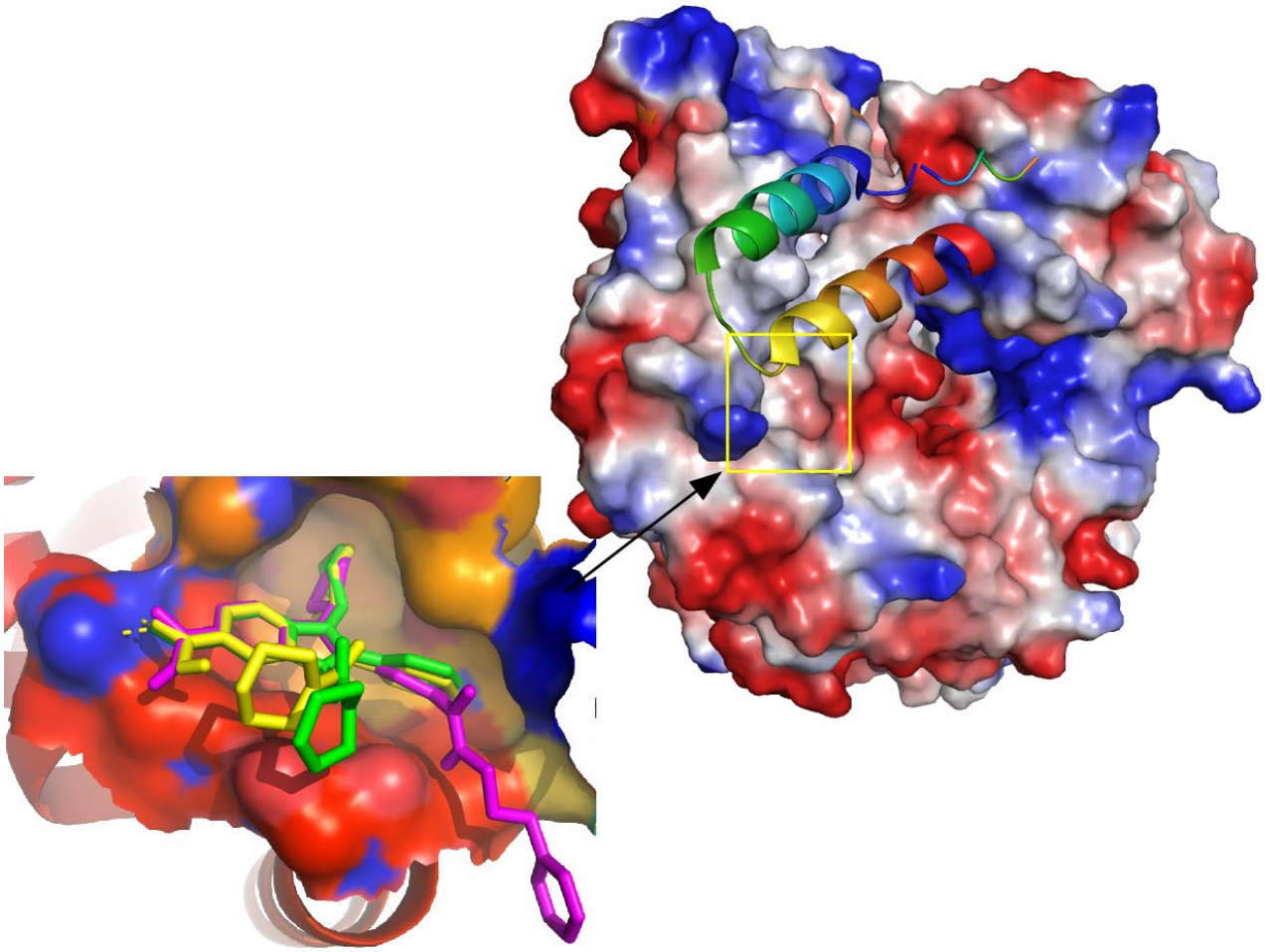
ANNUAL REPORT 2022



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

UNIVERSITY "MIGUEL HERNÁNDEZ"

IDiBE
UNIVERSITAS
Miguel Hernández

DIRECTOR'S FOREWORD

The Institute of Research, Development, and Innovation in Healthcare Biotechnology in Elche (IDiBE) is one of the University Research Institutes at the University *Miguel Hernandez de Elche*. The IDiBE 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 26 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 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 our Plan of Actions.

As in previous years, our groups have been active in securing funding from both governmental and private sources (up to 2.5 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 our out-reach programs (Science with tapas; And you, what do you research on?, International Day of Women and Girls in Science) In addition, we have consolidated the Master Degree in Biotechnology and Bioingeneering with the Institute of Bioingeneering that is becoming a national reference in the field. In addition, we continued with the Eramus mundus European Master on translational cosmetic and dermatological sciences with the Universities of Piemonte Orientale (Italy), Namur (Belgium) and Humboldt (Germany). 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 3 lead compounds in clinical development and one in pre-clinical. 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 2022 have been: (i) an increment in technology transfer actions to the productive sectors of our society through the innovation office; (ii) incorporation of a unit for business development (UCIE) funded by the AVI-GVA to further potentiate translation and exploitation of results; (iii) reaching an 85% of publications in Q1 journals; (iv) acquisition of innovative infrastructures funded by the GVA and the EU that have provided new technologies that will allow the Institute to embark on more competitive projects; and, (iii) getting a score of Excellent for our application to the seal of excellence María de Maeztu. Furthermore, we concluded the accommodation of a BL-2 laboratory in the Institute which will allow developing additional projects. This is in line with our current Plan of Action (2019-2022) that establishes the central mission to consolidate a innovative, interdisciplinary and international (3I) research program in the area of Healthcare Biotechnology.

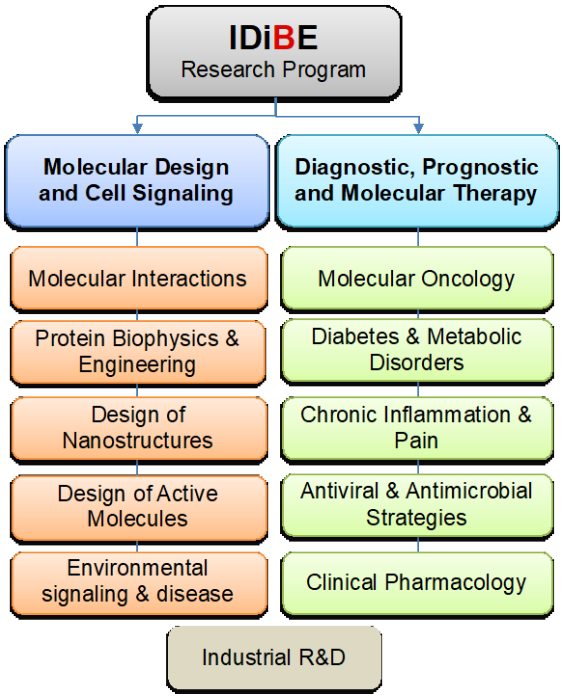
Prof. Antonio Ferrer-Montiel

IDiBE director

STRUCTURE AND GENERAL DESCRIPTION

The IDiBE Action Plan for 2019-2022

The IDiBE R&D program is organized in two major research lines that cover all the activities carried out by our teams. These lines are: (i) **Molecular Design and Cell Signaling** and, (ii) **Molecular Diagnostic, Prognostic and Therapy**. Each line is structured in specific sublines that accurately define the actions of the different groups, and also highlight the channels of communication between both research lines, which is essential for exploiting the synergies that emerge from the multidisciplinarity. **An industrial R&D** line for natural extracts complements the research lines. This organization also favors internal collaborations, sharing the infrastructures, and a more rational and productive use of all resources, including the technological platforms. Consequently, in the next four-year period, the IDiBE aspires to become a center of reference in the discovery of pharmacological and biotechnological tools, with a clear translational and transfer potential. The intense and sustain work in this line is the central objective for the next four-year period, and to so agreements with PROs will be pursued which will permit reinforcing deficient areas or those that require an impetus for their consolidation, and thereby generating a unique and unprecedented project on a national and international level.



R&D organization

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

A. Molecular Design and Cell Signaling

The main objective of this research line is to advance our knowledge in the structure-function relations of small molecules and macromolecules with the aim of transforming 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. An additional objective of this research line is to understand the cell signaling mechanisms used by environmental signals such as endocrine disruptors and other pollutants that may be the underlying cause of diseases with an increase prevalence. These studies aim to identify the molecular composition of the signaling mechanisms and to validate targets for drug intervention. Environmentally-mediated disease or aggravation of

human disease is an emerging societal challenge directly linked to progress in western countries and heavy contamination in poor countries.

This research line involves 8 research groups. The different scientific backgrounds of the researchers involved allows for a multidisciplinary approach of the societal and technological challenges investigated. The main research fields under this core line are:

1. Molecular interactions, protein biophysics, and engineering. 2. Design and validation of nanostructures. 3. Design of active molecules. 4. Environmental signaling and disease.

B. Molecular Diagnostic, Prognostic, and Therapy

The research line for Molecular Diagnostic, Prognostic, and Therapy pursues the identification and validation of molecular markers in human and animal pathologies of high prevalence, as well as the development of diagnostic and prognostic methods and therapeutic or preventive strategies. This research line is made up of a multi-disciplinary research team, which covers from molecular aspects to semi-industrial biological actives. This multidisciplinarity is sustained by the contribution of 8 consolidated groups, which provide a balanced composition that favors a high competitiveness in scientific contributions, raising resources, training research staff and generating exploitable and transferable technologies.

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 which make up this line of research has reinforced the identification of synergies and common interests between groups, promoting collaborations which 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 a close collaboration with the University Hospitals of Elche and Alicante, 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 the industrial developments (including products and processes for healthcare biotechnology).

1. Molecular Oncology. 2. Diabetes and Metabolic disorders. 3. Chronic inflammation and pain. 4. Antiviral and antimicrobial strategies. 5. Clinical pharmacology.

MOLECULAR DESIGN AND CELL SIGNALING

MOLECULAR DESIGN AND CELL SIGNALING

Molecular Recognition and Protein Biophysics and Engineering

Group name: BIOTHERMODYNAMICS OF MOLECULAR RECOGNITION PROCESSES

Our group is involved two main research lines. On the one hand, Dr. Neira leads the research dealing with the biophysical characterization the biomolecules and interactions involved in in the phosphorylation transfer in micro-organisms, the assembly of the capsid of HIV and intrinsically disordered proteins implicated in pancreatic cancer. On the other, Dr. Gómez research activities focus on the design and characterization of nano and microparticles coated with polyelectrolytes to be used in the transport and controlled delivery of different biomolecules, the storage of labile biomolecules used as drugs and the capture and recovery of different pollutants in continental waters.

Staff

Javier Gómez Pérez (ORCID: 0000-0001-9612-5075)

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

Rocío Esquembre Tomé (ORCID: 0000-0002-9054-9106)

Postdoctoral Researchers

Felipe Hornos Adán (ORCID: 0000-0002-9360-4086)

Technicians

Elisa Pérez García

Publications

Esquembre R, Renart ML, Poveda JA, Mateo CR. Silica/Proteoliposomal Nanocomposite as a Potential Platform for Ion Channel Studies. Molecules. 2022; 27(19):6658. doi.org/10.3390/molecules27196658

Neira JL, Araujo-Abad S, Cámara-Artigas A, Rizzuti B, Abian O, Giudici AM, Velazquez-Campoy A, de Juan Romero C. Biochemical and biophysical characterization of PADI4 supports its involvement in cancer. Arch Biochem Biophys. 2022 Mar 15;717:109125. doi: 10.1016/j.abb.2022.109125. Epub 2022 Jan 23. PMID: 35081374.

Neira JL, Rizzuti B, Abián O, Araujo-Abad S, Velázquez-Campoy A, de Juan Romero C. Human Enzyme PADI4 Binds to the Nuclear Carrier Importin a3. Cells. 2022 Jul 11;11(14):2166. doi: 10.3390/cells11142166.

Science dissemination: outreach activities

Científicos detectan la unión de dos proteínas que intervienen en el cáncer (infosalus.com). José Luis Neira.

PADI4: La proteína desertora de las filas del cuerpo humano - iDescubre (fundaciondescubre.es). José Luis Neira.

Number of Congress Communications

National contributions: 2

Poster presentations: 2

Governmental Projects and Funding

Biosensors for marine environmental monitoring: control of the ecotoxicological status of coral reefs (BioSensReef). 1/12/2022 - PROYECTOS DE TRANSICIÓN ECOLÓGICA Y TRANSICIÓN DIGITAL 2021 (TED2021-129894B-I00) UA-UMH AGENCIA ESTATAL DE INVESTIGACIÓN MINISTERIO DE CIENCIA E INNOVACIÓN. IPs: Montilla Jiménez (UA)/C. Reyes Mateo Martínez (UMH).

Biosensores de transducción combinada basados en matrices híbridas multienzimáticas (BioFLEC). 25/09/2022 - 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. IPs: Montilla Jiménez (UA)/C. Reyes Mateo Martínez (UMH).

Unidad preclínica para cuantificar interacciones moleculares para optimizar candidatos a fármacos. 01/01/2021 - Programa Operativo del Fondo Europeo de Desarrollo Regional (FEDER) de la Comunitat Valenciana. (IDIFEDER/2021/036) UMH. CONSELLERIA DE INNOVACIÓN, UNIVERSIDADES, CIENCIA Y SOCIEDAD DIGITAL. GENERALITAT VALENCIANA. IP: Antonio Ferrer (UMH).

Nuevas estrategias contra el cáncer: inhibición de las interacciones moleculares de las proteínas deiminasas de arginina. Subvenciones para grupos de investigación consolidados – AICO 2022, (CIAICO/2021/135) FISABIO CONSELLERIA DE INNOVACIÓN, UNIVERSIDADES, CIENCIA Y SOCIEDAD DIGITAL. GENERALITAT VALENCIANA. IPs: Camino de Juan Romero, José Luis Neira Faleiro.

QuiRLab: Digitalización del material de laboratorio mediante etiquetado de códigos QR. 01/01/2022 – 31/12/2022. Rocío Esquembre Tomé.

R&D Management

Reviewer of CONICET (JLN) (2008-…).

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

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

Reviewer of ERC (JLN) (2018-…).

Editorial Boards

Editor Archives of Biochemistry and Biophysics (2013-…). José L. Neira.

Group name: FLUORESCENT NANOMATERIALS APPLIED BIOTECHNOLOGY

Our group is interested in the development of new fluorescent materials with applications in biological systems. On one hand, we design and develop fluorescent biosensors with high sensitivity, based on the entrapment of organic molecules and biomolecules in inorganic and organic matrices, and characterize these hybrid materials at a molecular level in order to improve their applications. On the other hand, we work on the design of fluorescent and photothermal nanoparticles in applications such as bioimaging, controlled drug delivery, and sensing devices for biomolecules. Other group activities include the characterization of macromolecular interactions, especially in non-conventional systems, such as hydrogels and deep eutectic solvents, and the development of tunable plasmonic nanohybrids for photoactivated biocatalysis.

Staff

Carmen Reyes Mateo Martínez (ORCID: 0000-0002-2085-1676)

Mª José Martínez Tomé (ORCID: 0000-0002-7042-2642)

External collaborators integrated in the group

Francisco Montilla (0000-0003-4769-9130)

Ph. D Students

Yolanda Inmaculada Alacid Martínez (ORCID: 0000-0003-2762-449X)

Technicians

Elisa Pérez García

Publications

Alacid Y, Quintero Jaime AF, Martínez-Tomé MJ, Mateo CR, Montilla F. Disposable Electrochemical Biosensor Based on the Inhibition of Alkaline Phosphatase Encapsulated in Acrylamide Hydrogels. Biosensors. 2022; 12(9):698. doi.org/10.3390/bios12090698

Esquembre R, Renart ML, Poveda JA, Mateo CR. Silica/Proteoliposomal Nanocomposite as a Potential Platform for Ion Channel Studies. Molecules. 2022; 27(19):6658. doi.org/10.3390/molecules27196658

PhD Theses

Título: Desarrollo de nuevas nanoformulaciones terapeúticas. Student: Marta Rubio-Camacho. Supervisors: C.R. Mateo and M.J. Martinez Tomé. Qualification: Sobresaliente Cum Laude. 04/04/2022.

Science dissemination: outreach activities

Jornadas de divulgación científica "Ciencia con tapas":

- "Nuevos avances en diagnóstico y tratamiento del cáncer", Fnac (Alicante), 03-05-2022.

- "Mejorar lo inmejorable. Mejora de variedades tradicionales de tomate", Fnac (Alicante), 02/11/2022.

Mª José Martínez Tomé. Comité organizador

Jornada "Día internacional de la mujer y la niña en la ciencia en el IDiBE". Investigadoras en biotecnología sanitaria, Centro de Congresos "Ciutat d´Elx" de Elche" (Elche), 09/02/22.

Mª José Martínez Tomé. Comité organizador.

Number of Congress Communications

National contributions: 4

Poster presentations: 4

International contributions: 2

Oral presentations: 1

Poster presentations: 1

Awards

Premio al Talento Docente 02/12/2022 C. Reyes Mateo.

Governmental Projects and Funding

Biosensors for marine environmental monitoring: control of the ecotoxicological status of coral reefs (BioSensReef). 1/12/2022 - PROYECTOS DE TRANSICIÓN ECOLÓGICA Y TRANSICIÓN DIGITAL 2021 (TED2021-129894B-I00) UA-UMH AGENCIA ESTATAL DE INVESTIGACIÓN MINISTERIO DE CIENCIA E INNOVACIÓN. IPs: Montilla Jiménez (UA)/C. Reyes Mateo Martínez (UMH)

Biosensores de transducción combinada basados en matrices híbridas multienzimáticas (BioFLEC). 25/09/2022 - 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. IPs: Montilla Jiménez (UA)/C. Reyes Mateo Martínez (UMH)

Unidad preclínica para cuantificar interacciones moleculares para optimizar candidatos a fármacos. Generalitat Valenciana. IDIFEDER/2021/036. 01/01/2021 – 31/12/2022. IP: Antonio Ferrer.

AYUDA UMH PARA PROYECTOS DE DIFUSIÓN DE LA CIENCIA, LA TECNOLOGÍA Y LA INNOVACIÓN 2022 - 01/01/2022 – 31/12/2022. Carmen Reyes Mateo Martínez.

QuiRLab: Digitalización del material de laboratorio mediante etiquetado de códigos QR. 01/01/2022 – 31/12/2022. Carmen Reyes Mateo Martínez.

AYUDA UMH PARA PROYECTOS DE DIFUSIÓN DE LA CIENCIA, LA TECNOLOGÍA Y LA INNOVACIÓN 2022 - 01/01/2022 – 31/12/2022. Mª José Martínez Tomé.

Private funding: Technical Services and Assistance

"Reprodución en el laboratorio de la tecnología desarrollada por la empresa ENMA para la detección temprana de antígenos" Enma Medical Analytical S.L. 29/01/2022-18/05/2022. Carmen Reyes Mateo Martínez.

R&D Management

Reviewer of Nanomaterials (CRM)

Reviewer of Molecules (CRM)

Reviewer ACS Omega (CRM)

Group name: DESIGN AND VALIDATION OF NANOMATERIALS

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.

Staff

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

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

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

Postdoctoral Researchers

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

Ph. D Students

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

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

Technicians

Elisa Pérez García

Publications

Bello-Perez M, Esparza I, De la Encina A, Bartolome T, Molina T, Sanjuan E, Falco A, Enjuanes L, Sola I, Usera F. Pulsed-Xenon Ultraviolet Light Highly Inactivates Human Coronaviruses on Solid Surfaces, Particularly SARS-CoV-2. International Journal of Environmental Research and Public Health. 2022, 19(21), 13780. doi: 10.3390/ijerph192113780

Falco A, Adamek M, Pereiro P, Hoole D, Encinar JA, Novoa B, Mallavia R. The Immune System of Marine Organisms as Source for Drugs against Infectious Diseases. Marine Drugs. 2022, 20(6), 363. Doi: 10.3390/md20060363

Adamek M, Rebl A, Matras M, Lodder C, Abd El Rahman S, Stachnik M, Rakus K, Bauer J, Falco A, Jung-Schroers V, Piewbang C, Techangamsuwan S, Surachetpong W, Reichert M, Tetens J, Steinhagen D. Immunological insights into the resistance of Nile tilapia strains to an infection with tilapia lake virus. 2022, Fish & Shellfish Immunology, 124, 118-133. doi: 10.1016/j.fsi.2022.03.027

Adamek M, Matras M, Rebl A, Stachnik M, Falco A, Bauer J, Miebach AC, Teitge F, Jung-Schroers V, Abdullah M, Krebs T, Schröder L, Fuchs W, Reichert M, Steinhagen D. Don't Let It Get Under Your Skin!–Vaccination Protects the Skin Barrier of Common Carp From Disruption Caused by Cyprinid Herpesvirus 3. Frontiers in Immunology. 2022, 13, 787021. doi: 10.3389/fimmu.2022.787021

Patents

Inventores: Figueras A, Gasset M, Novoa B, Rey M, Mallavia R, Medina RM, Martínez-López A. Título: "Peptido de miticina y su uso en regeneración celular" P201831154; Concedida: 20/10/2021.

Science dissemination: outreach activities

III Jornadas de Investigación HGUE-IDiBE. Juan Alberto Falcó Graciá – Comité organizador.

III Jornadas de Investigación HGUE-IDiBE. Ricardo Mallavia Marin - Conferenciante invitado.

Jornadas de puertas abiertas IDiBE 2022. Ricardo Mallavia Marin - Conferenciante invitado.

Number of Congress Communications

National contributions: 11

Oral presentations: 1

Poster presentations: 10

International contributions: 7

Oral presentations: 2

Poster presentations: 5

Governmental Projects and Funding

Desarrollo y evaluación traslacional de nanofibras de extractos mucilaginosos de pez con potencial terapéutico para

aplicaciones en acuicultura y ganadería (MUCIPEUTICS). 01/10/2019 – PROYECTOS DE I+D+I "RETOS DE LA SOCIEDAD" 2018 (RTI2018-101969-J-I00). FEDER / Ministerio de Ciencia, Innovación y Universidades – Agencia Estatal de Investigación. UMH. IP: Juan Alberto Falcó Graciá.

Unidad preclínica para cuantificar interacciones moleculares para optimizar candidatos a fármacos. Generalitat Valenciana. IDIFEDER/2021/036. 01/01/2021 – 31/12/2022. IP: Antonio Ferrer.

Terapias metabólicas para el tratamiento de enfermedades infecciosas en peces de cultivo REf: MetDisFish. Fondo europeo Marítimo, de Pesca y de Acuicultura (FEMPA). Ministerio de Agricultura, Pesca y Alimentación. 30/12/2021 – 15/10/2023. Proyecto Coordinado CSIC-UMH. IP UMH: Ricardo Mallavia Marín. IP coordinator: Beatriz Novoa García.

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. IP: 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. IP Meuri del Camino de Juan Romero (IP1) y Miguel Salceda (IP2).

R&D and Educational Committees

Member of the Scientific Committee of the second annual international congress of doctorate students (Ricardo Mallavia).

R&D Management

Reviewers of Spanish State Research Agency (AEI) (2019-…) (Alberto Falcó).

Reviewers for different journals (number of revised manuscripts in 2022):

Ricardo Mallavia (9)

Alberto Falcó (5)

Editorial Boards

Special issue editions:

Juan Alberto Falcó Graciá (3): 2 in Nanomaterials (MDPI) and 1 in Marine Drugs (MDPI).

Reviewer Board member of:

Nanomaterials (MDPI) (2020-…) (Juan Alberto Falcó Graciá).

Marine Drugs (MDPI) (2020-…) (Juan Alberto Falcó Graciá).

Frontiers in Immunology (Frontiers Media) (2022-…) (Juan Alberto Falcó Graciá).

Frontiers in Aquaculture (Frontiers Media) (2022-…) (Juan Alberto Falcó Graciá).

Group name: PROTEIN ARCHITECTURE

Research Area

The group´s expertise lies in the field of Protein Engineering by combining computational and experimental approaches for biochemical, biophysics and structural characterization of macromolecules and their interactions with proteins, peptides and small molecules of a different nature. The group aims to unravel the molecular mechanisms of key proteins involved in different signaling pathways, recognition and fusion processes applied to different areas of biotechnology. One of the main objectives of the group is the design of peptides and/or small molecules with antiviral properties able to inhibit fusion processes and cell invasion. Besides that, the group is interested on protein folding and misfolding (amyloids) behind diseases.

Current Research Lines

- Design and development of antivirals against Zika and Dengue

The most successful strategies for the design and development of antivirals are (i) the blockade of proteins involved in the mechanism of fusion that facilitates the entry of the virus into the cell (structural proteins), and (ii) the inhibition of the enzymatic activity of non-structural

proteins (NS) involved in the virus replication mechanism. The design of peptides derived from the sequence of Flavivirus envelope proteins (E) allow the direct interaction to cellular membrane to inhibit the viral fusion. Similarity, peptides derived from the interaction area are able to inhibit the replication machinery of the virus. These peptides will facilitate the development of new antiviral therapies.

In collaboration with Cambridge University.

- Peptides design with inhibition capability of SARS-Cov-2 virus

The main objective of this study is to know the mutant spectrum of SARS-CoV-2, causative agent of COVID-19. The genome of this virus is composed of a molecule of RNA that mutates when it replicates, therefore, knowing how it mutates is a good strategy to design a treatment that decreases its infectivity. By use of genetic ultrasequencing techniques and QuasiFlow software, it has been able to analyze the virus variants in each patient individually. The information derived has been used by the research team to design several peptides with inhibitory capability against SARS-CoV-2.

In collaboration with University of Málaga.

- Identification of cytokines inhibitors in glioblastoma multiform.

- Development, optimization and testing of algorithms for protein stability prediction.

In collaboration with Centre for genomic regulation (CRG)-Barcelona.

- Identify proteins that they could be exploited as biomarkers for diagnostic purposes in amyloidogenic diseases.

In collaboration with Foundation for the Promotion of Health and Biomedical Research of the Valencian Community (FISABIO).

Available techniques

• Determination of protein stability in the presence or absence of ligands under desired experimental conditions:

Differential Scanning nano-Calorimetry (DSC)

• Thermodynamic analysis of Protein-ligand interaction, protein-protein interaction and protein-lipid interaction:

Isothermal Titration Calorimetry (ITC)

• Fluorescence Spectroscopy and Fluorescence Anisotropy

• Evaluation of secondary structure, folding and binding properties of proteins:

Circular Dichroism (CD)

• To detect aggregates in macromolecular solutions and determine the size of proteins, nucleic acids, and

complexes or to monitor the binding of ligands:

Dynamic Light Scattering (DLS)

• kinetics analysis of biomolecular interactions (protein-protein; ligand-protein; lipid-protein; protein-antibody

interactions):

Surface Plasmon Resonance (SPR) (Biacore x-100)

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.

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

Ph.D. Nerea Irigoyen. Division of Virology, Department of Pathology. University of Cambridge. Cambridge, United Kingdom.

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.

Science Dissemination: Outreach Activities

Jornada de divulgación de Ciencia con Tapas: Investigadoras en Biotecnología Sanitaria. Día Internacional de la Mujer y la Niña en la Ciencia. Instituto de Investigación, Desarrollo e Innovación en Biotecnología Sanitaria de Elche. Universidad Miguel Hernandez. 09/02/2022. Ana María Fernández Escamilla.

Number of Congress Communications

National contributions: 4

Oral presentations: 2

Poster presentations: 2

Governmental Projects and Funding

Terapia Antiviral de Combinacion con Inhibidores de las Actividades Exon Correctora y Mtasa del Coronavirus Sars-Cov-2 y Mutagenesis Letal Para Impedir la Evasion del Virus a la Defensa Inmunitaria Innata Antiviral. CV20-10932, 11/11/2020-06/12/2022. IP: Ana Grande Pérez.

Desarrollo de nuevos fármacos inhibidores de CDK4 dirigidos contra la interfase CDK4-cyclinaD1 para el tratamiento del glioblastoma multiforme. CONVOCATORIA 2021 DE CONCESIÓN DE AYUDAS PARA ACCIONES PREPARATORIAS DE APOYO A LA EXPLORACIÓN Y FORMULACIÓN DE FUTUROS PROYECTOS DE INVESTIGACIÓN Y DE INNOVACIÓN COORDINADAS ENTRE INVESTIGADORES/AS DE LA UNIVERSITAT MIGUEL HERNÁNDEZ Y PROFESIONALES DE FISABIO. GENERALITAT VALENCIANA Y FUNDACIÓ FISABIO. A01. 01/01/2022 - 12/31/2022. IPs: José Antonio Encinar Hidalgo, Meuri del Camino de Juan Romero.

Unidad preclínica para cuantificar interacciones moleculares para optimizar candidatos a fármacos. CONSELLERIA DE INNOVACION, UNIVERSIDADES, CIENCIA Y SOCIEDAD DIGITAL (GENERALITAT VALENCIANA). IDIFEDER/2021/036. 01/01/2021-31/12/2022. IP: Antonio Vicente Ferrer Montiel.

R&D Management

Reviewers of Archives of Biochemistry and Biophysics. A. M. Fernández Escamilla.

Reviewer of Scientific reports. A. M. Fernández Escamilla.

Scientific Society Councils

Name of the society: Red temática de Estructura y Función de Proteínas. http://redproteinas.iqfr.csic.es/

Name of the society: Sociedad Española de Biofísica (SBE). http://www.sbe.es/

Name of the society: Sociedad Española de Bioquímica y Biología Molecular (SEBBM). http://www.sebbm.es/

Editorial Boards

Review Editor in Frontiers in Physiology - Membrane Physiology and Membrane Biophysics (2018-.....). A. M. Fernández Escamilla.

Structure-Function Relationships in Membrane Proteins

Group name: 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)

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

Postdoctoral Researchers

Mª Lourdes Renart Pérez

Ph. D Students

Carlos Coll Díez

Technicians

Eva Martínez Martínez

Publications

Giudici AM, Renart ML, Coutinho A, Morales A, González-Ros JM, Poveda JA. Molecular Events behind the Selectivity and Inactivation Properties of Model NaK-Derived Ion Channels. Int J Mol Sci. 2022 23(16):9246. doi: 10.3390/ijms23169246

Esquembre R, Renart ML, Poveda JA, Mateo CR. Silica/Proteoliposomal Nanocomposite as a Potential Platform for Ion Channel Studies. Molecules. 2022 27(19):6658. doi: 10.3390/molecules27196658

Manzano JI, Perea-Martínez A, García-Hernández R, Andrés-León E, Terrón-Camero LC, Poveda JA, Gamarro F. Modulation of Cholesterol Pathways in Human Macrophages Infected by Clinical Isolates of Leishmania infantum. Front Cell Infect Microbiol. 2022 12:878711. doi: 10.3389/fcimb.2022.878711. eCollection 2022.

Ivorra I, Alberola-Die A, Cobo R, González-Ros JM, Morales A. Xenopus Oocytes as a Powerful Cellular Model to Study Foreign Fully-Processed Membrane Proteins. Membranes (Basel). 2022 12(10):986. doi: 10.3390/membranes12100986

Neira JL, Araujo-Abad S, Cámara-Artigas A, Rizzuti B, Abian O, Giudici AM, Velazquez-Campoy A, de Juan Romero C. Biochemical and biophysical characterization of PADI4 supports its involvement in cancer. Arch Biochem Biophys. 2022 717:109125. doi: 10.1016/j.abb.2022.109125. Epub 2022 Jan 23.

Coutinho A, Díaz-García C, Giudici AM, Renart ML. Insights into the Conformational Dynamics of Potassium Channels Using Homo-FRET Approaches. In: Springer Series on Fluorescence. Springer, Cham. 2022. https://doi.org/10.1007/4243_2022_24

PhD Theses

Título: Probing the structural plasticity in the potassium channel KcsA using homo-FRET methodologies. Student: Clara Díaz García. Supervisors: Ana Coutinho y Maria Lourdes Renart. Instituto Superior Técnico (Universidad de Lisboa, Portugal), and IDiBE (UMH, Elche, España) Qualification: Sobresaliente Cum Laude. 05/03/2022.

Invited Talks and Courses

Conformational plasticity of the potassium channel KcsA: lipid and ion modulation. 44 CONGRESO NACIONAL DE LA SOCIEDAD ESPAÑOLA DE BIOQUIMICA Y BIOLOGIA MOLECULAR. Conferencia Invitada. Lugar: Malaga, 07/09/2022. José Antonio Poveda Larrosa.

Conformational plasticity of ion channels: a fluorescence-based approach. RECI VIII. CONGRESO DE LA RED ESPAÑOLA DE CANALES IONICOS. Conferencia Invitada. Lugar: San Juan de Alicante, 24/05/2022. José Antonio Poveda Larrosa.

Science Dissemination: Outreach Activities

Modulación del canal de potasio KcsA por lípidos aniónicos: papel de las argininas del sitio no anular. Jornada científica IDIBE 2022, 21/07/2022. Ana Marcela Giudici.

Number of Congress Communications

National contributions: 2

Oral presentations: 1

Poster presentation: 1

International contributions: 3

Oral presentations: 1

Poster presentation: 2

Governmental Projects and Funding

Estudio de los estados conformacionales del filtro de selectividad de los canales iónicos: hacia la comprensión de la permeación, selectividad e inactivación. Ref. PGC2018-093505-B-I00. 01/01/2019-30/06/2022. PROYECTOS DE I+D – GENERACIÓN DE CONOCIMIENTO, MINISTERIO DE CIENCIA, INNOVACIÓN. IPs: José Manuel González-Ros y José Antonio Poveda Larrosa.

Nuevas estrategias contra el cáncer: inhibición de las interacciones moleculares de las proteínas deiminasas de arginina (InterPATh), CIAICO/2021/135, GVA. 01/01/2022-31/21/2024. IP: Camino de Juan Romero y José Luis Neira Faleiro.

Unidad preclínica para cuantificar interacciones moleculares para optimizar candidatos a fármacos. 01/01/2021 a 31/12/2022. Proyectos de Equipamiento científico-técnico IDIFEDER2021/036. IP: Antonio Ferrer Montiel.

PROGRAMA INVESTIGO GVA (INVEST/2022/108). 01/11/2022 a 31/10/2024. Proyectos competitivos de subvención pública cuyo objeto es, exclusivamente, la contratación de personal. IP: José Antonio Poveda Larrosa.

R&D Management

Reviewer for Membranes (JAPL)

Reviewer for "Archives of Biochemistry and Biophysics" (JAPL, AMG, MLR)

Reviewer for "International Journal of Molecular Sciences" (JMGR)

Evaluator for FWF Austrian Science Fund (JMGR)

Evaluator for "Agència de Gestió d'Ajuts Universitaris i de Recerca" (JMGR)

Evaluator for MINECO (JMGR)

Reviewer for "Oncotarget" (JMGR)

Editorial Boards

Associated Editor of International Journal of Molecular Sciences (JMGR, 2019-...).

Associated Editor of International Journal of Molecular Sciences (JAPL, 2019-...).

MOLECULAR DIAGNOSTIC, PROGNOSTIC, AND THERAPY

MOLECULAR DIAGNOSTIC, PROGNOSTIC AND THERAPY

Bioactive Molecules

Group name: DESIGN AND DEVELOPMENT OF BIOACTIVE MOLECULES

The D&DBM group is composed of a multidisciplinary team of researchers and professors at the Institute of Research, Development and Innovation in Healthcare of the Miguel Hernández University of Elche.

The research group is focused on the biological activity and mechanism-of-action of natural and synthetic compounds and their application to alleviate human chronic diseases such as cancer, obesity and non-communicable diseases using cell and animal models and human trials. The group has also an intense activity on technology transfer and services to companies belonging to areas such as food market, functional beverages, nutraceuticals and dermocosmetics.

To achieve these goals, our group has experience and facilities to develop extraction procedures, analytical characterization techniques, in silico screening, cellular and animal models and the capability and background experience to develop human intervention assays.

Staff

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Publications

Verdura S, Encinar JA, Teixidor E, Segura-Carretero A, Micol V, Cuyàs E, Bosch-Barrera J, Menendez JA. Silibinin Overcomes EMT-Driven Lung Cancer Resistance to New-Generation ALK Inhibitors. Cancers 2022, 14, (24).

Srivastava R, Fernández-Ginés R, Encinar JA, Cuadrado A, Wells G. The current status and future prospects for therapeutic targeting of KEAP1-NRF2 and β-TrCP-NRF2 interactions in cancer chemoresistance. Free radical biology & medicine 2022, 192, 246-260.

Verdura S, Encinar JA, Fernández-Arroyo S, Joven J, Cuyàs E, Bosch-Barrera J, Menendez JA. Silibinin Suppresses the Hyperlipidemic Effects of the ALK-Tyrosine Kinase Inhibitor Lorlatinib in Hepatic Cells. International journal of molecular sciences 2022, 23, (17).

Fernández-Ginés R, Encinar JA, Hayes JD, Oliva B, Rodríguez-Franco MI, Rojo AI, Cuadrado A. An inhibitor of interaction between the transcription factor NRF2 and the E3 ubiquitin ligase adapter β-TrCP delivers anti-inflammatory responses in mouse liver. Redox Biol 2022, 55, 102396.

Babiloni-Chust I, Dos Santos RS, Medina-Gali RM, Perez-Serna AA, Encinar JA, Martinez-Pinna J, Gustafsson JA, Marroqui L, Nadal A. G protein-coupled estrogen receptor activation by bisphenol-A disrupts the protection from apoptosis conferred by the estrogen receptors ERa and ERβ in pancreatic beta cells. Environment international 2022, 164, 107250.

Falco A, Adamek M, Pereiro P, Hoole D, Encinar JA, Novoa B, Mallavia R. The Immune System of Marine Organisms as Source for Drugs against Infectious Diseases. Marine drugs 2022, 20, (6).

Cravotto C, Grillo G, Binello A, Gallina L, Olivares-Vicente M, Herranz-López M, Micol V, Barrajón-Catalán E, Cravotto G. Bioactive Antioxidant Compounds from Chestnut Peels through Semi-Industrial Subcritical Water Extraction. Antioxidants (Basel). 2022 May 18;11(5):988.

Almudena Martín-Martínez, Noelia Sánchez-Marzo, Diana Martínez-Casanova, Mercedes Abarquero-Cerezo, Maria Herranz-López, Enrique Barrajón-Catalán, Maria Matabuena-Yzaguirre. High global antioxidant protection and stimulation of the collagen synthesis of new anti-aging product containing an optimized active mix. J Cosmet Dermatol. 2022; 21: 3993– 4000.

Herrero D, Albericio G, Higuera M, Herranz-López M, García-Brenes MA, Cordero A, Roche E, Sepúlveda P, Mora C, Bernad A. The Vascular Niche for Adult Cardiac Progenitor Cells. Antioxidants (Basel). 2022 Apr 29;11(5):882.

Patents

TREATMENT OF NRF2-RELATED DISEASES. Inventores: Antonio Cuadrado Pastor (45%), Raquel Fernández Ginés (15%), José Antonio Encinar (15%), Rafael León Martínez (5%), Juan Felipe Franco Gonzáles (5%), Manuel García López (5%), María Isabel Rodríguez Franco (5%), Ana Isabel Rojo Sanchís (5%). PHAR compound has been submitted for international patent (application number PCT/EP2022/050657; priority date of January 13, 2022) for use as PPI inhibitor of beta-TrCP/NRF2 and use in therapy of liver disease.

Invited Talks and Courses

"Técnicas de extracción de compuestos del cannabis y métodos analíticos para la caracterización de los compuestos". I Simposio Internacional sobre el Uso de Cannabis y Derivados Cannabinoides. Rosario (Argentina). Barrajón-Catalán, Enrique.

"Uso de plantas medicinales en la mejora de la salud desde una perspectiva científica". SEMINARIOS, MÁSTER EN BIOLOGÍA MOLECULAR Y BIOTECNOLOGÍA. Universidad de Murcia (España). Herranz-López, María.

Science Dissemination: Outreach Activities

"Buscando en el mar nuevas soluciones para el cáncer", oral communication at "Ciencia con tapas". EBC, Alicante 2022.

"Antitumorales de origen marino, una nueva oportunidad para el tratamiento del cáncer", oral communication at "La FHactoría". EBC, 2022.

"Uso de plantas de la dieta en la mejora de la obesidad desde una perspectiva científica". oral communication at PINT OF SCIENCE. MHL 2022.

"Con los ojos de la ciencia". Revista Divulgación UMH-Sapiens. MHL, 2022.

Number of Congress Communications

International contributions: 2

Poster presentations: 1

Oral presentations: 1

National contributions: 6

Poster presentations: 2

Oral presentations: 4

Governmental Projects and Funding

NeurotechEU Research and Innovation (NeurotechRI). European Commission. Project related to "The European University of Brain and Technology-NeurotechEU". European Commission, ERASMUS+ (2021-24). IP: 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. IP: 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. IPs: VMM y MHL. Funding: 548,816.10 € (2021-24).

TED2021-129932B-C32. "Valorization of rice straw byproduct trough the development of new biotechnological uses for cosmetic industries". Ministerio de Ciencia e Innovación. IPs: 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. IPs: EBC and VMM. Funding: 198,000 € (2022-2024).

APOTIP/2021/014. "Characterization and identification of the endophytic microflora of Mediterranean plant species: application in the development of nutraceuticals". Generalitat Valenciana (2021-22). IP: VMM. Funding: 36,000 €.

CIBER Fisiopatología de la Obesidad y la Nutrición, CIBEROBN (CB12/03/30038). Instituto de Salud Carlos III (ISCIII), 28029 Madrid, Spain (3º/32, 2021).

Desarrollo de nuevos fármacos inhibidores de CDK4 dirigidos contra la interfase CDK4-cyclinaD1 para el tratamiento del glioblastoma multiforme. Ref.: ILISABIO/2021/A01. Financiador: Universidad Miguel Hernández de Elche. IPs: Dr. José Antonio Encinar y Camino de Juan. 2022. Funding: 5,000 €.

Estudio farmacogenómico para el tratamiento de las enfermedades inflamatorias intestinales. Programa Unisalut. IP: VMM. Funding: 5,000 €.

ILISABIO22_AP12, LiCiaBetes. Metabolitos antioxidantes de la Lippia citriodora y su contribución frente al aumento de la interacción leucocito-endotelio en pacientes con diabetes tipo 2. Programa Unisalut 2022. IP: MHL. Funding: 5,000 €.

AP2021-03, METOB. Búsqueda de moléculas bioactivas como reprogramadores metabólicos en modelos celulares de obesidad. Programa UMH-LA FE 2021. IP: MHL. Funding: 5,000 €.

Private funding: Technical Services and Assistance

9 technical services to 6 different external companies (total amount: 8.621,61€)

R&D and Educational Committees

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

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

R&D Management

E. Barrajón-Catalán is reviewer of PROCIENCIA-Concytec, Perú (2021-act.)

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

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

Guest Editors of the Special Issue "Antioxidants and Skin Protection II" in Antioxidants (MPDI). María Herranz, Enrique Barrajón, Vicente Micol.

Guest Editors of the Special Issue "Connection of Marine Natural Products and Cell Apoptosis-II" in Marine Drugs (MPDI). María Herranz, Enrique Barrajón, Vicente Micol.

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

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 microorganism for agriculture and feedstock.
5. Development of new nutritional products from fermentation processes.

Staff

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

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Manuel Valero Roche

External collaborators integrated in the group

Prof. Dr. Francisco Martin Bermudo. Universidad Pablo Olavide (Sevilla).

Prof. Dra. Madalina Neascu. Gut Health Theme, Rowett Institute, School of Medicine, Medical Sciences & Nutrition, University of Aberdeen.

Prof. Dra. Farah Hosseinian. Department of Chemistry, CARLETON UNIVERSITY.

Ph. D Students

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

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

Sara Gea Botella

Publications

Goikoetxea-Usandizaga, Naroa1; Bravo, Miren1; Egia-Mendikute, Leire2; Abecia, Leticia3,4; Serrano-Maciá, Marina1; Urdinguio, Rocío G.5,6,7,8; Clos-García, Marc9; Rodríguez-Agudo, Rubén1; Araujo-Legido, Raquel10,11; López-Bermudo, Lucía10,11; Delgado, Teresa C.1; Lachiondo-Ortega, Sofía1; González-Recio, Irene1; Gil-Pitarch, Clàudia1; Peña-Cearra, Ainize3; Simón, Jorge1; Benedé-Ubieto, Raquel12; Ariño, Silvia13; Herranz, Jose M.14,15; Azkargorta, Mikel16; Salazar-Bermeo, Julio17; Martí, Nuria17; Varela-Rey, Marta1; Falcón-Pérez, Juan M.18,19; Lorenzo, Óscar7,20; Nogueiras, Rubén21,22,23; Elortza, Félix16; Nevzorova, Yulia A11,24; Cubero, Francisco J11; Saura, Domingo17; Martínez-Cruz, Luis Alfonso1; Sabio, Guadalupe25; Palazón, Asís2,19; Sancho-Bru, Pau13; Elguezabal, Natalia26; Fraga, Mario F5,6,7,8,18; Ávila, Matías A.13,14; Bataller, Ramón27; Marín, José J.G.28; Martín, Franz6,7; Martínez-Chantar, María Luz1. The outcome of boosting mitochondrial activity in alcoholic liver disease (ALD) is organ-dependent. Hepatology ():10.1097/HEP.0000000000000303, February 9, 2023. DOI: 10.1097/HEP.0000000000000303.

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.

Number of Congress Communications

National contributions: 2

Poster presentations: 2

Private Funding

Contrato para la realización del proyecto " Caracterización y aprovechamiento de subproductos de la producción industrial de licores a partir de limón (Citrus Limon L.). Proyectos I+D solicitados por terceros-VEGASCORZA S.L. Duración: 28/07/2021 – 27/04/2022. IPs: Nuria Martí.

Editorial Boards

Antioxidants

Food Microbiology

Molecules

Food science & Technology

Horticulturae

Chronic inflammation & pain

Group name: Sensory Neurobiology

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 wells 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.

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

Verónica Rivero

External collaborators integrated in the group

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Ph. D Students

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Angela Lamberti

Technicians

José Manuel Serrano García

Publications

Villalba E, De la Torre-Martínez R, Fernández-Carvajal A, Ferrer-Montiel A. Paclitaxel in vitro reversibly sensitizes the excitability of IB4(-) and IB4(+) sensory neurons from male and female rats. British Journal of Pharmacology 2022 179(14):3693-3710. https://doi.org/10.1111/bph.15809

Martín-Escura C, Medina-Peris A, Spear LA, de la Torre-Martínez R, Olivos-Oré LA, Barahona MA, González-Rodríguez S, Fernández-Ballester G, Fernández-Carvajal A, Artalejo A, Ferrer-Montiel A, González-Muñiz R. β-Lactam TRPM8 antagonist RGM8-51 displays analgesic activity in different animal models. Int J Mol Sci. 2022 Feb 28;23(5):2692. doi: 10.3390/ijms23052692 https://pubmed.ncbi.nlm.nih.gov/35269831/

Iraci N, Ostacolo C, Medina-Peris A, Ciaglia T, Novoselov AM, Altieri A, Cabañero D, Fernandez-Carvajal A, Campiglia P, Gomez-Monterrey I, Bertamino A, Kurkin AV. In Vitro and In Vivo Pharmacological Characterization of a Novel TRPM8 Inhibitor Chemotype Identified by Small-Scale Preclinical Screening. Int J Mol Sci. 2022 23(4), 2070. https://doi.org/10.3390/ijms23042070

Di Sarno V, Giovannelli P, Medina-Peris A, Ciaglia T, Di Donato M, Musella S, Lauro G, Vestuto V, Smaldone G, Di Matteo F, Bifulco G, Castoria G, Migliaccio A, Fernandez-Carvajal A, Campiglia P, Gomez-Monterrey I, Bertamino A. New TRPM8 blockers exert anticancer activity over castration-resistant prostate cancer models.European Journal of Medicinal Chemistry 2022 238:114435.

https://doi.org/10.1016/j.ejmech.2022.114435

Alarcón-Alarcón D. Cabañero D, de Andrés-López J, Nikolaeva-Koleva N, Giorgi S, Fernández-Ballester G, Fernández-Carvajal A, Ferrer-Montiel A. TRPM8 contributes to sex dimorphism by promoting recovery of normal sensitivity in a mouse model of chronic migraine. Nature communication 2022 Oct 22;13(1):6304. https://doi.org/10.1038/s41467-022-33835-3

Fernández-Carvajal A, Fernández-Ballester G, Ferrer-Montiel A. TRPV1 in chronic pruritus and pain: soft modulation as a therapeutic strategy. Frontiers In Molecular Neuroscience 2022 15:930964 DOI: 10.3389/fnmol.2022.930964 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9478410/

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Gonzalez-Foutel NS, Glavina J, Borcherds WM, Safranchik M, Barrera-Vilarmau S, Sagar A, Estana A, Barozet A, Garrone NA, Fernandez-Ballester G, Blanes-Mira C, Sanchez IE, de Prat-Gay G, Cortes J, Bernado P, Pappu RV, Holehouse AS, Daughdrill GW, Chemes LB. Conformational buffering underlies functional selection in intrinsically disordered protein regions. Nature Structural & Molecular Biology 2022 29, 781-790. https://doi.org/10.1038/s41594-022-00811-w.

Creation of Spin-Off Firms

ANTALGENICS (2015-actualidad).

PROSPERA BIOTECH (2014-actualidad).

HAWK BIOSYSTEMS (2015-actualidad).

Patents

Compositions for treating hyperhidrosis. EP22382149.7. Antonio Ferrer.

PhD Theses

Título: Descubrimiento de nuevos moduladores de TRPM8 y su potencial terapéutico. Student: Alicia Medina Peris. Advisor: Asia Fernández Carvajal. 22/12/2022.

Organization of Meetings

RECI VIII. Congreso de la Red Española de Canales Iónicos. May 24-27, 2022. Alicante, Spain. Antonio Ferrer & Asia Fernández.

Invited Talks and Courses

8th International Iberian Biophysics Congress. June 20-21, 2022. Bilbao. Spain. https://www.iibc2022bilbao.com/ Asia Fernández.

Congreso de la Sociedad de Oncología Médica. Sesión: Café con el experto "Neuropatía periférica por quimiterapia". October 18-20, 2022. Antonio Ferrer.

Skin@Bath. Skin Sensory Dysfunction Produced by Chemotherapeutic Drugs. December 14-16, 2022. Bath. Antonio Ferrer.

Science Dissemination: Outreach Activities

Ciencia con Tapas. Monthly outreach activity of IDiBE. October 2022. Asia Fernández.

XIV Jornadas de San Alberto. Facultad de Ciencias Experimentales. UMH. November 2022.

Number of Congress Communications

National contributions: 10

Oral presentations: 2

Poster presentations: 8

International contributions: 19

Oral presentations: 5

Poster presentations: 14

Awards

Premio al talento docente 2022. Asia Fernández.

Governmental Projects and Funding

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

Unidad preclínica para cuantificar interacciones moleculares para optimizar candidatos a fármacos. GENERALITAT VALENCIANA. IDIFEDER/2021/036. 2021-2022. IP: Antonio Ferrer.

Neuropatía por quimioterapia: fisiopatología, dimorfismo sexual e intervención terapéutica. ChemoTheRapy-Induced neuropathy: pathophysiLOGY, 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. IP: Antonio Ferrer-Montiel y Ana Gomis García.

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

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 neurocosmecéuticos 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

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. Molecular and cell biology. Coordinator: Asia Fernández.

Scientific Society Councils

SBE. Past-President: Antonio Ferrer.

Spanish representative IUPAB - Antonio Ferrer.

SEBBM representative in FEBS – Antonio Ferrer.

SEBBM. President-elect-Antonio Ferrer.

RECI. Coordinator-Antonio Ferrer.

Editorial Boards

Revista de la SEBBM (2022). Antonio Ferrer (Editor in chief).

Journal of Pharmacological Sciences (2022). A. Ferrer Montiel.

The Open Journal of Pain (2022). A. Ferrer Montiel.

Frontiers in Pharmacology (2022). A. Ferrer Montiel.

Frontiers in Neurosciences (2022). A. Ferrer Montiel.

Journal of Neurosciences (2022). A. Ferrer Montiel.

International Journal Molecular Science (2022). Antonio Ferrer.

Scientific Reports (2014-2022). A. Fernandez-Carvajal

Frontiers in Physiology (2015-2022). A. Fernandez-Carvajal.

Frontiers in Pharmacology (2021-2022) A. Fernandez-Carvajal.

IJMS (2020-2022). A. Fernandez-Carvajal.

UMH editorial board (2019-2022). A. Fernandez-Carvajal.

Antiviral Strategies

Group name: ANTIVIRAL STRATEGIES IN AQUACULTURE

The major goal of the group is de design, development and testing of novel vaccines for viral diseases of aquacultured fish species, with emphasis on the zebrafish and rainbow trout models.

Year 2022 has been a transition time, with the final part of project RTI2018 and the starting phases of the new PID2021 project (2022-2025), where the focus has moved to a new biotechnological platform for the production of recombinant viral antigens for fish: microalgae cells, moving on the previous E. coli-based production systems. In parallel, a project aimed to scaling-up the vaccine production and testing under fish farm-like conditions was initiated. The group have also expanded its interest to additional viral pathogens of fish such as IHNV and SAV viruses.

Staff

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

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

Ph. D Students

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

Ainhoa Gómez Quintanilla

Publications

Ortega-Villaizan MdM, Chico V, Perez L. Fish Innate Immune Response to Viral Infection—An Overview of Five Major Antiviral Genes. Viruses. 2022; 14(7):1546. https://doi.org/10.3390/v14071546

Rojas M, Aceituno P, Salvador ME, Garcia-Ordoñez M, Teles M, Ortega-Villaizan MdM, Perez L, Roher N. How modular protein nanoparticles may expand the ability of subunit anti-viral vaccines: The spring viremia carp virus (SVCV) case. Fish Shellfish Immunol. 2022, 131:1051-1062. https://doi.org/10.1016/j.fsi.2022.10.067

Invited Talks and Courses

SARS-CoV-2 en aguas residuales de Elche. III JORNADAS DE INVESTIGACIÓN BIOMÉDICA HGUE-IDiBE. Elche. April 8th, 2022. Luis Perez.

Science dissemination: outreach activities

MEJORAR LO INMEJORABLE. MEJORA DE VARIEDADES TRADICIONALES DEL TOMATE. Divulgation Talk series "Ciencia con Tapas" (IDiBE – UMH). Alicante. Nov 2nd, 2022. Luis Perez and Santiago García.

IDIBE-UMH Open doors/Guided tours for high school and college students: x 4.

Number of Congress Communications

International contributions: 10

Oral presentations: 4

Poster presentations: 6

Governmental Projects and Funding

Enhancing antiviral responses in fish: From rational design of prophylactics to in vivo responses. PROYECTOS DE I+D+I "RETOS DE LA SOCIEDAD" – Ministerio de Ciencia Innovación y Universidades. RTI2018 – 096957 –B-C22. IP: Luis Perez; Co-IP: María del Mar Ortega-Villaizán.

Contracte per la realització de una proba de valoració d'una vacuna anti VHSV modular administrada en la dieta dels peixos així com l'establiment deles condicions generals per les que es regirà la present prestació. IP: Ortega-Villaizan Romo, María Del Mar.

Novel Chlamydomonas-encapsulated recombinant protein oral vaccines for IHNV 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. P.I.s: 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. P.I.s: María del Mar Ortega-Villaizán and Luis Perez.

Group name: ANTIVIRAL STRATEGIES: MOLECULAR DYNAMICS AND DOCKING

Study of the structure and interaction of structural and non-structural proteins from enveloped viruses such as Dengue, Zika or SARS with model biomembranes and its lipidic components, aiming to identify their molecular mechanism and biological function through the use of molecular dynamics and docking. Our ultimate goal is the finding of new antivirals and therapeutic targets in order to to develop new leading compounds useful for improved combined therapies.

Staff

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

Publications

Villalaín J. Interaction of Lassa virus fusion and membrane proximal peptides with late endosomal membranes. Biochim Biophys Acta Biomembr. 2022 Nov 1;1864(11):184031. doi: 10.1016/j.bbamem.2022.184031.

Villalaín J. Procyanidin C1 Location, Interaction, and Aggregation in Two Complex Biomembranes. Membranes (Basel). 2022 Jul 5;12(7):692. doi: 10.3390/membranes12070692.

Villalaín J. Envelope E protein of dengue virus and phospholipid binding to the late endosomal membrane. Biochim Biophys Acta Biomembr. 2022 May 1;1864(5):183889. doi: 10.1016/j.bbamem.2022.183889.

R&D Management

Reviewer of BBA, ABB, Membranes, CPL, Biochemistry. J. Villalaín.

Group name: VIRAL IMMUNOLOGY & THERAPEUTICS

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

Staff

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

Publications

Ryan FJ, Hope CM, Masavuli MG, Lynn MA, Mekonnen ZA, Yeow AEL, Garcia-Valtanen P, Al-Delfi Z, Gummow J, Ferguson C, et al. Long-term perturbation of the peripheral immune system months after SARS-CoV-2 infection. BMC medicine 2022, 20, 26, doi:10.1186/s12916-021-02228-6.

Perkins GB, Tunbridge M, Salehi T, Chai CS, Kireta S, Johnston J, Penko D, Nitschke J, Yeow AEL, Al-Delfi Z, Drogemuller CJ, Garcia-Valtanen P, et al. Concurrent vaccination of kidney transplant recipients and close household cohabitants against COVID-19. Kidney international 2022, 101, 1077-1080, doi:10.1016/j.kint.2022.02.015.

Garcia-Valtanen P, Hope CM, Masavuli MG, Yeow AEL, Balachandran H, Mekonnen ZA, Al-Delfi Z, Abayasingam A, Agapiou D, Stella AO, et al. SARS-CoV-2 Omicron variant escapes neutralizing antibodies and T cell responses more efficiently than other variants in mild COVID-19 convalescents. Cell reports. Medicine 2022, 3, 100651, doi:10.1016/j.xcrm.2022.100651.

Governmental Projects and Funding

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

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.

Group name: 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)

Ph. D Students

Maria Elizabhet Salvador Mira (ORCID: 0000-0002-8877-2018)

Celia García Quintanilla

Ainhoa Gómez Quintanilla

Technicians

Remedios Torres Montero

Publications

Ortega-Villaizan MDM, Chico V & Perez L. Fish Innate Immune Response to Viral Infection-An Overview of Five Major Antiviral Genes. Viruses 2022 14, doi:10.3390/v14071546

Ortega-Villaizan MDM, Coll J & Rimstad E. Editorial: The role of red blood cells in the immune response of fish. Front Immunol. 2022 13, 1005546, doi:10.3389/fimmu.2022.1005546

Rojas-Peña M, Aceituno P, Salvador ME, García-Ordoñez M, Teles M, Ortega-Villaizan MDM, Pérez L, Roher N. How modular protein nanoparticles may expand the ability of subunit anti-viral vaccines: The spring viremia carp virus (SVCV) case. Fish Shellfish Immunol. 2022 131, 1051-1062, doi:10.1016/j.fsi.2022.10.067

Invited Talks and Courses

"Tratamientos ecosostenibles para peces en acuicultura" en el marco de la acción XIV SEMANA DE LA CIENCIA en el Centro Cultural Virgen del Carmen, Torrevieja, 18/11/2022. María del Mar Ortega-Villaizán Romo.

Number of Congress Communications

Total contributions: 10

Awards

Premio en la primera fase de la 12ª Maratón de Creación de Start-ups UMH: "Acuicultura Segura". Maria Del Mar Ortega-Villaizan Romo y Verónica Chico Gras.

Governmental Projects and Funding

Towards Sustainable Oral Antiviral Vaccines: nanostructured proteins versus microalgae-encapsulated antigens (TSUNAMI). 2022-2025. PID2021-126710OB-C22. Ministry of Science, Innovation and Universities. Ps: Luis Perez Garcia-Estañ; Maria 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. IPs: Maria 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. IP: Maria del Mar Ortega-Villaizan Romo.

ENHANCING ANTIVIRAL RESPONSES IN FISH: From rational design of prophylactics to in vivo responses. 2019-2022. RTI2018-096957-B-C22. Ministry of Science, Innovation and Universities. IPs: Luis Perez, María del Mar Ortega-Villaizán.

REDFLAG - Salmonid red blood cells - sensors of stress and infection. Norwegian Research Council. NRC# 302551. IP: Maria K. Dahle. Investigadores: 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. IP: María del Mar Ortega-Villaizán.

Private funding: Contracts

Realització de una proba de valoració d'una vacuna anti-VHSV modular administrada en la dieta dels peixos. Fundacion Bosch i Gimpera. FUNDBOSCHGIMPERA1.22D. 31/12/2021 - 30/04/2022.

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).

Molecular and Cellular Oncology

Group name: MOLECULAR ONCOLOGY

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

Miguel Saceda Sánchez (ORCID: 0000-0002-1564-3602)

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

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

Postdoctoral Researchers

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

External collaborators integrated in the group

Dr. Victor Manuel Barbera Juan

Dr. Jose Martin Nieto

Ph. D Students

Elizabeth Perez Valenciano (ORCID: 0000-0001-9271-0592)

Salomé Araujo Abad (ORCID: 0000-0001-7387-0363)

Technicians

Antonio Manresa Manresa.

Sergio Martí Torregrosa.

Publications

Araujo-Abad S, Saceda M, de Juan Romero C. Biomedical application of small extracellular vesicles in cancer treatment. Adv Drug Deliv Rev. 2022 Mar;182:114117. doi: 10.1016/j.addr.2022.114117. Epub 2022 Jan 19. PMID: 35065142.

Neira JL, Araujo-Abad S, Cámara-Artigas A, Rizzuti B, Abian O, Giudici AM, Velazquez-Campoy A, de Juan Romero C. Biochemical and biophysical characterization of PADI4 supports its involvement in cancer. Arch Biochem Biophys. 2022 Mar 15;717:109125. doi: 10.1016/j.abb.2022.109125. Epub 2022 Jan 23. PMID: 35081374.

Neira JL, Rizzuti B, Abián O, Araujo-Abad S, Velázquez-Campoy A, de Juan Romero C. Human Enzyme PADI4 Binds to the Nuclear Carrier Importin a3. Cells. 2022 Jul 11;11(14):2166. doi: 10.3390/cells11142166.

Organization of Meetings

III Jornadas de Investigación Biomédica HGUE-IDiBE 08/04/2022. Miembro del Comité Organizador: Camino de Juan Romero.

Invited Talks and Courses

"Glioblastoma derived exosomes: Nanoparticles for glioma treatment". Jornada Científica IDiBE, 21/7/2022. Camino de Juan Romero.

Science Dissemination: Outreach Activities

New on several public media:

- Científicos detectan la unión de dos proteínas que intervienen en el cáncer (infosalus.com)

-PADI4: La proteína desertora de las filas del cuerpo humano - iDescubre (fundaciondescubre.es)

-Detectan la unión de dos proteínas que intervienen en el cáncer (dicyt.com)

Number of Congress Communications

National contributions: 1

Poster presentations: 1

International contributions: 3

Poster presentations: 3

Awards

Travelling fellowship of The Company of Biologists (DMMTF2110601) for a short-term visit at the Cancer Research Center of Marseille-France (CRCM) (INSERM).

Governmental Projects and Funding

Desarrollo de nuevas terapias y biomarcadores de utilidad para el diagnóstico y el tratamiento del glioblastoma multiforme. Nº of researchers: 4. Funding entity or bodies: FUNDACION PARA EL FOMENTO DE LA INVESTIGACION SANITARIA Y BIOMEDICA EN LA COMUNITAT VALENCIANA. Start-End date: 04/01/2021 - 31/12/2022. Total amount: 22.600 €. IP: Miguel Saceda Sánchez.

Evaluación del papel dual de la proteína inducida por interferon IFITM1 en la adquisición de quimiorresistencia en cáncer y en la invasividad viral. IFITMI y Sars-cov-2. Nº of researchers: 5. Funding entity or bodies: FUNDACION PARA EL FOMENTO DE LA INVESTIGACION SANITARIA Y BIOMEDICA EN LA COMUNITAT VALENCIANA. Start-End date: 20/01/2021 - 20/01/2022. Total amount: 5.000 €. IP: Miguel Saceda Sánchez.

Nanoformulaciones de sulfuro de cobre como agentes terapéuticos para tumores de mal pronóstico. Convocatoria UMH/FISABIO (convocatoria ILISABIO 2022). IP: Miguel Saceda Sánchez.

Respuesta a interferón y adquisición de quimiorresistencia en carcinomas de páncreas y colon. Convocatoria (FISABIO/La FE). IP: Pilar García Morales.

Identificación de nuevas dianas terapéuticas para el pronóstico y la mejora del tratamiento del Glioblastoma. Proyectos en Salud (PI22/00824). INSTITUTO DE SALUD CARLOS III. IP: Camino de Juan Romero, Co IP: Miguel Saceda Sánchez.

Nuevas estrategias contra el cáncer: inhibición de las interacciones moleculares de las proteínas deiminasas de arginina (CIAICO/2021/135) AICO-GVA IP: José Luis Neira Faleiro, Co IP: Camino de Juan Romero.

Evaluación del efecto dual del boro en el tratamiento de los carcinomas: Inducción de muerte celular y reversión de la transición epitelio-mesenquimal. Convocatoria Polisabio (UGP-21-266). UPV/FISABIO. IP: Miguel Saceda Sánchez.

Desarrollo de nuevos fármacos inhibidores de CDK4 dirigidos contra la interfase CDK4-cyclinaD1 para el tratamiento del glioblastoma multiforme. Convocatoria Ilisabio (UGP-21-308) FISABIO/UMH. IP Camino de Juan Romero. Co IP: José Antonio Encinar Hidalgo.

Study of the mechanism underlying the tumorigenic capacity of the glioblastoma multiforme (CP19/00095) INSTITUTO DE SALUD CARLOS III. Miguel Servet. IP Dra. de Juan.

Private funding: Contracts

CONTRATO DE OPCIÓN DE LICENCIA Y TRANSFERENCIA DE RESULTADOS ENTRE LA FUNDACIÓN PARA EL FOMENTO DE LA INVESTIGACIÓN SANITARIA Y BIOMÉDICA DE LA COMUNITAT VALENCIANA (FISABIO) Y APPLYNANO SOLUTIONS S.L. (para la evaluación de nanoformulaciones de grafeno como transportadores de antineoplásicos y/o vectores de terapias enzimáticas antitumorales). IP: Miguel Saceda Sánchez.

Diabetes & metabolic disorders

Group name: DIABETES RESEARCH UNIT

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 ERα, ERβ 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 stablish gender-based therapeutic for diabetes.

3. The role of interferon-α (IFNalpha) 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 IFNalpha plays a critical role in the initiation of the disease but the molecular mechanisms underlying IFNalpha effects directly on pancreatic cells are largely unknown. The results of this project will provide a better understanding of the effects of IFNalpha exposure on alpha- and beta-cell function and will develop new therapeutic strategies selecting small molecules that inhibit TYK2-mediated IFNalpha 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.

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Publications

Babiloni-Chust I, Dos Santos RS, Medina-Gali RM, Perez-Serna AA, Encinar JA, Martinez-Pinna J, Gustafsson JA, Marroqui L, Nadal A. G protein-coupled estrogen receptor activation by bisphenol-A disrupts the protection from apoptosis conferred by the estrogen receptors ERa and ERβ in pancreatic beta cells. Environment International 2022 Jun;164:107250. doi: 10.1016/j.envint.2022.107250

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Dos Santos RS, Medina-Gali RM, Babiloni-Chust I, Marroqui L, Nadal A. In Vitro Assays to Identify Metabolism-Disrupting Chemicals with Diabetogenic Activity in a Human Pancreatic β-Cell Model. Int J Mol Sci. 2022 May 1;23(9):5040. doi: 10.3390/ijms23095040

Tudurí E, Soriano S, Almagro L, Montanya E, Alonso-Magdalena P, Nadal Á, Quesada I. The pancreatic β-cell in ageing: Implications in age-related diabetes. Ageing Res Rev. 2022 Sep;80:101674. doi: 10.1016/j.arr.2022.101674

Tudurí E, Soriano S, Almagro L, García-Heredia A, Rafacho A, Alonso-Magdalena P, Nadal Á, Quesada I. The Effects of Aging on Male Mouse Pancreatic β-Cell Function Involve Multiple Events in the Regulation of Secretion: Influence of Insulin Sensitivity. J Gerontol A Biol Sci Med Sci. 2022 Mar 3;77(3):405-415. doi: 10.1093/gerona/glab276

Bernal K, Touma C, Erradhouani C, Boronat-Belda T, Gaillard L, Al Kassir S, Le Mentec H, Martin-Chouly C, Podechard N, Lagadic-Gossmann D, Langouet S, Brion F, Knoll-Gellida A, Babin PJ, Sovadinova I, Babica P, Andreau K, Barouki R, Vondracek J, Alonso-Magdalena P, Blanc E, Kim MJ, Coumoul X. Combinatorial pathway disruption is a powerful approach to delineate metabolic impacts of endocrine disruptors. FEBS Lett. 2022 Dec;596(24):3107-3123. doi: 10.1002/1873-3468.14465

Merino B, Casanueva-Álvarez E, Quesada I, González-Casimiro CM, Fernández-Díaz CM, Postigo-Casado T, Leissring MA, Kaestner KH, Perdomo G, Cózar-Castellano I. Insulin-degrading enzyme ablation in mouse pancreatic alpha cells triggers cell proliferation, hyperplasia and glucagon secretion dysregulation. Diabetologia 2022 Aug;65(8):1375-1389. doi: 10.1007/s00125-022-05729-y

Grajales D, Vázquez P, Ruíz-Rosario M, Tudurí E, Mirasierra M, Ferreira V, Hitos AB, Koller D, Zubiaur P, Cigudosa JC, Abad-Santos F, Vallejo M, Quesada I, Tirosh B, Leibowitz G, Valverde ÁM. The second-generation antipsychotic drug aripiprazole modulates the serotonergic system in pancreatic islets and induces beta cell dysfunction in female mice. Diabetologia 2022 Mar;65(3):490-505. doi: 10.1007/s00125-021-05630-0.

Organization of meetings

GORDON RESEARCH CONFERENCE ON ENVIRONMENTAL ENDOCRINE DISRUPTORS. Member of the Organizing Committee. Sunday River, Maine, EEUU, Junio 2022. Angel Nadal.

Reunión Anual CIBERDEM 2022. Member of the Organizing Committee. Mataró

(Barcelona), Noviembre 2022. Angel Nadal

CIBERDEM Young Investigators. Member of the Organizing Committee. Mataró (Barcelona). Noviembre 2022. Angel Nadal

Invited Talks and Courses

Identification of endocrine disruptors with diabetogenic activity using pancreatic beta cells. VIII Simpósio Anual do Centro de Pesquisa em Obesidade e Comorbidades, Obesity and Comorbidities Center, Universidade Estadual de Campinas, Brasil. October 2022. Angel Nadal.

The pancreatic alpha-cell: old stories and new challenges in diabetes. VIII Simpósio Anual do Centro de Pesquisa em Obesidade e Comorbidades, Obesity and Comorbidities Center, Universidade Estadual de Campinas, Brasil. October 2022. Ivan Quesada.

Endocrine disruptors and pancreatic beta cells. 1ST CIMUS Symposium: "From bench to human traslational research", Santiago de Compostela. July 2022. Angel Nadal.

Endocrine disruptors and beta cells. HEEDS OBESITY WORKSHOP, Racine, Wisconsin, EEUU. September 2022. Angel Nadal.

Endocrine disruptors as environmental determinants of diabetes mellitus. Fall Seminars Series Chicago Center for Health and Environment, University of Illinois at Chicago, Chicago, EEUU. September 2022. Angel Nadal.

Members of the European Parliament Briefing on Endocrine Disrupting Chemicals: From Science to Public Health Protection. The Endocrine Society Webinar. June 2022. Angel Nadal.

Diabesity and EDC exposure. 24 th European Congress of Endocrinology. Milan. May 2022. Paloma Alonso-Magdalena.

Diabesidad y disruptores endocrinos. Noveno congreso de Diabesidad SED, SEEN y SEEDO. Madrid. June 2022. Paloma Alonso-Magdalena.

Amistades peligrosas: Obesidad y los disruptores endocrinos. XVIIL Congreso Nacional de la Sociedad Española para el estudio de la Obesidad. November 2022. Paloma Alonso-Magdalena.

La célula beta pancreática y el reto metabólico del embarazo: buscando las causas de la diabetes mellitus gestacional. III Jornadas de Investigación Biomédica HGE-IDiBE. April 2022. Paloma Alonso-Magdalena.

TYK2 inhibitors as a potential therapeutic strategy to prevent T1D development. Ciclo De Seminarios Antônio Luiz Vianna. Rio de Janeiro. July 2022. Laura Marroquí Esclapez.

Science Dissemination: Outreach Activities

PRIMERA JORNADA CIENTÍFICA: ADEC (Asociación de Diabéticos Elda y Comarca)-Unidad de Investigación Básica en Diabetes-UMH. Elda, 18/11/2022.

PRIMERA JORNADA CIENTÍFICA: ADOC (Asociación de Diabéticos Orihuela y Comarca)-Unidad de Investigación Básica en Diabetes-UMH. Orihuela, 20/11/2022.

Artículo de divulgación: El problema de la disrupción endocrina. Revista Diabetes-SED. Paloma Alonso-Magdalena.

Artículo de divulgación: #Hicieron Historia Linda Brown Buck. Revista UMH-Sapiens y UMH-TV. Laura Marroquí Esclapez.

Number of Congress Communications

National contributions: 16

Oral presentations: 3

Poster presentations: 13

International contributions: 2

Oral presentations: 1

Poster presentations: 1

Awards

Premio Santander-UMH para jóvenes investigadores. Laura Marroquí Esclapez.

Governmental Projects and Funding

OBERON-An integrative strategy of testing systems for identification of EDs related to metabolic disorders. Proyecto del Programa Marco de la UE, European Comission. 2019-2023. IP. Paloma Alonso-Magdalena.

Papel de la señalización mediada por TGFb en las adaptaciones metabólicas maternas durante el embarazo: implicaciones para el desarrollo de la diabetes mellitus gestacional. Proyectos Plan Estatal PID 2020 (PID2020-113112RB-I00). 2021-2024. IP. Paloma Alonso-Magdalena.

Regulación de la viabilidad y de la función de las células ß y a pancreáticas por los receptores de estrógenos ERß y GPER: papel enla terapia de la diabetes mellitus. Proyecto del Programa Prometeo de la GVA. IP: Ángel Nadal Navajas.

Beating Goliath: Generation of NoveL, Integrated and Internationally Harmonised Approaches for Testing Metabolism Disrupting Compounds. E Proyecto del Programa Marco de la UE, European Comission. IP: Ángel Nadal Navajas.

Efectos de la exposición simultánea a disruptores endocrinos y dieta rica en grasa sobre la célula beta pancreática e implicaciones en la diabetes mellitus de tipo 2. Plan Nacional de I+D+I. Ministerio de Ciencia e Innovación, Agencia Estatal de Investigación. IP: Angel Nadal Navajas.

Descifrando las respuestas inducidas por interferón-alfa de las células alfa y beta pancreáticas: una oportunidad para buscar nuevas dianas terapéuticas para la diabetes tipo1. Agencia Estatal De Investigación (PID2020-117569RA-I00). 01/09/2021-31/08/2024. IP: Laura Marroqui Esclapez.

R&D Management

Reviewer of Journals: Environmental Toxicology and Pharmacology, Aging-US. Ivan Quesada.

Grant Reviewer of: Swiss National Science Foundation, Fonds de la Recherche Scientifique (FNRS), Fondo para la Investigación Científica y Tecnológica (FONCYT) de la República Argentina, Agencia Estatal de Investigación, Agencia Andaluza del Conocimiento-Junta de Andalucía. Ivan Quesada.

Grant Reviewer of: Swiss National Science Foundation, Agencia Estatal de Investigación, Sociedad Española de Diabetes, European Science Foundation. Paloma Alonso-Magdalena.

Reviewer of Journals: Science of the Total Environment, Journal of Physiology and Biochemistry, Metabolism-Clinical and Experimental, Environmental International. Paloma Alonso-Magdalena.

24th European Congress of Endocrinology. Milán. Mayo 2022. Reviewer of Abstracts. Paloma Alonso-Magdalena.

XXXIII Congreso Nacional de la Sociedad Española de Diabetes. Las Palmas. Abril 2022. Reviewer of Abstracts. Paloma Alonso-Magdalena.

Grant Reviewer of: AGAUR (Agencia Catalana D'ajuts Universitaris I De Recerca), Czech Science Foundation, Diabetes UK. Laura Marroquí Esclapez.

Reviewer of Journals: BMC Molecular and Cell Biology, Biochemical Pharmacology, Frontiers in Endocrinology, Frontiers in Physiology, Biomedicines. Laura Marroquí Esclapez.

Reviewers of journal: Food and Chemical Toxicology, Chemosphere, Science of Total Environment, Environmental Pollution. Angel Nadal.

Grant Reviewer of: Agencia Estatal de Investigación-España, Angel Nadal.

Scientific Society Councils

Member of the Endocrine Disrupting Chemicals Advisory Group of the Endocrine Society (Angel Nadal).

Member of the Endocrine Disrupting Chemicals Working Group European Society of Endocrinology (Angel Nadal).

Member of the Scientific Advisory Board Food Packaging Forum Foundation, Zurich, Switzerland (Angel Nadal)

Editorial Boards

Editorial Board Member: Scientific Reports, Endocrine Connections, International

Journal of Molecular Sciences, Frontiers in Physiology. Paloma Alonso-Magdalena.

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

Editorial Board Member: Frontiers in Physiology, Frontiers in Endocrinology, Frontiers in Neuroscience. Angel Nadal.

Clinical pharmacology

Group name: IMMUNOPHARMACOLOGY AND IMMUNO-ONCOLOGY

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

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Publications

Baile-Maxía S, Mangas-Sanjuán C, Ladabaum U Hassan C, Rutter, M D, Bretthauer M, Medina-Prado L, Sala-Miquel N, Pomares OM, Zapater P, & Jover R. Risk Factors for Metachronous Colorectal Cancer or Advanced Adenomas After Endoscopic Resection of High-risk Adenomas. Clinical Gastroenterology and Hepatology : The Official Clinical Practice Journal of the American Gastroenterological Association. 2022. https://doi.org/10.1016/J.CGH.2022.12.005

de-Madaria E, Buxbaum J.L, Maisonneuve P, García García de Paredes A, Zapater P, Guilabert L, Vaillo-Rocamora A, Rodríguez-Gandía MÁ, Donate-Ortega J, Lozada-Hernández EE, Collazo Moreno AJR, Lira-Aguilar A, Llovet LP, Mehta R, Tandel R, Navarro P, Sánchez-Pardo AM, Sánchez-Marin C, Cobreros M, … Bolado F. Aggressive or Moderate Fluid Resuscitation in Acute Pancreatitis. The New England Journal of Medicine. 2022, 387(11), 989–1000. https://doi.org/10.1056/NEJMOA2202884

Gutiérrez A, Zapater P, Ricart E, González-Vivó M, Gordillo J, Olivares D, Veral, Mañosa M, Gisbert JP, Aguas M, Sánchez-Rodríguez E, Bosca-Watts M, Laredo V, Camps B, Marín-Jiménez I, Zabana Y,

Martín-Arranz MD, Muñoz R, Navarro M, … Francés R. Immigrant IBD Patients in Spain Are Younger, Have More Extraintestinal Manifestations and Use More Biologics Than Native Patients. Frontiers in Medicine. 2022, 9. https://doi.org/10.3389/FMED.2022.823900

Mangas-Sanjuan C, Seoane A, Alvarez-Gonzalez MA, Luè A, Suárez A, Álvarez-García V, Bujanda L, Portillo I, González N, Cid-Gomez L, Cubiella J, Rodríguez-Camacho E, Ponce M, Díez-Redondo P, Herráiz M, Pellisé M, Ono A, Baile-Maxía S, Medina-Prado L, … Jover R. Factors associated with lesion detection in colonoscopy among different indications. United European Gastroenterology Journal. 2022, 10(9), 1008–1019. https://doi.org/10.1002/UEG2.12325

Lozano-Ruiz B, Tzoumpa A, Martínez-Cardona C, Moreno D, Aransay AM, Cortazar AR, Picó J, Peiró G, Lozano J, Zapater P, Francés R, & González-Navajas, JM. Absent in Melanoma 2 (AIM2) Regulates the Stability of Regulatory T Cells. International Journal of Molecular Sciences. 2022, 23(4), 2230. https://doi.org/10.3390/ijms23042230

Villodre C, Taccogna L, Zapater P, Cantó, M, Mena L, Ramia JM, Lluís F, Afonso N, Aguilella V, Aguiló J, Alados JC, Alberich M, Apio AB, Balongo R, Bra E, Bravo-Gutiérrez A, Briceño FJ, Cabañas J, Cánovas G, … Zambudio N. Simplified risk-prediction for benchmarking and quality improvement in emergency general surgery. Prospective, multicenter, observational cohort study. International Journal of Surgery (London, England). 2022, 97. https://doi.org/10.1016/J.IJSU.2021.106168

Orts B, Gutierrez A, Madero L, Sempere L, Frances R, & Zapater P. Clinical and Immunological Factors Associated with Recommended Trough Levels of Adalimumab and Infliximab in Patients with Crohn's Disease. Frontiers in Pharmacology. 2022, 12. https://doi.org/10.3389/FPHAR.2021.795272

Campo-Betancourth, C. F., Ortiz Sebastián, S., Estrada Caballero, J. L., Llopis Torremocha, C., Villodre Tudela, C., Ruiz de la Cuesta García-Tapia, E., Gracia Alegría, E., Carbonell Morote, S., Salas Rezola, E., Cárdenas Jaén, K., Zapater, P., Bernabéu Aguirre, C., & Ramia Ángel, J. M. Early postoperative complications after gastric bypass revisional surgery in patients with previous sleeve gastrectomy versus primary gastric bypass. Surgery for Obesity and Related Diseases : Official Journal of the American Society for Bariatric Surgery. 2022, 18(10), 1246–1252. https://doi.org/10.1016/J.SOARD.2022.05.028

Melgar P, Rodríguez-Laiz GP, Lluís N, Alcázar-López C, Franco-Campello M, Villodre C, Pascual S, Rodríguez-Soler M, Bellot P, Miralles C, Perdiguero M, Díaz M, Mas-Serrano P, Zapater P, Ramia JM, & Lluís F. Textbook outcome among patients undergoing enhanced recovery after liver transplantation stratified by risk. A single-center retrospective observational cohort study. International Journal of Surgery (London, England). 2022, 99. https://doi.org/10.1016/J.IJSU.2022.106266

Piñero P, Morillas M, Gutierrez N, Barragán, E, Such E, Breña J, García-Hernández MC, Gil C, Botella C, González-Navaja JM, Zapater P, Montesinos P, Sempere A, & Tarín F. Identification of Leukemia-Associated Immunophenotypes by Databaseguided Flow Cytometry Provides a Highly Sensitive and Reproducible Strategy for the Study of Measurable Residual Disease in Acute Myeloblastic Leukemia. Cancers. 2022, 14(16). https://doi.org/10.3390/CANCERS14164010

Lluís N, Asbun H, Besselink MG, Capurso G, Garg PK, Gelrud A, Khannoussi W, Lee HS, Leppäniemi A, Löhr JM, Mahapatra SJ, Mancilla C, van Santvoort HC, Zapater P, Lluís F, de Madaria E, & Ramia JM. International multidisciplinary survey on the initial management of acute pancreatitis: Perspective of point-of-care specialists focused on daily practice. Journal of Hepato-Biliary-Pancreatic Sciences. 2022. https://doi.org/10.1002/JHBP.1201

Lluís N, Parra J, Villodre C, Zapater P, Jalali A, Cantó M, Mena L, Ramia JM, Lluís F, Afonso N, Aguilella V, Aguiló J, Alados JC, Alberich M, Apio AB, Balongo R, Bra E,

Bravo-Gutiérrez A, Briceño FJ, … Zambudio N. Prediction of peritoneal soiling in acute appendicitis with simple clinical and laboratory data. Prospective, multicenter, cohort study of 2,645 adult patients nationwide. International Journal of Surgery (London, England). 2022, 104. https://doi.org/10.1016/J.IJSU.2022.106741

Medina-Prado L, Mangas-Sanjuan C, Baile-Maxía S, Martínez-Roca AA, Murcia Ó, Zarraquiños S, Rodríguez-Camacho E, Aginagalde AH, Álvarez-Urturi C, Valverde-Roig MJ, Zapater P, Bujanda L, Salas D, Portillo I, Pellisé M, Cubiella J, & Jover R. Risk of Colorectal Cancer and Advanced Polyps One Year After Excision of High-Risk Adenomas. Diseases of the Colon and Rectum. 2022, 65(9), 1112–1120. https://doi.org/10.1097/DCR.0000000000002068

Invited Talks and Courses

Impact of TRPV1 expression on CD4+ cells in bacterial translocation during liver cirrosis. 47 Congreso Anual de la Asociación Española para el Estudio del Hígado (AEEH). Madrid. 26/05/2022.

Number of Congress Communications

National contributions: 5

Oral presentations: 1

Poster presentations: 4

Governmental Projects and Funding

Effect of high salt intake in the development of hepatocellular carcinoma and the immunological profile of patients with compensated cirrhosis. 01/01/2020 – 31/12/2022 – PROYECTOS DE INVESTIGACIÓN EN SALUD – ACCIÓN ESTRATÉGICA EN SALUD 2019 (PI19/01554) – INSTITUTO DE SALUD CARLOS III. IP: José Manuel González Navajas.

The Salt-Th17 axis in tumor growth and response to immunotherapy. 01/01/2020 – 31/12/2023. PLAN GenT (CDEI-03/20-A) – CONSELLERIA DE SANITAT – GENERALITAT VALENCIANA. IP: José Manuel González Navajas.

The importance of IL-1RAP signalling in hepatocellular carcinoma. 19/05/2021 – SUBVENCIONES DEL PROGRAMA SANTIAGO GRISOLÍA – GENERALITAT VALENCIANA 2021 (GRISOLIAP/2021/083). ISABIAL. IP: José Manuel González Navajas.

Estrategia de bloqueo multicitocina para reducir el desarrollo de carcinoma hepatocelular y mejorar la terapia de inhibición de puntos de control inmunológicos. 01/01/2023 – 31/12/2025. PROYECTOS DE INVESTIGACIÓN EN SALUD – INSTITUTO DE SALUD CARLOS III (PI22/01907.). 244.420,00€. ISABIAL. IP: José Manuel González Navajas

R&D Management

Reviewer of the National Agency for Evaluation and Prospective (ANEP) (JMGN).

Reviewer of Health Research Projects – Strategic Action in Health – Institute of Health Carlos III (JMGN).

Member of the Departmental Research Commission – General University Hospital of Alicante – ISABIAL (JMGN).

Subcoordinador del Área de Investigación en Patología Digestiva de ISABIAL (JMGN).

Reviewer of the National Agency for Evaluation and Prospective (ANEP) (PZH).

Reviewer of the Progress and Health Foundation, Andalusian Public Health System (PZH).

Member of the Departmental Research Commission – General University Hospital of Alicante – ISABIAL (PZH).

Member of the Research Ethics Committees of San Juan and Orihuela Hospitals (PZH).

Member of the Drug Research Ethics Committee of Elche Hospital (PZH).

Editorial Boards

Associate Editor – Section Inflammation. Frontiers in Immunology (JMGN) (2020-…).

Group name: HEPATIC AND INTESTINAL IMMUNOBIOLOGY GROUP

Our research focuses on the immunobiology of inflammation in the gut-liver axis, with a multidisciplinary approach aimed at understanding the role of bacterial translocation and the interaction between the microbiome and the Immune System in the context of advanced chronic liver disease and in inflammatory bowel disease.

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Publications

Gil-Gómez A, Rojas Á, García-Lozano MR, Muñoz-Hernández R, Gallego-Durán R, Maya-Miles D, Montero-Vallejo R, Gato S, Gallego J, Francés R, Soriano G, Ampuero J, Romero-Gómez M. Impact of a Loss-of-Function Variant in HSD17B13 on Hepatic Decompensation and Mortality in Cirrhotic Patients. Int J Mol Sci. 2022 Oct 6;23(19):11840. doi: 10.3390/ijms231911840. PMID: 36233142; PMCID: PMC9569581.

Hassan M, Juanola O, Keller I, Nanni P, Wolski W, Martínez-López S, Caparrós E, Francés R, Moghadamrad S. Paneth Cells Regulate Lymphangiogenesis under Control of Microbial Signals during Experimental Portal Hypertension. Biomedicines. 2022 Jun 25;10(7):1503. doi: 10.3390/biomedicines10071503. PMID: 35884808; PMCID: PMC9313283.

Gallego-Durán R, Albillos A, Ampuero J, Arechederra M, Bañares R, Blas-García A, Bernà G, Caparrós E, Delgado TC, Falcón-Pérez JM, Francés R, Fernández-Barrena MG, Graupera I, Iruzubieta P, Nevzorova YA, Nogueiras R, Macías RIR, Martín F, Sabio G, Soriano G, Vaquero J, Cubero FJ, Gracia-Sancho J. Metabolic-associated fatty liver disease: From simple steatosis toward liver cirrhosis and potential complications. Proceedings of the Third Translational Hepatology Meeting, organized by the Spanish Association for the Study of the Liver (AEEH). Gastroenterol Hepatol. 2022 Nov;45(9):724-734. English, Spanish. doi: 10.1016/j.gastrohep.2022.02.005. Epub 2022 Mar 3. PMID: 35248669.

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Ye H, Chen C, Wu H, Zheng K, Martín-Adrados B, Caparros E, Francés R, Nelson LJ, Gómez Del Moral M, Asensio I, Vaquero J, Bañares R, Ávila MA, Andrade RJ, Isabel Lucena M, Martínez-Chantar ML, Reeves HL, Masson S, Blumberg RS, Gracia-Sancho J, Nevzorova YA, Martínez-Naves E, Cubero FJ. Genetic and pharmacological inhibition of XBP1 protects against APAP hepatotoxicity through the activation of autophagy. Cell Death Dis. 2022 Feb 10;13(2):143. doi: 10.1038/s41419-022-04580-8. PMID: 35145060; PMCID: PMC8831621.

Linares R, Gutiérrez A, Márquez-Galera Á, Caparrós E, Aparicio JR, Madero L, Payá

A, López-Atalaya JP, Francés R. Transcriptional regulation of chemokine network by biologic monotherapy in ileum of patients with Crohn's disease. Biomed Pharmacother. 2022 Mar;147:112653. doi: 10.1016/j.biopha.2022.112653. Epub 2022 Jan 22. PMID: 35078095.

Orts B, Gutierrez A, Madero L, Sempere L, Frances R, Zapater P. Clinical and Immunological Factors Associated with Recommended Trough Levels of Adalimumab and Infliximab in Patients with Crohn's Disease. Front Pharmacol. 2022 Jan 3;12:795272. doi: 10.3389/fphar.2021.795272. PMID: 35046819; PMCID: PMC8762261.

PhD Theses

Título: Efecto de los disruptores endocrinos sobre la respuesta inflamatoria sistémica, y perfil quimiotáctico tisular regulado por terapia biológica en la enfermedad de Crohn. Student: Raquel Linares Fernández. Advisor: Rubén José Francés Guarinos. 12/05/2022.

Number of Congress Communications

National contributions: 6

Oral presentations:1

Poster presentations: 5

International contributions: 5

Oral presentations:1

Poster presentations: 4

Governmental Projects and Funding

Therapeutic targets and biomarkers from precision medicine in MAFLD (PreMed-MAFLD). Ministerio de Ciencia e Innovación (PI21/0082). Rubén Francés. (IIS ISABIAL, Hospital General Uni-versitario de Alicante). 01/01/2022-31/12/2023. 157.000 €.

Función de LSECtin en la restricción de la transición desde la respuesta innata a la respuesta adaptativa patogénica por células T CD4+ en cirrosis. De 01/01/2020 hasta 31/12/2022. Agencia Estatal de Investigación (PID2019-107036RB-I00). IP: Rubén Francés

Role of LSECtin in aging and the liver-brain axis in cirrhosis. De 01/01/2021 hasta 31/12/2024. Generalitat Valenciana - Consellería de Innovación, Universidad y Ciencia (PROMETEO 2021/033). IP: Rubén Francés.

R&D Management

Revisor de la Agencia Nacional de Evaluación y Prospectiva (AEI).

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

Coordinador grupo CIBERehd.

Editorial Boards

Associate Editor – Section Cytokines. Frontiers in Immunology (Frontiers Media S.A.). Rubén Francés.

Group name: RECEPTORS AND MECHANISMS INVOLVED IN ANALGESIA

Our group is formed by professors of the University Miguel Hernández and physicians of the Department of Anaesthesia, Resuscitation and Pain Relief Therapy of the General University Hospital of Alicante. We develop translational and clinical research on pain therapy and anaesthesia. Present lines of research are:

1. Regarding translational research we are interested in the neurobiological basis of the variability in opiate actions in normal and pathological conditions, at molecular level.

2. The analgesic efficacy of radiofrequency for the relief of the Greater Trochanteric Pain Syndrome

3. Ambispective comparative study of post operative cognitive dysfunction after anaesthesia using inhalatory anaesthesics in bariatric surgery

Staff

Juan José Ballesta Payá

Ph. D Students

Luis Gómez Salinas

Yolanda Sastre Peris

Physicians from the General University Hospital of Alicante

PhD THESES (2022)

Título: Probing the structural plasticity in the potassium channel KcsA using homo-FRET methodologies

Autor: Clara Díaz García

Fecha de Lectura: 05/03/2022

Dirección: Ana Coutinho (Instituto Superior Técnico (Universidad de Lisboa, Portugal) y Maria Lourdes Renart

Título: "Desarrollo de nuevas nanoformulaciones terapéuticas"

Autor: Marta Rubio Camacho

Fecha de Lectura: 04/04/2022

Dirección: Carmen Reyes Mateo Martínez / María José Martínez Tomé

Título: "Efecto de los disruptores endocrinos sobre la respuesta inflamatoria sistémica, y perfil quimiotáctico tisular regulado por terapia biológica en la enfermedad de Crohn"

Autor: Raquel Linares Fernández

Fecha de Lectura: 12/05/2022

Dirección: Rubén José Francés Guarinos

Título: "In vitro methods of biopharmaceutical evaluation in the blood-brain barrier"

Autor: Bárbara Sánchez Dengra

Fecha de Lectura: 27/05/2022

Dirección: María del Val Bermejo Sanz

Título: "Recovery and characterization of viral diversity from aquatic short-and long-read metagenomes"

Autor: Asier Zaragoza Solas

Fecha de Lectura: 21/10/2022

Dirección: Francisco Eduardo Rodríguez Varela

Título: "Descubrimiento de nuevos moduladores de TRPM8 y su potencial terapéutico"

Autor: Alicia Medina Peris

Fecha de Lectura: 22/12/2022

Dirección: Asia Fernández Carvajal

SEMINARS (2022)

MASTER PROGRAMME SEMINARS

Título: **DESCIFRANDO LA FUNCIÓN DE LA "INSULIN-DEGRADING ENZYME" (IDE) EN EL ACLARAMIENTO Y RESISTENCIA DE LA INSULINA EN EL HÍGADO.**

Ponente / Institución: Germán Perdomo. Instituto de Biología y Genética Molecular (IBGM)-CSIC (Valladolid).

Viernes, 14 de enero de 2022.

Título: **PRECISION DEUTERATION AS A NEW TOOL IN THE MEDICINAL CHEMIST'S TOOLBOX TO ACCESS SUPERIOR DRUGS.**

Ponente / Institución: Tracey Pirali. Università del Piemonte Orientale.

Viernes, 4 de febrero de 2022.

Título: **RECENT ADVANCES AND INDUSTRIAL PERSPECTIVES, IN GREEN EXTRACTION PROCESSES.**

Ponente / Institución: Giancarlo Cravotto. University of Turin.

Viernes, 18 de febrero de 2022.

Título: **INSIGHTS INTO PICORNAVIRUS BIOLOGY AND EVOLUTION FROM DEEP MUTATIONAL SCANNING ANALYSES.**

Ponente / Institución: Ron Geller. Institute for Integrative Systems Biology (I2SysBio), University of Valencia-CSIC.

Viernes, 04 de marzo de 2022.

Título: **RITMOS BIOLÓGICOS Y SUS APLICACIONES EN BIOMEDICINA Y ACUICULTURA.**

Ponente / Institución: Fº Javier Sanchez Vázquez. Universidad de Murcia.

Viernes, 11 de marzo de 2022.

Título: **INHIBIR NUPR1, UNA ESTRATEGIA PROMETEDORA CONTRA EL CÁNCER.**

Ponente / Institución: Patricia Santofimia INSERM (Francia).

Viernes, 08 de abril de 2022.

Título: **BET-INDEPENDENT MLV INTEGRATION IS RETARGETED IN VIVO AND SELECTS DISTINCT GENOMIC ELEMENTS FOR LYMPHOMAGENESIS.**

Ponente / Institución: - Ivan Nombela Diaz. Institute of Virology – Charite Universitaetsmedizin Berlin.

Viernes, 29 de abril de 2022.

Título: **PROBING THE CONFORMATIONAL PLASTICITY OF THE POTASSIUM CHANNEL KcsA USING HOMO-FRET METHODOLOGIES.**

Ponente / Institución: Ana Coutinho. iBB- Institute for Bioengineering and Biosciences, Univ. Lisbon, Portugal.

Viernes, 18 de noviembre de 2022.

Título: **DETERMINACIÓN DE LOS DESTINOS METABÓLICOS DE LOS ÁCIDOS GRASOS EN LA ENFERMEDAD DEL HÍGADO GRASO NO ALCOHÓLICO.**

Ponente / Institución: Prof. Michele Alves-Bezerra. Universidad de Sevilla.

Viernes, 25 de noviembre de 2022.

Título: **EL EJE ENTERO-CUTÁNEO: NUEVA DIANA TERAPÉUTICA EN DERMOPATÍAS INFLAMATORIAS.**

Ponente / Institución: Vicente Navarro López. Bioithas s.l. Parque científico de Alicante y Universidad Católica de Murcia (UCAM)

Viernes, 9 de diciembre de 2022.

Título: **APPLIED HOLOGENOMICS: LEVERAGING MICROBIOTA SERVICES THROUGH HOLO-OMIC ANALYSES IN FARMED FISH.**

Ponente / Institución Morten Limborg. Center for Evolutionary Hologenomics, GLOBE institute, Faculty of Health and Medical Science.

Viernes, 16 de diciembre de 2022.

PhD PROGRAMME SEMINARS

Título: **MEJORA DE LA CICATRIZACIÓN DE PECES MEDIANTE ADITIVOS NATURALES EN DIETA**.

Ponente / Institución: María Ángeles Esteban Abad. Universidad de Murcia.

Martes, 1 de marzo de 2022.

Título: **CÁNCER COLORRECTAL: Wnt, VITAMINA D Y ORGANOIDES.**

Ponente / Institución: Alberto Muñoz. Instituto de Investigaciones Biomédicas "Alberto Sols", CSIC-Universidad Autónoma de Madrid.

Jueves, 31 de marzo de 2022.

Título: **NUEVAS CLAVES EN EL ORIGEN DE LA HIPERGLUCAGONEMIA EN DIABETES.**

Ponente / Institución: Beatriz Merino. Instituto de Biología y Genética Molecular (IBGM)-CSIC (Valladolid).

Jueves, 5 de mayo de 2022.

Título: **STRUCTURAL AND FUNCTIONAL PROFILING OF ENVIRONMENTAL CONTAMINANTS AT THE LEVEL OF NUCLEAR RECEPTORS.**

Ponente / Institución: Patrick Balaguer. Instituto de Investigación del Cáncer de Montpellier (IRCM)-INSERM.

Lunes, 16 de mayo de 2022.

Título: **MARINE BIOTECHNOLOGY, OMICS AND GLOBAL HEALTH.**

Ponente / Institución: Beatriz Novoa. Instituto de Investigaciones Marinas, CSIC

Miércoles, 25 de mayo de 2022.

Título: **BÚSQUEDA DE UN GLUCOCORTICOIDE CON EFECTOS METABÓLICOS ADVERSOS MENORES: EVIDENCIA PRECLÍNICA CON FUROATO DE MOMETASONA.**

Ponente / Institución: Alex Rafacho. Departamento de Ciencias Fisiológicas de la Universidad Federal de Santa Catarina.

Viernes, 16 de septiembre de 2022.

Título: **IMPACTO DE LA EXPOSICIÓN PREVIA AL EMBARAZO AL PESTICIDA ORGANOFOSFORADO MALATIÓN EN LA HOMEOSTASIS DE LA GLUCOSA: EFECTOS DURANTE LA GESTACIÓN Y SUS CONSECUENCIAS EN LA DESCENDENCIA.**

Ponente / Institución: Alex Rafacho. Departamento de Ciencias Fisiológicas de la Universidad Federal de Santa Catarina.

Miércoles, 21 de septiembre de 2022.

Título: **TRANSCRIPCIÓN, EPIGENÉTICA Y BÚSQUEDA DE NUEVOS BIOMARCADORES EN NEUROPATOLOGÍAS.**

Ponente / Institución: Luis M. Valor. Hospital General Universitario Dr. Balmis, Instituto de Investigación Sanitaria y Biomédica de Alicante (ISABIAL).

Viernes, 23 de septiembre de 2022.

Título: **INMUNIDAD BRANQUIAL BAJO CONDICIONES DE HACINAMIENTO EN SALMO SALAR.**

Ponente / Institución: Luis Mercado Vianco. Grupo de Inmunidad de Peces. Instituto de Biología. Pontifica Universidad Católica de Valparaíso, Chile.

Lunes, 10 de octubre de 2022.

Título: **PHASE SEPARATION AND DYNAMICS ON "HYBRID POLYMER/LIPID VESICLES": APPLICATION OF ADVANCED FLUORESCENCE AND MICROSCOPY METHODOLOGIES.**

Ponente / Institución: Manuel Prieto. iBB- Institute for Bioengineering and Biosciences, Univ. Lisbon, Portugal.

Viernes, 18 de noviembre de 2022.

Título: **EMERGENCE AND EVOLUTION OF BACTERIAL PATHOGENS: DECIPHERING A COMPLEX PHENOMENON.**

Ponente / Institución: Salvador Moreno Almagro. University of Central Florida.

Lunes, 12 de diciembre de 2022.

Financial and administrative management

General Manager

María Amparo García Gutiérrez

Logistic Coordinator

Eva del Río Pons

Administration team

Vicente Lucerga (Officer)

Rosa María Balonga Rodríguez

María Teresa Prieto Ávila

María Elva González Martínez

Innovation Office

Gabriel Estañ Cerezo

Alejandra Lucía Terol Díaz-Rodríguez

The Innovation Office is working on the transference of the research results obtained by IDiBE's researchers. It is funded by the Agencia Valenciana de la Innovación (AVI) through two projects (INNTA1/2021/11 and INNVA2/2022/8). INNVA2/2022/8 has been granted in 2022.

Its work is done by detecting funding opportunities, looking for new partners (universities and innovative companies), reviewing grant proposal and advising about how to protect and transfer research results. During 2022, the Innovation Office has also coordinated activities such as the training courses:

-"Research on patent database" by Blanca Vila from Oficina Española de Patentes y Marcas (OEPM) on (06/06/2022).

-"Design Thinking Applied to tech transfer" by Ángel Alba from Innolandia (09/11/2022 and 30/11/2022).

-"European Projects" by Juan José Candel and Jorge Lorente from Zabala (22/11/2022).

-"Creating startups from university" by Pablo López and Roberto Graña from Implicatum (12-13/12/2022).

In addition, the Innovation Office has organized the participation of IDiBE in the specialized congresses FarmaForum (05-06/10/2022), Foro Transfiere (16-17/02/2022) and has collaborated in the organization of the III Research Day between researchers from the General Hospital of Elche and IDiBE (08/04/2022).

Finally, the Innovation Officer Gabriel Estañ has done some public presentations about the IDiBE capabilities including in the III Research Day between researchers from the General

Hospital of Elche and IDiBE (08/04/2022), in the VLC Health&I, organized by the entity Bioval (20/10/2022), in the Alicante Technology Forum (01/12/2022), and in the ISABIAL InnovaSummit (27/01/2023). Also, Gabriel Estañ has participated in the workshop XII Innovation Day organized by the business entity Quimacova (15/07/2022) and in another one with the Sociedad Española de Químicos Cosméticos (SEQC) done on the 28th April of 2022.

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	Mean impact factor	Total impact factor
66	85	10.56	697

Dissemination

- Out-reach seminars "Ciencia con tapas":
  - "Nuevos avances en diagnóstico y tratamiento del cáncer", Fnac (Alicante), 03-05-2022.
  - "Mejorar lo inmejorable. Mejora de variedades tradicionales de tomate", Fnac (Alicante), 02/11/2022.

- Jornada "Día internacional de la mujer y la niña en la ciencia en el IDiBE". Investigadoras en biotecnología sanitaria, Centro de Congresos "Ciutat d´Elx" de Elche" (Elche), 09/02/22.

- IDIBE-UMH Open doors/Guided tours for high school and college students, 27/10/22, 28/10/22, 08/11/22, 11/11/22.

- Jornada Científica IDiBE 2022, 21/07/2022.

Entrepreneurship

- Prospera Biotech SL

- AntalGenics SL

- Hawk Biosystems SL

- Mitra solutions technologies SL

- Innovation Labo

Clinical development

- 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

- AVX-012 starts phase III clinical trial in USA for dry eye syndrome. Sponsors: Aerie Pharmaceuticals Inc. Alcon acquieres Aerie Pharmaceuticals.
- Oncapsisens, a novel formulation for alleviating symptoms of chemotherapy induced neuropathy starts a clinical study to evaluate a preventive effect in 10 hospitals. Sponsor: Prospera Biotech.
- Ecrisens, a novel formulation for excessive sweating or hyperhidrosis. A pilot study reports excellent results attenuating excessive sweating in armpits and hands.
- AG1529 continues in regulated pre-clinical safety studies for chronic psoriasic pruritus. Sponsor: AntalGenics.

ANNUAL REPORT 2022

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

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