

PhD position on “Modeling the energy supply of the brain in health and disease” (full-time/100%)



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UNIVERSITY
OF BERN

ARTORG CENTER
BIOMEDICAL ENGINEERING RESEARCH

The **ARTORG Center for Biomedical Engineering Research** is the University of Bern’s transdisciplinary Center of Excellence for medical technology research. Its mission is to tackle unmet clinical needs and envision future challenges in diagnosis, monitoring and treatment to create viable healthcare technology solutions with imagination, agility and purpose. Its projects run from discovery and basic research to clinical translation.

Project background

The key energy substrates of the brain are glucose and oxygen. Both are delivered to the brain via an intricate network of blood vessels. Recently, novel datasets resolving the entire vasculature of the mouse brain became available, which offer unique opportunities to study the brain’s energy supply. This requires developing and applying novel numerical methods to simulate blood flow and nutrient transport in large microvascular networks and the surrounding tissue.

Job description

The candidate’s work focuses on developing a simulation framework to model transport in large microvascular networks and the surrounding tissue. Moreover strategies on how to quantify the brain’s energy supply in different conditions need to be derived. Both for model development and validation we collaborate with different groups. Thus, the ability to collaborate in an interdisciplinary team, as well as a well-structured working approach and careful data analysis are key for the successful completion of the project.

Requirements

The ideal candidate is highly motivated, able to work and acquire knowledge independently and has the following qualifications:

- MSc in engineering, computer science or comparable.
- Experience in mathematical and numerical modeling of physical processes.
- Programming skills in C++ and/or Python.
- Prior experience in parallel computing/programming is considered a plus.
- Strong interest in biomedical research questions.
- Strong communication and writing skills in English.

General information

The candidate will be affiliated with the University of Bern as PhD student and will be supervised by Dr. Franca Schmid. The position is funded for 4 years. The starting date is in autumn 2022. The salary will be according to regulations of the Swiss National Science Foundation. The candidate will be a member of the [Cardiovascular Engineering research group](#) (Chair: Prof. Dr. Dominik Obrist), which works on various topics related to biomedical flow systems and offers a creative and international working environment with a strong connection to the clinics and attractive conditions to conduct competitive research.

Application

If you are interested in working on an interdisciplinary and innovative project please send your application to Dr. Franca Schmid (franca.schmid@unibe.ch). The application should contain the following documents: 1) motivation letter (1 page), 2) CV (including contact information of two references), 3) recommendation letter, 4) full transcripts from undergraduate studies (both Bachelor and Master) and 5) abstract of the master thesis. The documents should be combined into ONE pdf file. Applications will be reviewed until the position is filled.

About the University of Bern

The University of Bern is located at the heart of Switzerland. Internationally connected and regionally anchored, it cultivates exchange with society and strengthens partnerships between science, medicine, business, and politics. The University of Bern is committed to a deliberate and ethical responsibility towards people, animate and inanimate nature. As an important educator, promoting enterprise and industry in the region and beyond, it distinguishes itself through problem-oriented research into questions of pressing social relevance. The University of Bern is an equal opportunity employer, promotes healthy work-life-balance and safe working environments, and strives to increase the number of women at all levels in its faculties.