

21.10.21

At the Engineering Mathematics and Computing Lab (EMCL) the following position is to be filled with 39.5h/week from December 1st, 2021 or as soon as possible thereafter:

PhD Student Position in Mathematics (f/m/d)

Project: Mathematical Oncology

Cancer is one of the leading causes of disease-related death worldwide. In recent years, rapid increase in the molecular understanding of cancer has unraveled significant additional complexity of the disease. Although large amounts of data on cancer genetics and molecular characteristics are available and accumulating with increasing speed, adequate interpretation of these data still represents a major bottleneck. This is exactly where mathematics can be applied to oncology: Through mathematical modeling of complex biological processes we are able to gain novel medical insights.

The project aim is three-fold: Firstly, mathematically modeling the evolution of hereditary tumors to improve the existing prevention strategies, secondly, elevating tumor immunology to a genome-wide level using adequate data analysis and modeling techniques, and thirdly, predicting the efficacy of clinical approaches for diagnostics, prevention and treatment based on the developed models.

The project will be supervised by Prof. Dr. Vincent Heuveline (EMCL) and PD Dr. Matthias Kloor (ATB). It is fully funded by Klaus Tschira Foundation Project "Mathematics in Oncology". Remuneration is based on TV-L E 13. The position is fully funded for 3 years.

Your tasks:

- Developing mathematical models (e.g. ODEs and PDEs) for hereditary cancer evolution at the example of Lynch syndrome colorectal carcinogenesis based on molecular and genetic behavior
- Analyzing molecular and genome sequencing data for differentiation of the multiple pathways in Lynch syndrome carcinogenesis
- Modeling neoantigen evolution to deepen the understanding of tumor-immune interaction
- Work closely with tumor biologists and medical experts to calibrate and validate mathematical models with cancer data

Your profile:

- Completed master's degree in Mathematics, Computer Science, or related disciplines
- Strong mathematical background and solid programming experience (e.g. Python or Mathematica or C++)
- Good English language skills
- Interest in medical applications, joy in working in an interdisciplinary team environment

We look forward to receiving your application, which you should send to lydia.mehra@uni-heidelberg.de with the usual documents (curriculum vitae, certificates, etc.) in a single PDF file by **November 15, 2021**.

Heidelberg University stands for equal opportunities and diversity. Disabled persons will be given preference if they are equally qualified. Information on job postings and the collection of personal data is available at <https://www.uni-heidelberg.de/en/job-market> (English) and www.uni-heidelberg.de/stellenmarkt (German).