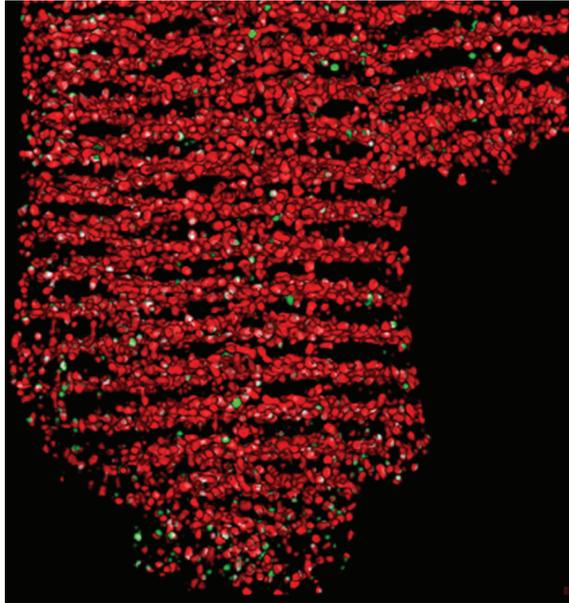


A group of world-class, interdisciplinary scientists are researching cardiovascular disease, with particular focus on arrhythmia, atrial fibrillation and heart failure.



Graduate Programs

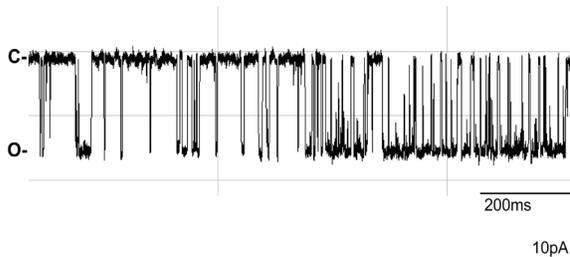
Cell & Developmental Biology (MSc, PhD)

Biochemistry & Molecular Biology (MSc, PhD)

Pathology & Laboratory Medicine (MSc, PhD)

Experimental Medicine (MSc, PhD)

Zoology (MSc, PhD)



Research Strengths & Facilities

We study cardiovascular problems at multiple levels, ranging all the way from high-resolution structures of individual proteins (X-ray crystallography), to functional studies at the protein level (electrophysiology), at the cellular level (cellular imaging), and the organism level (using genetic manipulation). This allows us to get an integrated view of disease mechanisms.

The Cardiovascular Research Group (CRG) consists of principal investigators, postdoctoral fellows, graduate students, undergraduates, research associates and technicians studying the electrical and contractile activity of the heart under normal and diseased conditions. <http://crg.lsi.ubc.ca/>

Our strengths are high resolution analysis of ion channel electrical activity and structure/function relationships in proteins and intact cells.

We blend a variety of modern and traditional techniques to investigate cardiac diseases and their underlying mechanisms, including:

- Protein crystallography and biochemistry
- Electron tomography and microscopy
- Multiple fluorescence platforms for 3D cellular imaging
- Molecular biology
- Transgenic models of human disease
- Stem cells
- Electrophysiology
- Mathematical modeling

We are a highly interdisciplinary group with a vibrant research atmosphere that includes lab meetings, journal clubs and group discussions.

We're located in the Life Sciences Institute (LSI), a new state-of-the-art facility with an open-lab concept that encourages interactivity both within the group and with other research groups in the LSI.

Our trainees have been awarded prestigious scholarships and travel the world to present their research at international conferences. We encourage and welcome your inquiries.



The Cardiovascular Research Group is studying how the heart generates and maintains its regular beat, and controls its force of contraction.

CRG Researchers:

Eric Accili: is studying proteins that enable the heart to initiate its own rhythm independently of the nervous system.

Christopher Ahern: is interested in voltage-gated sodium channels as regulators of electrical excitability in the cells of nerve and muscle.

David Fedida and Steven Kehl: are studying how the heart generates, maintains and regulates electrical activity. Electrical potential is transmitted across the heart as the cells alternately depolarize and re-polarize, due to the coordinated action of a multitude of intramembrane proteins. Any defects in this action can trigger atrial fibrillation and a variety of ventricular arrhythmias.

Harley Kurata: studies regulatory mechanisms of inwardly-rectifying potassium (Kir) channels. Current research is aimed towards identifying novel interactors and regulators of channel function, and investigating the detailed mechanisms of Kir channel gating and blockade.

Edwin Moore: is studying the mechanisms which control excitation-contraction coupling in muscle cells.

Filip Van Petegem: is investigating the structure and function of calcium-selective channels in health and disease. Current research themes are focussed on how mutations lead to cardiac arrhythmias and understanding protein-protein interactions through the use of X-ray crystallography, electrophysiology, and various biophysical methods.

James Johnson: is studying the in vivo role of cardiac ryanodine receptors and calcium homeostasis in multiple cellular functions, including apoptosis, using a combination of imaging and genetic engineering techniques. His lab is interested in links between diabetes and heart disease.



Recent Publications

Pless SA, Galpin JD, Niciforovic AP, Ahern CA. (2011). Contributions of counter-charge in a potassium channel voltage-sensor domain. *Nature Chemical Biology* 7:617-623.

Schulson MN, Fletcher P, Scriven DRL, Moore EDW. (2011). Couplons in rat atria form distinct sub-groups defined by their molecular partners. *J Cell Science* 124:1167-1174.

Peters CJ, Werry D, Gill HS, Accili EA, Fedida D. (2011). Mechanism of accelerated current decay caused by an episodic ataxia type-1-associated mutant in a potassium channel pore. *J Neurosci* 31:17449-59.

Ching-Chieh Tung, Paolo A. Lobo, Lynn Kimlicka, Filip Van Petegem. (2010). The N-terminal disease hot spot of ryanodine receptors forms a cytoplasmic vestibule. *Nature* 468:585-588.

Bround MJ, Asghari P, Wambolt R, Bohunek L, Smits C, Philit M, Kieffer TJ, Lakatta EG, Boheler KR, Moore EDW, Allard MF, Johnson JD (2012). Cardiac ryanodine receptors control heart rate and rhythmicity in adult mice. *Cardiovascular Research* 96:372-80.

Graduate Studies Admission

UBC Faculty of Graduate Studies establishes common minimum academic requirements. One of the main requirements for LSI graduate programs is securing a research supervisor.

Contact

Recruitment & Outreach Coordinator
lsi.grad@ubc.ca
website: grad.lsi.ubc.ca

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The University of British Columbia

UBC is a global centre for research and teaching, consistently ranked among the 40 best universities in the world. Surrounded by the beauty of the Canadian West, UBC embraces bold new ways of thinking that attract exceptional students and faculty. It is a place where innovative ideas are nurtured in a globally connected research community, providing unparalleled opportunities to learn, discover and contribute in one's own way. UBC is a place of mind.