

**Job announcement no. 084/2024**

The Helmholtz Institute for RNA-based Infection Research (HIRI) is offering a position as

**Postdoc (f/m/d)**

for the research project “Deciphering the binding rules of programmable RNA antibiotics”.

The Vogel (HIRI, Würzburg) and Smyth (IBMC, Strasbourg) teams are seeking a post-doctoral fellow to investigate the molecular mechanisms of antisense peptide nucleic acids (PNA)-based antibiotics. PNAs are DNA mimics with an uncharged backbone that bind nucleic acids with sequence specificity and high affinity. PNAs targeting mRNAs of essential bacterial genes show bactericidal effects in several microbial species, but our mechanistic understanding of PNA activity and their target gene spectrum is limited. Notably, PNA-mediated growth inhibition is not universally associated with target mRNA depletion, and it is still not known how to minimize potential off-targeting.

This joint project will combine the Vogel lab’s expertise in PNA antibiotics with the Smyth lab’s expertise in RNA structural probing. The specific goal is to define the binding rules of PNAs to their target nucleic acids and to understand how this impacts mRNA functions, such as translation. Ultimately, this will pave the way for targeted killing of pathogenic bacteria and/or the precise editing of human microbiota for therapeutic purposes.

**Responsibilities:**

- Responsible for the content of research tasks
- Design and realisation of experiments
- Preparation of scientific publications
- Preparing and giving presentations in English at national and international level
- Supervision of research assistants, doctoral candidates, Master's/Bachelor's students

**Requirements:**

- Successfully completed university or master's degree in natural sciences
- PhD (FR Molecular Biology, Biochemistry or in a related field of biosciences)
- Experience in analysing RNA structures or working with microbial cultures is desirable
- Interest in data science would be an advantage
- Very good communication skills and values creativity and collaboration
- Ability to work independently and enthusiastically in a team
- Enthusiasm for a dynamic and international working environment reliable and responsible and high scientific standards
- Ability and willingness to travel regularly between France and Germany essential
- Strong written and spoken English language skills
- Highly motivated, organized, and creative
- Strong publication record given career stage

**We offer you:**

- An attractive and varied job in a future-oriented research institute
- A state-of-the-art infrastructure and the latest technologies
- 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
- Subsidization of 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 position is held at the Helmholtz Centre for Infection Research GmbH (HZI) in Braunschweig. The place of employment is Würzburg.

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. The position is suitable for part-time work.

<b>Starting date:</b>	As soon as possible. The contract will initially run for two years.
<b>Salary:</b>	E 13 TVöD Bund
<b>Working time:</b>	39 hours per week
<b>Place of work:</b>	Würzburg
<b>Probation period:</b>	6 months
<b>Published:</b>	17.07.2024
<b>Closing date:</b>	18.08.2024

For further information please contact Dr. Redmond Smyth, phone +49 931 31 89152, email: [redmond.smyth@helmholtz-hiri.de](mailto:redmond.smyth@helmholtz-hiri.de). For more information about the HIRI look at [www.helmholtz-hiri.de](http://www.helmholtz-hiri.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** a cover letter, resume, (employment) references, certificates, and (if available) work samples or reference projects with your application materials and a ½ - 1 page description of a prior research project. Please refrain from sending a photo.

**Please send** your complete application, quoting the **reference number 084/2024**, 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 the HIRI:

The Helmholtz Institute for RNA-based Infection Research (HIRI) is the first institution of its kind worldwide to combine ribonucleic acid (RNA) research with infection biology. Based on novel findings from our strong basic research program, our long-term goal is to develop innovative therapeutic approaches to better diagnose and treat human infections. HIRI is a site of the Braunschweig Helmholtz Centre for Infection Research (HZI) in cooperation with the Julius-Maximilians-Universität Würzburg (JMU) and is located on the Würzburg Medical Campus.

More information at [www.helmholtz-hiri.de](http://www.helmholtz-hiri.de).

### More information about our research:

<https://www.helmholtz-hiri.de/en/research/organisation/people/person/prof-joerg-vogel/>

The Vogel lab explores non-coding RNA and RNA-binding proteins of bacterial pathogens, phages, and other members of the human microbiome. They develop deep sequencing-based techniques, such as single-cell RNA-seq, dual RNA-seq and Grad-seq to globally investigate the molecular biology of these organisms. They seek to elucidate how bacteria use RNA as a regulator during infection, and pioneer RNA-based therapeutics to target these pathogens with precision.

- Popella L, Jung J, Do PT, Hayward RJ, Barquist L, Vogel J. Comprehensive analysis of PNA-based antisense antibiotics targeting various essential genes in uropathogenic *Escherichia coli*. *Nucleic Acids Res.* 2022 Jun 24;50(11):6435-6452. doi: 10.1093/nar/gkac362. PMID: 35687096; PMCID: PMC9226493.
- Hör J, Jung J, Đurica-Mitić S, Barquist L, Vogel J. INRI-seq enables global cell-free analysis of translation initiation and off-target effects of antisense inhibitors. *Nucleic Acids Res.* 2022 Dec 9;50(22):e128. doi: 10.1093/nar/gkac838. PMID: 36229039; PMCID: PMC9825163.

<https://www.helmholtz-hiri.de/en/research/organisation/people/person/redmond-smyth/>

The Smyth lab investigates the role of RNA structure in regulating viral infection processes. They use molecular virology, RNA biochemistry and advanced RNA structural probing technologies to dissect RNA structure and function relationships. They are aiming to identify conserved and essential structural elements that could be targets for RNA-based therapeutics.

- Gribling-Burrer AS, Bohn P, Smyth RP. Isoform-specific RNA structure determination using Nano-DMS-MaP. *Nat Protoc.* 2024 Feb 12. doi: 10.1038/s41596-024-00959-3. Epub ahead of print. PMID: 38347203.
- Bohn P, Gribling-Burrer AS, Ambi UB, Smyth RP. Nano-DMS-MaP allows isoform-specific RNA structure determination. *Nat Methods.* 2023 Jun;20(6):849-859. doi: 10.1038/s41592-023-01862-7. Epub 2023 Apr 27. PMID: 37106231; PMCID: PMC10250195.