GRK 2174 Neurobiology of Social & Emotional Dysfunctions

PhD position available

Project "The role of coding and non-coding RNAs and their downstream signaling in social fear in mice"

in the labs of Profs. Gunter Meister and Inga Neumann

Research on RNA developed with breath-taking speed and led to the identification of many exciting classes of RNA molecules and their role in psychopathologies including non-coding RNAs (ncRNA). In a previous project (Royer et al., 2022), we characterized the dynamic expression of non-coding RNAs on a gene- and transcript-based level within the lateral septum of social fear conditioned (SFC) mice and characterized the role of the long non-coding RNA Meg3 in social fear extinction and subsequent memory consolidation.

The comprehensive RNA-Seq data sets generated will now serve as valuable resource for further investigating the role of other non-coding RNAs, and their products, such as micropeptides. Functionally, micropeptides have been linked to developmental processes, cancer or cardiovascular diseases, but potential roles in the brain or particularly in socio-emotional behaviour have not been reported so far. Thus, this highly innovative project will break new grounds into this direction.

Based on our large dataset and in collaboration with our bioinformatics unit the PhD student will mine the SFC-regulated ncRNAs for potential micropeptides, will then start to identify these micropeptides and characterize them biochemically and functionally, i.e. in the context of social versus non-social fear behaviour. Behavioural validation of identified micropeptides will be achieved by using specific overexpression and knock down strategies including shRNA-mediated knock down strategies in combination with behavioural studies.

Methods: Deep Sequencing and RT qPCR for quantification of RNA levels; primary embryonic and adult hypothalamic cells for in vitro studies; shRNAs for gene specific knock down; behavioural tests for social preference, social and non-social fear conditioning; targeted mass spectrometry for the identification of micropeptides (collaboration with mass spectrometry unit), RNAscope, stereotaxic surgery, local microinfusions, IHC, western blot analyses.

Start of funding: June 2023

The position is funded for at least three years, (TV-L E13; 65%). The project is part of the DFG Graduate Programme "Neurobiology of Social and Emotional Dysfunctions" GRK 2174.

For application details please see our webpage

https://www.uni-regensburg.de/research/grk-emotion/grk-home/index.html

Further Contact:
Prof. Dr. Gunter Meister, Dept. of Biochemistry, University of Regensburg
gunter.meister@ur.de