Postdoctoral position in clinical metabolomics

Metabolomics group at the University of Lausanne together with the Neuropsychiatry and Biomarker group at the University Hospital in Lausanne are looking for a talented and motivated post-doctoral fellow to join a young and dynamic team in the newly established metabolomics unit at the Faculty of Biology and Medicine. It is a joint interdisciplinary project with a goal to apply the state-of-the-art technology and approaches in metabolomics to advance the understanding of brain energy metabolism and the role it plays in brain function (please see the project description below).

Project Description

Neurodegenerative CNS disorders, such as Alzheimer disease (AD), are thought to be associated with and perhaps caused by alterations in central energy metabolism and derived oxidative stress. However, these metabolic alterations, beyond the reduced glucose metabolism, remain largely unexplored. Metabolomics, as a powerful phenotyping technology, in combination with orthogonal clinical approaches, has the potential to accelerate the understanding of mechanisms that underlie complex diseases such as AD and to unravel new pathways and molecular sites of presumed therapeutic intervention. In this context, our main objective is to identify the metabolic signatures of AD combining untargeted UPLC-HRMS and targeted UPLC-MS/MS metabolic profiling of peripheral blood, skin-derived fibroblasts, cerebrospinal fluid (CSF) and brain tissue of clinically well characterized subjects with confirmed AD and healthy aged controls without cerebral AD pathology. In three consecutive aims we wish to 1) identify and link peripheral and central metabolic alterations associated with AD in paired blood plasma and CSF samples, 2) investigate metabolic response in skin-derived fibroblast cell cultures under controlled conditions, before and after stress stimulation, considering a subset of the participants 3) characterize the tissue metabolic activity of the most affected brain regions, the frontal cortex and the hippocampus, using LC-HRMS in combination with MALDI-HRMS imaging, and investigate it in association with region-specific amyloid and tau accumulation. The revealed alterations at the metabolite and pathway level will be further correlated with CSF markers of the “core” AD pathology (Aβ1–42, tau, and P-tau181), the acquired proteome data, structural Magnetic Resonance Imaging (MRI), and clinical assessment data, including the patient’s body mass index (BMI), genetic risk factors, blood-brain-barrier (BBB) permeability, and cognitive decline at follow-up.

The successful candidate should be able to take the lead of the project in the interaction with the rest of the multidisciplinary team at UNIL (Metabolomics group, Faculty of Biology and Medicine, PI: Dr. J. Ivanisevic) for metabolomic analyses and at CHUV (Neuropsychiatry and Biomarker group, Department of Psychiatry & Leenaards Memory Center, Clinical Neurosciences, PI: Dr. Julius Popp, MD) for clinical meta-data investigation. We expect the candidate to be independent, take the initiative and explore the acquired data as best as possible in terms of statistical modelling, pathway and network-embedded analyses. The candidates with a stronger background in bioinformatics will be given a priority.

Your profile

- PhD in in the natural or medical sciences
- Excellent scientific track record, including at least one publication as first author in a good quality, peer reviewed international journal
- Experience with mass spectrometry based metabolomics, particularly the back end bioinformatics aspect is highly desired
- Experience with statistical data modelling is also highly desired
- Experience with the interpretation of complex mass spectra and metabolite identification, as well as the knowledge and understanding of biochemistry will be considered as an advantage
- Commitment and capacity to work effectively in an international and multidisciplinary team
- Excellent demonstrated communication skills in English (spoken and written)

Place of employment and work

The candidate will work in the Metabolomics group at the University of Lausanne (UNIL), located in the center of Lausanne. For more information about our service and research group please visit: www.unil.ch/metabolomics. UNIL offers an outstanding scientific environment and a competitive salary, while Lausanne provides a high standard of living and dynamic cultural atmosphere. Ideally situated along the lake of Geneva, near Lausanne's city center, UNIL campus brings together over 120 nationalities. The seminars with high-profile international speakers as well as other events are organized on a regular basis within the LIMNA network.

Terms of employment

Deadline for application: **12 June 2017**
Project start date: **As soon as possible upon selection**
Employment fraction: **Minimum 80%, ideally 100%**
Duration of the position: **2 years**

Application

Please submit your application including a CV, a letter of motivation and contact information of at least two references by e-mail in a single pdf file via UNIL website (Emlpois/Assistantes et assistants) at https://www.unil.ch/central/fr/home/menuinst/organisation/emplois.html. In the cover letter, detail how your profile fits the research project, your skills and long-term career goals.

Contact person

For further information about the position please contact a platform coordinator Dr. Julijana Ivanisevic at julijana.ivanisevic@unil.ch or a Senior Scientist Dr. Hector Gallart Ayala at hector.gallartayala@unil.ch.