



FRIEDRICH-SCHILLER-
UNIVERSITÄT
JENA



The **collaborative research group “Epigenetics of Aging” of Holger Bierhoff** is located at the Center for Molecular Biomedicine (CMB) of the Friedrich Schiller University Jena and is also an associated research group of the Leibniz Institute on Aging - Fritz-Lipmann Institute (FLI). The group invites applications for a

PhD Position (TVL13/2)

Research focus of the lab / Research projects:

Our group is interested in how epigenetic (dys-)regulation is linked to aging and aging-associated diseases. We specially focus on regulatory RNAs and their impact on chromatin structure and transcriptional regulation. Currently, we have two main research aspects in the lab:

One topic deals with **RNA:DNA triple helix (triplex) formation**, a novel mechanism by which regulatory RNAs recognize their target sites in the genome. RNA:DNA triplex-formation facilitates a sequence-specific DNA recognition without unwinding of the DNA double helix and triplex-target sites are abundant in mammalian genomes. However, the actual formation and regulatory functions of RNA:DNA triplexes in cells are poorly understood so far. Therefore, we have developed novel tools and techniques to detect ncRNA:DNA triplexes genome-wide and to functionally characterize their impact on the epigenetic regulation.

The second research topic of the lab deals with **regulatory RNAs that are involved in aging-related epigenetic changes**. We are especially interested in the regulation of interspersed DNA elements, e.g. rRNA genes and retrotransposons, that account for a large portion of the genome in mammals. Our previous work has shown that long non-coding RNAs (lncRNAs) induce a novel type of heterochromatin at these regions in quiescent, terminally differentiated and senescent cells (Bierhoff et al., *Mol Cell*, 2014). We aim to study this process in further detail by identifying new lncRNAs and uncover how the epigenetic changes contribute to the aging phenotype.

Both projects are conducted in cultured human and mouse cell lines and to a smaller extent also in the simple model organism *Caenorhabditis elegans*. The work involves various molecular biology and epigenetic techniques like Western Blotting, protein (co-) immunoprecipitation, Chromatin immunoprecipitation (ChIP), RNA IP, gene expression analysis by reverse transcription and quantitative PCR (qPCR). The projects will also use high-throughput analyses like ChIP-seq, RNA-seq and mass spectrometry.

For both projects we are seeking **highly motivated PhD candidates** to support our team. Previous experience in Cell/Molecular Biology and/or Epigenetics as well as bioinformatic analysis of large data sets is advantageous, but no prerequisite.

The PhD position will be integrated in the Leibniz Graduate School on Aging and Age Related Diseases. Please acquaint yourself with the graduate school using the platform: <http://lgsa.leibniz-fli.de/application/application-guideline/> and apply according to application guideline as soon as possible, not later than December 9, 2017