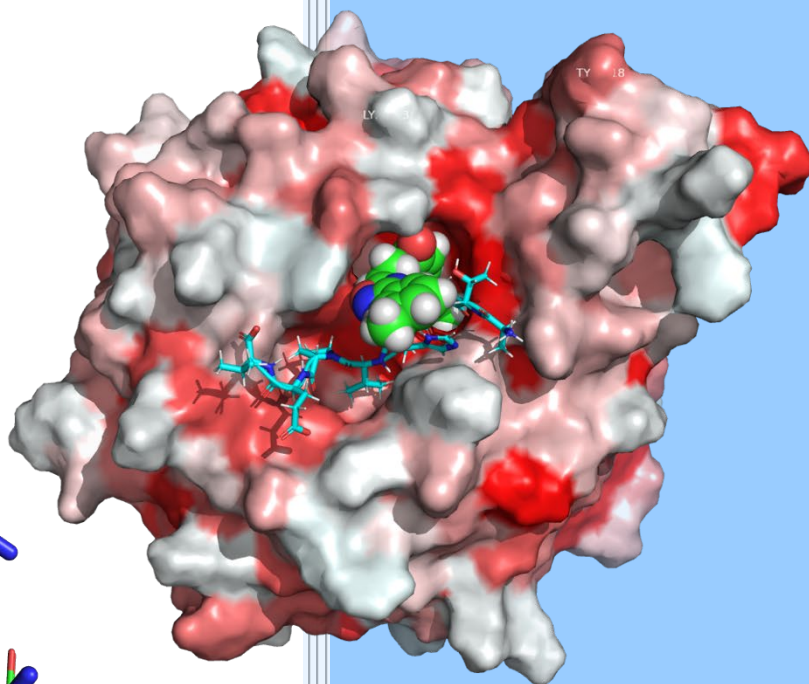
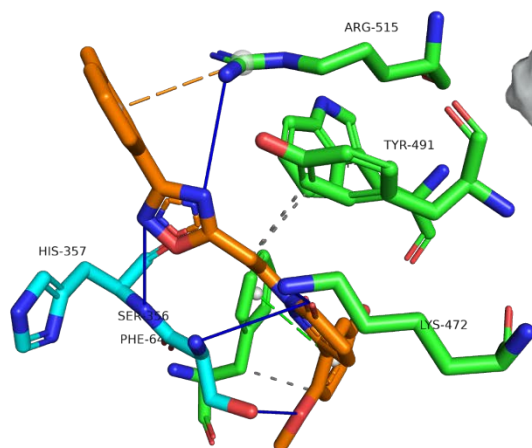


ANNUAL REPORT 2024

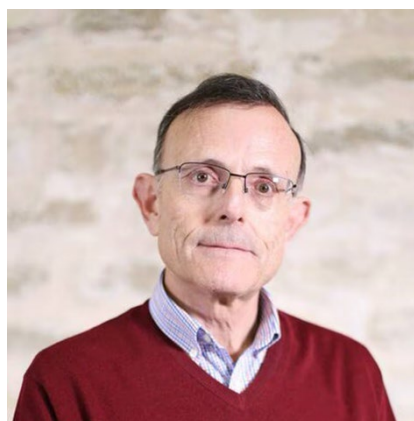


INSTITUTE OF RESEARCH,
DEVELOPMENT, AND
INNOVATION IN HEALTHCARE
BIOTECHNOLOGY
OF ELCHE
UNIVERSITY "MIGUEL HERNÁNDEZ"


IDiBE
UNIVERSITAS
Miguel Hernández

DIRECTOR'S FOREWORD

The University Institute of Research, Development, and Innovation in Healthcare Biotechnology in Elche (IDiBE) of the University *Miguel Hernandez de Elche* is located in the University Campus in Elche, occupying a 4,000 sq. m. of laboratory in the Torregaitán Building. IDiBE aims to become a Research Institute that excels in transformative science and its translational to society. In the past 27 years, the IDiBE (previously IBMC) has excelled in its scientific production, in the exploitation of the generated results and technologies and its societal disseminating programs. This translational excellence has thrust the creation of several spin-off companies and Joint ventures with private enterprises and local Hospitals. This seminal vision has been kept invariable and can be fully appreciated in our Annual Reports reporting our achievements in research, exploitation, training and dissemination activities, in line with the objectives set in all of our Plans of Action.



As in previously, our groups have been active in securing funding from both governmental (national and autonomic), international and private sources (up to 2.0 M€), publishing papers in high impact journals that are widely cited, training young scientists (pre and postdoctoral) with the highest scientific standards as recognized by recent audits of our training programs, and to disseminate our activities and milestones to society through intense out-reach programs (Science with tapas; International Day of Women and Girls in Science and IDiBE cuenta). In addition, we have consolidated the Master Degree in Biotechnology and Bioengineering with the Institute of Bioengineering that is becoming a national reference in the field. In addition, we continued with the Erasmus mundus European Master of Science in skin health and care with the Universities of Piemonte Orientale (Italy) and Namur (Belgium). A major success of the Institute has been the commercialization of innovative products generated from the research projects in the fields of nutraceuticals, cosmeceuticals and biotechnology; and having on NDA application in the FDA, 3 lead compounds in clinical development. Our translational activities are reinforced with four technological platforms. This success has been possible thanks to our philosophy of potentiating communication and collaborations, and sharing all the infrastructures, as well as to the commitment of our administrative and technical personnel to the IDiBE project.

The major milestones for 2024 have been: (i) incrementing our technology transfer actions to the productive sectors of our society through the innovation office; (ii) strengthening the unit for business development (UCIE) funded by the AVI-GVA to further potentiate translation and exploitation of results; (iii) maintaining an 81% of publications in Q1 journals and 38% in D1; (iv) acquisition of innovative infrastructures funded by the GVA and the EU that have provided new technologies such as a mass cytometry (Hyperion) unit for single cell proteomics, that will allow the Institute to embark on more competitive projects; (v) following our Plan of action (2023-2026) centered in the development and exploitation of human-based microphysiological systems to become a reference center of innervated organoids and organ-on-chip; and (vi) executing the input of our external advisory board for increasing the visibility and international recognition. Furthermore, we started the activities in the BL-2 laboratory which will allow to expand the scope of social challenges to be addressed by our research teams.

Prof. Antonio Ferrer-Montiel, Director

STRUCTURE AND GENERAL DESCRIPTION

The IDiBE Action Plan for 2023-2026

IDiBE aspires in this period to become an international leader in preclinical healthcare biotechnology by achieving an ambitious Research Technology Development (RTD) program that will foster translation and exploitation, internationalization, and social impact. It will also attract talented students to be trained, and promising early career scientists that will bring new skills, ideas, and excellence to IDiBE. Our progress towards excellence in translational science has been possible due to a rigorous commitment to our 3 previous strategic plans that set the basis of an interdisciplinary, and innovative RTD in molecular and preclinical biotechnology directed to transform the generated knowledge into health assets that increase societal wellbeing. The strategic plan (2023-2026) sets the objectives and actions necessary to reinforce the strengths, correct the weaknesses, and exploit current opportunities to become an international leader in preclinical biotechnology.

The IDiBE R&D program is organized into two inter-related departments to promote integration and collaboration among IDiBE members: (i) **Molecular biotechnology** to provide a tailored molecular toolbox of pharmacological tools, biosensors, and delivery systems for preclinical research; (ii) **Preclinical biotechnology** to strengthen research on diabetes mellitus and obesity, endocrine disruptors, hard-to-treat cancers (i.e. glioblastoma, hepatocarcinoma), liver and gastrointestinal (GI) diseases (chronic inflammation and intestinal microbiome), peripheral neuropathies (chronic pain), and anti-infective strategies for human and animal health (Figure 1). This organization also favors internal collaborations, sharing the infrastructures, and a more rational and productive use of all resources, including the technological platforms.

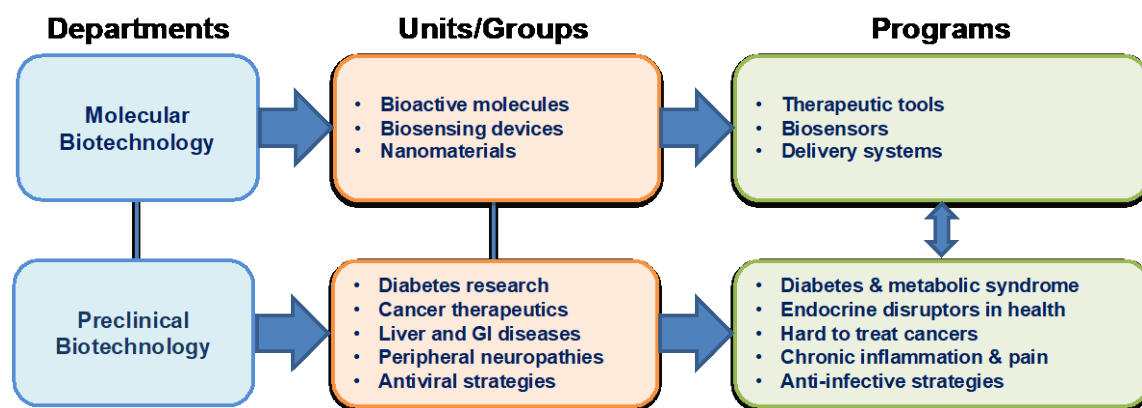


Figure 1. IDiBE RTD organization

In scientific terms, the targets of these research departments of the IDiBE are developed as follows:

A. Molecular Biotechnology

Its main objective is to advance our knowledge in the structure-function relations of small molecules and macromolecules to transform their activity for biotechnological purposes and to design better ligands that modulate their function, as well as nanotechnology-based systems that help their deliver to the site of action.

Three groups carry out their research in this molecular biotechnology department: the bioactive molecules group led by Prof. Vicente Micol; the biosensing and biorecognition group led by Prof. Reyes Mateo; and the nanobiomaterials group led by Prof. Ricardo Mallavia. The different scientific backgrounds of the researchers involved allow for a multidisciplinary approach to the societal and technological challenges investigated.

B. Preclinical Biotechnology

Its goal is to strengthen research on health societal challenges that require interdisciplinary teams to deliver innovative solutions. These challenges include human and animal health as well as the identification of environmental pollutants thus focusing on the concept of OneHealth. This research line is made up of a multi-disciplinary research team, which covers from molecular aspects to semi-industrial biological actives. This multidisciplinaryity is sustained by the contribution of consolidated groups, which provide a balanced composition that favors high competitiveness in scientific contributions, raising resources, training research staff, and generating exploitable and transferable technologies. Five groups are involved in this department, the diabetes research unit led by Prof. Ángel Nadal; the cancer therapeutic unit led by Prof. Miguel Saceda; the liver and GI disease group led by Prof. Rubén Francés; the group of Peripheral Neuropathies led by Prof. Antonio Ferrer; and the group of antiviral strategies led by Prof. M^a del Mar Ortega-Villaizán.

The milestones achieved in this line of research have had and have a high scientific impact as is evident from the scientific publications in internationally recognized journals, as well as the generation of unique technologies which are protected by worldwide patents and have been licensed out to interested companies. One strong point of this research line to be highlighted is the high level of national and international collaborations with public and private research organizations, which contribute to increasing the impact of the activities and their internationalization. Furthermore, the interrelation of the sub-lines that make up this line of research has reinforced the identification of synergies and common interests between groups, promoting collaborations that speed up the achievement of results and technologies.

The activities in this line clearly have a high potential for clinical translation, which has materialized in the creation of clinical joint units with the University Hospitals of Elche (Joint Research Unit IDiBE-UMH/ HGUE-FISABIO) and Alicante (Joint Research Unit IDiBE-UMH/ HGUA-ISABIAL), and of industrial exploitation that has led to continuous and consolidated collaborations with biotech and pharmaceutical companies. Indeed, these research lines are complemented by an additional complementary subline dealing with industrial developments (including products and processes for healthcare biotechnology).

C. Core Technologies

The Action Plan has organized the core technology in three major platforms (Figure 2) that assemble complementarily all the generated and acquired technologies and infrastructures for a shared and synergistic use.

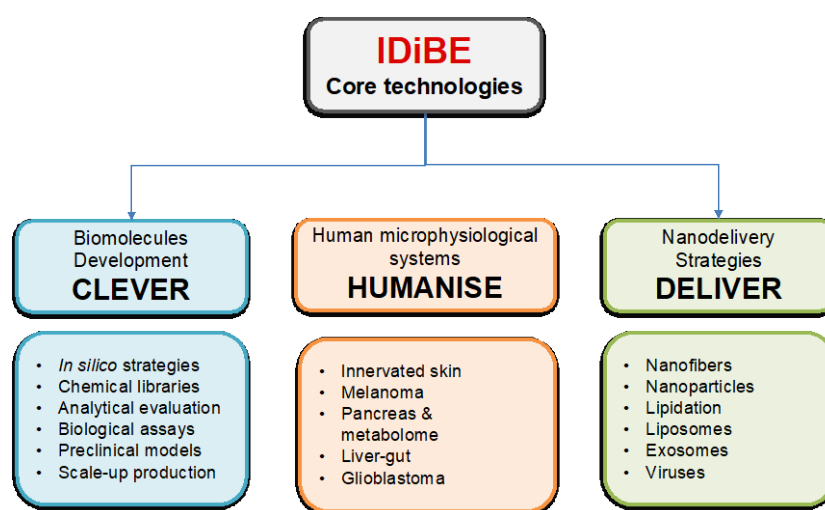


Figure 2. Technological Platforms

MOLECULAR BIOTECHNOLOGY

MOLECULAR BIOTECHNOLOGY

Development of therapeutic tools from both natural and synthetic sources

Unit/Group name: DESIGN AND DEVELOPMENT OF BIOACTIVE MOLECULES

The Design and Development of Bioactive Molecules Group is an interdisciplinary team focused on the design, extraction, purification and evaluation of bioactive molecules from natural sources, always based on scientific evidence and pursuing excellence in all our work and projects. Our group also has a strong track record of technology transfer to the business world, participating in joint developments and translational research projects.

Staff

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Technicians

María Teresa Garzón Cabrerizo

Isabel Serrano Toribio

Publications

Verdura S, Encinar JA, Gratchev A, Llop-Hernández A, López J, Serrano-Hervás E, Teixidor E, López-Bonet E, Martín-Castillo B, Micol V, Bosch-Barrera J, Cuyàs E, Menendez JA. Silibinin is a suppressor of the metastasis-promoting transcription factor ID3. *Phytomedicine* 2024; 128, 155493. doi: 10.1016/j.phymed.2024.155493

Fernández-Ginés R, Encinar JA, Escoll M, Carnicero-Senabre D, Jiménez-Villegas J, García-Yagüe AJ, González-Rodríguez A, García-Martínez, I, Valverde AM, Rojo AI, Cuadrado A. Specific targeting of the NRF2/beta-TrCP axis promotes beneficial effects in NASH liver disease. *Redox Biology* 2024; 69 103027. doi: 10.1016/j.redox.2024.103027

Gilgioni EH, Li A, St-Pierre-Wijckmans W, Shen TK, Perez-Chavez I, Hovhannisyán G, Lisjak M, Negueruela J, Vandenbempt V, Bauza-Martínez J, Herranz JM, Ezerina D, Demine S, Feng Z, Vignane T, Otero Sanchez L, Lambertucci F, Prasnicka A, Deviere J, Hay DC, Encinar JA, Pal Singh S, Messens J, R. Filipovic MR, Sharpe HJ, Treppe E, Wu W, Gurzov EN. PTPRK regulates glycolysis and de novo lipogenesis to promote hepatocyte metabolic reprogramming in obesity. *Nature Communication* 2024; 15, 9522. doi: 10.1038/s41467-024-53733-0

Menendez JA, Cuyàs E, Encinar JA, Vander Steen T, Verdura S, Llop-Hernández Á, López J, Serrano-Hervás E, Osuna S, Martín-Castillo B, Lupu R. The Fatty Acid Synthase (FASN) signalome: A molecular guide for precision oncology.

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Villegas-Aguilar MC, de la Luz Cádiz-Gurrea M, Sánchez-Marzo N, Barrajón-Catalán E, Arráez-Román D, Fernández-Ochoa A, Segura-Carretero A. The Application of Untargeted Metabolomic Approaches for the Search of Common Bioavailable Metabolites in Human Plasma Samples from *Lippia citriodora* and *Olea europaea* Extracts. *Journal of Agricultural and Food Chemistry* 2024. <https://doi.org/10.1021/acs.jafc.4c05325>

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Quesada-Vazquez S, Eseberri I, Les F, Pérez-Matute P, Herranz-López M, Atgí C, López-Yus M, Aranaz P, Oteo Ja, Escoté X, Lorente-Cebrián S, Roche E, Courtois A, López V, Puy-Portillo M, Milagro Fi, Carpené C. Polyphenols and metabolism: from present to future challenges. *Journal of Physiology and Biochemistr.* 2024; 81, pp. 1 - 23. doi: 10.1007/s13105-024-01046-7

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Book chapters

de Juan-Maciá P, Losada-Echeberría M, Micol V, Barrajón-Catalán E, Herranz-López M. Cancer and Obesity: Crosstalk Between Adipocytes and Cancer Cells in the Tumor Microenvironment as a New Target in Cancer Research. In: *Interdisciplinary Cancer Research.* Springer, Cham. 2024; https://doi.org/10.1007/16833_2024_430

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Patents

Patent applied (July 2024): Compuestos identificados como inhibidores de CDK4 para uso como medicamentos. Co-inventores: José Antonio Encinar (25 %).

Patent: "Composition for controlling weight by modulating levels of peptides involved in fullness and/or appetite" Reference: 20170294/2026; P201731147. Company: Monteloeder/UMH. N. of

inventors: 5. Filing Date: 25/09/2017; Priority date (granted): 25/10/18. US and International Patent. Classification: US 2020/0268823 (PCT/ES2018/070600).

Patent: "Composition of vegetable extracts with flavonoids to alleviate the multiple effects of air pollution on the skin". Company: Monteloeder. N. of inventors: 6. Reference: ES2689105 (B2). Filing Date: 30/04/2018; Priority date (granted): 08/11/18.

Patent: "Obtaining and purification of carotenoids from by-products of the industrialization of persimmon and application in foods and beverages of a functional nature". N. of inventors: 14. Reference: 201700646. Company: Mitra Sol Tech. Filing Date: 20/06/2017; Priority date (granted): 20/12/18.

Patent: Extracción de compuestos biológicamente activos a partir de residuos de la industria de la vinificación. Inventores/autores/obtenedores: N. Martí; M. Valero; R. Martínez; M. Berenguer; V. Micol; S. Vegara; V. Sánchez-Valdepeñas; D. Saura; E. Barrañón-Catalán. Entidad titular de derechos: Universidad Miguel Hernández. Nº de solicitud: ES20150000423 20150605. País de inscripción: España. Fecha de registro: 2015. Fecha de concesión: 2017. Empresas: Mitra Sol. Technologies S.L.; Universidad Miguel Hernández de Elche.

Patent: Método de producción de pectina modificada de cítricos. Inventores/autores/obtenedores: Domingo Saura; Nuria Martí; Vicente Micol; Lorena Funes; Salud Vegara; Galina Ignatieva; Enrique Barrañón-Catalán; Manuel Valero; Pedro Mena; Rafael Martínez; M^o Remedios Berenguer; Miguel Moliner. Entidad titular de derechos: Universidad Miguel Hernández. Nº de solicitud: 2013-01183. País de inscripción: España. Fecha de registro: 11/12/2014. Empresas: Universidad Miguel Hernández de Elche.

Patent: "Combinación sinérgica de polifenoles con actividad antibiótica eficaz frente a cepas de bacterias resistentes a antibióticos". Inventores/autores/obtenedores: Laura Tomás Menor; Enrique Barrañón Catalán; Juan Carlos Rodríguez Díaz; María Aznar Cerdán; Antonio Segura Carretero; Jorge

Joven; Javier Abel Menéndez; Domingo Saura; Nuria Martí; Vicente Micol Molina. Entidad titular de derechos: Universidad Miguel Hernández de Elche. Nº de solicitud: ES201301181. País de inscripción: España. Fecha de registro: 11/12/2013. Empresas: Mitra Sol. Technologies S.L.

Patent: "Combinación sinérgica de flavonoides y vitamina C". Inventores/autores/obtenedores: Nuria Martí Bruñá; Domingo Saura López; Pedro Mena Parreño; Vicente Micol Molina; Manuel Valero Roche; Rafael Martínez Font; Nieves Muñoz Mateo; Salud Vegara López; Lorena Funes Gómez; Enrique Barrañón-Catalán. Entidad titular de derechos: Universidad Miguel Hernández de Elche. Nº de solicitud: ES20130000578 20130605. País de inscripción: España. Fecha de registro: 05/06/2013. Empresa: Mitra Sol. Technologies S.L.

Patent: "Extractos de plantas del género Cistus enriquecidos en polifenoles con actividades biológicas". Inventores/autores/obtenedores: Enrique Barrañón-Catalán; Vicente Micol Molina; Nuria Martí Bruñá; Manuel Valero Roche; Emilio Guilén Cerdá; Nieves Muñoz Mateo; Domingo Saura López. Entidad titular de derechos: QUÍMICAS DEL VINALOPO, S.L. Nº de solicitud: ES20090002106 20091023. País de inscripción: España. Fecha de registro: 23/10/2009. Empresas: Químicas del Vinalopó.

Invited Talks and Courses

Looking for new ingredients in nature screening and cosmetic applications. Summer Course. Cosmetic: from bench to business, The Faculty of Pharmacy Universitas Gadjah Mada (Indonesia, online session, 07/07/24). Speaker: EBC.

Patterns of circulating cytokines after 2 types of exercise in active type-1 diabetic patients. 21th Conference on Trans-Pyrenean Investigations on Obesity and Diabetes (CTPIOD). (Pamplona, oral presentation, 21/10/2024). Speaker: MHL.

Science Dissemination: Outreach Activities

"La ciencia detrás de los nutracéuticos". Nombre del congreso: III ENCUENTRO DE JOVENES BIOTECNOLOGOS DEL SUR DE

ESPAÑA -BIOSOUTH. Tipo de participación: Participativo - Ponencia oral. (comunicación oral). Intervención por: Por invitación. Fecha de celebración: 2024. Entidad organizadora: Federación Española de Biotecnología.

“El poder de los péptidos en el cuidado de la piel”. Mahsan Divanbeigi Kermani, Barrajón-Catalán E, Marielle Boonen. Artículo en número de invierno de la revista profesional INDUSTRIA COSMETICA.

“EMOTION: un máster universitario con vocación innovadora e internacional”. Barrajón-Catalán E, Herranz-López M, Devesa Giner I, Fernández A. Artículo en número de invierno de la revista profesional INDUSTRIA COSMETICA.

Web grupo Investigación y Proyecto Prometeo: <https://obraincity.umh.es/>

Number of Congress Communications

International contributions: 8

Poster presentations: 6

Oral presentations: 2

National contributions: 17

Poster presentations: 9

Oral presentations: 8

Governmental Projects and Funding

CPP2022-009795. “Valorización del quitosano para la producción de plásticos sostenibles para la industria cosmética y para ecologizar las propiedades de los cosméticos”. Proyectos de Colaboración Público-Privada, 2023. MINISTERIO DE CIENCIA E INNOVACIÓN (2023-2025). PI at UMH: MHL. Funding: 184.863 €.

NeurotechEU Research and Innovation (NeurotechRI). European Commission. Project related to “The European University of Brain and Technology-NeurotechEU”. European Commission, ERASMUS+ (2021-24). PH2020-IBA-SwafS-Support-2-2020. SEP-210723856, 101035817I: J. Gallar. Funding: 249,894.15 € (UMH); 1.999.732,90 € (total).

INNEST/2022/103. “Development of advanced recycling techniques for rice

straw to be used by footwear industry”. AGENCIA VALENCIANA DE INNOVACIÓN, 2022-2024. PI: EBC. Funding: 154,125.22 €.

PROMETEO/2021/059. “New therapeutic approaches in metabolic diseases: modulation of food intake and energy balance through nutraceuticals and neurotechnology”. GENERALITAT VALENCIANA (2021-2024). Pis: VMM y MHL. Funding: 548,816.10 €.

TED2021-129932B-C32. “Valorization of rice straw byproduct through the development of new biotechnological uses for cosmetic industries”. MINISTERIO DE CIENCIA E INNOVACIÓN. Pis: EBC y VMM. Funding: 230,000.00 €.

PID2021-125188OB-C32. “A multi-omic approach to evaluate the healthy effects of encapsulated olive leaf extracts on obesity (ObeOMic)”. MINISTERIO DE CIENCIA E INNOVACIÓN (2022-2024). Pis: EBC and VMM. Funding: 198,000 €.

Innovative technologies to monitor and reduce Non-Exhaust Emissions, particles and microplastics of Vehicles and pavements to improve air quality and human health (LIFE NEEVE). Comisión Europea. Call: LIFE-2023-SAP-ENV. 2024-2027. PI: EBC. Total funding: 2.760.638,52€ (121.787,40€ at UMH).

01170/2024. “Desarrollo de productos sanitarios antimicrobianos de uso tópico basados en extractos vegetales polifenólicos (VEGETOP)” (2024). Universidad Miguel Hernández de Elche, Vicerrectorado de Investigación y Transferencia. PI: FJAM. Funding: 2,225 €.

ILISABIO24_AP7. “Búsqueda de metabolitos biomarcadores en pacientes de cáncer de colon con enfermedad avanzada (METABOAGE)”. FISABIO. Pis: María Losada Echeberría y Luis Sánchez Guillén. Funding: 5,000 € (2025).

NeurotechEU-Alianza European University of Brain and Technology. Ministerio de Universidades. Referencia: 19804. 01/01/2022 – 31/12/2024. Pis: Juana Gallar Martínez Vicente Micol Molina. Funding: 223.660,74 €.

Private funding: Technical Services and Assistance

"Caracterización y pruebas de actividad de ingredientes de origen natural con potencial aplicación cosmética". Technological support contract for the company Innovation Labo Technologies, SL. Funding: 45.000€ (2023-2026).

2 technical services to 26 different external companies (total amount: 12.050€).

Projects Submitted

Integrated Neuro- and Nutraceuticals for Obesity Self-Management – INNOS. Prometeo 2024. Generalitat Valenciana. PIs: VMM. Funding: 600.000 €.

HORIZON-ERC Starting Grant. "Nanotechnology Enhanced Cistus-based Therapy against Antibiotic-Resistant infections (NECTAR). European Commission. PI: FJAM. 1,500,000 € (2025-2029). Under evaluation.

25BWF-427 "Metabolic Crosstalk Between Tumor Cells and Adipocytes: Mechanisms and Novel Therapies". Branco-Weiss Foundation. PI: MLE. Funding: 640,000 € (2025-2030).

R&D and Educational Committees

Enrique Barrajon Catalán belongs to the "Comité ético y de integridad en la investigación, CEII" of the Miguel Hernández University.

María Herranz López and Enrique Barrajon Catalán belong to the "Trabajos Fin de Grado Interdisciplinares" Program of the Miguel Hernandez University.

R&D Management

E. Barrajon-Catalán is reviewer of PROCENCIA-Concytec, Perú (2021-act.)

E. Barrajon-Catalán is reviewer of Agencia Española de Investigación (AEI), Spain (2021-act.)

M. Herranz-López is reviewer of Agencia Española de Investigación (AEI), Spain (2021-act.)

Vicente Micol is reviewer of Agencia Española de Investigación (AEI), Spain (2007-act.)

Editorial Boards

E. Barrajon-Catalán is Board Member of Molecules (2021-2023).

M. Herranz-López is Topical Advisor Panel Member of International Journal of Molecular Science (2022-2023).

Vicente Micol is member of the Editorial Board of Antioxidants (MDPI).

Development of biosensors for diagnostic and/or therapeutic prognosis

Unit/Group name: BIOSENSING AND BIORECOGNITION

Research group: BIO-MULTIFUNCTIONAL ASSEMBLIES GROUP

The group explores the molecular interactions among different components (biomolecules, polymers, nanomaterials/particles, etc.) within different environments (physiological media, deep eutectic solvents, etc.) in order to assemble them into devices and exploit their full potential in applications such as biosensing, controlled drug delivery or biomolecule storage.

Research Lines of the Group:

– Development of fluorescent platforms for biosensing applications.

– Development of hybrid nanomaterials for biomedicine and environmental applications.

– Characterization of biological systems in confined and non-conventional environments.

– Development of submicrometric particles with ultra-high loading capacity for long-term storage of labile biomacromolecules.

– Design of nanoparticles composites for the oral administration of insulin.

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Rául Martínez Baquero

Technicians

Elisa Pérez García

Ahmed Balah Tahiri (Postgraduate researcher)

Publications

Rubio-Camacho M, Cuestas-Ayllón C, Torres-Herrero B, Martínez-Tomé MJ, De la Fuente JM, Mateo CR. Harnessing the power of thermosensitive liposomes with gold nanoprisms and silica for controlled drug delivery in combined chemotherapy and phototherapy. *RSC Advances* 2024; 14, 23073–23082. doi: 10.1039/d4ra03359k

Garcia-Peiro J.I, Guerrero-López P, Hornos F, Hueso J.L, Garcia-Aznar J.M, Santamaria J. The Pattern of Copper Release in Copper-Based Nanoparticles Regulates Tumor Proliferation and Invasiveness in 3D Culture Models. *Small Sci.* 2400206. Doi: 10.1002/smssc.202400206

Science dissemination: outreach activities

INTERNATIONAL DAY OF WOMEN AND GIRLS IN SCIENCE DAY AT IDiBE ("CIENCIA CON TAPAS")

- "Investigadoras en biotecnología sanitaria, Aula de la Plaça de Baix (Elche). Marcela Giudici Besseghini y Nuria Martí Bruña. 13/02/24. M^a José Martínez Tomé. Organizing committee.

SCIENCE OUTREACH DAY "CIENCIA CON TAPAS" in the framework of "LA FERIA DE LA CIENCIA Y LA TECNOLOGÍA DE ELCHE" (FeCyT):

- "El papel de la ciencia y la tecnología en la lucha contra el cambio climático actual", edificio Valona de la UMH, (Elche), Jorge Olcina Cantos. 17/05/2024. M^a José Martínez Tomé. Organizing committee.

SCIENCE OUTREACH DAY "CIENCIA CON TAPAS":

- "Migraña: Comprendiendo el dolor, buscando soluciones", edificio Valona de la UMH, (Elche). Antonio Ferrer Montiel. 12/11/2024. M^a José Martínez Tomé. Organizing committee.

WOMEN AND SCIENCE WEEK AT THE SECONDARY SCHOOL CANÓNIGO MANCHÓN.

- "Trayectorias Científicas" I.E.S Canónigo Manchón (Crevillente) 08/02/2024. C. Reyes Mateo Martínez and Rocío Esquembre Tomé. Invited speakers.

Number of Congress Communications

National contributions: 2

Poster presentations: 2

International contributions: 15

Oral presentations: 1

Poster presentations: 14

Awards

GENAM-RSEQ Award for the best poster communication (Young Researcher) NyNA2024."Development of novel biosensing platforms coupling fluorescent nanoparticles and enzymes in eutectogels" R.Esquembre, R. Martínez Baquero, Y. Alacid, M.J. Martínez-Tomé, F. Hornos, J. Gómez, F. Montilla and C.R. Mateo

Governmental Projects and Funding

Enzimas en hidrogeles nanocompuestos como plataformas de biodetección y biocatálisis: aplicación al descubrimiento y degradación de fármacos. 1/09/2023 – 31/08/2026. PROYECTOS DE GENERACIÓN DE CONOCIMIENTO 2022 (PID2022-138507OB-I00). AGENCIA ESTATAL DE INVESTIGACIÓN MINISTERIO DE CIENCIA E INNOVACIÓN. PIs: C. Reyes Mateo/M^a José Martínez. Funding: 125.000 €.

Proteínas en hidrogeles como plataformas con capacidad de reconocimiento molecular: aplicación para el desarrollo de biosensores fluorescentes. 2023 – 2025. Subvenciones a grupos de investigación consolidados (AICO) (CIAICO/2022/131). CONSELLERIA DE INNOVACIÓN, UNIVERSIDADES, CIENCIA Y SOCIEDAD DIGITAL. PIs: C. Reyes Mateo/F. Javier Gómez. Funding: 90.000 €.

Biosensors for marine environmental monitoring: control of the ecotoxicological status of coral reefs

(BioSensReef). 1/12/2022 – 30/11/2024. PROYECTOS DE TRANSICIÓN ECOLÓGICA Y TRANSICIÓN DIGITAL 2021 (TED2021-129894B-I00) UA-UMH AGENCIA ESTATAL DE INVESTIGACIÓN MINISTERIO DE CIENCIA E INNOVACIÓN. PIs: Montilla Jiménez (UA)/C. Reyes Mateo Martínez (UMH). Funding: 195.500 €.

Biosensores de transducción combinada basados en matrices híbridas multienzimáticas (BioFLEC). 25/09/2022 – 25/09/2025. EXPRESIONES DE INTERÉS DE PROYECTOS DEL PROGRAMA DE I+D+i DE MATERIALES CON FUNCIONALIDADES AVANZADAS PARA LA NUEVA TRANSFORMACIÓN TECNOLÓGICA. (MFA/2022/058). UA-UMH CONSELLERIA DE INNOVACIÓN, UNIVERSIDADES, CIENCIA Y SOCIEDAD DIGITAL. GENERALITAT VALENCIANA. PIs: Montilla Jiménez (UA)/C. Reyes Mateo Martínez (UMH). Funding: 163.534 €.

R&D Management

Reviewer of Journal of Molecular Liquids (CRM).

Research group: STRUCTURE-FUNCTION RELATIONSHIP OF ION CHANNELS

Our group studies the structure-function relationships in membrane proteins, especially neuroreceptors and ion channels. The final aim is to understand how these proteins work at the molecular level and how they are modulated by lipids, ligands or other proteins in order to find new potential targets for drug discovery.

Staff

José Manuel González-Ros (ORCID: 0000-0002-4804-6855)

José Antonio Poveda Larrosa (ORCID: 0000-0003-0722-3752)

Ana Marcela Giudici Besseghini (ORCID: 0000-0002-3753-4861)

External collaborators integrated in the group

Alberto Potenza

PhD Students

Carlos Coll Díez (ORCID: 0009-0009-3121-0725)

Technicians

Eva Martínez Martínez (part time)

Publications

Coll-Díez C, Giudici AM, Potenza A, González-Ros JM, Poveda JA. pH-induced conformational changes in the selectivity filter of a potassium channel lead to alterations in its selectivity and permeation properties. *Front. Pharmacol.* 2024; 15:1499383. doi: 10.3389/fphar.2024.1499383

Renart ML, Giudici AM, González-Ros JM, Poveda JA. Steady-state and time-resolved fluorescent methodologies to characterize the conformational landscape of the selectivity filter of K⁺ channels. *Methods* 2024; 225:89-99. doi:10.1016/j.ymeth.2024.02.010

Coutinho A, Poveda JA, Renart ML. "Conformational dynamic studies of prokaryotic potassium channels explored by homo-FRET methodologies" in Potassium Channels, Methods and Protocols. Ed. Simone Furini, Springer. Methods Mol Biol. 2024; 2796:35-72. doi: 10.1007/978-1-0716-3818-7_3

Organization of Meetings

Chair at RECI congress, Granada.

Scientific committee, RECI congress, Granada.

Invited Talks and Courses

INTERNATIONAL DAY OF WOMEN AND GIRLS IN SCIENCE DAY AT IDiBE ("CIENCIA CON TAPAS"). "Investigadoras en biotecnología sanitaria, Aula Plaça de Baix (Elche), 13/02/24. Marcela Giudici. Speaker.

"Instituto de Investigaciones Biológicas", University of Mar del Plata, Argentina. Marcela Giudici. Speaker.

Number of Congress Communications

International contributions: 2

Oral presentations: 1

Poster presentation: 1

Governmental Projects and Funding

Nuevos antibióticos peptídicos que actúan sobre lípidos de membrana de bacterias patógenas (NAPALM-BP).

Agencia Estatal de Investigación AEI, Proyecto de Colaboración Público-Privada (CPP2022-009522). 01/12/2023-30/11/2026. Grant: 106.898,00 €. Participation: Investigator. Institution: UMH.

Nuevas estrategias contra el cáncer: inhibición de las interacciones moleculares de las proteínas de imininasas de arginina (InterPATH). CIAICO/2021/135, GVA. 01/01/2022-31/21/2024. Grant: 90.000 €. PI: Camino de Juan Romero y José Luis Neira Faleiro. Participation: Investigator. Institution: FISABIO.

Investigación biomédica en canales iónicos: comprensión científica y aplicación biotecnológica. PROGRAMA INVESTIGO GVA (INVEST/2022/108). 01/11/2022 - 31/10/2024. Grant 66.217,92 €. PI: José Antonio Poveda Larrosa. Institution: UMH.

Projects Submitted

Modulación alostérica de canales iónicos procariontas y eucariotas por moléculas hidrofóbicas: analogías vs especificidades (AMPERION). Subvenciones para grupos de investigación consolidados. AICO. Presupuesto: 90.000 €. PIs: José A. Poveda Larrosa y Ana Marcela Giudici.

Editorial Boards

Topic editor in Frontiers in Pharmacology (2024-).

Academic editor of International Journal of Molecular Sciences (2021-).

Design of nanomaterials for efficient delivery systems on nanostructures (nanomaterials) and DNA-based vaccines

Unit/Group name: DESIGN AND VALIDATION OF NANOBIMATERIALS

Our group works in the design, synthesis and characterization of polymeric materials with potential biological applications. We are now focusing on the preparation of nanostructures, mainly nanofibers, based on polymeric biomaterials. At all times we are looking for the training of graduate students in pharmacy and biotechnology.

Ricardo Mallavia Marin (ORCID: 0000-0001-8058-1009)

Rocío Díaz Puertas (ORCID: 0000-0002-3288-5697)

Postdoctoral Researchers

Amalia Mira Carrió (ORCID: 0000-0002-1909-5498)

Staff

External collaborators integrated in the group

Juan Alberto Falcó Graciá (ORCID: 0000-0001-7726-6577)

PhD Students

Rocío Díaz Puertas (ORCID: 0000-0002-3288-5697)

Juan Suardíaz Muro (ORCID: 0000-0003-0648-2541)

Pedro Valentin Badia Hernandez (ORCID: 0009-0000-5449-3611)

Technicians

Elisa Pérez García

Publications

Díaz-Puertas R, Rodríguez-Cañas E, Lozoya-Agulló MJ, Badia-Hernández PV, Álvarez-Martínez FJ, Falcó A, Mallavia R. Bovine serum albumin and lysozyme nanofibers as versatile platforms for preserving loaded bioactive compounds. *International Journal Biological Macromolecules* 2024 ; 280, 136019. doi: 10.1016/j.ijbiomac.2024.136019

Invited Talks and Courses

Invited Lecture at the Scientific Conference of IDiBE - Innovation in Nanobiotechnology for Antimicrobial Applications (Rocío Díaz Puertas).

Science dissemination: outreach activities

Participation in the Science and Technology Fair of Elche (FeCiTElX) - Polymer Workshop.

SCIENCE OUTREACH DAY "CIENCIA CON TAPAS": "Migraña: Comprendiendo el dolor, buscando soluciones", edificio Valona de la UMH, (Elche). Antonio Ferrer Montiel. 12/11/2024. Rocío Díaz Puertas. Moderator.

Number of Congress Communications

National contributions: 3

Poster presentations: 3

International contributions: 8

Poster presentations: 8

Governmental Projects and Funding

Biopolímeros para la administración de tratamientos contra el glioblastoma. Biopolymers for delivery of glioblastoma treatments. MINISTERIO DE CIENCIA E INNOVACIÓN, PDI-2011-12353OB-C21. 01/09/2022-31/12/2025. PI: Ricardo Mallavia Marin.

Identificación de nuevas dianas terapéuticas para el pronóstico y mejora del tratamiento de glioblastoma. Identification of new therapeutic targets for the prognosis and improvement of glioblastoma treatment. FIS, PI-22-00824. 01/01/2023-31/12/2025. PI Meuri del Camino de Juan Romero (PI1) y Miguel Saceda (PI2).

Estudio comparativo de la expresión génica diferencial asociada a enfermedades neurodegenerativas como base para el desarrollo de nuevas terapias para el glioblastoma. CONSELLERIA DE EDUCACIÓN GENERALITAT VALENCIANA, CIAICO/2022/081 January 2023-Dicember 2025. PIs: Miguel Saceda Sánchez y M^a Salud García Ayllón.

Inteligencia artificial materiales biológicos y reciclados: rediseñando el futuro de la moda. Ministerio de Educación, Formación Profesional y Deportes, AINN23/00445, January 2025-May 2026; PI coordinador: Centro de formación medio rural Badajoz, (PI Elche) Ricardo Mallavia.

Valorización del quitosano para la producción de plásticos sostenibles para la industria cosmética y para ecologizar las propiedades de los cosméticos. Proyectos de Colaboración Público-Privada, 2023. CPP2022-009795. MINISTERIO DE CIENCIA E INNOVACIÓN (2023-2025). PI at UMH: María Herranz.

R&D Management

Reviewers for different journals (number of revised manuscripts in 2024): RMM (21), RDP (1).

Reviewer of Dirección General de Investigación e Innovación Tecnológica de la Comunidad de Madrid. RMM.

PRECLINICAL BIOTECHNOLOGY

PRECLINICAL BIOTECHNOLOGY

Anti-infective strategies

Unit/Group name: **ANTIVIRAL STRATEGIES**

Research group: **ANTIVIRAL STRATEGIES IN AQUACULTURE**

The major goal of the group is the design, development and testing of novel vaccines for viral diseases of aquacultured fish species, with special focus on rainbow trout and Mediterranean sea bass.

In year 2024 the first set of objectives of the new project 2022-2025 (1) have been achieved. Viral antigens (IHN-V-G, SAV-E2) have been produced in the green algae *Chlamydomonas reinhardtii* and the first in vivo tests (oral administration to fish) have been carried out. We are now entering the final phase of the project.

The "Proof of Concept" project PdC 2022 (2) delivered a formulated-feed oral vaccine against VHSV for rainbow trout. The vaccine was tested but the large-scale trial was met with unsatisfactory results. Work to refine the administration regime is in progress.

In 2024 the group has been actively participating in national and regional networks: Marine Epidemiology Network, EPIMAR (3); and THINKINAZUL.

Staff

Luis Perez García-Estañ (ORCID: 0000-0003-4078-8763)

María del Mar Ortega-Villaizán (ORCID: 0000-0003-2065-0601)

PhD Students

María E. Salvador Mira (ORCID: 0000-0002-8877-2018)

Ainhoa Gómez Quintanilla

Yeray Cerpa Damas (ORCID: 0009-0009-0785-0415)

Publications

Salvador-Mira M, Sánchez-Córdoba E, Solivella M, Nombela I, Puente-Marín S, Chico V, Perez L, Pérez-Berna AJ, Ortega-Villazán M. Endoplasmic reticulum stress

triggers unfolded protein response as an antiviral strategy of teleost erythrocytes. *Front. Immunol.* 2024; 15:1466870. doi: 10.3389/fimmu.2024.1466870.

Science dissemination: outreach activities

"Contraste de Fases"- a monthly radio program on science news. Pilar García, Miguel Saceda, Luis Perez and Manuel Sánchez. UMH Radio.

Number of Congress Communications

National contributions: 1

Oral presentations: 1

International contributions: 7

Oral presentations: 7

Governmental Projects and Funding

Novel *Chlamydomonas*-encapsulated recombinant protein oral vaccines for IHN-V and SAV. Antiviral efficacy compared to injectable nanopellet (NPs) vaccination. PROYECTOS DE GENERACIÓN DE CONOCIMIENTO 2021 - PID2021-126710OB-C22. MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES. 2022-2025. PIs: Luis Perez, María del Mar Ortega-Villaizán.

Pre-market testing of NanoPellet (NP)-formulated feed vaccines for viral diseases in aquaculture. PROYECTOS PRUEBA DE CONCEPTO - PDC2022-133194-C22. MINISTERIO DE CIENCIA INNOVACIÓN Y UNIVERSIDADES. PIs: María del Mar Ortega-Villaizán and Luis Perez.

Red de Epidemiología en el medio acuático natural: Vigilancia de virus de riesgo en acuicultura. MINISTERIO DE CIENCIA E INNOVACIÓN. Redes de Investigación 2022. RED2022-134796-T. 2023-2024. PI: Carlos Pereira Dopazo (Univ. Santiago de Compostela).

Governmental Projects

Proyectos Generación de Conocimiento PID2024. Refinement of newly developed Chlamydomonas-encapsulating recombinant oral vaccines for IHNV and SAV2. PIs: María del Mar Ortega-Villaizán y Luis Perez.

R&D Management

Reviewer of Agencia Estatal de Investigación (AEI, Spain). Proyectos de Generación de Conocimiento 2023. Project Category: General Unoriented Research (Investigación No Orientada), Type B.

Research group: RED BLOOD CELLS IN ANTIVIRAL IMMUNOLOGY

Fish are the phylogenetically oldest vertebrate group with an immune system with clear similarities to the immune system of mammals. However, it is an actual matter of fact that the current knowledge of the fish immune system seems to lack the key piece to complete the puzzle. In an attempt to solve this question, our group have demonstrated that rainbow trout RBCs can respond to viral infections by themselves with an innate immune response, by means of producing antiviral molecules and exerting a paracrine antiviral communication with other cells, and with a potential adaptive immune response, by means of antigen processing and presentation and complement system regulation. Apart from this, we also focus our investigation on the search of prophylactics or therapeutics to treat the major aquaculture viral infections.

Staff

María del Mar Ortega-Villaizán Romo (ORCID: 0000-0003-2065-0601)

Postdoctoral Researchers

Verónica Chico Gras (ORCID: 0000-0001-6983-2786)

PhD Students

María Elizabeth Salvador Mira (ORCID: 0000-0002-8877-2018)

Celia García Quintanilla (ORCID: 0009-0005-2461-5637)

Adrián López Murcia (ORCID: 0009-0002-0673-1069)

Yeray Cerpa Damas (ORCID: 0009-0009-0785-0415)

Ainhoa Gómez Quintanilla

Publications

Salvador-Mira M, Sánchez-Córdoba E, Solivella M, Nombela I, Puente-Marín S, Chico V, Perez L, Pérez-Berna AJ, Ortega-Villaizán MDM. Endoplasmic reticulum stress triggers unfolded protein response as an antiviral strategy of teleost erythrocytes. *Frontiers in Immunology* 2024; doi: 10.3389/fimmu.2024.1466870

Kersting DK, García-Quintanilla C, Quintano N, Estensoro I, Ortega-Villaizán MDM. Dusky grouper massive die-off in a Mediterranean marine reserve. *Mediterranean Marine Science* 2024; 25 (3), pp. 578 – 585. doi: <https://doi.org/10.12681/mms.38147>

Morales-Lange B, Ortega-Villaizán MDM, Rocha SDC, Montero R, Øverland M. Editorial: Chrono-immunonutrition in aquaculture towards robust and resilient fish. *Frontiers in Immunology* 2024; 15, doi: 10.3389/fimmu.2024.1547738

Organization of Meetings

Workshop Organization "I Workshop en Inmunología, Nutrición y Bienestar en Acuicultura". 03/12/2024.

Science dissemination: outreach activities

Responsable comité divulgación IDiBE-UMH. Organización actividades: Ciencia con Tapas, IDiBE-CUENTA, Jornada Científica del IDiBE. Visitas de Institutos de Educación Secundaria.

Divulgación científica en centros de enseñanza. Bienestar y salud con la UMH. Investigación en biología celular y el uso de la microscopía para la búsqueda de estrategias antivirales en acuicultura.

Number of Congress Communications

International contributions: 10

Oral presentations: 9

Poster presentations: 1

Governmental Projects and Funding

Training fish nucleated erythrocytes for innovative antiviral solutions in aquaculture. TRAININGERY. CNS2022-135920. AGENCIA ESTATAL DE INVESTIGACIÓN. CNS-2022. PI: María del Mar Ortega-Villaizan Romo.

Scaling up NanoPellet (NP) based vaccine production to meet industrial requirements and european regulatory standards. 2022-2024. PDC2022-133194-C22. MINISTRY OF SCIENCE, INNOVATION AND UNIVERSITIES. PIs: María del Mar Ortega-Villaizan Romo; Luis Perez Garcia-Estañ

Antiviral Proteins Applied as Therapeutics in Aquaculture (AntiVirFish). 2022-2023. 101069282. ERC PROOF OF CONCEPT. EUROPEAN RESEARCH COUNCIL. PI: María del Mar Ortega-Villaizan Romo.

REDFLAG - Salmonid red blood cells - sensors of stress and infection. NORWEGIAN RESEARCH COUNCIL. NRC# 302551. PI: Maria K. Dahle. Partner: María del Mar Ortega-Villaizán.

Extractos naturales para aplicación como antivirales en acuicultura (NaturAcuiVir). GVA-THINKINAZUL/ 2021/020. GENERALITAT VALENCIANA. Estrategia Conjunta de Investigación e Innovación en Ciencias Marinas - Plan Complementario de I+D+I -Plan de Recuperación, Transformación y Resiliencia. PI: María del Mar Ortega-Villaizán.

Novel Chlamydomonas-encapsulated recombinant protein oral vaccines for IHN and SAV. Antiviral efficacy compared to injectable nanopellet (NPs)

vaccination. Proyectos de Generación de Conocimiento 2021 - PID2021-126710OB-C22. Ministerio de Ciencia, Innovación y Universidades. PIs: Luis Perez, María del Mar Ortega-Villaizán.

Pre-market testing of NanoPellet (NP)-formulated feed vaccines for viral diseases in aquaculture. Proyectos Prueba de Concepto - PDC2022-133194-C22. Ministerio de Ciencia Innovación y Universidades. PIs: María del Mar Ortega-Villaizán, Luis Perez.

Projects Submitted

RNA-based antiviral therapeutic feed for aquaculture. UPGRADE-AntiVirFish. EIC Transition 2024. Coordinator PI: María del Mar Ortega-Villaizan.

Novel feeds for climate impact resilient aquaculture. FEED-US. HORIZON-CL6-2024-FARM2FORK-02-7-two-stage. Coordinator PI: María del Mar Ortega-Villaizan.

A non-invasive rapid test for in situ fish immune status surveillance & improved fish health by novel functional feeds. SAFETYFISH. EIC Pathfinder 2024. Coordinator: María del Mar Ortega-Villaizán.

R&D Management

Expert Evaluator for Agencia Estatal de Investigación, Spain (2019-ongoing). María del Mar Ortega-Villaizán.

Editorial Boards

Editorial Board member of PLOS One (2019- ongoing).

Editorial Board member of Frontiers in Immunology (2018- ongoing).

Editorial Board member of Vaccines (2020- ongoing).

Editor in Intechopen (2020-ongoing).

Research group: ANTIVIRAL STRATEGIES AGAINST ENVELOPED VIRUSES USING HIGH-PERFORMANCE BIOCOMPUTING

Development of molecular dynamics bioinformatics tools to study the interaction of proteins from viruses with biomembranes with the aim of finding new antiviral molecules and therapeutic targets to develop new leading compounds useful for improving combination therapies.

Staff

José Villalaín Boullón (ORCID: 0000-0002-5148-141X)

Publications

Villalaín J. Location and interaction of idebenone and mitoquinone in a membrane similar to the inner mitochondrial membrane. Comparison with ubiquinone 10. *Free Radic Biol Med.* 2024; Sep;222:211-222. doi: 10.1016/j.freeradbiomed.2024.06.017.

Villalaín J. Bisphenol F and Bisphenol S in a Complex Biomembrane: Comparison with

Bisphenol A. *J Xenobiot.* 2024; Sep 4;14(3):1201-1220. doi: 10.3390/jox14030068

Villalaín J. Localization and Aggregation of Honokiol in the Lipid Membrane. *Antioxidants (Basel)* 2024; Aug 22;13(8):1025. doi: 10.3390/antiox13081025

Villalaín J. Localization, aggregation, and interaction of glycyrrhizic acid with the plasma membrane. *J Biomol Struct Dyn.* 2024; Nov 27:1-11. doi: 10.1080/07391102.2024.2434037

Editorial Boards

Board member *Biochimica Biophysica Acta Biomembranes* (2020-2025).

Board member *Membranes* (2019-2025).

Research group: PROTEIN ARCHITECTURE GROUP

Bioinformatics and experimental approaches are critical to the discovery of small molecules and peptides with pharmacological potential. These integrated approaches combine the power of computational prediction with experimental validation, accelerating the drug discovery process and improving the chances of identifying successful therapeutic candidates.

Our interest is in the discovery of small molecules and peptides with pharmacological potential and the identification and characterization of macromolecules as potential drug targets, including biochemical assays to characterize enzymatic activity, binding affinity and other functional properties, biophysical techniques using methods such as isothermal titration calorimetry (ITC), differential scanning calorimetry, fluorescence, circular dichroism and structural techniques such as X-ray crystallization. One of our main goals is the design and understanding of protein-ligand interactions with pharmacological potential, including molecular docking for computational prediction of ligand binding modes and affinities and

molecular dynamics simulations to study the dynamic behavior of protein-ligand complexes, site-directed mutagenesis as experimental validation of key residues in binding interactions, binding assays to quantify binding affinities and kinetics using various experimental techniques, and structure-based drug design using 3D structures of targets.

Staff

Ana María Fernández Escamilla (ORCID: 0000-0002-6615-4913)

External collaborators integrated in the group

Ph.D. Luis Serrano Pubull. Director CRG Centro de Regulación Genómica (CRG) Barcelona. Spain.

Prof. Ana Grande and Prof. Enrique Viguera. Instituto de Hortofruticultura Subtropical y Mediterránea. Departamento de Biología Celular, Genética y Fisiología. Universidad de Málaga-CSIC, Spain.

Prof. Ana Martínez Gil and Ph.D. Carmen Gil. Ph.D. Elnaz Aledavood. Translational Medicinal and Biological Chemistry Group

CIB Margarita Salas, Spanish National Research Council (CSIC) Madrid, Spain.

Ph.D. María D. Ferrer García. Senior researcher Foundation for the Promotion of Health and Biomedical Research (FISABIO) Alicante, Spain.

Ph.D. Daniel Lietha. Signaling and Cell Adhesion Group. CIB Margarita Salas, Spanish National Research Council (CSIC) Madrid, Spain.

Ph.D. María Salud García Ayllón. Foundation for the Promotion of Health and Biomedical Research of the Valencian Community (FISABIO). General University Hospital of Elche, Alicante, Spain.

Patents

Title: Combination therapy against SARS-CoV-2 and other coronaviruses. PAT: P202330781. Contributors: Ana Grande; Enrique Viguera; Ana María Fernández-Escamilla; Gregorio Fernández Ballester; Sergio Ortega del Campo; Clara M Blanes Mira; M Isabel Viciano Ramos; Encarnación Clavijo Frutos; Jesús Leandro Santos González. Universidad de Málaga/Universidad Miguel Hernández.

PhD Theses

Title: Discovery of inhibitors of the ns2b-ns3 enzyme complex of the ZIKA virus by computational virtual screening. Student: Erika Fernández Martínez. 01/07/2024.

Science Dissemination: Outreach Activities

KICK OFF MEETING (Networking)

Project title: Targeting SGK1: Bridging Therapies for Parkinson's and Cardiovascular Diseases (SGK1-4PDCar). Participating institutions: CIB-CSIC/CIBERCV/CIBERNED/IIBM/UAM/CNIC. Location: CIB-CISIC (Madrid) Date: 06/09/2024.

Number of Congress Communications

National contributions: 3

Poster presentations: 3

Governmental Projects and Funding

Development of a human INS peptide for the treatment and prevention of avian influenza. 2024 to present. Unisalut support modality for the development of innovation projects. ilisabio sub-programme. GRANT NUMBER: ILISABIO24_PI01. PI Ana María Fernández Escamilla.

Development of a human innate immune peptide for the treatment and prevention of influenza virus infection (Do-HumanVIP). HEALTH TECHNOLOGY DEVELOPMENT PROJECT. Proof of Concept (PoC) projects 2024 to present. GRANT NUMBER: DTS24/00012. PI María de los Desamparados Ferrer.

SOCS1 and SOCS3 proteins as potential therapeutic strategies for neuroinflammation associated with Alzheimer's disease. UNISALUT. Modality of support for preparatory actions 2024 to present. GRANT NUMBER: ILISABIO24_AP3 PI Ana María Fernández Escamilla.

Projects Submitted

Mechanisms of assembly and force activation in Focal Adhesions (FAact). Convocatoria 2024 - «Proyectos de Generación de Conocimiento» y actuaciones para la formación de personal investigador predoctoral asociadas a dichos proyectos. PI Daniel Lietha. CIB-CSIC (Madrid).

R&D Management

Agencia Nacional de Evaluación y Prospectiva (ANEP).

Scientific Society Councils

Protein Structure and Function Thematic Network (<http://redproteinas.iqfr.csic.es/>).

Spanish Society of Biophysics (SBE) (<http://www.sbe.es/>)

Spanish Society of Biochemistry and Molecular Biology (SEBBM) (<http://www.sebbm.es/>).

Editorial Boards

Review Editor in Frontiers in Physiology - Membrane Physiology and Membrane Biophysics (2018-.....).

Research group: VIRAL IMMUNOLOGY & THERAPEUTICS

Development of new DNA vaccines to prevent pediatric diseases of high prevalence.

Staff

Pablo Garcia Valtanen (ORCID: 0000-0003-4382-6446)

Postdoctoral Researchers

Milagros Collados Rodríguez (ORCID: 0000-0002-2304-6402)

Organization of Meetings

Co-organizer with Dr Edward Carter (University of Bath, UK) of the monthly seminar series between the Centre for Therapeutic Innovation in Uni of Bath and IDIBE in UMH, Spain (September 2024-ongoing).

Invited Talks and Courses

Title: New vaccines (and adjuvants) to prevent herpesvirus infections and other immune conundrums. Institution-host: Professor Banafshe Larijani, Director of the Centre for Therapeutic Innovation (2024, Bath, UK).

Science dissemination: outreach activities

Interviewed for the podcast x.women – Vacunas, historia e importancia (Episodio 7, 29 Nov 2024) available on Spotify https://open.spotify.com/episode/0da5cHCRtq7Vr1218B05Wm?si=cAYoV1GOQN60DFrELe_I2A

Number of Congress Communications

International contributions: 3

Poster presentations: 2

Oral presentations: 1

Governmental Projects and Funding

Inducción de una respuesta inmune antitumoral en glioblastoma mediante la utilización de cultivos primarios obtenidos del propio paciente. INMATAQ.

Convocatoria: UniSalut-ILISABIO-Acciones preparatorias . ILISABIO24_AP10. Entidad: Fundación FISABIO y Universidad Miguel Hernández. 01/03/2025-01/03/2025. 01/03/2025-01/03/2025. PI: Pablo Garcia Valtanen. (Universidad Miguel Hernández de Elche). 20/12/2024-20/12/2025. 5000 €.

Combinación de immuno-fenotipado profundo de células mononucleares de sangre periférica utilizando citometría de masas y aprendizaje automático para descubrir predictores de infección por citomegalovirus en receptores de trasplantes de riñón. Convocatoria: XI Convocatoria Intramural de ISABIAL. Ref. 2024/B/7 Entidad: Instituto de Investigación Sanitaria y Biomédica de Alicante. 10/09/2024-10/09/2025. PI: Pablo Garcia Valtanen. (Universidad Miguel Hernández de Elche). 10/09/2024-09/09/2025. 4000 €.

Development of new vaccines to attack the biggest viral threats to newborns and infants. 23/06/2015 – Plan Gen T (CIDEAGENT) - GVA 2022 28 (CIDEXG/2022/40). Conselleria de Innovación, Universidades, Ciencia y Sociedad Digital. 31/07/2023-31/07/2027. PI: Pablo García Valtanen.

HORIZON MSCA-PF "Restore DNases anti-viral potential" (REDAVIP, action 101146746) 13/1/2025-12/1/2027. PI: Milagros Collados Rodríguez. 181,152.96 €,

Projects Submitted

CaixaBank Health Research Health 2025 – Ref. HR25-00792. A nucleic acid vaccine dual adjuvant system to fight herpesviral disease in vulnerable individuals.

R&D Management

Reviewer for Vaccine, Kidney International, Scientific Reports, Applied Microbiology and Biotechnology, Helminthologia, Pharmaceutical Research, Fish and Shellfish Immunology, Bioscience Reports. P. García Valtanen.

Diabetes and obesity / Endocrine disruptors in health

Unit/Group name: DIABETES RESEARCH UNIT (UNIBAD)

Diabetes mellitus is characterized by hyperglycaemia caused by an insulin deficiency. Its prevalence is rising, reaching 425 million people worldwide (www.idf.org). In Spain a 13.8% of adult population is diabetic and 3 of 10 people have problems with glucose metabolism (Soriguer et al, Diabetologia 2012). There are two main types of diabetes mellitus. Type 1 diabetes is caused by an autoimmune attack against β -cells, which is the cell type responsible for producing and releasing insulin, the only hormone in our organism able to decrease glucose. When the β -cell is destroyed, no more insulin is produced and, therefore, the patient depends on insulin injection. Between a 10 and 15% of diabetic persons are diagnosed as Type 1. About 80-85% of diabetics are diagnosed as Type 2, which occurs when peripheral tissues experience a decrease in insulin sensitivity or insulin resistance together with an incapacity of the β -cell to produce and secrete enough insulin to counteract such resistance. Then, hyperglycemia progresses because insulin secretion and β -cell mass are below a critical threshold.

The etiology of both diabetes types is different, but both forms are the result of a gene by environment interaction. Our research unit works to understand how different environmental factors such as high fat diet and endocrine disrupting chemicals work to increase diabetes susceptibility.

We work on four different research lines:

1- The role that endocrine disrupting chemicals (EDCs) in the etiology of Diabetes. We study how exposure to EDCs at different times during life, from pregnancy to adulthood, affects insulin sensitivity as well as the function of the endocrine pancreas. We address this problem by investigating in mice how these chemicals change the expression of genes related to β -cell function, death and division, during fetal development as well as during adulthood. We combine in vivo research with ex vivo and in vitro approaches to molecularly understand

how EDCs alter β -cell function, division and death.

This should give light to the hormone receptors involved as well as the molecular pathways used and end-points affected by EDCs exposure, which will help to establish harmonizing testing protocols to identify EDCs with diabetogenic effects.

The results of this research line in the last two decades have been seminal to establish the link between EDC exposure and diabetes mellitus.

2. The physiological role of estrogen receptors ER α , ER β and GPER1 in the islet of Langerhans. Using molecular biology and electrophysiology, we study how estrogens influence the plasticity of the endocrine pancreas during the adaptation to pregnancy and obesity. This will help us to better understand sex differences in glucose regulation and the development of new chemicals that should help to establish gender-based therapeutic for diabetes.

3. The role of interferon- α (IFN α) in pancreatic α - and β -cells in early stages of type 1 diabetes. Type 1 diabetes (T1D) is a chronic autoimmune disease characterized by pancreatic islet inflammation and specific destruction of insulin-producing beta-cells by the immune system. In early stages of T1D IFN α plays a critical role in the initiation of the disease but the molecular mechanisms underlying IFN α effects directly on pancreatic cells are largely unknown. The results of this project will provide a better understanding of the effects of IFN α exposure on alpha- and beta-cell function and will develop new therapeutic strategies selecting small molecules that inhibit TYK2-mediated IFN α signaling pathway in alpha- and beta-cells.

4. Maternal metabolic adaptations during pregnancy: implications for the development of gestational diabetes mellitus. Gestational diabetes mellitus (GDM) is the most common metabolic disorder of pregnancy. In addition to the

transient maternal hyperglycaemia during pregnancy, GDM predisposes the mother and the offspring for increased risk of developing T2D and obesity. Using animal and in vitro models we aim to understand the molecular basis of this disease and to identify altered signaling pathways leading to the development of GDM. We also aim to explore potential therapeutic tools which may present beneficial effects in the prevention and control of GDM.

Staff

Ángel Nadal Navajas (ORCID: 0000-0003-4178-2152)

Cristina Ripoll Orts (ORCID: 0000-0003-0935-8722)

Esther Fuentes Marhuenda (ORCID: 0000-0002-9113-739X)

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Laura Marroquí Esclapez (ORCID: 0000-0003-2931-9317)

Reinaldo Sousa dos Santos (ORCID: 0000-0002-3219-4730)

Postdoctoral Researchers

Hilda Ferrero Hidalgo (ORCID: 0000-0001-7960-7523)

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Marina Serrano Macia (ORCID: 0000-0003-4183-6384)

External collaborators (Universidad de Alicante)

Juan Martínez-Pinna (ORCID: 0000 0003 0777 2049)

Sergi Soriano Úbeda (ORCID: 0000 0001 9844 7027)

Regla María Medina Gali (ORCID: 0000-0001-9401-8292)

PhD Students

Atenea Alexandra Pérez Serna (ORCID: 0000-0002-7594-6365)

Roberto Sempere Navarro (ORCID: 0009-0005-4317-4945)

Daniel Guzmán Llorens (ORCID: 0000-0003-1734-9383)

Technicians

María Luisa Navarro García

María Salomé Ramón Penalva

Beatriz Bonmatí Botella

Publications

La Merrill MA, Smith MT, McHale CM, Heindel JJ, Atlas E, Cave MC, Collier D, Guyton KZ, Koliwad S, Nadal A, Rhodes CJ, Sargis RM, Zeise L, Blumberg B. Consensus on the Key Characteristics of Metabolism Disruptors. *Nature Reviews* 2024; *Endocrinology*. doi: 10.1038/s41574-024-01059-8

Garcia-Gutierrez E, O'Mahony AK, Dos Santos RS, Marroquí L, Cotter PD. Gut microbial metabolic signatures in diabetes mellitus and potential preventive and therapeutic applications. *Gut Microbes* 2024 Jan-Dec;16(1):2401654. doi: 10.1080/19490976.2024.2401654

Sabadell-Basallote J, Astiarraga B, Castaño C, Ejarque M, Repollés-de-Dalmau M, Quesada I, Blanco J, Nuñez-Roa C, Rodríguez-Peña MM, Martínez L, De Jesus DF, Marroquí L, Bosch R, Montanya E, Sureda FX, Tura A, Mari A, Kulkarni RN, Vendrell J, Fernández-Veledo S. SUCNR1 regulates insulin secretion and glucose elevates the succinate response in people with prediabetes. *J Clin Invest*. 2024 May 7;134(12):e173214. doi: 10.1172/JCI173214

Vom Saal FS, Antoniou M, Belcher SM, Bergman A, Bhandari RK, Birnbaum LS, Cohen A, Collins TJ, Demeneix B, Fine AM, Flaws JA, Gayraud V, Goodson WH 3rd, Gore AC, Heindel JJ, Hunt PA, Iguchi T, Kassotis CD, Kortenkamp A, Mesnage R, Muncke J, Myers JP, Nadal A, Newbold RR, Padmanabhan V, Palanza P, Palma Z, Parmigiani S, Patrick L, Prins GS, Rosenfeld CS, Skakkebaek NE, Sonnenschein C, Soto AM, Swan SH, Taylor JA, Toutain PL, von Hippel FA, Welshons WV, Zalko D, Zoeller RT. The Conflict between Regulatory

Agencies over the 20,000-Fold Lowering of the Tolerable Daily Intake (TDI) for Bisphenol A (BPA) by the European Food Safety Authority (EFSA). *Environmental Health Perspectives* 2024; 132(4):45001. doi: 10.1289/EHP13812

Ruiz-Pino A, Goncalves-Ramírez A, Jiménez-Palomares M, Merino B, Castellano-Muñoz M, Vettorazzi JF, Rafacho A, Marroquí L, Nadal Á, Alonso-Magdalena P, Perdomo G, Cózar-Castellano I, Quesada I. Hyperglucagonemia and glucagon hypersecretion in early type 2 diabetes result from multifaceted dysregulation of pancreatic mouse α -cells. *Pflugers Arch*. 2025 Feb;477(2):207-221. doi: 10.1007/s00424-024-03045-5

Organization of meetings

Gordon Research Conference on Environmental Endocrine Disruptors, Il Ciocco, Italy, 2024 (<https://www.grc.org/environmental-endocrine-disruptors-conference/2024/>). Ángel Nadal.

VI Workshop ¿What is going on in diabetes research? Elche, Noviembre 2024. Member of the Organizing Committee: Laura Marroquí, Reinaldo S. dos Santos.

Invited Talks and Courses

Plastics and Human Health Symposium. New York University, New York, USA. Ángel Nadal.

Swiss Symposium on Endocrine Disrupting Chemicals- ETH Zurich, Zurich, Suiza. Ángel Nadal.

Diabetes Research School-German Center for Diabetes Research, Madrid. Ángel Nadal.

The European Congress of Endocrinology 2024. European Society of Endocrinology Annual Meeting. Stockholm, Sweden. Ángel Nadal.

European Society of Endocrinology-Spotlights on Science: Endocrine Disruptors (Online). Ángel Nadal.

XXXV Congreso Nacional de la Sociedad Española de Diabetes (2024), Granada. Iván Quesada.

60th EASD Annual Meeting. Session chairman. Madrid. Iván Quesada.

X Simpósio OCRC, Limeira, Brasil. Iván Quesada.

XX Congreso Nacional Sociedad Española de Obesidad. Paloma Alonso-Magdalena.

La Recherche en France sur les Perturbateurs Endocriniens. French Society of Cellular and Molecular Toxicology (Online). Paloma Alonso-Magdalena.

SED DIRECTO: Highlights SED del 60th Annual Meeting of the EASD: Comunicación interorgánica y sensibilidad insulínica: claves para optimizar el manejo de la diabetes. Reinaldo Sousa dos Santos.

Science Dissemination: Outreach Activities

Participation in Mind and Matters by Nick Jikomes, USA podcast <https://mindandmatter.substack.com/p/endocrine-disruptors-and-metabolism>. Ángel Nadal.

Collaboration with Science Media Center, Spain (<https://sciencemediacentre.es/autor/angel-nadal>). Ángel Nadal.

Collaboration con La voz de Galicia (<https://www.lavozdegalicia.es/noticia/lavozdelasalud/vida-saludable/2024/10/12/disruptores-endocrinos-examen-ciudadano-siglo-xxi-mayor-riesgo-exposicion-via-digestiva/00031728720376308925381.htm>) Ángel Nadal.

El papel de las células alfa pancreáticas en la fisiopatología de la diabetes. DIABETES-SOCIEDAD ESPAÑOLA DE DIABETES. ISSN:0417-3988. Iván Quesada.

Collaboration with Sociedad Española de Obesidad. Paloma Alonso-Magdalena (<https://www.seedo.es/index.php/comu>)

[nicacion/196-disruptores-endocrinos-y-contaminacion-impacto-en-obesidad](#)).

“Relación gen-ambiente en la etiología de la diabetes tipo 1”. Jornadas de Divulgación IDiBE 2024. Reinaldo Sousa dos Santos.

La Noche Mediterránea de las Investigadoras, MEDNIGHT. Tabarca. Laura Marroquí Esclapez.

Jornadas IDiBE cuenta. Día Mundial de la Diabetes, Elche 14/11/2024. Unidad de Investigación Básica en Diabetes.

Number of Congress Communications

National contributions: 8

Poster presentations: 8

International contributions: 4

Poster presentations: 4

Awards

Premio Alberto Sols a la mejor labor investigadora en la modalidad de investigación básica 2024. Ángel Nadal.

Governmental Projects and Funding

Relación entre ERalpha, ERbeta y GPER en las células beta del páncreas y su papel en la regulación de los canales de potasio y la apoptosis inducida por estrógenos ambientales. 01/09/2021-31/08/2024-MINISTERIO DE CIENCIA E INNOVACIÓN. AGENCIA ESTATAL DE INVESTIGACIÓN. PIs : Ángel Nadal y Juan Martínez-Pinna.

Beating Goliath: Generation Of Novel, Integrated and Internationally Harmonised Approaches for Testing Metabolism Disrupting Compounds. 01/01/2019-31/06/2024- EUROPEAN COMMISSION. REF.: GA 825489. PI: Ángel Nadal.

Efectos fisiológicos de la señalización extranuclear selectiva del receptor de estrógenos en células-beta pancreáticas y neuronas hipotalámicas. Ministerio de Ciencia e Innovación. AGENCIA ESTATAL DE INVESTIGACIÓN. REF: PID2023-150256NB-I00. 01/09/2024-31/12/2028. PIs: Angel Nadal y Juan Martinez-Pinna.

Towards understanding the effects of bile acids on the endocrine pancreas: from health to obesity and double burden of malnutrition. Programa SPRINT para proyectos internacionales de investigación (SPRINT-UMH-FAPESP). Desde 21/10/2024 hasta: 31/10/2025. PI: Ivan Quesada.

An integrative strategy of testing systems for identification of EDs related to metabolic disorders (OBERON). 01/01/2019 – 31/06/2024- EUROPEAN COMMISSION, Horizon 2020 -Research and Innovation Framework Programme. PI: Paloma Alonso-Magdalena.

Papel de la señalización mediada por TGFbeta en las adaptaciones metabólicas maternas durante el embarazo: implicaciones para el desarrollo de la diabetes mellitus gestacional. 01/09/2021- 31/08/2024-Proyectos I+D+I 2020 -MODALIDADES "RETOS INVESTIGACIÓN" Y "GENERACIÓN DE CONOCIMIENTO" PID2020 -AEI/MCI. AGENCIA ESTATAL DE INVESTIGACION (PID2020-113112RB-I00). PI: Paloma Alonso-Magdalena.

Challenges for maternal diabetes prevention after gestational diabetes: deciphering the molecular and functional endocrine pancreas remodelling during pregnancy and postpartum. Ministerio de Ciencia e Innovación. AGENCIA ESTATAL DE INVESTIGACIÓN. REF: PID2023-146795OB-I00. 01/09/2024-31/12/2028. PIs: Paloma Alonso-Magdalena e Ivan Quesada.

Understanding the role of endocrine disruptors in the transition from pregnancy to postpartum: an opportunity to prevent maternal diabetes. Programa de Excelencia PROMETEO, Generalitat Valenciana. 01/09/2024-31/08/2028. PIs: Paloma Alonso-Magdalena y Angel Nadal.

Descifrando las respuestas inducidas por interferón-alfa de las células alfa y beta pancreáticas: una oportunidad para buscar nuevas dianas terapéuticas para la diabetes tipo 1. 01/09/2021-31/08/2024- AGENCIA ESTATAL DE INVESTIGACIÓN (PID2020-117569RA-I00). PI: Laura Marroquí.

ALPHA-SURVIVE: Unraveling Alpha Cell Survival Strategies and Their Potential Therapeutic Application for Protecting Pancreatic Islet Beta Cells in Type 1 Diabetes 01/01/2024 - 31-12-2025- Generalitat Valenciana. CIAPE/2023/2. PI: Laura Marroquí.

Interfiriendo al Interferón alfa en Diabetes tipo 1 (InterfiriendoIFNa). 01/09/2023 - 31/08/2025- AGENCIA ESTATAL DE INVESTIGACIÓN (CNS2022-135505). PI: Laura Marroquí.

Resiliencia celular en la diabetes tipo 1: desvelando mecanismos adaptativos de estrés inducidos por la exposición a interferón α . 01/09/2024 - 31/08/2027. "Proyectos de Generación de Conocimiento". Ministerio de Ciencia, Innovación y Universidades - Agencial Estatal de Investigación. REF: PID2023-147823OB-I00. PI: Laura Marroquí Esclapez.

Generación de un biobanco de células madre pluripotenciales inducibles (iPSCs) derivadas sangre de pacientes control y con diabetes tipo 1 y estudio de susceptibilidad genética de este tipo pacientes. 01/01/2024 - 30/06/2025. UniSalut/ILISABIO (UGP-23-254). PI: Laura Marroquí Esclapez y Evangelina Boix.

Molecular characterization of the crosstalk between type 1 diabetes candidate genes and coxsackievirus B infection in β -cells and patient-derived lymphoblastoid. 04/2024 - 04/2029. Instituto de Salud Carlos III (CP23/00026, Miguel Servet program). PI: Reinaldo Sousa dos Santos.

Projects Submitted

Convocatoria 2023 - "Proyectos de Generación de Conocimiento".

EFSD/Lilly European Diabetes Research Programme.

Acciones Preparatorias UniSalut (ILISABIO).

Solicitud de subvenciones para la captación de proyectos europeos u otros programas de carácter internacional (APE) - Generalitat Valenciana.

Solicitud de la Ayuda FSED a Proyectos de Investigación en Diabetes.

PROMETEO-Generalitat Valenciana 2024.

R&D Management

Grant Reviewer: Agencia Estatal de Investigación (España). Ángel Nadal.

Grant Reviewer: National Research Council Canada, Agencia Estatal de Investigación (Spain), Fonds de la Recherche Scientifique (FNRS) Belgium. Iván Quesada.

Grant reviewer: Instituto de Salud Carlos III (Spain), Agencia Estatal de Investigación (Spain), National Research Council Canada (Canada), French Society of Endocrinology (France). Paloma Alonso-Magdalena.

Grant Reviewer of: Instituto de Salud Carlos III (España), ANR / L'Agence Nationale de la Recherche (France). Laura Marroquí Esclapez.

Reviewer of Nature Communications, Environment International, FASEB Journal, Environmental Research. Ángel Nadal.

Reviewer of Journals: Metabolism, Sci Rep, BBA. Iván Quesada.

Reviewer of Journals: Metabolism-Clinical and Experimental, Journal of Clinical Endocrinology and Metabolism. Paloma Alonso-Magdalena.

Reviewer of Journals: Diabetes, Clinical and Translational Medicine, Frontiers in Endocrinology, Frontiers in Physiology, Biomedicines. Laura Marroquí.

Abstract Congress Reviewer: European Association for the Study of Diabetes EASD Congress 2024; European Society of Endocrinology Congress ECE 2024. Paloma Alonso-Magdalena.

Membership of: Sociedad Española de Diabetes (SED), European Association for the Study of Diabetes (EASD), Islet Society. Laura Marroquí.

Membership of: Sociedad Española de Diabetes (SED), Sociedad Española para el estudio de la Obesidad (SEEDO), Sociedad Española de Ciencias Fisiológicas (SECF), Endocrine Society, European Society for Endocrinology, Sociedad Española de Endocrinología y Nutrición (SEEN), Sociedad Española de

Bioquímica y Biología Molecular (SEBBM).
Ángel Nadal.

Membership of: Sociedad Española de Diabetes (SED), European Association for the Study of Diabetes (EASD), Societat Catalana de Biologia. Iván Quesada.

Membership of: Sociedad Española de Diabetes (SED), European Association for the Study of Diabetes (EASD), Sociedad Española para el estudio de la Obesidad (SEEDO), Sociedad Española de Ciencias Fisiológicas (SECF). Paloma Alonso-Magdalenalena.

Editorial Boards

Associate Editor Environmental Endocrinology and Membrane Physiology and Biophysics-Frontiers in Physiology. Ángel Nadal.

Review Editor Frontiers in Endocrinology and Frontiers in Neuroscience. Ángel Nadal.

Editorial Board Member: Frontiers in Endocrinology, Frontiers in Physiology, Biomedicines. Laura Marroquí Esclapez.

Editorial Board Member: Frontiers in Physiology, International Journal of Molecular Sciences. Paloma Alonso-Magdalenalena

Development of new tools in the area of cancer, especially in tumours as glioblastoma or pancreatic and breast cancer

Unit/Group name: HARD TO TREAT CANCERS UNIT

Research group: CHEMORESISTANCE AND CANCER GROUP

Dr. Miguel Saceda and Dr Camino de Juan are leading this group, both are staff researchers at the Foundation for the Promotion of Health and Biomedical Research of the Valencian Community (FISABIO). Our group has developed a line of research focused on the search for alternative treatments in tumors that have acquired resistance to antineoplastic treatments. Within this line, we have started the generation of primary cultures of particularly aggressive and resistant tumors, such as glioblastoma and pancreatic carcinoma. Such cultures have been constituted in a model of predictive test of response applicable ex vivo to patients. In addition, we are isolating exosomes and obtaining organoids from patients' samples and developing new animal models as study models closest to the patient. Likewise. Actual research lines:

- Search and development of biomarkers of sensitivity and/or resistance to chemo and radiation therapy in glial and pancreatic tumors.

- Development of nanotechnological-based enzyme treatments for chemo and radio resistant tumors.

- Development of alternative therapies for chemo and radio resistant tumors based on signal transduction pathways and cellular epigenetic control.

- Evaluation of exosomes as drug transporters for patient treatment and as potential liquid biopsies.

- Development of preclinical in vitro and in vivo models.

Staff

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Postdoctoral Researchers

Dr. Pilar Garcia Morales (ORCID: 0000-0002-8424-4613)

Maria Fuentes Baile (ORCID: 0000-0003-3653-2407)

External collaborators integrated in the group

Dr. Víctor Manuel Barberá Juan (ORCID: 0000-0002-4012-6973). Position held in the group: Collaborating clinical researcher. Area or Department of research: Molecular Genetics Hospital General Universitario de Elche.

Dr. Teresa Quintanar Verdúñez. Position held in the group: Collaborating clinical researcher. Area or Department of Research: Oncology.

Carlos Martorell Llobregat. Role in the group: Collaborating clinical researcher. Area or Department of Research: Oncology.

Javier Gallego Plazas. Role in the group: Collaborating clinical researcher. Area or Department of Research: Oncology.

PhD Students

José Marcos Berna Belmonte (ORCID: 0000-0003-1571-9416)

Publications

Araujo-Abad S, Berna JM, Lloret-Lopez E, López-Cortés A, Saceda M, de Juan Romero C*. Exosomes: from basic research to clinical diagnostic and therapeutic applications in cancer. *Cell Oncol (Dordr)*. 2024; Sep 19. doi: 10.1007/s13402-024-00990-2

Larriba E, de Juan Romero C*, García-Martínez A, Quintanar T, Rodríguez-Lescure Á, Soto JL, Saceda M, Martín-Nieto J*, Barberá VM*. Identification of new targets for glioblastoma therapy based on a DNA expression microarray. *Comput Biol Med*. 2024 Sep;179:108833. doi: 10.1016/j.combiomed.2024.108833

Patents

Patent: P20243055.

Science Dissemination: Outreach Activities

"Contraste de Fases"- a monthly radio program on science news. Pilar García, Miguel Saceda, Luis Perez and Manuel Sánchez. UMH Radio.

Number of Congress Communications

International contributions: 4

Poster presentations: 4

Awards

Premio Talento Docente. Miguel Saceda Sánchez.

Governmental Projects and Funding

2022-2025. Health Research Projects. Identification of new therapeutic targets for the prognosis and improvement of glioblastoma treatment. (PI22/00824). ISCIII. 147.620 €. PIs: Camino de Juan/Miguel Saceda.

2023-2025. AICO 2022. New strategies against cancer: inhibition of molecular interactions of arginine protein deiminases (CIAICO 2022/081). GVA. 90.000€. €. PIs: Miguel Saceda/Maria Salud García Ayllon.

2023-2025. APOTI. Graphene-based anti-tumour nanoformulations. (CIAPOT/2022/7). GVA. 36000 €. Contract with the Applynano Solutions S.L. company.

2023-2024. ILISABIO 2024. Copper sulfide nanoformulations as therapeutic agents for poor-prognosis tumors. ILISABIO 5000€. PIs: Miguel Saceda/ Juan Carlos Ferrer Millan.

Projects Submitted

AECC postdoctoral

AECC Lab

APOTI

FPU

Proyectos de I+D+I en salud del ISCIII

R&D Management

2021-act ISCIII project evaluator.

2020-act Junta de Andalucía project evaluator.

2020-act Biobanco Andaluz.

2020-act Junta de Castilla león.

Research group: MOLECULAR NEUROBIOLOGY AND CANCER GROUP

Dr. Miguel Saceda and Dr Camino de Juan are leading this group, both are staff researchers at the Foundation for the

Promotion of Health and Biomedical Research of the Valencian Community (FISABIO). Our group has developed a line

of research focused on the search for alternative treatments in tumors that have acquired resistance to antineoplastic treatments. Within this line, we have started the generation of primary cultures of particularly aggressive and resistant tumors, such as glioblastoma and pancreatic carcinoma. Such cultures have been constituted in a model of predictive test of response applicable *ex vivo* to patients. In addition, we are isolating exosomes and obtaining organoids from patients' samples and developing new animal models as study models closest to the patient. Likewise. Actual research lines:

- Search and development of biomarkers of sensitivity and/or resistance to chemo and radiation therapy in glial and pancreatic tumors.
- Development of nanotechnological-based enzyme treatments for chemo and radio resistant tumors.
- Development of alternative therapies for chemo and radio resistant tumors based on signal transduction pathways and cellular epigenetic control.
- Evaluation of exosomes as drug transporters for patient treatment and as potential liquid biopsies.
- Development of preclinical *in vitro* and *in vivo* models.

Staff

Camino de Juan Romero (ORCID: 0000-0001-7890-8447)

External collaborators integrated in the group

Dr. Víctor Manuel Barberá Juan (ORCID: 0000-0002-4012-6973). Position held in the group: Collaborating clinical researcher. Area or Department of research: Molecular Genetics Hospital General Universitario de Elche.

Dr. Teresa Quintanar Verdúñez. Position held in the group: Collaborating clinical researcher. Area or Department of Research: Oncology.

Carlos Martorell Llobregat. Role in the group: Collaborating clinical researcher.

Area or Department of Research: Neurosurgery.

PhD Students

José Marcos Berna Belmonte (ORCID: 0000-0003-1571-9416)

Julia Ruiz Agulló

Publications

Araujo-Abad S, Berna JM, Lloret-Lopez E, López-Cortés A, Saceda M, de Juan Romero C*. Exosomes: from basic research to clinical diagnostic and therapeutic applications in cancer. *Cell Oncol (Dordr)*. 2024; Sep 19. doi: 10.1007/s13402-024-00990-2

Larriba E, de Juan Romero C*, García-Martínez A, Quintanar T, Rodríguez-Lescure Á, Soto JL, Saceda M, Martín-Nieto J*, Barberá VM*. Identification of new targets for glioblastoma therapy based on a DNA expression microarray. *Comput Biol Med*. 2024 Sep;179:108833. doi: 10.1016/j.combiomed.2024.108833

Araujo-Abad S, Rizzuti B, Soto-Conde L, Vidal M, Abian O, Velazquez-Campoy A, Neira JL*, de Juan Romero C*. Citrullinating enzyme PADI4 and transcriptional repressor RING1B bind in cancer cells. *Int J Biol Macromol*. 2024 Aug;274(Pt 1):133163. doi: 10.1016/j.ijbiomac.2024.133163

Araujo-Abad S, Rizzuti B, Vidal M, Abian O, Fárez-Vidal ME, Velazquez-Campoy A, de Juan Romero C*, Neira JL*. Unveiling the Binding between the Armadillo-Repeat Domain of Plakophilin 1 and the Intrinsically Disordered Transcriptional Repressor RYBP. *Biomolecules*. 2024 May 7;14(5):561. doi: 10.3390/biom14050561

Dagenais P, Jahanbakhsh E, Capitan A, Jammes H, Reynaud K, De Juan Romero C, Borrell V, Milinkovitch MC. Mechanical positional information guides the self-organized development of a polygonal network of creases in the skin of mammalian noses. *Curr Biol*. 2024 Oct 22;S0960-9822(24)01296-X. doi: 10.1016/j.cub.2024.09.055

Singh A, Del-Valle-Anton L, de Juan Romero C, Zhang Z, Ortuño EF, Mahesh A, Espinós A, Soler R, Cárdenas A, Fernández V, Lusby R, Tiwari VK, Borrell V*. *Gene*

regulatory landscape of cerebral cortex folding. Sci Adv. 2024 Jun 7;10(23):eadn1640. doi: 10.1126/sciadv.adn1640

Patents

Patent: P20243055.

Science Dissemination: Outreach Activities

Dissemination of AICO project results in the media: local press (e.g. Ideal (10/14/24)), through foundations (e.g. FISABIO, iDescubre: A 'marriage' of proteins against tumor development - iDescubre; or PADI4: The protein deserter from the ranks of the human body - iDescubre (fundaciondescubre.es)).

Number of Congress Communications

International contributions: 6

Poster presentations: 6

Awards

2024 "Premios SANTANDER-UMH para jóvenes investigadores 2023" to Salomé Araujo for our article entitle "Biomedical application of exosomes in cancer treatment".

Governmental Projects and Funding

2020-2025. Miguel Servet 2019. Study of the mechanism underlying the tumorigenic capacity of the GBM multiforme. (CP19/00095) ISCIII. 242.500 €. PI: Camino de Juan.

2022-2025. Health Research Projects. Identification of new therapeutic targets for the prognosis and improvement of glioblastoma treatment. (PI22/00824). ISCIII. 147.620 €. PIs: Camino de Juan y Miguel Saceda.

2022-2024. AICO. Inhibiting protein-protein interactions of the protein-arginine deiminases PADI2 and PADI4 involved in cancer. (CIAICO 2021/135). GVA. 90.000 €. PIs: Camino de Juan y José Luis Neira.

2023-2025. APOTI. Development of new drugs for therapeutic targets found by transcriptomic analysis (CIAPOT/2022/3). GVA. 36.000€. Contract with the BIOARRAY company. PI: Camino de Juan.

Projects Submitted

Consolidacion investigadora

AECC predoctoral

AECC postdoctoral

AECC Lab

Juan de la Cierva

AICO

BEST

APOST

ACIF

APOTI

FPU

Proyectos de I+D+I en salud del ISCIII

R&D Management

2023-act ISCIII project evaluator.

2023-act Junta de Andalucía project evaluator.

2021-act. Evaluator/ Coordinator of the Science/Health Area of the Agency for Quality Assurance in the Galician University System (ACSUG). "Ayudas de apoyo a la etapa predoctoral", "Ayudas de apoyo a la etapa postdoctoral", "Ayudas programa doctorado industrial", "Ayudas del programa de consolidación y estructuración de unidades de investigación competitivas".

2020- Act. Peer reviewer for Elsevier (Biomedicine & Pharmacotherapy, Archives of Biochemistry and Biophysics, Biochemistry and Biophysics Reports), Nature publishing group (Advanced Sciences, Cell death and disease). Wiley Online Library (Advance Science).MDPI (Cancers, Nanomaterials, Pharmaceutics, International Journal of Molecular Sciences, Viruses, Applied Sciences, Cells).

Research group: STRUCTURE OF PROTEINS

The group is dedicated to elucidate the structure and function of protein by using biophysical and spectroscopic approaches.

Staff

José Luis Neira Faleiro (ORCID: 0000-0002-4933-0428)

Publications

Liu X, Jimenez-Alesanco A, Li Z, Rizzuti B, Neira JL, Estaras M, Peng L, Chuluyan E, Garona J, Gottardo F, Velazquez-Campoy A, Xia Y, Abian O, Santofimia-Castaño P, Iovanna J. Development of an efficient nupr1 inhibitor with anticancer activity. *Sci Rep.* 2024 Nov 27;14(1):29515. doi: 10.1038/s41598-024-79340-z

Neira JL, Rizzuti B, Abian O, Velazquez-Campoy A. Isolated auto-citrullinated regions of PADI4 associate to the intact protein without altering their disordered conformation. *Biophys Chem.* 2024 Sep;312:107288. doi: 10.1016/j.bpc.2024.107288

Araujo-Abad S, Rizzuti B, Soto-Conde L, Vidal M, Abian O, Velazquez-Campoy A, Neira JL, de Juan Romero C. Citrullinating enzyme PADI4 and transcriptional repressor RING1B bind in cancer cells. *Int J Biol Macromol.* 2024 Aug;274(Pt 1):133163. doi: 10.1016/j.ijbiomac.2024.133163

Araujo-Abad S, Rizzuti B, Vidal M, Abian O, Fárez-Vidal ME, Velazquez-Campoy A, de Juan Romero C, Neira JL. Unveiling the Binding between the Armadillo-Repeat Domain of Plakophilin 1 and the Intrinsically Disordered Transcriptional Repressor RYBP. *Biomolecules.* 2024 May 7;14(5):561. doi: 10.3390/biom14050561

Neira JL, López-Redondo ML, Cámara-Artigas A, Marina A, Contreras A. Structure and dynamics of the cyanobacterial regulator SipA. *Arch Biochem Biophys.* 2024 Apr;754:109943. doi: 10.1016/j.abb.2024.109943

Santofimia-Castaño P, Fraunhoffer N, Liu X, Bessone IF, di Magliano MP, Audebert S, Camoin L, Estaras M, Brenière M, Modesti M, Lomberk G, Urrutia R, Soubeyran P, Neira JL, Iovanna J Targeting NUPR1-dependent stress granules formation to induce synthetic lethality in KrasG12D-driven tumors. *EMBO Mol Med.* 2024

Mar;16(3):475-505. doi: 10.1038/s44321-024-00032-2

Neira JL, Palomino-Schätzlein M, Rejas V, Traverso JA, Rico M, López-Gorgé J, Chueca A, Cámara-Artigas A. Three-dimensional solution structure, dynamics and binding of thioredoxin m from *Pisum sativum*. *Int J Biol Macromol.* 2024 Mar;262(Pt 1):129781. doi: 10.1016/j.ijbiomac.2024.129781

Invited Talks and Courses

EMBO Workshop on: Mechanism of citrullination regulation in health and disease (Toulouse, July 2024).

Number of Congress Communications

International contributions: 1

Oral presentations: 1

Governmental Projects and Funding

Inhibiting protein-protein interactions of the protein-arginine deiminases PADI2 and PADI4 involved in cancer – 2022/2024 (CIACO/2021/0135). FISABIO-UMH. GENERALITAT VALENCIANA. PI: Camino de Juan Romero and José L Neira.

Unlocking the hidden treasures of aquatic extremophiles: sustainable development of industrially relevant novel active biomolecules – 2024/2028 (EXPLORA HORIZON H2020-101181841). UMH. EUROPEAN UNION. PI: José L Neira.

Projects Submitted

AICO. Generalitat Valenciana. FISABIO-UMH.

AEI. UMH.

R&D Management

Reviewer of CONICET (JLN) (2008-...).

Reviewer of Israeli Science Foundation (JLN) (2016-...)

Reviewer for Czech Science Foundation (JLN) (2010-...)

Reviewer of FNRS (JLN) (2018-...)

Reviewer of ERC (JLN) (2021-...)

Member (Interdisciplinary member) of the C5 Commission of ANECA (Molecular and Cellular Biology) (2023-...)

Editorial Boards

Board member Archives of Biochemistry and Biophysics (2010-2013; 2023-...).

Board member Archives of Biochemistry and Biophysics (2018-...).

Research group: RESEARCH GROUP ON GENETICS, EPIGENETICS AND TRANSCRIPTION IN NEUROPATHOLOGIES

Our group is interested on the identification of novel diagnostics tools in gliomas (including the aggressive glioblastomas) by analyzing biomaterial from patients (tissue, primary cultures) using transcriptomics, epigenomics, multivariable correlations and artificial intelligence. From the point of view of therapeutics, we are interested on elucidating the mechanisms of action of epigenetic-modulating drugs.

Another line of research is focused Huntington's disease: search of novel biomarkers and assessment of novel preclinical biomodels.

Staff

Luis Miguel Valor Becerra (ORCID: 0000-0002-1229-0565)

PhD Students

Juan Felipe Gallego Serna (ORCID: 0009-0001-9207-2217) (UMH)

Luna Guerra Núñez (ORCID: 0000-0003-4770-4622) (ISABIAL)

Not formally affiliated to IDiBE, under the PhD Program in Sanitary Biotechnology.

Publications

Cano-Cano F, Martín-Loro F, Gallardo-Orihuela A, González-Montelongo MDC, Ortuño-Miquel S, Hervás-Corpión I, de la Villa P, Ramón-Marco L, Navarro-Calvo J, Gómez-Jaramillo L, Arroba AI, Valor LM. Retinal dysfunction in Huntington's disease mouse models concurs with local gliosis and microglia activation. *Sci Rep.* 2024 Feb 20;14(1):4176. doi: 10.1038/s41598-024-54347-8

Invited Talks and Courses

"Biomarcadores transcripcionales y epigenéticos en cáncer cerebral y enfermedad de Huntington". Seminarios en Biociencias, Facultad de Ciencias,

Universidad de Alicante. San Vicent del Raspeig, Spain. 12/01/2024.

"Nuevos avances en el diagnóstico y pronóstico de neuropatologías". Sesiones de investigación ISABIAL. Alicante, Spain. 14/11/2024.

Science Dissemination: Outreach Activities

"La investigación sobre la enfermedad de Huntington en Alicante". Jornadas de investigación asociadas al Reto Solidario GR 330, Asociación Valenciana de Enfermos de Huntington (AVAEH). Orihuela, Spain. 26/05/2024.

Number of Congress Communications

International contributions: 5

Poster presentations: 5

Governmental Projects and Funding

Mejora del diagnóstico y pronóstico del cáncer cerebral mediante integración de variables multimodales espaciales. 24/12/2024 - 23/12/2025. XI CONVOCATORIA ISABIAL 2024 (2024-0568). ISABIAL. PI: Luis Miguel Valor.

Relevancia de la activación por glucocorticoides del eje somatotropo en el comportamiento agre-sivo de los tumores silentes de línea corticotropa. Modalidad de proyecto: De investigación y desarrollo incluida traslacional. 01/01/2025 - 31/12/2026. CIBER ENFERMEDADES RARAS (PIT23). ISABIAL. CIBERER. PI: Antonio Picó Alfonso.

Plataforma inteligente de análisis dinámico de células procedentes de glioblastomas. 16/01/2024 - 15/01/2025. X CONVOCATORIA ISABIAL 2023 (2023-0303). ISABIAL. PI: Luis Miguel Valor.

Neuroinflamación en la enfermedad de Huntington: modelización en ratones y correlatos periféricos en pacientes. 01/09/2023 - 31/10/2025. CONSOLIDACIÓN INVESTIGADORA 2022 (CNS2022-136169). ISABIAL. MINISTERIO DE CIENCIA E INNOVACIÓN. PI: Luis Miguel Valor.

Plataforma Integral e Inteligente para la Medicina de Precisión aplicada a Tumores Cerebrales. 01/10/2022 - 30/09/2024. PROYECTOS ESTRATÉGICOS EN COOPERACIÓN. ISABIAL. AGÈNCIA VALENCIANA DE LA INNOVACIÓ (AVI) (INNEST/2022/168). PI: Luis Miguel Valor.

Plataforma de análisis avanzado de textos científicotécnicos para la extracción de tendencias y conocimiento mediante técnicas de PLN. 01/10/2022 - 30/09/2024. PROYECTOS ESTRATÉGICOS EN COOPERACIÓN. ISABIAL. AGÈNCIA VALENCIANA DE LA INNOVACIÓ (AVI) (INNEST/2022/54). PI: Sandra Gomis Pont.

Biomarcadores específicos de tipo celular en sangre periférica de pacientes con enfermedad de Huntington. 07/07/2022 - 06/07/2024. CONVOCATORIA EXTRAORDINARIA DE AYUDAS 2021.

ISABIAL. FUNDACIÓN NAVARRO-LUCIANO TRIPODI. PI: Luis Miguel Valor.

Clasificación multiómica de pacientes y nuevos modelos de escrutinio farmacológico en la enfermedad de Huntington. 01/01/2024 - 31/12/2026. PROYECTOS DE I+D+I EN SALUD (PI23/01568). ISABIAL. INSTITUTO DE SALUD CARLOS III – FEDER. PI: Luis Miguel Valor.

Projects Submitted

Ayudas a la investigación - IX Convocatoria de ayudas a la investigación. Fundación FEDER.

Convocatoria de ayudas a la investigación 2024, Fundacion Bienvenida Navarro-Luciano Tripodi.

Subvenciones a Grupos Consolidados CIAICO/2025. Generalitat Valenciana.

Subvenciones del Programa Santiago Grisolia CIGRIS/2025. Generalitat Valenciana.

R&D Management

Reviewer of ANEP / EVALUA (2010-).

Chronic inflammation and pain

Unit/Group name: PERIPHERAL NEUROPATHIES

CHRONIC INFLAMMATION, PAIN AND PRURITUS. Understanding sensory neural signaling. This subline is centered in understanding the mechanisms underlying the pro-algesic sensitization of sensory neurons as well as their desensitization upon resolution of injury or diseases. Our hypothesis considers that chronification results from a lack or defective resolution of neural sensitization. We are focused in three pathologies: (i) chronic migraine as a paradigm of chronic inflammatory pain that additionally shows a strong sex dimorphism; (ii) chemotherapy induced peripheral neuropathy as a model of neuropathic pain syndrome; and, (iii) psoriatic pruritus as a model of chronic itch. The common aspect of these three conditions is the involvement of the peripheral sensory system that is sensitized by increasing its electrogenic activity. We

focus on the role of ion channels involved in the generation of action potentials and in their propagation, i.e. thermoTRP channels, Na, Kv and HCN channels. Furthermore, we investigate how the activity of these channels is affected by pro-algesic agents. The aim of these studies is to validate therapeutic targets that are subsequently used in our drug discovery program to identify and develop drug candidates that restore channel activity and the neural sensitivity.

DESIGN OF BIOACTIVE MOLECULES. Discovery of drug candidates for nociceptive precision therapy. The identification and design of bioactive molecules for different applications (anti-inflammatory, analgesic and anti-pruritus) is first based on a computational strategy using molecular modeling, docking and

dynamics on the validated therapeutic targets. In addition, *in silico* screening is also applied to virtual libraries composed of thousands to millions of molecules from natural and synthetic sources. Hit compounds are validated in HTS assays, and lead compounds pharmacologically characterized *in vitro* and *in vivo*. Selected drug candidates are licensed out to biotech companies for pre-clinical and clinical development.

Staff

Antonio Ferrer Montiel (ORCID: 0000-0002-2973-6607)

Gregorio Fernández Ballester (ORCID: 0000-0002-5412-8611)

Asia Fernández Carvajal (ORCID: 0000-0003-2741-1427)

Postdoctoral Researchers

David Cabañero (ORCID: 0000-0002-1133-0908)

Olivia Gross (ORCID: 0000-0002-1299-3076)

Verónica Rivero (ORCID: 0009-0000-7167-7201)

Magdalena Nikolaeva (ORCID: 0000-0002-2617-3108)

External collaborators integrated in the group

Rosario Gonzalez-Muñiz. Instituto de Química Médica (IQM-CSIC).

PhD Students

Jorge de Andrés López (ORCID: 0000-0001-7797-4688)

Simona Giorgi (ORCID: 0000-0001-9431-6759)

Laura Butrón García (ORCID: 0000-0001-5931-4934)

Eva María Villalba Riquelme (ORCID: 0000-0002-0301-0672)

Angela Lamberti

María López López (ORCID: 0009-0003-1023-3553)

Technicians

José Manuel Serrano García

Tania Trujillo Ruiz

Publications

Sastre D, Colomer-Molera M, de Benito-Bueno A, Valenzuela C, Fernández-Ballester G, Felipe A. KCNE4-dependent modulation of Kv1.3 pharmacology. *Biochemical Pharmacology* 2024; 226, 116368.

doi.org/10.1016/j.bcp.2024.116368

Nikolaeva-Koleva M, Butron L, Sempere A, Rivero V, Fernández-Ballester G, Espinosa A, Vergassola M, Mastrocola E, Zucchi S, Ragni L, Mangano G, Devesa I. Design and Validation of Novel Potential Antiperspirant Peptides Blocking M3-Gaq Sweat Signaling Cascade. *Int J Pept Res Ther.* 2024; 30, 47. doi.org/10.1007/s10989-024-10628-4

Lamberti A, Serafini M, Aprile S, Bhela IP, Goutsiou G, Pessolano E, Fernandez-Ballester G, Ferrer-Montiel A, Di Martino RMC, Fernandez-Carvajal A, Pirali T. The multicomponent Passerini reaction as a means of accessing diversity in structure, activity and properties: Soft and hard vanilloid/cannabinoid modulators. *Eur J Med Chem.* 2024; 279:116845. doi.org/10.1016/j.ejmech.2024.116845

Luque A, Blanes-Mira C, Caballero L, Martínez-Melgarejo PA, Nicolás-Albujer M, Pérez-Alfocea F, Fernández-Ballester G, Pérez-Pérez JM. Identification of novel inhibitors of plant GH3 IAA-amido synthetases through molecular docking studies. *Physiologia Plantarum* 2024; 176(6):e14612. doi.org/10.1111/ppl.14612

Sastre D, Colomer-Molera M, Roig S, de Benito-Bueno A, Socuellamos P, Fernández-Ballester G, Valenzuela C, Felipe A. Molecular mapping of KCNE4-dependent regulation of Kv1.3. *American Journal of Physiology-Cell Physiology* 2024; 327(6), C1497-C1513. doi.org/10.1152/ajpcell.00499.2024

Hingorani S, Paniagua Soriano G, Sánchez Huertas C, Villalba Riquelme EM, López Mocholí E, Martínez Rojas B, Alastrué Agudo A, Dupraz S, Ferrer Montiel AV, Moreno Manzano V. Transplantation of dorsal root ganglia overexpressing the NaChBac sodium channel improves locomotion after complete SCI. *Mol Ther.* 2024 Jun 5;32(6):1739-1759. doi: 10.1016/j.ymthe.2024.03.038

SPIN-OFF/START UP Companies

ANTALGENICS (2015-actualidad). Board of Directors. Antonio Ferrer (President).

PROSPERA BIOTECH (2014-actualidad). Board of Directors. Asia Fernández (member) and Antonio Ferrer (President). Scientific Advisory Board. Asia Fernández (Chair).

HAWK BIOSYSTEMS (2015-actualidad). Board of Directors. Antonio Ferrer. (President).

Patents

Phospholipase C inhibitor peptides and uses thereof. PCT/EP2024/087437. Antonio Ferrer, Isabel Devesa, Gregorio Fernández.

COMPOSITIONS FOR TREATING HYPERHIDROSIS. 18/841,333 en Estados Unidos. Antonio Ferrer.

PhD Theses

Title: Direct conversion and microfluidic chambers as tools to study the in-vivo sketch of human sensory neurons. Student: Simona Giorgi. Advisor: Dr. Antonio Vicente Ferrer Montiel and Dra. Asia Fernández Carvajal. 23/02/2024.

Organizing of Scientific Committees

RECI Webinars. Antonio Ferrer.

46º Congreso de la Sociedad de Bioquímica y Biología Molecular. Antonio Ferrer.

IX RECI Meeting. Antonio Ferrer.

Invited Talks and Courses

Congreso de la Sociedad Española del Dolor. León. Mayo 2024. Invited speaker: Antonio Ferrer.

Science Dissemination: Outreach Activities

XVI Jornadas de San Alberto. Facultad de Ciencias Experimentales. UMH. November 2024. Antonio Ferrer.

DivulgaNOBEL. December 2024. Gregorio Fernández.

SCIENCE OUTREACH DAY "CIENCIA CON TAPAS": "Migraña: Comprendiendo el

dolor, buscando soluciones", edificio Valona de la UMH, (Elche). Invited speaker: Antonio Ferrer. 12/11/2024.

Number of Congress Communications

National contributions: 3

Oral presentations: 2

Poster presentations: 1

International contributions: 9

Oral presentations: 2

Poster presentations: 7

Awards

Teaching Talent Award 2024: Asia Fernández.

Governmental Projects and Funding

Sex dimorphism in migraine: thermoTRPs as hormonal and drug targets (GIOCONDA). PID2021-126423OB-C21. 2022-2025 PI: Antonio Ferrer & Asia Fernández.

Prototipo de organoide funcional de piel humana inervada para investigación en dolor (OPERA) PROYECTOS PRUEBA DE CONCEPTO - MINECO 2022 PDC2022-133405-I00. 2022-2025 PI: Antonio Ferrer & Asia Fernández.

Neuropatía por quimioterapia: fisiopatología, dimorfismo sexual e intervención terapéutica. ChemoTheRapy-Induced neuropathy: pathophysiology, sex dimorphism and therapeutic intervention (TRILOGY). Generalitat Valenciana, Conselleria d'Innovació, Universitats, Ciència i Societat Digital. Programa Prometeo para grupos de investigación de excelencia – PROMETEO 2021. PROMETEO/2021/031. 2021-2024. PI: Antonio Ferrer-Montiel y Ana Gomis García.

Nanoparticle-based imaging and therapy of chronic pain in the dorsal root ganglion (PIANO). Horizon 2020-MSCA training Network (Ref. nº 859938). 2021-2024. PI: Antonio Ferrer.

Obtención de compuestos con actividad antifúngica frente a *Candida Auris* mediante cribado computacional de alta eficacia. Ayudas para la realización

de acciones preparatorias UMH/IIS La Fe 2022. UMH. Ref.: 2022i005. 2023-2024. PI: Gregorio Fernández.

Valorización de residuos de fruta a materias primas de base microalgal para obtener nuevos productos de alto valor añadido y reducir emisiones de CO₂ (Frutalga) INNEST/2023/321 PI: Antonio Ferrer & Asia Fernández.

Análisis neurosensorial de canalopatías infantiles complejas. Fundación Soledad. PI Antonio Ferrer & Asia Fernández.

PROGRAMA INVESTIGO GVA (INVEST/2023/462_1). PI: Asia Fernández.

PROGRAMA INVESTIGO GVA (INVEST/2023/462_2) INVEST/2023/462_2 PI: Asia Fernández.

Private funding: R&D Contracts

Contrato de licencia de patente "Compuestos antagonistas del receptor TRPM8 y sus aplicaciones. AntalGenics. Antonio Ferrer y Asia Fernández.

Contrato para la realización de los trabajos de evaluación de la actividad de neurocosmécuticos en neuronas sensoriales que forman parte del Proyecto "DESARROLLO DE NEUROCOSMÉTICOS PARA EL CUIDADO DE LA PIEL SENSIBLE Y SUS ANEXOS". Prospera Biotech. Antonio Ferrer.

Private funding: Technical Services and Assistance

Supervisión científica desarrollo inhibidores PLC. AntalGenics SL. Antonio Ferrer.

Projects Submitted

Human Vascularized Neuroimmune Microphysiological Systems To Model Tumour Microenvironment (pALADIN) HORIZON-MSCA-2023-DN-01-01. Proposal ID 101168658. Antonio Ferrer (submitted).

Human Innervated, Vascularized, and Immunized Tumours-On-Chip as Surrogates for Animal Testing (MITIGATE) HORIZON-HLTH-2024-TOOL-05-06-two-stage. Proposal ID 101155749-1 Antonio Ferrer (submitted).

Protein and insect chitin based on a beehive with electronically maintained

homeostasis: a sustainable source of CO₂ - neutral functional foods (apiChitin). HORIZON-CL6-2024-FARM2FORK-01-7. Proposal ID 101182161. David Cabañero (submitted).

Preparation of proposal High impact chronic pain as a disorder of executive function: molecular to psychosocial mechanisms and translation. (Wellcome Trust discovery Awards). CIAPE-GVA (GVRTE/2023/4633822). Antonio Ferrer (Submitted).

R&D and Educational Committees

Erasmus Mundus EU master: The European Master in Translational Cosmetic and Dermatological Sciences (EMOTION). Coordinator: Asia Fernández.

IDiBE doctorate Program. Healthcare Biotechnology. Coordinator: Gregorio Fernández.

Scientific Society Councils

IUBMB. Representante - Antonio Ferrer

SEBBM. Presidente- Antonio Ferrer

Fundación SEBBM - Presidente- Antonio Ferrer

RECI. Coordinador -Antonio Ferrer

FEBS. Comité de finanzas -Antonio Ferrer

FEBS. Council - Antonio Ferrer

SAB-CTI. Vocal - Antonio Ferrer

University of Bath Court. Vocal- Antonio Ferrer

Editorial Boards

Revista de la SEBBM (2023). Antonio Ferrer (Editor in chief).

Journal of Pharmacological Sciences (2023). Antonio Ferrer.

Frontiers in Pharmacology (2023). Antonio Ferrer.

Frontiers in Neurosciences (2023). Antonio Ferrer.

Journal of Neurosciences (2022). Antonio Ferrer.

International Journal Molecular Science (2023). Antonio Ferrer.

Scientific Reports (2014-2023). A. Fernandez-Carvajal

Frontiers in Physiology (2015-2023). A. Fernandez-Carvajal.

Frontiers in Pharmacology (2021-2023) A. Fernandez-Carvajal.

IJMS (2020-2023). A. Fernandez-Carvajal.

Immunological aspects associated with liver and gastrointestinal diseases

Unit/Group name: **LIVER AND GI DISEASES**

Research group: **HEPATIC AND INTESTINAL IMMUNOBIOLOGY GROUP**

Imhi lab's main line of research focuses on the immunobiology of bacterial translocation and inflammation in the gut-liver axis, with a multidisciplinary approach aimed at understanding the interaction between the microbiome and the Immune System and identifying new potentially useful targets in the recovery of homeostasis in advanced chronic liver disease and in inflammatory bowel disease.

Staff

Rubén Francés Guarinos (ORCID: 0000-0001-5105-1201)

Esther Caparrós Cayuela (ORCID: 0000-0002-9681-0408)

Isabel Gómez-Hurtado Cubillana (ORCID: 0000-0003-4305-9427)

Oriol Juanola Juárez (ORCID: 0000-0001-7432-8808)

External collaborators integrated in the group

Benedikt Simbrunner, Vienna University Hospital.

Postdoctoral Researchers

Marina Serrano Maciá

PhD Students

Sebastián Martínez López (ORCID: 0000-0003-1720-845X)

Enrique Ángel Gomis (ORCID: 0000-0003-0736-7625)

Manel Hadid

Hong Liang

Technicians

Paula Boix (ORCID: 0000-0003-2857-9790)

Publications

Sáez-Leyva J, Lennol MP, Avilés-Granados C, García-Ayllón MS, Gutiérrez A, Francés R, Sáez-Valero J. Altered plasma levels of the SARS-CoV-2-related proteins ACE2 and TMPRSS2 in patients with Crohn's disease. *Sci Rep.* 2024 Dec 5;14(1):30346. doi: 10.1038/s41598-024-81810-3. PMID: 39638806; PMCID:PMC11621418.

Alvarado-Tapias E, Maya-Miles D, Albillos A, Aller R, Ampuero J, Andrade RJ, Arechederra M, Aspichueta P, Banales JM, Blas-García A, Caparros E, Cardoso Delgado T, Carrillo-Vico A, Claria J, Cubero FJ, Díaz-Ruiz A, Fernández-Barrena MG, Fernández-Iglesias A, Fernández-Veledo S, Francés R, Gallego-Durán R, Gracia-Sancho J, Irimia M, Lens S, Martínez-Chantar ML, Mínguez B, Muñoz-Hernández R, Nogueiras R, Ramos-Molina B, Riveiro-Barciela M, Rodríguez-Perálvarez ML, Romero-Gómez M, Sabio G, Sancho-Bru P, Ventura-Cots M, Vidal S, Gahete MD. Proceedings of the 5th Meeting of Translational Hepatology, organized by the Spanish Association for the Study of the Liver (AEEH). *Gastroenterol Hepatol.* 2024 Dec;47(10):502207. English, Spanish. doi: 10.1016/j.gastrohep.2024.502207. Epub 2024 May 8. PMID: 38723772.

Martínez-López S, García-Gutiérrez MS, Navarrete F, Gómez-Hurtado I, Zapater P, Ángel E, Juanola O, López-Cánovas JL, Boix P, Hadid MC, Puig-Kröger A, Gahete MD, Manzanares J, Caparrós E, Francés R. Aging Deteriorates Blood Brain Barrier Function and Polarizes Adaptive T Cell Expansion Contributing to Neurocognitive Damage in Experimental Cirrhosis. *Aging*

Dis. 2024; Nov 23. doi: 10.14336/AD.2024.0932. Epub ahead of print. PMID: 39656486.

Ampuero J, Aller R, Gallego-Durán R, Crespo J, Calleja JL, García-Monzón C, Gómez-Camarero J, Caballería J, Lo lacono O, Ibañez L, García-Samaniego J, Albillos A, Francés R, Fernández-Rodríguez C, Maya-Miles D, Diago M, Poca M, Andrade RJ, Latorre R, Jorquera F, Morillas RM, Escudero D, Hernández-Guerra M, Pareja-Megía MJ, Banales JM, Aspichueta P, Benlloch S, Rosales JM, Turnes J, Romero-Gómez M; HEPAmet Registry. The biochemical pattern defines MASLD phenotypes linked to distinct histology and prognosis. *J Gastroenterol.* 2024 Jul;59(7):586-597. doi: 10.1007/s00535-024-02098-8. Epub 2024; Apr 15. PMID: 38619600; PMCID: PMC11217049.

Martínez-López S, Ángel-Gomis E, Gómez-Hurtado I, Fernández-Iglesias A, Morante J, Gracia-Sancho J, Boix P, Cubero FJ, Zapater P, Caparrós E, Francés R. Cirrhosis-downregulated LSECtin can be retrieved by cytokines, shifts the TLR- induced LSECs secretome and correlates with the hepatic Th response. *Liver Int.* 2024 Apr;44(4):996-1010. doi: 10.1111/liv.15836. Epub 2024 Jan 31. PMID:38293766.

Juanola O, Francés R, Caparrós E. Exploring the Relationship between Liver Disease, Bacterial Translocation, and Dysbiosis: Unveiling the Gut-Liver Axis. *Visc Med.* 2024 Feb;40(1):12-19. doi: 10.1159/000535962. Epub 2024 Jan 23. PMID: 38312368; PMCID: PMC10836950.

Aldars-García L, Gil-Redondo R, Embade N, Riestra S, Rivero M, Gutiérrez A, Rodríguez-Lago I, Fernández-Salazar L, Ceballos D, Manuel Benítez J, Aguas M, Baston-Rey I, Bermejo F, José Casanova M, Lorente R, Ber Y, Ginard D, Esteve M, de Francisco R, García MJ, Francés R, Rodríguez Pescador A, Velayos B, Del Río EG, Marín Pedrosa S, Minguez Sabater A, Barreiro-de Acosta M, Algaba A, Verdejo Gil C, Rivas O, Royo V, Aceituno M, Garre A, Baldán-Martín M, Ramírez C, Sanz-García A, Lozano JJ, Sidorova J, Millet O, Bernardo D, Gisbert JP, Chaparro M. Serum and Urine Metabolomic Profiling of Newly Diagnosed Treatment-Naïve Inflammatory Bowel Disease Patients. *Inflamm Bowel Dis.* 2024 Feb 1;30(2):167-

182. doi: 10.1093/ibd/izad154. PMID: 37536268.

Caparrós E, García-Martínez I, Pedro Zapater, Lucía Madero, Valverde ÁM, Ana Gutiérrez, Francés R. An altered expression of miR-376a-3p and miR-20a-5p in peripheral blood exosomes regulates the autophagy and inflammatory systemic substrates, and relates to the smoking habit and age in Crohn's disease. *FASEB J.* 2024 Jan 31;38(2):e23418. doi: 10.1096/fj.202301761R. PMID: 38226870.

Guerra I, Barros F, Chaparro M, Benítez JM, Martín-Arranz MD, de Francisco R, Piqueras M, de Castro L, Carbajo AY, Bermejo F, Mínguez M, Gutiérrez A, Mesonero F, Cañete F, González-Muñoz C, Calvo M, Sicilia B, Alfambra E, Rivero M, Lucendo AJ, Tardillo CA, Almela P, Bujanda L, van Domselaar M, Ramos L, Fernández Sánchez M, Hinojosa E, Verdejo C, Gimenez A, Rodríguez-Lago I, Manceñido N, Pérez Calle JL, Moreno MDP, Delgado-Guillena PG, Antolín B, Ramírez de la Piscina P, Casanova MJ, Soto Escribano P, Martín Arranz E, Pérez-Martínez I, Mena R, García Morales N, Granja A, Boscá Watts MM, Francés R, Fernández C, Calafat M, Roig-Ramos C, Vera MI, Carracedo Á, Domènech E, Gisbert JP; ENEIDA Project of GETECCU. Evaluation of Genetic Variants Associated with the Risk of Thiopurine-Related Pancreatitis: A Case Control Study from ENEIDA Registry. *Dig Dis.* 2024;42(3):257-264. doi: 10.1159/000537782. Epub 2024 Mar 8. PMID:38452742.

Organizing of Meetings

Congreso CIBER 10º CONGRESO CIBER 2024 (CENTRO DE INVESTIGACION BIOMEDICA EN RED). Miembros del Comité Organizador de un Congreso o del Comité Científico UMH Valencia 27/11/2024 - 29/11/2024.

Curso de Hepatología Básica 49 CONGRESO ANUAL ASOCIACIÓN ESPAÑOLA PARA EL ESTUDIO DEL HIGADO. Moderadores de Mesas Redondas y Sesiones Científicas UMH Madrid. 14/02/2024 - 16/02/2024.

49 CONGRESO ANUAL ASOCIACIÓN ESPAÑOLA PARA EL ESTUDIO DEL HIGADO

49 CONGRESO ANUAL ASOCIACIÓN ESPAÑOLA PARA EL ESTUDIO DEL HIGADO. Miembros del Comité Organizador de un Congreso o del Comité Científico UMH Madrid. 14/02/2024 - 16/02/2024.

Invited Talks and Courses

Reunión Annual Geteccu 2024 "Terapia Combianda Avanzada". Invited talk. Rubén Francés.

Reunión Sociedad Española Reumatología "Etiopatogenia de las IMIDs". Invited talk. Rubén Francés.

Reunión Hepatología traslacional 2024 "Papel de la interacción fibroblasto-linfocito en la barrera intestinal durante la cirrosis". Invited talk. Rubén Francés.

BOEHRINGER SCIENCE SYMPOSIUM EXPLORING THE NEXUS: SYSTEMIC INFLAMMATION, GUT PERMEABILITY, AND DECOMPENSATED LIVER CIRRHOSIS. "Gut barrier dysfunction in cirrhosis and its contribution to systemic inflammation". Invited talk. Rubén Francés.

Science Dissemination: Outreach Activities

Ayuda UMH para proyectos de difusión de la ciencia, la tecnología y la innovación 2024 - Rubén Francés Guarinos. VITDIF24/23. 01/01/2024 31/12/2024.

IV Jornada de Divulgación en Inmunología. Programa y Referencia: PIEU_B/2023_25. 01/10/2023 - 30/09/2024.

Number of Congress Communications

National contributions: 8

Oral presentations: 2

Poster presentations: 6

International contributions: 4

Oral presentations: 1

Poster presentations: 3

Research group: LIVER CANCER IMMUNOLOGY AND IMMUNOTHERAPY

Our research group is dedicated to investigate the cellular and molecular

Governmental Projects and Funding

Unlocking and retrieval of LSEctin as homeostasis-promoting mechanisms in liver sinusoidal endothelial cells in cirrhosis (DELTA). Ministerio de Ciencia e Innovación (PID2023-149765OB-I00). Rubén Francés. (Universidad Miguel Hernández de Elche). 01/01/2024-30/12/2026. 275.000 €.

Therapeutic targets and biomarkers from precision medicine in MAFLD (PreMed-MAFLD). MINISTERIO DE CIENCIA E INNOVACIÓN (PI21/0082). Rubén Francés. (IIS ISABIAL, Hospital General Universitario de Alicante). 01/01/2022 -31/12/2023. 157.000 €.

Role of LSEctin in aging and the liver-brain axis in cirrhosis. GENERALITAT VALENCIANA - CONSELLERÍA DE INNOVACIÓN, UNIVERSIDAD Y CIENCIA (PROMETEO 2021/033). PI: Rubén Francés. 01/01/2021 - 31/12/2024.

R&D and Educational Committees

Esther Caparrós. Coordinator of "Cátedra de Investigación en Cronicidad SEMERGEN UMH".

R&D Management

Panel sintetizador Comisión Digestivo, Cirugía y Metabolismo de la Acción Estratégica en Salud, Instituto de Salud Carlos III.

Evaluador proyectos Generación de Conocimiento, Agencia Estatal Investigación.

Evaluador programa Juan de la Cierva/Ramón y Cajal, Agencia Estatal Investigación.

Editorial Boards

Rubén Francés. Associate Editor. *Frontiers in Immunology* (2020-...).

interactions between the immune system and cancer, particularly liver cancer.

Our current projects focus on:

- The role of CD4+ T cells in hepatocellular carcinoma (HCC)
- The progression from hepatic steatosis to HCC
- The impact of sodium intake on the tumor microenvironment and the immune response against liver cancer

Staff

José Manuel González-Navajas (ORCID: 0000-0002-1591-939X)

PhD Students

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Joanna Picó Carrasco (ORCID: 0000-0003-0909-8094)

Technicians

Beatriz Lozano Ruiz (ORCID: 0000-0001-6714-7179)

Number of Congress Communications

National contributions: 2

Poster presentations: 2

International contributions: 2

Poster presentations: 1

Oral presentations: 1

Awards

Best Clinical Poster Award (Premio al "Mejor Póster Clínico"). 49 Congreso Anual de la Asociación Española para el Estudio del Hígado (AEEH). Dietary salt intake affects the Th17-dependent inflammatory profile of patients with cirrhosis and aggravates liver injury in mice. Madrid. 14-16/02/2024.

Governmental Projects and Funding

R01CA276642-01A1. Chronic exposure to house dust mites: a new risk factor for lung cancer in never smokers. 06/2023 – 05/2028. RO1 GRANT PROGRAM. NATIONAL CANCER INSTITUTE (NCI) – NATIONAL INSTITUTES OF HEALTH (NIH) OF

THE UNITED STATES OF AMERICA. PI: Eyal Raz. \$3.100.000

PI22/01907. A multi-cytokine blocking strategy to reduce HCC development and improve immune checkpoint inhibition therapy. INSTITUTO DE SALUD CARLOS III – MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES. 01/01/2023 – 31/12/2025. 245.000€. PI: José Manuel González Navajas.

CIPROM/2023/4. The MASLD – Inflammasome axis in inflammatory disease and tumor development. Programa PROMETEO para Grupos de Investigación de Excelencia. Conselleria de Educación, Cultura, Universidades y Empleo. Generalitat Valenciana. 01/09/2024 – 31/08/2028. 597.521€. PI: José Manuel González Navajas y Rodrigo Jover Martínez.

CNS2023-145676. Effect of salt intake on the efficacy of immune checkpoint inhibition therapy. Programa para la Consolidación Investigadora 2023. Agencia Estatal de Investigación (AEI) – Ministerio de Ciencia, Innovación y Universidades. 01/04/2024 – 31/12/2025. 198.432€. PI: José Manuel González Navajas.

Projects Submitted

CaixaResearch Health – Individual Projects. Spatial and single-cell transcriptomic analysis to elucidate the transition from steatosis to hepatocellular carcinoma. La Caixa Foundation. PI: José Manuel González Navajas.

R&D Management

Reviewer – Agencia Estatal de Investigación (AEI) (2018 – present) (JMGN).

Reviewer – Instituto de Salud Carlos III – Acción Estratégica en Salud (AES) (2013 – present) (JMGN).

Reviewer – Asociación Española Contra el Cáncer (AECC). (2021, 2023) (JMGN).

Reviewer for the Journals (in 2024): Cell Death & Differentiation, Frontiers in Immunology (JMGN).

Member of the Research Committee of ISABIAL – Hospital General Universitario Dr. Balmis – ISABIAL (2014 – present) (JMGN).

Member of the Ethics & Research Integrity Committee of IDiBE (2023 – present) (JMGN).

Deputy Coordinator of the Digestive Research Area of ISABIAL (2021 – present) (JMGN).

Member of the Organizing Committee – VII Researchers' Meeting of ISABIAL (JMGN).

External Member, Ph.D. evaluation committee for Ria Pinioti – KU Leuven, Leuven, Belgium (JMGN).

Editorial Boards

Associate Editor of *Frontiers in Immunology* (2020 – present) (JMGN).

Research group: Immunopharmacology of Liver Diseases

We develop translational research on immunopharmacology. Our research projects are mostly devoted to study the mechanism of action and the pharmacokinetic-pharmacodynamic relationship of drugs widely used in clinical practice in inflammatory diseases and cancer, especially in digestive diseases. In 2020, our studies were centered basically in:

1. Immunoregulatory effects of beta-blockers drugs in patients with cirrhosis in risk of development of hepatocellular carcinoma.
2. Role of inflammasome in the development of hepatocellular carcinoma.
3. Mechanism of action of antibiotics used to reduce bacterial translocation in patients with cirrhosis.
4. Pharmacokinetic-pharmacodynamic relationship of biological drugs used in inflammatory bowel diseases

Staff

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Rolando Illescas Quiroz

Isidro Aguado Sempere

Ana Hurtado Soriano

Publications

Baile-Maxía S, Mangas-Sanjuan C, Sala-Miquel N, Barquero C, Belda G, García-Del-Castillo G, García-Herola A, Penalva JC, Picó MD, Poveda MJ, de-Vera F, Zapater P, Jover R. Incidence, characteristics, and predictive factors of post-colonoscopy colorectal cancer. *United European Gastroenterol J.* 2024 Jan 17. doi: 10.1002/ueg2.12512. PMID: 38234220.

Bernabeu P, Belén-Galipienso O, van-der Hofstadt C, Gutiérrez A, Madero-Velázquez L, García Del Castillo G, García-Sepulcre MF, Aguas M, Zapater P, Rodríguez-Marín J, Ruiz-Cantero MT, Cameo JI, Jover R, Sempere L. Psychological burden and quality of life in newly diagnosed inflammatory bowel disease patients. *Front Psychol.* 2024 Jan 29;15:1334308. doi: 10.3389/fpsyg.2024.1334308. PMID: 38348263.

Martínez-López S, Ángel-Gomis E, Gómez-Hurtado I, Fernández-Iglesias A, Morante J, Gracia-Sancho J, Boix P, Cubero FJ, Zapater P, Caparrós E, Francés R. Cirrhosis-downregulated LSEctin can be retrieved by cytokines, shifts the TLR-induced LSECs secretome and correlates with the hepatic Th response. *Liver Int.* 2024 Jan 31. doi: 10.1111/liv.15836. PMID: 38293766.

Caparrós E, García-Martínez I, Pedro Zapater, Lucía Madero, Valverde ÁM, Ana Gutiérrez, Francés R. An altered expression of miR-376a-3p and miR-20a-5p in peripheral blood exosomes regulates the autophagy and inflammatory systemic substrates, and relates to the smoking habit and age in Crohn's disease. *FASEB J.* 2024 Jan

31;38(2):e23418. doi: 10.1096/fj.202301761R. PMID: 38226870.

Medina-Prado L, Sala-Miquel N, Aicart-Ramos M, López-Cardona J, Ponce-Romero M, Ortíz O, Pellisé M, Aguilera L, Díez-Redondo P, Núñez-Rodríguez H, Seoane A, Domper-Arnal MJ, Borao-Laguna C, González-Bernardo Ó, Suárez A, Muñoz-Tornero M, Bustamante-Balén M, Soutullo-Castiñeiras C, Balleste-Peris B, Esteban P, Jiménez-Gómez M, Albert M, Lucas J, Valdivieso-Cortázar E, López-Serrano A, Solano M, Tejedor-Tejada J, Trelles M, Zapater P, Jover R. Effect of the SARS-CoV-2 pandemic on colorectal cancer diagnosis and prognosis. *Cancer Med.* 2024 Mar;13(5):e6923. doi: 10.1002/cam4.6923. PMID: 38491824.

Gutiérrez A, Muñoz-Pérez R, Zapater P, Mira C, Rodríguez A, Sempere-Robles L, Torregrosa ME, Alfayate R, Moreno-Torres V, Bernal L, Belén-Galipienso O, Cameo JI, Sirera P, Herreros B, Bernabeu P, Moreno-Pérez O, Madero-Velázquez L. Inhibin B and antiMüllerian hormone as surrogate markers of fertility in male and female Crohn's disease patients: a case-control study. *Front Med (Lausanne).* 2024 Apr 25;11:1374603. doi: 10.3389/fmed.2024.1374603. PMID: 38725465.

Baile-Maxía S, Mangas-Sanjuán C, Ladabaum U, Sánchez-Ardila C, Sala-Miquel N, Hassan C, Rutter MD, Bretthauer M, Zapater P, Jover R. Risk factors for metachronous colorectal cancer or advanced lesions after endoscopic resection of serrated polyps: a systematic review and meta-analysis. *Gastrointest Endosc.* 2024 Oct;100(4):605-615.e14. doi: 10.1016/j.gie.2024.05.021. Epub 2024 Jun 6. PMID: 38851458.

Martinez-Moreno B, Martínez Martínez J, Herrera I, Guilabert L, Rodríguez-Soler M, Bellot P, Miralles C, Pascual S, Irúzun J, Zapater P, Palazón-Azorín JM, Gil Guillén V, Jover R, Aparicio JR. Correlation of endoscopic ultrasound-guided portal

pressure gradient measurements with hepatic venous pressure gradient: a prospective study. *Endoscopy.* 2024 Sep 3. doi: 10.1055/a-2369-0759. Epub ahead of print. PMID: 39025130.

Herrera I, Almenara S, Bellot P, Miralles C, Rodríguez M, Gómez-González L, Palazón JM, Pascual S, Zapater P. Tobacco is a Leading Risk Factor for Liver and Extrahepatic Cancers in Patients With Liver Cirrhosis: A Prospective Cohort Study. *J Clin Exp Hepatol.* 2024 Nov-Dec;14(6):101472. doi: 10.1016/j.jceh.2024.101472. Epub 2024 Jun 22. PMID: 39100888.

Martínez-Roca A, Cubiella J, García-Heredia A, Guill-Berbegal D, Baile-Maxía S, Mangas-Sanjuán C, Sala-Miquel N, Madero-Velázquez L, Alenda C, Zapater P, González-Núñez C, Iglesias-Gómez A, Codesido-Prado L, Díez-Marfín A, Kaminski MF, Erichsen R, Adamí HO, Ferlitsch M, Pellisé M, Holme Ø, Dekker E, Bretthauer M, Jover R; EPoS Study Group. Prediction of metachronous advanced colorectal neoplasia by KRAS mutation in polyps. *United European Gastroenterol J.* 2024 Nov;12(9):1179-1189. doi: 10.1002/ueg2.12667. Epub 2024 Oct 13. PMID: 39400528.

R&D Management

Revisor de la Agencia Estatal de Investigación (AEI).

Revisor de la Fundación Progreso y Salud, Consejería de Salud Andalucía

Miembro de la Comisión de Investigación Departamental – Hospital General Universitario de Alicante – ISABIAL

Miembro de los Comités de Ética de la Investigación de los Hospitales de San Juan y Orihuela

Miembro del Comités de Ética de la Investigación con Medicamentos del Hospital de Elche.

Unit/Group name: Infectious Diseases and HIV/AIDS Research Group – Hospital General Universitario de Elche

The Infectious Diseases and HIV/AIDS Research Group of the Hospital General

Universitario de Elche (HGUE), led by Dr. Félix Gutiérrez and Dr. Mar Masiá, is a

consolidated research group attached to the Fundación para el Fomento de la Investigación Sanitaria y Biomédica de la Comunitat Valenciana (FISABIO). The group is made up of 6 postdoctoral researchers, 5 predoctoral researchers, 2 research technicians/assistants, 2 statisticians, 1 project manager and 1 research nurse.

It is a multidisciplinary group (infectious disease specialists, microbiologists, biochemists, and statisticians) with a broad experience of more than two decades in infectious disease research that has made contributions to knowledge mainly in the fields of HIV/AIDS, respiratory infections, influenza pandemic and COVID-19.

Staff

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Catalina Robledano García

Jennifer Vallejo Rufino

Rafael Pascual Martínez

Publications

García-Abellán J, García JA, Padilla S, Fernández-González M, Agulló V, Mascarell P, Botella Á, Gutiérrez F, Masiá M. No accelerated progression of subclinical atherosclerosis with integrase strand transfer inhibitors compared to non-nucleoside reverse transcriptase inhibitors. *The Journal of Antimicrobial Chemotherapy* 2024 Oct 25; 80(1): 126–137. <https://doi.org/10.1093/jac/dkac383>

Gutiérrez F. Editorial comment on: Increased incidence of diabetes in people living with HIV treated with first-line integrase strand transfer inhibitors: A French multicentre retrospective study. *HIV Medicine* 2024 Sep 27; 26(1), 4–5. <https://doi.org/10.1111/hiv.13719>

Suárez-García I, Alejos B, Moreno C, Martín Torres J, Masiá M, García-Fraile LJ, Riera M, Dalmau D, Rodríguez-Rosado R, Muga R, Moreno S, Jarrín I & CoRIS cohort. Long-term effectiveness and tolerability of dolutegravir/lamivudine in treatment-naive people with HIV: an analysis of a multicentre cohort at 96 weeks. *The Journal of Antimicrobial Chemotherapy* 2024; Dec 23. <https://doi.org/10.1093/jac/dkac456>

Gutiérrez F, Fernández-González M, Ledesma C, Losada-Echeberría M, Barrajón-Catalán E, Masiá M. Insights on drug levels and non-sustained viral suppression with long-acting cabotegravir and rilpivirine therapy. *Clinical Infectious Diseases* 2024; Dec 13. <https://doi.org/10.1093/cid/ciae617>

Collins SP, Shotwell MS, Strich JR, Gibbs KW, de Wit M, Files DC, Harkins M, Hudock K, Merck LH, Moskowitz A, Apodaca KD, Barksdale A, Safdar B, Javaheri A, Sturek JM, Schragger H, Iovine NM, Tiffany B, Douglas I, Gutiérrez F, ... ACTIV-4 Host Tissue Investigators. Fostamatinib for hospitalized adults with COVID-19 and hypoxemia: A randomized clinical trial. *JAMA Network Open* 2024; Dec 3, 7(12),

e2448215.

<https://doi.org/10.1001/jamanetworkopen.2024.48215>

Garrido-Rodríguez V, Bulnes-Ramos Á, Olivas-Martínez I, Pozo-Balado MDM, Álvarez-Ríos AI, Gutiérrez F, Izquierdo R, García F, Tiraboschi JM, Vera-Méndez F, Peraire J, Rull A, Pacheco YM, & CoRIS cohort. The persistence of low CD4/CD8 ratio in chronic HIV-infection, despite ART suppression and normal CD4 levels, is associated with pre-therapy values of inflammation and thymic function. *Journal of Microbiology, Immunology, and Infection* 2024; Dec, 57(6), 854–867. <https://doi.org/10.1016/j.jmii.2024.08.007>

Gutiérrez F, Padilla S, García-Abellán J, Gutiérrez-Ortiz de la Tabla A, Ledesma C, Masiá, M. Cancer screening in people with HIV: Implementation in clinical practice and barriers perceived by medical specialists in Spain. *Enfermedades Infecciosas y Microbiología Clínica (English Ed)* 2024; Dec, 42(10), 563–569. <https://doi.org/10.1016/j.eimce.2024.01.007>

Gutiérrez F, Fernández-González M, Ledesma C, Losada-Echeberría M, Barrajón-Catalán E, García-Abellán J, De Stefano D, López L, Bello-Pérez M, Padilla S, Masiá M. Virological history predicts non-sustained viral suppression with long-acting cabotegravir and rilpivirine therapy, independent of pharmacokinetic parameters. *Clinical Infectious Diseases* 2024; Sep 19. <https://doi.org/10.1093/cid/ciae475>

Gutiérrez F, López L, Galera C, Tiraboschi JM, Portu J, García-Fraile L, García Del Toro M, Bernal E, Rivero A, García-Abellán J, Flores J, González-Cordón A, Martínez O, Bravo J, Rosado D, Montero M, Sirera G, Torralba M, Galindo MJ, ... IMPAC-Neo Study Group. Early detection of cancer and precancerous lesions in persons with HIV through a comprehensive cancer screening protocol. *Clinical Infectious Diseases* 2024; Jul 3. <https://doi.org/10.1093/cid/ciae359>

Masiá M, García JA, García-Abellán J, Padilla S, Fernández-González M, Agulló V, Gosalbes MJ, Ruíz-Pérez S, Mascarell P, Botella A, Gutiérrez F. Distinct gut

microbiota signatures associated with progression of atherosclerosis in people living with HIV. *The Journal of Infectious Diseases* 2024; May 14. <https://doi.org/10.1093/infdis/jiae243>

Padilla S, Ledesma C, García-Abellán J, García JA, Fernández-González M, de la Rica A, Galiana A, Gutiérrez F, Masiá M. Long COVID across SARS-CoV-2 variants, lineages, and sublineages. *iScience* 2024; Apr 19, 27(4), 109536. <https://doi.org/10.1016/j.isci.2024.109536>

Moyle G, Assoumou L, de Castro N, Post FA, Curran A, Rusconi S, De Wit S, Stephan C, Raffi F, Johnson M, Masia M, Vera J, Jones B, Grove R, Fletcher C, Duffy A, Morris K, Pozniak A, & NEAT ID Foundation and the WISARD study group. Switching to dolutegravir plus rilpivirine versus maintaining current antiretroviral therapy regimen in virologically suppressed people with HIV-1 and the Lys103Asn (K103N) mutation: 48-week results from a randomised, open-label pilot clinical trial. *The Lancet. HIV* 2024; Mar, 11(3), e156–e166. [https://doi.org/10.1016/S2352-3018\(23\)00292-8](https://doi.org/10.1016/S2352-3018(23)00292-8)

Number of Congress Communications

National contributions: 3

Oral presentations: 1

Poster presentations: 2

International contributions: 1

Poster presentations: 1

Governmental Projects and Funding

Factores inmunológicos, bacteriológicos y virológicos potencialmente implicados en la recurrencia de displasia anal de alto grado en personas con VIH. Instituto de Salud Carlos III (PI22/01949). 01/01/23 - 31/12/25. PI: Mar Masiá. Funding: 87.120,0€.

CIBER en Enfermedades Infecciosas. Instituto de Salud Carlos. Instituto de Salud Carlos III (CB21/13/00011). Desde 01/01/2022. PI: Félix Gutiérrez (Mar Masiá y otros miembros del grupo en el equipo investigador). Funding: 60.000,0 €.

Subvenciones para grupos de investigación consolidados (AICO/2021/205). Agencia financiadora: Fundación para el Fomento de la Investigación Sanitaria y Biomédica en la Comunitat Valenciana (FISABIO). 2021-2023. PI: Mar Masia. Funding: 90.000,00 €.

Private funding

VH4524184 Proof-of-Concept in Treatment-Naïve Adults Living with HIV-1. EudraCT: 2023-507173-18-00 Financiación: ViiV Healthcare UK Limited.

A study to evaluate the efficacy, safety, and tolerability of using an oral once-daily 2 drug regimen compared to an oral once-daily 3 drug regimen for the treatment of HIV-1 in adults who have not previously taken antiretroviral therapy. EudraCT: 2023-504993-40-00. Financiación: ViiV Healthcare UK Limited.

A Phase 3, Randomized, Active-Controlled, Double-Blind Clinical Study to Evaluate the Antiretroviral Activity, Safety, and Tolerability of Doravirine/Islatravir (DOR/ISL 100 mg/0.25 mg) Once-Daily in HIV-1 Infected Treatment-Naïve Participants. This protocol amendment is applicable only to participating EU countries. Número de protocolo: 053-02. Financiación: Merck Sharp & Dohme LLC - Ensayo clínico fase III aleatorizado, doble-ciego, multicéntrico que evalúa la eficacia y seguridad de dexametasona comparado con placebo en pacientes con gripe grave.(Ensayo FLUDEX). EudraCT: 2024-513209-30.

Projects Submitted

Subvenciones Programa Prometeo para grupos de investigación de excelencia. PROMETEO. Convocatoria 2024. PI: Mar Masia.

Proyecto I+D+I en Salud PI24/02000 en la convocatoria Acción Estratégica en Salud 2024. PI: Félix Gutiérrez.

Contrato Río Hortega CM24/00232 en la convocatoria Acción Estratégica en Salud 2024. PI: Paula Mascarell.

Proyecto BECASPRO: Characterization of the postpartum period in women living with HIV in the multicenter, convocatoria 2024. PI: Mar Masia y Rebeca Izquierdo.

Convocatoria Unisalut. ILISABIO. Acciones preparatorias. PI: Melissa Belló y Asia Fernández. Acrónimo: RESERVIH. Número de solicitud: 1.

Convocatoria: Subvenciones a grupos de investigación emergentes. GE. PI: Melissa Belló. Acrónimo: BANDERA. Título: Identificación de biomarcadores para el diagnóstico no invasivo de lesiones precancerosas anales en pacientes con alto riesgo de infección por el virus del papiloma humano (HPV). Número de registro: GVRTE/2024/5571727.

Ayudas a la investigación Fundación Eugenio Rodríguez Pascual. Expediente: FERP-2024-087. PI: Melissa Belló Pérez. Título: Caracterización de los reservorios de VIH en pacientes con diferentes respuestas al tratamiento antirretroviral y diseño de una herramienta de predicción de viremias de bajo grado.

CONVOCATORIA 2024 DE AYUDAS A PROYECTOS DE INVESTIGACIÓN EN EL CAMPO DE LA INMUNOLOGIA TUMORAL. PI: Melissa Belló Pérez.

R&D and Educational Committees

Directora del Comité de Ética del Hospital de Elche: Mar Masia.

Coordinación Unidad Mixta HGUE-IDiBE: Félix Gutiérrez.

Director del Departamento de Medicina Clínica de la UMH: Félix Gutiérrez.

Director del Máster en Enfermedades Infecciosas y Saludo internacional de la UMH: Félix Gutiérrez.

Jefe de Estudios del Hospital General Universitario de Elche: Félix Gutiérrez.

Directora del Programa de Doctorado de Salud Pública, Ciencias Médicas y Quirúrgicas de la UMH: Mar Masia.

R&D Management

Reviewer in journals such as JAMA, CID, AIDS and Journal of Antimicrobial Chemotherapy: Mar Masia.

Associate editor asociada de BMC Infectious Diseases y European Journal of Medical Research: Mar Masia.

Reviewer in journals such as Lancet Infectious Diseases, Clinical Infectious

Unit/Group name: **INDUSTRIAL DEVELOPMENTS FOR HEALTH INGREDIENTS**

In order to cover the basic activities in the field of biotechnology, it is possible to define a biotechnology product as a good or service, the development of which requires the use of one or more biotechnology techniques. On the other hand, into the specific area of “industrial biotechnology” it is convenient to highlight that scientific and technological complexity are also inherent to biotechnology and consequently, it should be understood that interfaces and overlaps among other techniques.

The main lines in that area are:

1. Optimization of industrial processes for functional beverages production and waste management for nutraceutical ingredients with a bio-economy perspective.
2. Semi-industrial scale production of nutraceuticals from plants, herbs or by-products.
3. Identification & Purification of bioactive molecules from waste management, and small-scale production herein for agricultural biological pest control.
4. Identification, isolation, culture development and pilot plant scale production of microorganisms for agriculture and feedstock.
5. Development of new nutritional products from fermentation processes.

Staff

Nuria Martí Bruña (ORCID: 0000-0003-1820-9593)

Maria Concepción Martínez Madrid (ORCID: 0000-0003-3231-3995)

Domingo Saura López (ORCID: 0000-0003-4711-0744)

Manuel Valero Roche (ORCID: 0000-0002-4662-5730)

Postdoctoral Researchers

Bryan Moreno Chamba (ORCID: 0000-0002-4263-2239)

External collaborators integrated in the group

Dr. Madalina Neacsu (ORCID: 0000-0002-3875-2764). Rowett Institute, University of Aberdeen, Scotland, UK.

Dr. Sylvia H. Duncan (ORCID: 0000-0002-4903-0978). Rowett Institute, University of Aberdeen, Scotland, UK.

Dr. Farah Hosseinian (ORCID: 0000-0002-8278-3226). Institute of Biochemistry, Carleton University, Ottawa, Canada.

Dr. Pedro Mena Parreño (ORCID: 0000-0003-2150-2977). Department of Food and Drugs. Università degli Studi di Parma.

Dr. Victoria Lizama Abad (ORCID: 0000-0002-1677-6909). Institute of Food Engineering-FoodUPV, Universitat Politècnica de València, Valencia, Spain.

Dr. Francisco Martín Bermudo (ORCID: 0000-0002-5745-8704). Centro Andaluz de Biología Molecular y Medicina Regenerativa, Universidad Pablo de Olavide, Sevilla, Spain.

Dr. Genoveva Berná (ORCID: 0000-0001-8185-8428). Biología Molecular e Ingeniería Bioquímica. Universidad Pablo de Olavide, Sevilla, Spain.

PhD Students

Julio Salazar Bermeo (ORCID: 0000-0002-8920-9817)

Sergio Navarro Covas

Karol Lizeth Espinoza Solorzano

Publications

Moreno-Chamba B, Salazar-Bermeo J, Hosseinian F, Martín-Bermudo F, Aguado M, de la Torre R, Martínez-Madid MC, Valero M, Martí N, Saura D. Aromatic and cannabinoid profiles of Cannabis inflorescences and seed oils: A comprehensive approach for variety characterization. *Ind. Crops Prod.* 2024

Apr;210. 118143. doi:
10.1016/j.indcrop.2024.118143

López-Bermudo L, Moreno-Chamba B, Salazar-Bermeo J, Hayward NJ, Morris A, Duncan GJ, Russell WR, Cárdenas A, Ortega A, Escudero-López B, Berná G, Martí-Bruñá N, Duncan SH, Neacsu M, Martín F. Persimmon fiber-rich ingredients promote anti-inflammatory responses and the growth of beneficial anti-inflammatory Firmicutes species from the human colon. *Nutrients* 2024 Aug 01;16(15), 2518. doi: 10.3390/nu16152518

Moreno-Chamba B, Salazar-Bermeo J, Narváez-Asensio M, Navarro-Simarro P, Saura D, Neacsu M, Martí N, Valero M, Martínez-Madrid MC. Polyphenolic extracts from *Diospyros kaki* and *Vitis vinifera* by-products stimulate cytoprotective effects in bacteria-cell host interactions by mediation of transcription factor Nrf2. *Phytomedicine* 2024 Nov;134. 156020. doi: 10.1016/j.phymed.2024.156020

Patents

Inventores: Saura D, Barrajón-Catalán E, Martí N, Martínez R, Micol V, Valero M, Vegara Gomez S. Título: Contrato de licencia de patente 201300578 "Combinación sinérgica de flavonoides y vitamina C". Titular: MITRA SOL TECHNOLOGIES SL. Fecha inicio: 13/05/2016. Fecha fin: 12/05/2033. Referencia patente: 201300578.

Inventores: Saura D, Barrajón-Catalán E, Rodríguez Díaz JC, Tomás Menor L, Martí N, Micol V. Título: Contrato de licencia de patente 201301181 "Preparado hecho a base de una combinación sinérgica de polifenoles con actividad antibiótica". Titular: MITRA SOL TECHNOLOGIES SL. Fecha inicio: 13/05/2016. Fecha fin: 12/05/2033. Referencia patente: 201301181.

Inventores: Saura D, Barrajón-Catalán E, Martí N, Martínez R, Micol V, Valero M, Vegara Gomez, S. Título: Contrato de licencia de patente 201301183 "Método de producción de pectina modificada de cítricos". Titular: MITRA SOL TECHNOLOGIES SL. Fecha inicio: 13/05/2016. Fecha fin: 12/05/2033. Referencia patente: 201301183.

Inventores: Saura D, Martí N, Micol V, Valero M. Título: Contrato de licencia patente 201500423. Titular: MITRA SOL TECHNOLOGIES SL. Fecha inicio: 27/03/2013. Fecha fin: 05/06/2035. Referencia patente: 201500423.

Inventores: Saura D, Berenguer Martínez MDR, Martí N, Micol V, Valero M, Vegara Gomez S. Título: Contrato de licencia 201200830 "Equipo de expansión instantánea a vacío y ultrasonidos". Titular: MITRA SOL TECHNOLOGIES SL. Fecha inicio: 13/05/2016. Fecha fin: 12/05/2032. Referencia patente: 201200830.

Inventores: Saura D, Martí N, M Martínez-Madrid MC. Título: Envase para bebidas nutricionales. Propietario: UNIVERSIDAD MIGUEL HERNANDEZ DE ELCHE. Fecha solicitud: 30/04/2020. Fecha concesión: 04/03/2022. Referencia: P202030369.

PhD Theses

Title: Bounded polyphenols from persimmon by-products: Modulatory, anti-virulence and cytoprotective effects against bacterial pathogens. Student: Bryan Moreno Chamba. Advisor: Dra. Nuria Martí Bruñá and Dr. Manuel Valero Roche. 29/07/2024. <https://www.educacion.gob.es/teseo/teseo/imprimirFichaHco.do?idFicha=848168>

Title: Simbiosis industrial en el aprovechamiento del residuo del caqui para la elaboración de productos formulados con bioactivos. Student: Sara Gea Botella. Advisor: Dr. Domingo Saura López and Dr. Manuel Valero Roche. 22/10/2024. <https://www.educacion.gob.es/teseo/teseo/imprimirFichaHco.do?idFicha=856275>

Number of Congress Communications

National contributions: 3

Poster presentations: 2

Oral presentations: 1

International contributions: 3

Poster presentations: 3

Awards

Premios Santander-UMH para jóvenes investigadores: Julio Salazar Bermeo.

Private funding: Technical Services and Assistance

Contrato para la realización del trabajo "Estudio de proteínas de origen vegetal como ingrediente de una formulación de huevo vegano". Investigador(es) Marti N, Martínez-Madrid MC, Moreno Chamba BM, Saura D, Valero, M. Fecha inicio: 23/10/2024. Fecha fin: 31/12/2024. Importe anualidad: 10000 €.

Projects Submitted

AICO GV. CIAICO - GRUPOS DE INVESTIGACIÓN CONSOLIDADOS.

PROYECTOS DE GENERACIÓN DE CONOCIMIENTO 2024. Referencia administrativa: PID2024-162743OB-I00 Modalidad B.

Editorial Boards

Board member Horticulturae.

Board member Food Microbiology (2010-2024) Manuel Valero Roche.

PhD THESES (2024)

Title: **DIRECT CONVERSION AND MICROFLUIDIC CHAMBERS AS TOOLS TO STUDY THE IN-VIVO SKETCHOF HUMAN SENSORY NEURONS**

PhD student: Dña. Simona Giorgi

Defense date: 23/02/2024

Supervisors: Dr. Antonio Vicente Ferrer Montiel and Dra. Asia Fernández Carvajal

URL: <https://www.educacion.gob.es/teseo/teseo/imprimirFichaHco.do?idFicha=835218>

Title: **BOUNDED POLYPHENOLS FROM PERSIMMON BY- PRODUCTS: MODULATORY, ANTI-VIRULENCE ANDCYTOPROTECTIVE EFFECTS AGAINST BACTERIAL PATHOGENS**

PhD student: D. Bryan Mauricio Moreno Chamba

Defense date: 29/07/2024

Supervisors: Dr. Manuel Valero Roche and Dra. Nuria Martí Bruñá

URL: <https://www.educacion.gob.es/teseo/teseo/imprimirFichaHco.do?idFicha=848168>

Title: **SIMBIOSIS INDUSTRIAL EN EL APROVECHAMIENTO DEL RESIDUO DEL CAQUI PARA LAELABORACIÓN DE PRODUCTOS FORMULADOS CON BIOACTIVOS**

PhD student: Dña. Sara Gea Botella

Defense date: 21/10/2024

Supervisors: Dr. Domingo Saura López and Dr. Manuel Valero Roche

URL: <https://www.educacion.gob.es/teseo/teseo/imprimirFichaHco.do?idFicha=856275>

SEMINARS (2024)

Master's seminars

Title: **VIVIR EN TORNO AL SOL...DE UNA FORMA SALUDABLE!**

Speaker / Institution: José Aguilera Arjona, Universidad de Málaga

Date: 26/01/2024

Title: **EL VINO COMO MODELO DE ESTUDIO EN ECOLOGÍA Y EVOLUCIÓN MICROBIANAS**

Speaker / Institution: Dr. Ignacio Belda Aguilar, Universidad Complutense de Madrid

Date: 09/02/2024

Title: **WHAT THE STRUCTURES OF AMYLOIDS TEACH US ABOUT AMYLOID PATHOLOGY**

Speaker / Institution: Dr. Frederic Rousseau and Dr. Joost Schymkowitz, VIB-KU Leuven Center for Brain & Disease Research

Date: 01/03/2024

Title: **NUESTROS AMIGOS LOS VIRUS**

Speaker / Institution: Dr. Manuel Martínez García, Universidad de Alicante

Date: 06/03/2024

Title: **¿CÓMO ENTRAN LOS VIRUS ZONÓTICOS EN NUESTRAS CÉLULAS?**

Speaker / Institution: Dr. Rafael San Juan, Universidad de Valencia – Instituto de Biología Integrativa de Sistemas (I2SysBio)

Date: 26/04/2024

Title: **EL NAD+ Y LA SALUD HUMANA. DESARROLLO BIOTECNOLÓGICO DE NUEVOS POTENCIADORES DE NAD+**

Speaker / Institution: : Dr. Álvaro Sánchez Ferrer, Departamento de Bioquímica y Biología Molecular, Universidad de Murcia

Date: 03/05/2024

Title: **EMERGING APPROACHES TO IMPROVE FISH LARVAE HEALTH**

Speaker / Institution: Dra. Ana Santos Rocha, CIIMAR, Universidad de Oporto

Date: 08/11/2024

Title: **REDOX CHANGES IN HEALTH AND DISEASE: NEW TOOLS BRING NEW INSIGHTS**

Speaker / Institution: Dra. Leticia Prates Roma, Zentrum für Human- und Molekularbiologie - Universität des Saarlandes

Date: 22/11/2024

Doctoral seminars

Title: **THE LINKS BETWEEN OBESITY AND CHILDHOOD LEUKEMIA**

Speaker / Institution: Steve Mittelman. University of California Los Angeles

Date: 28/10/2024

Title: **NO TIME TO DIE: STRATEGIES TO IMPROVE ISLET SURVIVAL AFTER TRANSPLANTATION**

Speaker / Institution: Emmanuel Ampofo. Institut für Klinisch-Experimentelle Chirurgie,
Universität des Saarlandes

Date: 22/11/2024

Others

Title: **VI WORKSHOP “WHAT IS GOING ON IN DIABETES RESEARCH?”**

Speaker / Institution: Dra. Laura Marroquí and Dr. Reinaldo S. Dos Santos

Date: 14/11/2024

Title: **I WORKSHOP “INMUNOLOGÍA, NUTRICIÓN Y BIENESTAR EN ACUICULTURA”**

Speaker / Institution: Dra. María del Mar Ortega-Villaizán (IDiBE- UMH) and Dra. Verónica
Chico (IDiBE-UMH)

Date: 03/12/2024

Financial and administrative management

General Manager

María Amparo García Gutiérrez / Javier Casanova Miralles

Logistic Coordinator

Eva del Río Pons

Administration team

Francisca Molino Tomás (Officer)

Vicente Lucerga Serrano

María Teresa Mora Cano

Rosa María Balonga Rodríguez

María Teresa Prieto Ávila

Laura Escarabajal Menárguez

Mónica Ballester Millán

María Luisa Chamorro González

Innovation Office

Gabriel Estañ Cerezo

Alejandra Lucía Terol Díaz-Rodríguez / Francisco Javier Martínez Hernández

The Innovation Office is working on the transfer of the obtained research results by IDiBE's researchers. Its staff consists of two people: Gabriel Estañ Cerezo and Alejandra Lucía Terol and it is funded by the Agencia Valenciana de la Innovación (AVI) through three projects (INNTA1/2023/17, INNVA2/2022/8 and INNVA2/2024/3). INNVA2/2022/8 ended in September and INNVA2/2024/3 was granted in 2024, starting in October.

The Innovation Office identifies funding opportunities (regional, national and international), reviews grant proposals, seeks new partners (universities and innovative companies) and provides advice on how to protect and transfer research results (one patent application was filled during 2024). Additionally, the Innovation Office manages IDiBE's LinkedIn account and updates its website, including news publications. During 2024, The Innovation Office has also coordinated several training activities such as:

- Public procurement of innovation (Tantum Consultores; 12/03/2024).
- EIC: first level European funding opportunity (Zirka Innotech; 29/04/2024).
- Augmented Innovation: Generative AI to manage innovation, or wherever you work (Innolandia; 30/04-07 and 14/05/2024).
- Organ-on-chip made easy (BeOnChip; 10/07/2024).
- QF-Pro technology for detecting protein-protein interactions (Hawk Biosystems; 16/09/2024).

Other works carried out by the Innovation Office were done in order create new marketing materials in PDF and in paper about IDiBE and our core technologies and two videos about IDiBE and the Innovation Office. Thus, the organization of the visits of some relevant stakeholders to IDiBE as the General Directors of Research Rafael Sebastián (21/02/2024) and Innovation Juan José Vélez (05/04/2024). In addition, the Innovation Office has organized the II HGUE-IDiBE Researchers meeting (05/06/2024), the second Young Researchers day (19/12/2024), and the participation of IDiBE in the congresses Farmaforum (25-26/09/2024), Alicante Conexión Salud Forum (10/06/2024), or AGROALNEXT (06-08/03/2024). Also, the Innovation Office has promoted the BOWIE Initiative: Bringing Oncology Work to Innovation in Elx with researchers from IDiBE and the General Hospital of Elche.

Finally, the Innovation Officer, Gabriel Estañ, has coordinate two creativity sessions with ISABIAL (23/04/2024) and FISABIO (17/04/2024) researchers and he has delivered some public presentations about entrepreneurship such as in the BioSouth Congress (02/03/2024) or about the IDiBE capabilities such the Blue Economy Day, organized by Bioval (03/07/2024), and others.

Technicians in charge of major scientific instruments of IDiBE

Microscopy and Bioprinting Units of IDiBE

Enrique Rodríguez Cañas

Mass Cytometry Unit of IDiBE

Dra. Marta Rubio Camacho

Agreements

- Center for Therapeutic Innovation (CTI), University of Bath, for the secondments of researchers and PhD students.

Bibliometrics of publications

| Number of publications (WoS) | % of Q1 (D1) | Mean impact factor | Total impact factor |
|------------------------------|--------------|--------------------|---------------------|
| 79 | 81 (38) | 14.31 | 572 |

Dissemination

- Centre for Therapeutic Innovation (University of Bath) and IDiBE online seminars:
 - “Atención a los canales iónicos TRPM8 sensibles al frío para aliviar la sintomatología relacionada con la migraña”. Dr. David Cabañero Ferri, Senior Researcher in the Peripheral Neuropathies Group. 24/09/2024.
 - “Biomateriales integradores inteligentes de novo para la atención sanitaria”. Dra. Nazia Mherban. 24/10/2024.
 - “Descifrando la diabetes tipo 1: la interacción entre la genética, los desencadenantes ambientales y las respuestas inmunes innatas impulsadas por los interferones tipo I”. Dr. Reinaldo Sousa and Dra. Laura Marroquí in the Diabetes Research Unit. 20/11/2024.
- Outreach seminars “Ciencia con tapas”:
 - INTERNATIONAL DAY OF WOMEN AND GIRLS IN SCIENCE DAY AT IDiBE: “Investigadoras en biotecnología sanitaria, Aula de la Plaça de Baix (Elche). Marcela Giudici Besseghini y Nuria Martí Bruña. 13/02/2024.
 - SCIENCE OUTREACH DAY “CIENCIA CON TAPAS” in the framework of “LA FERIA DE LA CIENCIA Y LA TECNOLOGÍA DE ELCHE” (FeCyT): “El papel de la ciencia y la tecnología en la lucha contra el cambio climático actual”, edificio Valona, UMH, (Elche), Dr. Jorge Olcina Cantos. 17/05/2024.
 - “Migraña: Comprendiendo el dolor, buscando soluciones”, edificio Valona, UMH, (Elche). Dr. Antonio Ferrer and Dr. Luis Gómez. 12/11/2024.
- IDiBE-UMH Open doors/Guided tours for high school and college students:
 - IES La Asunción de Elche (24/05/2024)
 - IES Maciá Abela de Crevillente (11/10/2024)
- Jornada Científica IDiBE 2024, 19/07/2024.
- I Jornada IDiBE CUENTA, Unidad de Investigación Básica en Diabetes 14/11/2024.

Impact on Honorary Doctorates and Scientific Awards

- IDiBE proposed Dr. Luis Serrano Pubul, Director of the Centre for Genomic Regulation, for the title of Doctor Honoris Causa at Miguel Hernández University, which subsequently conferred it upon him. 25/01/2024.
- IDiBE nominated Dr. Luis Serrano Pubul for the 2024 Jaume I Award in New Technologies and he was awarded.

Entrepreneurship

- Prospera Biotech SL
- AntalGenics SL
- Hawk Biosystems SL
- Mitra Solutions Technologies SL
- Innovation Labo

Clinical development

- **Acoltremon** (AVX-012) concludes phase III clinical trial in USA with positive results for dry eye syndrome and a NDA application is submitted to the FDA. Sponsors: Alcon.
- **Oncapsisens**, a novel formulation for alleviating symptoms of chemotherapy induced neuropathy concludes a phase II clinical study with positive effects preventing the neuropathy in hands, and reducing its severity. Sponsor: Prospera Biotech.
- **Vulvisens**, a novel formulation women intimate care is launched. Sponsor: Prospera Biotech.
- **Parentide®** continues in phase II clinical trials for chronic surgical pain. Sponsor: BCN Peptides.
- **Bicalutamide** is advancing to phase II clinical trials for treating Sanfilippo syndrome. Sponsor BCN Peptides
- **AG1529** halts regulated pre-clinical safety studies to reformulate the ointment. Sponsor: AntalGenics.

ANNUAL REPORT 2024

**INSTITUTE OF RESEARCH, DEVELOPMENT, AND
INNOVATION IN HEALTHCARE BIOTECHNOLOGY
IN ELCHE**

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