrahim E, Lahti L, Loncar-Turukalo T, Dharmo X, Simeon A, Nechyporenko A, Pio G, Przymus P, Sampri A, Trajkovic V, **Lacruz-Pleguezuelos B**, Aasmets O, Araujo R, Anagnostopoulos I, Aydemir Ö, Berland M, Calle ML, Ceci M, Duman H, Gündoğdu A, Havulinna AS, Kaka Bra KHN, Kalluci E, Karav S, Lode D, Lopes MB, May P, Nap B, Nedyalkova M, Paciência I, Pasic L, Pujolassos M, Shigdel R, Susin A, Thiele I, Truică CO, Wilmes P, Yilmaz E, Yousef M, Claesson MJ, Truu J, **Carrillo de Santa Pau E**. A toolbox of machine learning software to support microbiome analysis. *Front Microbiol*. 2023 Nov 22;14:1250806. doi: 10.3389/fmicb.2023.1250806. PMID: 38075858; PMCID: PMC10704913.
47. Romero-Tapiador S, **Lacruz-Pleguezuelos B**, Tolosana R, **Freixer G**, Daza R, Fernández-Díaz CM, et al. AI4FoodDB: a database for personalized e-Health nutrition and lifestyle through wearable devices and artificial intelligence. *Database(Oxford)*. 2023;2023. doi: 10.1093/database/baad049. PubMed PMID: 37465917; PubMed Central PMCID: PMC10354505.
48. Gil-Pichardo, A.; **Sánchez-Ruiz, A.**; **Colmenarejo, G**. Analysis of metabolites in human gut:cilluminating the design of guttargeted drugs. *Journal of Cheminformatics*. 15, 96 (2023).
49. Lacruz-Pleguezuelos B, Piette O, Garranzo M, Pérez-Serrano D, Milešević J, Espinosa-Salinas I, **Ramírez de Molina A**, Laguna T, Carrillo de Santa Pau E. FoodDrugs: a comprehensive food-drug interactions database with text documents and transcriptional data. *Database(Oxford)*. 2023 Nov 9;2023:baad075. doi: 10.1093/database/baad075. PMID: 37951712; PMCID: PMC10640380.
50. Meda N, Pardini S, Rigobello P, **Visioli F**, Novara C. Frequency and machine learning predictors of severe depressive symptoms and suicidal ideation among university students. *Epidemiol Psychiatr Sci*. 2023;32:e42. Epub 20230707. doi: 10.1017/s2045796023000550. PubMed PMID: 37417237; PubMed Central PMCID: PMC10387450.

METABOLIC ALTERATIONS



51. Navalón-Monllor V, Soriano-Romani L, Silva M, **de Las Hazas ML**, Hernando-Quintana N, Suárez Diéguez T, et al. Microbiota dysbiosis caused by dietetic patterns as a promoter of Alzheimer's disease through metabolic syndrome mechanisms. *Food Funct.* 2023;14(16):7317-34. Epub 20230814. doi: 10.1039/d3fo01257c. PubMed PMID: 37470232.
52. Muñoz-Cabrejas A, **Guallar-Castillón P**, Laclaustra M, Sandoval-Insausti H, Moreno-Franco B. Association between Sugar-Sweetened Beverage Consumption and the Risk of the Metabolic Syndrome: A Systematic Review and Meta-Analysis. *Nutrients.* 2023;15(2). Epub 20230113. doi: 10.3390/nu15020430. PubMed PMID: 36678301; PubMed Central PMCID: PMC9912256.
53. García S, Pastor R, Monserrat-Mesquida M, Álvarez-Álvarez L, ..., Corella D, Goday A, **Martínez JA**, Alonso-Gómez AM, ..., Josep Vidal J, Vázquez C, **Daimiel L**, Ros E, et al. Metabolic syndrome criteria and severity and carbon dioxide (CO₂) emissions in an adult population. *Global Health.* 2023;19(1):50. Epub 20230713. doi: 10.1186/s12992-023-00948-3. PubMed PMID: 37443076; PubMed Central PMCID: PMC10339536.
54. Mingo-Casas P, Blázquez AB, **Gómez de Cedrón M**, San-Félix A, **Molina S**, Escribano-Romero E, et al. Glycolytic shift during West Nile virus infection provides new therapeutic opportunities. *J Neuroinflammation.* 2023;20(1):217. Epub 20230927. doi: 10.1186/s12974-023-02899-3. PubMed PMID: 37759218; PubMed Central PMCID: PMC10537838.
55. Mérida DM, Moreno-Franco B, Marqués M, León-Latre M, Laclaustra M, **Guallar-Castillón P**. Phthalate exposure and the metabolic syndrome: A systematic review and meta-analysis. *Environ Pollut.* 2023;333:121957. Epub 20230614. doi: 10.1016/j.envpol.2023.121957. PubMed PMID: 37328121.
56. Boughanem H, Böttcher Y, **Tomé-Carneiro J**, **López de Las Hazas MC**, **Dávalos A**, Cayir A, et al. The emergent role of mitochondrial RNA modifications in metabolic alterations. *Wiley Interdiscip Rev RNA.* 2023;14(2):e1753. Epub 20220725. doi: 10.1002/wrna.1753. PubMed PMID: 35872632.

METAGENOMICS



57. D'Elia D, Truu J, Lahti L, Berland M, Papoutsoglou G, Ceci M, ..., Frohme M, Klammssteiner T, **Carrillo-de Santa Pau E**, **Marcos-Zambrano LJ**, Hron K, et al. Advancing microbiome research with machine learning: key findings from the ML4Microbiome COST action. *Front Microbiol.* 2023;14:1257002. Epub 20230925. doi: 10.3389/fmicb.2023.1257002. PubMed PMID: 37808321; PubMed Central PMCID: PMC10558209.
58. Melo NCO, **Cuevas-Sierra A**, **Fernández-Cruz E**, **de la OV**, **Martínez JA**. Fecal Microbiota Composition as a Metagenomic Biomarker of Dietary Intake. *Int J Mol Sci.* 2023;24(5). Epub 20230303. doi: 10.3390/ijms24054918. PubMed PMID: 36902349; PubMed Central PMCID: PMC10003228.

PUBLIC, ENVIRONMENTAL & OCCUPATIONAL HEALTH



59. García S, Bouzas C, Mateos D, Pastor R, Álvarez L, Rubín M, ..., **Alfredo J. Martínez**, Ángel M Alonso-Gómez, Julia Wärnberg, Jesús Vioque, Dora Romaguera, José López-Miranda, Ramon Estruch, Francisco J Tinahones, José Lapetra, Lluís Serra-Majem, Blanca Riquelme-Gallego, Xavier Pintó, José J Gaforio, Pilar Matia, Josep Vidal, Clotilde Vázquez, **Lidia Daimiel**, et al. Carbon dioxide (CO₂) emissions and adherence to Mediterranean diet in an adult population: the Mediterranean diet index as a pollution level index. *Environ Health.* 2023;22(1):1. Epub 20230105. doi: 10.1186/s12940-022-00956-7. PubMed PMID: 36600281; PubMed Central PMCID: PMC9814202.
60. García S, Ordoñez S, López-Molina VM, Lacruz-Pleguezuelos B, **Carrillo de Santa Pau E**, **Marcos-Zambrano LJ**. Citizen science helps to raise awareness about gut microbiome health in people at risk of developing non-communicable diseases. *Gut Microbes.* 2023;15(1):2241207. doi: 10.1080/19490976.2023.2241207. PubMed PMID: 37530428; PubMed Central PMCID: PMC10399471.
61. García S, Pastor R, Monserrat-Mesquida M, Álvarez-Álvarez L, Rubín-García M, Martínez-González M, ..., **Daimiel L**, et al. Ultra-processed foods consumption as a promoting factor of greenhouse gas emissions, water, energy, and land use: A longitudinal assessment. *Sci Total Environ.* 2023;891:164417. Epub 20230524. doi: 10.1016/j.scitotenv.2023.164417. PubMed PMID: 37236477.



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