



Join us at IMB as

A Post-doc in Transcription Factor Condensation Research

IMB (www.imb.de) is a research institute on the campus of Johannes Gutenberg University in Mainz, Germany. It is generously funded by the Boehringer Ingelheim Foundation and the state of Rhineland-Palatinate. Our research focuses on the biology of the cell nucleus and ranges from the molecular level to systems and computational approaches. Researchers at IMB are supported by strong core facilities that offer state-of-the-art equipment and training in protein production, microscopy, proteomics, cytometry, genomics and bioinformatics.

Background

As part of the Protein Disorder in Transcription group headed by Sina Wittmann, you will work on a project that studies **condensation of transcription factors on DNA**. Thanks to the development of new imaging techniques, recent years uncovered that the transcription initiation machinery condenses into **droplets with liquid-like properties**. The lab is generally interested in understanding how these transcriptional condensates are formed and how they regulate gene expression (for more information please visit [our website](#)). Biological condensation is often driven by intrinsically disordered regions (IDRs), protein regions that do not fold into a 3D structure but remain flexible. Strikingly, IDRs are highly over-represented in proteins involved in transcription, especially in transcription factors. We are trying to decipher how IDRs control the formation and properties of condensates with approaches that range from *in vitro* biochemistry to genome-wide expression and binding studies in cells.

The position: Deciphering the role of transcription factor IDRs in condensate assembly on DNA

In your project, we do not merely want to study bulk phenomena but decipher how the **IDR composition** controls the formation of transcription factor **assemblies on the molecular level**. For this, we are trying to determine how many molecules are contained within an assembly and what their molecular arrangement is. Furthermore, transcription factors assemble on DNA *in vivo* and you will specifically look at **the role of DNA** in the assembly process. To this end, you will use our brand-new Lumicks optical tweezers system, perform state-of-the-art microscopy, DNA curtain assays, recombinant expression and purification of proteins, phase separation and DNA binding assays as well as analysis of all data generated. The project is part of the collaborative research centre (**CRC**) **1551** which is a **multi-disciplinary** endeavour to understand 'polymer concepts in cellular function'. As such, the project is a **collaboration** with the groups of Edward Lemke and Martin Girard, both located on the same campus.

Tasks and responsibilities

- Characterisation of transcription factor assemblies using both bulk assays (fluorescence microscopy, scattering) and single-molecule assays (optical tweezers and DNA curtains)
- Generation of different DNA substrates
- Recombinant expression and purification of proteins
- Analysis and documentation of all data generated
- Regular participation and presentation at CRC1551 events which involves presenting to and discussing with scientists from other disciplines (physics, chemistry, computational biology)
- Regular participation and presentation in meetings at IMB and at conferences
- Study of relevant scientific literature

Requirements

- Highly motivated and creative researcher who enjoys multi-disciplinary science and single-molecule studies
- Recently completed PhD in biochemistry, structural biology or related discipline

- Strong background in biochemistry and biophysical assays
- Ability to work closely with scientists outside your field (esp. physicists)
- Experience in recombinant expression and purification of proteins as well as cloning
- Ability to work precisely and good attention to detail
- Ability to work independently as well as in a team
- Willingness to learn new skills
- Very good oral and written communication skills in English
- Experience in the following is desired:
 - working in an inter-disciplinary environment
 - using optical tweezers or other single-molecule technique
 - experimentation with IDR-containing proteins
 - fluorescence microscopy
 - python (or other language) for data analysis
 - background in the regulation of gene expression

Why join us

We offer a stimulating, diverse and international research environment, with a pleasant working atmosphere, and informal culture. The institute is modern, well-equipped and centrally located with good public transport links and parking. Integration within the CRC1551 offers a stimulating scientific environment on campus with many events relevant for your research and career progression.

Our offer includes

- Competitive salary and favourable pension scheme
- Advanced training opportunities
- Flexible working hours
- Employee events
- Job Ticket
- Full integration into the CRC1551 includes (more info about CRC1551 [here](#)):
 - Annual meetings
 - Additional travel money
 - Optional Winter School
 - Joint meeting with SPP2191
 - Possibility to participate in outreach activities
 - Mentorship program
 - Additional training opportunities
 - Regular seminars with world class speakers highly relevant to your field of research.

What else you need to know

- **Starting Date:** February 2025 or later
- **Duration:** initially 2 years with possibility of extension
- **Deadline:** 15th December 2024
- **International applicants:** we will assist you through the visa process, and also with your application for a residence/work permit after your arrival in Mainz.

Have we sparked your interest:

To apply, please upload your application containing your cover letter, CV, certificates and contact information of at least two professional references to our [application form](#) on imb.de/jobs/scientific-positions. Should you have any questions regarding the application process, please contact us by email hr@imb-mainz.de, quoting Ref. No. **#SWPD01**. Informal enquires should be addressed to [Dr Sina Wittmann](#). IMB is an equal opportunity employer.

Declaration of Consent and Data Protection

By sending us your application, you are consenting to us saving your personal data in order to carry out the selection process. You can find more information on data protection and retention periods at <https://www.imb.de/jobs/data-protection>.