

Genomics of Complex Diseases

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DESCRIPTION

Our group is focused on the acquisition, management, and analysis of multi-omics data and its integration with clinical and biological data for the identification of new biomarkers and the generation of risk prediction models to facilitate clinical decision-making in patients with vascular diseases (venous and arterial thrombosis and aneurysms). Also, to the study of biological processes in healthy people exposed to conditions of physiological stress (such as extreme sports). Our multidisciplinary team (Basic/Clinic) has a molecular biology laboratory, including functional analysis and cell cultures, that allows the control of the entire workflow of the process: from the generation of samples and data to the analysis and interpretation of the results.

MAIN LINES OF RESEARCH

- Venous Thrombosis. Led by Dr. José Manuel Soria.
- Angiology and Vascular Biology. Led by Dra. Mercedes Camacho.
- Genomics of Arterial Vascular Disease. Led by Dra. Maria Sabater-Lleal.
- Genomics in Sport Medicine. Led by Dr. José Manuel Soria.
- Interdisciplinary Areas of Bioinformatics and multi-omics Data. Led by Dr. José Manuel Soria.

SCIENTIFIC CHALLENGES

- Analysis of Omics data (Genomics, transcriptomics, epigenomics) in the field of complex diseases with a translational approach in cooperation with clinical groups.



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- Identify new biomarkers (genetic, epigenetic and/or plasmatic) that determine susceptibility to complex diseases.
- Identify new mechanisms involved in the development and progression of complex traits (susceptibility to complex diseases and to healthy status).
- Development of predictive algorithms that integrate the genetic, biological, and clinical information of the patients (Personalized Medicine).
- Development of computational tools based on mathematical models of artificial intelligence for modeling of diseases and physiological processes and patient virtualization from real data.
- Soria Fernández, José Manuel. Un enfoque genómico de e-Health en la trombosis asociada al cáncer (Proyecto ONCOTHROMB_2). PI20/00325. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 159.720,00 €.
- Soria Fernández, José Manuel. IMPaCT-DATA (IMP/00019) Programa de Ciencia de Datos "Infraestructura de datos para Medicina Personalizada". IMP/00019. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 21.633,33 €.
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ACTIVE GRANTS

- Camacho Perez, Maria Mercedes. Descifrando los mecanismos moleculares subyacentes a la formación del aneurisma de aorta: el estrés del retículo endoplásmico y el estrés oxidativo mitocondrial como nuevas dianas terapéuticas. PI20/01004. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2024. 145.200,00 €.
- Lobato Delgado, Barbara. Contratos predoctorales PFIS 2021. FI21/00197. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2025. 89.900,00 €.
- Sabater Lleal, Maria. Contratos Miguel Servet I 2017. CP17/00142. Instituto de Salud Carlos III (ISCIII). Duration: 2018-2023. 202.500,00 €.
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- Sabater Lleal, Maria. Nuevo enfoque ómico para predecir el crecimiento y la rotura del aneurisma aórtico abdominal. PID2019-109844RB-I00. Ministerio de Ciencia e Innovación (MICINN). Duration: 2020-2024. 133.100,00 €.
- Sabater Lleal, Maria. Population genomic variation, functional biology and the risk of venous thrombosis. NIH WASHINGTON 5R01HL134894-02. University of Washington. Duration: 2018-2023. 76.985,85 €.
- Sabater Lleal, Maria. Structural and Nucleotide Variation as Genomic Risks for Venous Thrombosis: TOPMED and INVENT Collaboration. R01HL154385. NIH. Duration: 2022-2024. 21.570,85 €.
- Soria Fernández, José Manuel. Desarrollo y validación de una nueva tecnología de análisis de datos transcriptómicos basada en IA para optimizar el seguimiento y tratamiento personalizado de pacientes con sobrepeso y obesidad. CPP2021-008423. Ministerio de Ciencia e Innovación (MICINN). Duration: 2022-2025. 265.248,90 €.
- Temprano Sagrera, Gerard. Nuevo enfoque ómico para predecir el crecimiento y la rotura del aneurisma aórtico abdominal. SLT017/20/000100. Departament de Salut Generalitat de Catalunya. Duration: 2021-2023. 90.579,14 €.

GRANTS AWARDED

- Soria Fernández, José Manuel. Genomics of Complex Diseases. 2021 SGR 00830. Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR). Duration: 2022-2024. 60.000 €.

DOCTORAL THESES DEFENDED

- Bagué Rosell, Sílvia. Capacitat pronòstica de l'expressió de gens relacionats amb el metabolisme de la glucosa en el control local dels pacients amb carcinoma de cap i coll. 17/02/2023. Universitat Autònoma de Barcelona. Supervisors: Avilés Jurado, Francesc Xavier; Camacho Perez de Madrid, Mercedes; León i Vintró, Xavier. <http://hdl.handle.net/10803/688678>.

SCIENTIFIC PRODUCTION

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