Thursday, June 6, 2019

PhD position in bioinformatics

"Epigenomic mechanisms of HIV genome integration in microglia cells"

The Health Data Science Unit (HDSU, www.hdsu.org) is a newly created unit of the BioQuant and medical Faculty of the University Heidelberg, which focuses on research topics related to digital health and the integration of clinical and genomic datasets. A major topic of the group of Dr. Carl Herrmann lies in the analysis of (epi)genomic datasets and single-cell datasets, as part of several consortia. We seek to develop novel approaches for the integration of multi-omics datasets, especially in a single-cell context.

The DFG-funded project *"Microglia 3D Chromatin landscape during HIV-1 latency"* in collaboration with the group of Dr. Marina Lusic (Center for Integrative Infectious Diseases) aims at understanding the cellular mechanisms leading to HIV genome insertion in brain microglia cells. These cells represent a significant reservoir of HIV-viruses which can enter a latent phase, and their infection leads to specific secondary diseases related to HIV infection. We want to understand the specificities of microglia infection compared to T-cells, and understand the role of the 3D chromatin architecture in driving the HIV insertion into the host genome, using newly developed genomic assays, epigenomic bulk datasets and single-cell RNA-seq experiments.

For the bioinformatics part of this project, we are looking for a PhD candidate; the bioinformatic project will consist in

- Combining the in-house human genomic datasets obtained in a microglia cell line with previously published datasets in human and mouse to build a comprehensive description of the epigenomic landscape in microglia;
- Compare the microglia specific aspects of HIV integration by comparison with T-cell datasets;
- Develop an analysis method for the GeneCap assay in order to detect integration sites as well as 3D interaction patterns;
- Combine the bulk datasets with the generated single-cell datasets to derive signatures of HIV infection response of the microglia cells

We are looking for a candidate with

- Interest in working at the border of computational biology and experimental virus biology;
- Background in analysis of high-throughput sequencing datasets
- Knowledge of R and other programming languages

What we are offering:

- a 65% E13 position
- An exciting multinational research environment on Heidelberg Campus
- An interdisciplinary research team within the BioQuant, Heidelberg (https://www.bioquant.uni-heidelberg.de/)

Application letters and CVs (as pdfs), together with contact information of two referees should be sent by mail to carl.herrmann@bioquant.uni-heidelberg.de