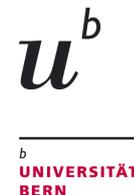


PhD student position in cardiac electrophysiology - biomechanics (experiments and modeling)



Department of Physiology, University of Bern
<http://www.physio.unibe.ch>

Keywords: physiology, biophysics, bioelectricity, biomechanics, tissue engineering, computer modeling, action potential, cardiac arrhythmias, heart, signal processing

Description:

Background:

Cardiac arrhythmias are prevalent causes of morbidity and mortality. The general goal of our research is to better understand the fundamental mechanisms leading to altered propagation of the electrical excitation (action potential) in cardiac tissue. Our interdisciplinary approach involves experiments (cardiac cell cultures grown on microelectrode arrays) and mathematical modeling (computer simulations of the action potential).

Research project:

Cardiac conduction depends on ion currents. However, conduction is also modulated by deformation of cardiac tissue. This process is called mechano-electrical feedback. We will use a newly developed experimental system permitting the application of controlled deformations to cultures of cardiac cells while recording their electrical activity. For this, we will design stretchable microelectrode arrays (collaboration with the Laboratory for Soft Bioelectronic Interfaces, Prof. S. Lacour, EPFL, Geneva) on which the cell cultures will be grown. This system will allow investigating various mechanisms of mechano-electrical feedback. These experiments will be paralleled with computer simulations using models of cardiac tissue. The study is expected to further our understanding of the interactions between bioelectricity and biomechanics.

The project is supported by the Swiss National Science Foundation.

Further details can be found on <http://www.physio.unibe.ch/~kucera/group/index.aspx>

Education and profile:

The ideal candidate

- has a master's degree in a discipline pertaining to the project (e.g., life sciences, medicine, biomedical sciences, biomedical engineering, physics)
- is interested in electrophysiological experiments
- is interested in developing new experimental techniques
- has previous working experience with mathematics (calculus, linear algebra) and programming languages (e.g., MATLAB, C/C++)
- is able to collaborate in an interdisciplinary manner with different research teams
- has a good knowledge of the English language (oral and written)
- has oral knowledge of German permitting to be involved in teaching activities (up to 10% of work time; practical workshops and tutoring of small groups of undergraduate medical students)

Candidates selected for an interview are expected to travel to Bern for a visit at their own expenses. Applications that do not fulfill these criteria will not be answered.

Entrance upon: Between July 1, 2019 and October 1, 2019, to be discussed.

Duration: 3-4 years.

Location: University of Bern, with regular activities at the Campus Biotech in Geneva (travel by train will be covered)

Applications: Applications (motivation statement, CV and a copy of the master's degree) are to be submitted by e-mail to: kucera@pyl.unibe.ch

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