

MD-PhD / PhD position in Neurology, Stroke

100%, September 1st, 2023 (later starting dates are possible)

Are you passionate about utilizing cutting-edge data-driven approaches to address critical healthcare challenges? Are you eager to make a meaningful impact in the field of stroke prevention? If so, we invite you to join our dynamic research team of the Neurology department of the University Hospital Basel as a PhD/MD-PhD student working on an exciting SNF funded international project focused on data-driven approaches.

The position is limited to three years and the earliest starting date is September 1st, 2023.

Your position

As a PhD or MD-PhD student, you will be an integral part of our research team and actively contribute to the development and implementation of data-driven approaches to identify strategies to prevent stroke recurrence. You will have access to a vast array of anonymized patient data, a blood biobank and state-of-the-art computing resources, and a collaborative work environment. Under the guidance of experienced researchers (clinical-research and data-science), you will have the opportunity to shape the direction of the project and conduct cutting-edge research in the field of healthcare analytics.

Responsibilities:

- Conduct a comprehensive review of existing literature on stroke, current preventative strategies secondary stroke, data analytics, and machine learning techniques
- Data harmonization of several international clinical datasets, organization of the overall logistics of the Swiss Stroke Biobank
- Collaborate with clinicians and researchers to identify relevant data sources and variables for analysis
- Develop and implement machine learning models and algorithms to identify potential biomarkers of stroke recurrence
- Analyze and interpret complex data sets to identify novel patterns and biomarkers
- Validate and evaluate the performance of the developed models using the one of the largest stroke data set to date
- Document research findings in academic publications and present at conferences
- Contribute to the collaborative and interdisciplinary research environment

Project Description:

Stroke is one of the major causes for invalidity and death worldwide. Patients who had suffered a stroke are at high risk for another one. Prevention of these recurrent strokes is, thus, very important. Therefore, innovative concepts and strategies in secondary stroke prevention are of major relevance. Currently, the strategy of stroke prevention is based on the presumed etiology of stroke which is commonly defined according to categories. This categorization, however, comes along with substantial limitations: Stroke aetiologies regularly overlap and recurrence rates even within distinct stroke categories are largely heterogeneous, which underscores the necessity of a more detailed representation of the actual mechanism of stroke recurrence at the biological level. Our project aims to initiate a paradigm shift towards an integrated pathophysiology-based evaluation of cerebrovascular risk. CRESCENDO is a transnational consortium using existing large-scale biosample collections of stroke patients with deep phenotyping in order to identify and validate molecular targets for prevention of stroke recurrence. To that end, we will investigate well-characterized biomarkers of inflammation, immunothrombosis, and stress in a hypothesis-driven approach and on the other hand additionally search for predictive targets of interest via a data-driven omics approach.

Environment:

The research group of Prof. Mira Katan (Deputy Chair of the Dept. of Neurology, Chair of the Research Board) is part of the neurovascular research cluster and stroke center at the University Hospital of Basel. The group focuses on translational stroke research to ultimately improve patient care. We offer a highly collaborative, interdisciplinary and international environment as the project is embedded in an international consortium. The Biomedical Data Science Lab at ETH Zurich, headed by Prof. Catherine Jutzeler, investigates data-driven solutions for healthcare applications with a focus on neurological conditions such as spinal cord injury, lower back pain, neuro-degenerative disorders and neurological tumors. Together, we are seeking a motivated PhD to join this growing team and contribute to interdisciplinary research partnerships.

Your profile

- A master's degree in computer science, data science, computational biology, biomedical engineering, or a related field; or a masters degree in medicine with a strong data science interest
- Strong programming skills, preferably in Python
- Some experience working with large datasets and data processing tools
- Solid understanding of data analysis and machine learning techniques
- Excellent written and oral communication skills
- Good knowledge (written/oral) of English
- Ability to work independently and collaboratively in a team environment
- Highly organized with excellent communication and interpersonal skills

Preferred Qualifications:

- Experience with machine learning algorithms and software (e.g., TensorFlow, PyTorch)
- Familiarity with biomedical data and research
- Experience with database management systems (e.g., SQL)

We offer you

- Engage in cutting-edge research with the potential for high impact for stroke survivors
- Opportunities for professional development
- Opportunities to engage with different communities bridging data science and medicine research leading to high-impact publications
- You will be part of a highly motivated, friendly and collaborative team
- You will be able to attend relevant (inter-) national conferences to increase your visibility and present the project outcomes
- You will be involved in the supervision of master students and teaching activities of the lab

Application / Contact

We are committed to diversity and inclusion in our research community. Applications from individuals with diverse backgrounds and underrepresented groups are particularly encouraged.

We look forward to receiving your application with the following documents:

- a letter of motivation (1-page max)
- CV
- Master diploma

Please send your application by e-mail to Prof. Mira Katan (mira.katan@unibas.ch).

Questions regarding the position should be directed to Prof. Mira Katan and Prof. Catherine Jutzeler, by e-mail at mira.katan@unibas.ch and catherine.jutzeler@hest.ethz.ch.

We evaluate applications on a rolling basis.