

**Job announcement No. 110/2024**

The department of Systems Immunology, led by Prof. Dr. Meyer-Hermann, at the Helmholtz Centre for Infection Research (HZI), is offering the position of a

**Doctoral Researcher (f/m/d) - “Dynamic simulation of immunological systems”**

**Project description:**

The advertised position is part of the NFDI4Immuno (<https://www.nfdi4immuno.de/>) consortium, involving experts from various areas including immunology, molecular and cellular biology, oncology, hematology, genetics, bioinformatics, machine learning, as well as data and software engineering. The NFDI4Immuno consortium aims to build the capability to combine data and metadata generated from immunological experiments, e.g. cytometry, immunoassays, sequencing, and imaging, providing its members with a federated infrastructure for all immunological data types. In addition, the consortium intends to develop tools and services to support its members with the adoption and utilization of interconnected and integrated data stored in its repositories.

Our group focuses on the development of germinal centers (GCs) simulation tools. GCs are microanatomical structures within lymphoid organs with an important role in the development of antibodies and memory cells for the long-lasting immunity against pathogens. Using the HYPHASMA simulation tool, developed based on a discrete agent-based modeling approach, we can simulate and study the dynamics of GCs at subcellular level and the process of affinity maturation. The agent-based modelling approach allows for the integration with various data types, e.g. various levels of sparsity, scale and dimension, as well as mechanistic information. Based on immune data, e.g. AIRR-seq, transcriptomic sequences and cytometry data, we can study the dynamic of the immune response.

As part of the NFDI4Immuno consortium, we will focus on the delivery of agent-based models to the consortium as well as an user-friendly interface to our simulation tools. A central part of this endeavor would be to integrate the datasets and repositories of the consortium with our simulation tools.

As a graduate in software engineering, mathematical modeling or biology, you will learn and contribute to the development of mathematical models and bioinformatic tools to derive insights on immunological systems and support the integration of various immunological data type into a simulation tool.

**Qualifications:**

- Master’s Degree/Diploma (or equivalent) in computer science, bioinformatics, physics, mathematics, data science or engineering
- Fluency in English (written and spoken)
- Ability to work independently and as part of an international team
- Highly motivated to develop scientific skills
- A hands-on experience with C++, C, Python or any object-oriented programming languages is required
- As our simulation tool is written in C++, experience with C++ will be preferred
- Knowledge with general immunology, bioinformatic approaches, data driven model parameterization and a good understanding of agent-based modeling strategies is considered an advantage

Disabled persons are given preference in the case of equal professional qualifications. The HZI aims for professional equality between women and men. The position is suitable for part-time work.

**We offer:**

- Modern laboratories, including S3 unit
- State-of-the-art analytical instrumentation
- Ample biological profiling platforms (*in vitro* and *in vivo*)
- A lively scientific community
- 30 days vacation, (24.12. & 31.12. are considered as completely free days)
- An annual additional payment (Weihnachtsgeld) analogue to § 20 TVöD
- Social security included
- Flexible working hours and workplace design
- DO IT- PhD initiative <https://www.helmholtz-hzi.de/de/karriere/do-it-doktorandeninitiative>
- A corporate culture of appreciation and promotion of equal opportunities
- Welcome Office
- Buddy System for new doctoral researchers
- Family Office, Child Holiday Care

The successful candidate will be integrated in the HZI International Graduate School for Infection Research (GS-FIRE) which provides an innovative structured PhD programme within the field of Infection Research <https://www.helmholtz-hzi.de/de/karriere/graduiererschule/curriculum/>.

**Starting date:** as soon as possible - initial contract for 3 years  
**Salary:** alike TVöD (Bund) E13 (75%)  
**Place of work:** Braunschweig  
**Probation period:** 6 months  
**Published on:** **18 July, 2024**  
**Closing date:** **08 August, 2024**  
**Application:** Applicants are required to complete the online application form here: <https://hzi.opencampus.net/> (Please select Job No. **110/2024**).

For further information please contact Michael Meyer-Hermann by email: [jobs@theoretical-biology.de](mailto:jobs@theoretical-biology.de).