

Regulation of Cardiac Rhythm and Contraction



Coordinator

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Members

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Main Lines of Research

- ▶ Receptor-mediated changes in intracellular calcium homeostasis in atrial fibrillation.
- ▶ Contribution of genetic variants to electrical remodelling and cardiac arrhythmogenesis.
- ▶ Effects of development and ageing on calcium handling in cardiac myocytes.
- ▶ Mathematical modeling of calcium homeostasis and electrical activity in cardiac myocytes.

Challenges

The goal is to consolidate the group as a reference in research on calcium handling in atrial fibrillation and to establish it within other lines of research by including emerging technology and fields of research. Specifically we aim to:

- ▶ Develop computational tools and models to improve the analysis and understanding of intracellular calcium handling in cardiac myocytes.
- ▶ Incorporate emerging technology such as stretching and measurements of force development in single cardiomyocytes.
- ▶ Consolidate current national and international collaborations and establish new strategic collaborations within emerging fields of research such as the use of super-resolution fluorescence imaging (STORM, STED-techniques) and the detection and role of Reactive Oxygen Species in diseased cardiomyocytes.
- ▶ Achieve international funding for incorporation of scientific expertise and participation in multidisciplinary international research projects.

Collaborations with other IIB Sant Pau Groups

- ▶ Clinical and Translational Cardiology (PI: Juan Cinca)
- ▶ Lipids and Cardiovascular Pathology (PI: Vicenta Lorente)
- ▶ Atherosclerosis and Vascular Biology (PI: José Martínez)

National Collaborations

- ▶ Diego Franco, Amelia Aranega. Departamento de Biología Experimental, Universidad de Jaén.
- ▶ Francisco Ciruela, Departament de Patologia i Terapèutica Experimental, Institut d'Investigació Biomèdica de Bellvitge (IDIBELL), Universitat de Barcelona.
- ▶ Blas Echebarria. Departament de Física Aplicada, Universitat Politècnica de Catalunya.
- ▶ Raul Benítez. Ingeniería de Sistemas, Automática i Informàtica Industrial, Universitat Politècnica de Catalunya.
- ▶ Vicente Andrés. Fisiopatología Cardiovascular Molecular y Genética, CNIC.
- ▶ Leif Hove-Madsen, Research Collaborator at the Spanish National Cardiovascular Research Network CIBERCV.

International Collaborations

- ▶ SR Wayne Chen. Department of Physiology and Pharmacology, University of Calgary, Canada.
- ▶ Glen F Tibbits. Department of Biomedical Physiology and Kinesiology, Simon Fraser University, Burnaby & Child and Family Research Institute, Vancouver, Canada.
- ▶ Edwin Moore. Cardiovascular Research Group, University of British Columbia, Vancouver, Canada.

Active Research Grants coordinated by Cardiac Rhythm and Contraction Group

- ▶ Marató TV3 2015-2030. Coordinated research project on "Adenosine receptors as new targets for the treatment of atrial fibrillation: Biomarker, Risk-Stratification and Therapy". 1/4/2016 - 31/3/2019.
- ▶ SAF2014-58286-C2-1-R. Coordinated research project on "Identification of molecular and Cellular Electrophysiological Risk factors That confer patients a high risk for Atrial fibrillation". 1/1/2015 - 31/8/2018.
- ▶ SGR-2014-1465GRE. Emerging research group on "Analysis and Control of Cardiac Rhythm". 1/1/2015 - 31/12/2017.

Collaborations

**Grants
Awarded
in 2017**

- ▶ Ana Llach Martínez. Receptors de rianodina com a nova diana per al tractament de la fibril·lació auricular. SLT002/16/00074. Departament de Salut. Duration: 2017-2019. 103,907.80 €.

Note: Total amount granted to PI. It does not include indirect costs.