PhD Position in Cancer Research
100 %

Research area
Treatment of a primary tumor is relatively well established, but limited options are available once brain metastases have established. Patients with melanoma brain metastasis have a poor median overall survival of less than 6 months. Thus, it is very important to develop therapies blocking tumor metastasis into the brain. During metastasis formation, cancer cells use the circulation to reach distant sites. In the brain, the metastasizing cancer cell must breach the tight blood-brain barrier (BBB). In this project, we will investigate the cellular and molecular mechanism enabling metastatic melanoma cells to breach the BBB.

Tasks
In a recent project, we have revealed the critical role of VLA-4 binding to endothelial VCAM-1 for melanoma cell adhesion to and intercalation into the BBB1. Based on these findings, the chosen candidate will study the molecular and cellular mechanism of melanoma cell migration across the BBB. The following questions might serve as example for the outline of project. Does VLA-4 engagement on the melanoma cells induce out-side-in signaling that contribute to the migration across the BBB? Are additional integrins of the melanoma cells involved? Which pathway do melanoma cells use to migrate across the BBB and does the junctional complexity of the BBB play a role? Expertise on an in vitro BBB model formed by primary mouse brain microvascular endothelial cells (pMBMECs) and various genetically modified mouse lines are available. The methodological focus will be laid on imaging approaches, whereas additional cell biological and biochemical methods will have to be applied where appropriate. The project may involve extending the existing BBB model from a 2D setup to 3D perfusable vessels. To strengthen the bioimaging skills, the candidate will transiently be involved in an interdisciplinary project connected to computer vision.

Requirements
- Master degree in life sciences or medicine.
- Strong scientific interest in molecular and cellular mechanisms leading to cell-cell interaction.
- Strong methodological interest in microscopy.
- Advanced skills in cell culture.
- Proactive working attitude.
- High disposition to contribute to the positive working atmosphere of the institute.
- Solid basis in modern computer skills and willingness to master new software

We offer
The Theodor Kocher Institute offers an international environment established by five independent research groups that all focus cell migration using high end in vitro and in vivo live cell imaging (www.tki.unibe.ch). The PhD candidate will be enrolled in the Graduate School for Cellular and Biomedical Sciences of the University of Bern (www.gcb.unibe.ch). Participation at the doctoral programs "Cell migration" and "Cutting edge microscopy" will be offered. The salary will be according to the guidelines of the Swiss National Science Foundation (www.snf.ch). Your working
place will be in the research group of PD Dr. phil. nat. Ruth Lyck (Orcid ID), Theodor Kocher Institute, University of Bern, Freiestrasse 1, 3012 Bern, Switzerland.

Please send your full application with transcripts of University Diplomas with grades, CV, two references, statement of research interest and motivation letter as a single PDF to ruth.lyck@tki.unibe.ch. The selection process runs until a suitable candidate has been selected; applications will be checked weekly. The position is available from February 1, 2019.

www.unibe.ch