



LEIBNIZ-INSTITUT  
FÜR UMWELT-  
MEDIZINISCHE  
FORSCHUNG

The IUF – Leibniz Research Institute for Environmental Medicine investigates the molecular mechanisms through which particles, radiation and environmental chemicals harm human health. The main working areas are environmentally induced aging of the pulmonary system and the skin as well as disturbances of the nervous and immune system. Through development of novel model systems, the IUF contributes to the improvement of risk assessment and the identification of novel strategies for the prevention / therapy of environmentally induced health damage. The core unit “Genome Engineering and Model Development (GEMD)” led by Dr. Andrea Rossi is looking for

**a student (f/m/d) for a master thesis with the title:**

**On-Target CRISPR/Cas9 Activity – Challenges in Accurate and Predictive Genome Editing.**

**The project:**

CRISPR/Cas9 has revolutionized genome engineering for both research and translational medicine. As we push the boundaries of this ground-breaking technology, it is essential to address potential challenges. CRISPR/Cas9 technology cannot guarantee perfect accuracy and predictability of genome editing end results. One of the major challenges occurs due to error-prone repairs of CRISPR/Cas9-induced DNA double-strand break lesions that may entail unanticipated large genomic modifications within the CRISPR/Cas9 on-target site, which could potentially lead to deleterious outcomes. However, the extent of this issue remains unclear, and it has not yet been determined whether this phenomenon is cell-specific or reagent-specific.

The aim of this thesis is to describe a bulletproof assessment of potential on-target effects that might occur due to respective mechanisms. Therefore, a CRISPR-screen on induced pluripotent stem cells (iPSCs) and established cell lines will be conducted. The importance of iPSCs in translational medicine underpins the importance of assessing potential adverse effects that may result from inaccurate editing events. Therefore, the project requires thorough experimental planning, the conduction of cutting-edge technology in genome editing, including high-throughput NGS and digital PCR methods.

**Your profile:**

Our working group is looking for a motivated student with a high level of commitment and team spirit. The applicant should have a completed bachelor’s degree in life sciences or biology. If you are passionate about pushing the frontiers of genome engineering, exploring cutting-edge techniques, and addressing critical questions in the field, we invite you to join our team. As part of our team, you will have the opportunity to contribute to ground-breaking research aimed at elucidating the complexities of CRISPR/Cas9 technology and developing strategies to mitigate associated risks.

07.03.2024

**We offer:**

We are currently seeking motivated individuals to a master's student position. As a member of our team, you will work alongside leading experts in the field, collaborate on exciting projects, and have access to state-of-the-art facilities and resources. Don't miss this opportunity to be at the forefront of genome engineering research. Apply now to join our dynamic team and make a meaningful impact on the future of biotechnology and medicine.

**Start:** As soon as possible

Please address your application (letter of motivation, CV, references, qualification certificates) with the reference "Master AG Rossi" in the subject line to [Bewerbung@IUF-Duesseldorf.de](mailto:Bewerbung@IUF-Duesseldorf.de):

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Application documents submitted by post are not returned. Documents for applicants not considered are destroyed appropriately once the procedure is complete.

