

Human Microbe Alliance for Universal Health (HUMAN) program

The Helmholtz Centre for Infection Research (HZI), is offering positions for

Junior Research Groups (m/f/d) **AI in Health and Infection Disease**

The Helmholtz Centre for Infection Research (HZI) is Germany's largest academic institution dedicated to infection research. It is a member of the Helmholtz Association, Germany's largest research organization, and a member of the German Center for Infection Research (DZIF). We cooperate with our regional university partners, TU-Braunschweig (TU-BS), the Hannover Medical School (MHH), the Leibniz University Hannover (LUH), the University of Veterinary Medicine Hannover (TiHo), and Göttingen University.

Within the newly established HUMAN program (Human Microbe Alliance for Universal Health) (www.helmholtz-hzi.de/human-microstar), the HZI invites applications for Junior Research Group Leaders to utilize artificial intelligence (AI) to address the following focus areas:

- 1. AI-supported Mechanistic Mathematical Modelling and Simulation**
- 2. Computational Network Sciences and AI for Biology and Health**

Join us to advance **AI-driven mechanistic modeling and simulation**, integrating dynamic systems theory and explainable AI to unlock deeper insights into biological systems and accelerate innovations in health research. Alternatively, you will help us to advance **computational network sciences** and AI for deeper, explainable insights into biological systems, driving innovations that will shape the future of health research.

The groups will be embedded within the vibrant scientific environment of the *Braunschweig Integrated Centre of Systems Biology* (BRICS) and is part of the *Lower Saxony Center for Artificial Intelligence and Causal Methods in Medicine* (CAIMed; www.caimed.de), providing exceptional opportunities for interdisciplinary collaboration.

Overview Positions:

1. AI-supported Mechanistic Mathematical Modelling and Simulation

You will pioneer **advanced AI integration** into mechanistic modelling and simulation. Your group will work on:

- Lifecycle-structure discovery and model conception
- Calibration and data assimilation
- Uncertainty quantification
- Surrogate and operator learning to accelerate simulation
- Optimal experimental design
- Model-based control/decision support
- Applications with a focus on **biological systems and health**

2. Computational Network Sciences and AI for Biology and Health

You will develop **innovative, AI-driven research programs** that combine:

- Network theory and AI
- Mechanistic mathematical modeling
- Reconstruction, analysis, and prediction of **complex biological network behaviour**

These positions include strong emphases on **emergent behaviour, modularity, and biological/health applications**.

Requirements:

- PhD in one of the following fields (depending on the focus area):
 - Applied mathematics, computer science, engineering, physics
 - Computational biology, bioinformatics, systems biology
- Proven expertise in:
 - Mechanistic modelling (ODE/PDE), agent-based models
 - Mathematical analysis of biological systems and networks
 - AI/ML applications in modelling, simulation, and network analysis
- Experience in one or more of the following areas is highly desirable:
 - Hybrid modelling, neural differential equations, or physics-informed neural networks
 - Equation discovery
 - Bayesian inference/uncertainty quantification
 - Surrogate modeling/operator learning
- Strong theoretical understanding of sub-network dynamics, modularity, and system behaviour
- Programming proficiency: Python, Julia, MATLAB, R, or C++
 - Including ML frameworks, version control, and reproducible workflows
- Familiarity with high-performance computing environments
- Ability to collaborate across disciplines, including clinical/experimental teams
- Experience supervising and mentoring students
- Strong publication record in peer-reviewed journals
- Experience in securing third-party funding
- Excellent communication skills (English and German)

We offer you:

Your Junior Research Group will be funded for a period of 5 years initially. Funding covers the group leader position, personnel as well as consumables and start-up lab equipment. The positions come with options for tenure and junior professorships at local universities, such as the TU Braunschweig, Hannover Medical School (MHH), Leibniz Universität Hannover (LUH), and Göttingen University. Based on an external review, successful group leaders will be offered an extension of the group for up to 4 years and a permanent position as group leader at HZI.

We offer competitive salaries and access to cutting-edge infrastructures and research networks. You will benefit from dedicated research support, onboarding and granting offices, mentorship, and participation in post-graduate programs.

- An attractive and varied job in a future-oriented research institute with an international environment in Braunschweig, one of Europe's most research-dense regions
- Flexible working hours, part-time models

- A corporate culture of appreciation and promotion of equal opportunities
- Extensive training and continuing education opportunities to develop professional knowledge and personal skills
- A family office to support family and career as well as childcare offers
- Interesting additional public service benefits
- Option of an additional employer subsidy for the job ticket

People with severe disabilities and equivalent professional qualifications who are suitable for the position are given preference. In order to protect your rights, we ask you to provide us with a clearly recognizable reference to the existence of a degree of severe disability in your cover letter or resume.

The HZI is actively committed to equality, diversity and integration. For this reason, the HZI pursues the goal of professional equality between women and men and expressly welcomes applications from qualified women. The position is suitable for part-time work.

Starting date:	As soon as possible. The contract will initially run for 5 years.
Salary:	E 15 TVöD Bund
Working time:	39 hours per week
Place of work:	Braunschweig
Probation period:	6 months
Published:	15.10.2025
Closing date:	26.11.2025

For further information, please contact Dr. Dirk Spitzer, phone +49 (0)531 6181-2066, email: dirk.spitzer@helmholtz-hzi.de.

How to apply:

When sending us your application documents, **please confirm** that you have read our privacy policy and that you agree to the processing of your personal data. Please use the text module in our [privacy policy](#) for this purpose. **Without these declarations we cannot consider or process your application** and will immediately delete any application documents already received after the application deadline.

Please include with your application a cover letter, CV, a list of publications, a separate outline of previous achievements and future research interests (max. 2 pages), a completed application form ([download here](#)), an outline of how DEI will be implemented in your future laboratory (max. half a page) and the names, addresses and e-mail addresses of three references. Please refrain from sending a photo.

Please send your complete application, quoting the **reference number 123/2025**, to the Helmholtz Centre for Infection Research GmbH, Human Resources Department, Inhoffenstr. 7, 38124 Braunschweig, Germany or by [e-mail](#). If you send your application in electronic form, please provide a **summary in one single (1) pdf document**.

We look forward to receiving your application!

About HUMAN:

HUMAN is funded by the Volkswagen Foundation and the Ministry of Science and Culture of Lower Saxony (MWK). The program is based on an integrative approach that applies novel technologies, systems biology, medical/life sciences and informatics to understand, predict and therapeutically target the mechanisms underlying health and disease.

The **HUMAN** program is linked to and benefits from the BMFT-funded **Microbial Stargazing (MICROSTAR)** program. MICROSTAR focuses on microbes, their effector mechanisms and their adaptation strategies in competition with other organisms. Together, **HUMAN-MICROSTAR** applies a holistic and comprehensive approach that has the potential to provide groundbreaking insights and new solutions for human health in the context of its microbial environment.

More details here: www.helmholtz-hzi.de/human-microstar.