JUSTUS-LIEBIG-
UNIVERSITÄT
GIESSEN

Job Title: PhD position: Medical Informatics / Bioinformatics For Precision Oncology

The **Institute of Neuropathology** at the **University of Giessen, Germany**, Director Prof. Till Acker, invites applications for

TWO PHD POSITIONS: COMPUTATIONAL/DEEP LEARNING IN NEUROONCOLOGY

The two positions are available immediately.

Your profile

We are looking for enthusiastic and highly motivated applicants holding, or about to obtain, a Master degree in Bioinformatics, Medical Informatics or similar. The candidates should have strong expertise in R, Python, Shell and Unix operating systems. Experience in Docker and Machine Learning / Deep Learning is helpful. Preference will be given to applicants with previous experience in one or more of the following areas: analysis of MethylationEPIC array, gene expression array, RNA-seq, integrative quantitative and post-quantitative analyses from multiple omics datasets, image analysis of histological data.

Topic:

Classification of malignant tumors and identification of tumor vulnerabilities is a key step in defining therapeutic possibilities and combat cancer. The combination of molecular and histopathology with advanced medical (bio)informatics provides novel opportunities to develop effective precision oncology approaches. We are particularly interested in understanding how the somatic epi/genetic changes that arise during tumor evolution correlate with (or induce) a histological phenotype, specific alterations in signalling pathways and characteristic targetable cancer cell vulnerabilities. The proposed projects will aim to 1) develop and employ **machine/deep-learning-based tools for automated detection and quantification of tumor abnormalities and classification of tumors** by using genome-wide DNA methylation data from cancer patients and automated microscopy image analyses of histopathological samples and 2) systematic discovery of signalling pathway alterations by **deconvolution of multidimensional genomics data (methylome and transcriptome) to aid precision diagnostics and identify potential therapeutic targets.**

What we offer

Our international team offers an **open, supportive, dynamic and motivating academic environment with excellent training opportunities** including the PhD graduate program of the International Giessen Graduate school for Life Sciences (GGL http://www.uni-giessen.de/cms/fbz/zentren/ggl) with the possibility to work on cutting edge research projects. We have won a number of external research grants and are involved in several national and international collaborative projects. We use a **wide spectrum of methods** including DNA methylation array analysis, next generation sequencing, bioinformatic analysis, animal models and *in vivo* tumor models as well as tumor biopsies, immunohistochemistry, *in situ* hybridization, light, epifluorescence and confocal microscopy, image analysis. Our group has a long-standing expertise in the molecular, cellular and functional characterization of brain,

lung and breast cancer development, with a special emphasis on microenvironment- and hypoxia-induced mechanisms in tumor biology.
See also: ukgm.de/ugm_2/deu/ugi_npa/5424.html

The activities of the two PhD students will be integrated in the framework of the MIRACUM-Consortium (Medical Informatics in Research and Care in University Medicine, Vice-Chair: Prof. Till Acker; see also: miracum.org) In addition, collaboration possibilities and advanced training at the de.NBI (German Network for Bioinformatics Infrastructure) as well as the newly founded University Center of BioMedical Informatics are available.

Please **send your application** as a single PDF: cover letter, your CV, certificates of your qualifications, your publication list and the contact details of at least two referees until **15.07.2019 to PD Dr. Attila Németh (Attila.Nemeth at patho.med.uni-giessen.de**). Applicants with disabilities but otherwise equal qualifications will be preferred.

Selected references:

Capper et al. *Nature* 2018; Segarra et al, *Science* 2018; Dopeso et al, *Cancer Research* 2018; Depner et al, *Nat Commun*. 2016; Filatova et al, *Cancer Research* 2016; Henze et al, *Nat Commun*. 2014; Garvalov et al, *Nat Commun*. 2014; Sawamiphak et al, *Nature* 2010