## **RNA-DNA Triple Helix formation in Chromatin Gene Regulation and Therapeutic Application**

The Längst Lab at the University of Regensburg is seeking a highly motivated PhD student to join our team and contribute to our cutting-edge research on RNA-DNA triple helices.

## About the Project

Eukaryotic chromosomes are intimately associated with a pool of chromosome-associated RNA playing crucial roles in nuclear architecture, chromatin structure, and gene expression. The formation of **RNA-DNA triple helices** enables sequence-specific binding of caRNA to DNA, defining a novel gene regulatory mechanism with significant therapeutic potential.

This DFG-funded PhD project will delve deep into the mechanism of RNA-DNA triple helix formation within cellular chromatin. You'll explore how **nucleosome positioning** and the **histone code** influence the formation of these triplexes, and study non-coding RNA-mediated gene regulation. The project also aims to develop a novel class of **RNA therapeutics**, with initial applications aimed at modulating the immune system. **Your research will address:** 

- The molecular mechanism of RNA-DNA triple helix formation within chromatin, using both reconstituted chromatin systems and mammalian cell culture.
- The specific roles of these RNA-DNA interactions in regulating gene expression.
- The **binding affinity and stability of these structures in vitro and in vivo**, utilizing a multidisciplinary approach encompassing **biochemical**, **biophysical**, **and bioinformatics methods**.

## About the Längst Lab

Our research (<u>www.laengstlab.com</u>), centers on understanding chromatin dynamics and its role in gene regulation. We are a collaborative and supportive team, committed to fostering the scientific growth of our members. The University of Regensburg provides a vibrant academic environment with excellent research facilities.

## We're looking for an enthusiastic candidate with:

- A Master's degree in biochemistry, molecular biology, biophysics, or a related field.
- A strong interest in chromatin biology, RNA biology, and gene regulation.
- Hands-on experience in molecular biology, protein biochemistry, and/or biophysical techniques.
- Excellent **communication skills** and the ability to work both independently and as part of a collaborative team.

If you're passionate about fundamental research with significant translational implications, we encourage you to apply. Please send your application, including a cover letter outlining your motivation and research interests, your detailed CV, and contact details of two academic references, to **gernot.laengst@ur.de**. We look forward to hearing from you

Prof. Gernot Längst Applied Epigenetics University of Regensburg



a H3-tail promoter nucleosome

PhD Position