

Advertising Postdoc position

Title of the position: Neuronal ensembles in brain pathways in chronic pain

Job position: Postdoctoral fellow

Deadline of the application: 30.06.2024

Starting date: As soon as possible

Contract length: 2-4 years

City: Heidelberg

Country: Germany

Institute: Pharmacology Institute

Department: Molecular Pharmacology

Contact details:

Name of the PI: Rohini Kuner

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Website of your institute/department: www.sfb1158.de

Description:

1. **Project Summary:** The precise basis of how pain is encoded in the brain remains unknown. Our past and recent work points to specificity of regions and pathways in mediating or modulating specific components of pain, such sensory, emotional and cognitive aspects. In this project, we aim to address neuronal ensembles, i.e. cohorts of specific and sparsely distributed neurons in the rodent brain, in key brain areas and study their plasticity as well as role in mouse models of acute and chronic pain.

2. **Project-related references:**

Stegemann A, Liu S, Retana Romero OA, Oswald MJ, Han Y, Beretta CA, Gan Z, Tan LL, Wisden W, Gräff J, Kuner R. Prefrontal engrams of long-term fear memory perpetuate pain perception. **Nature Neuroscience**. doi: 10.1038/s41593-023-01291-x, 2023

Gan, Z., Gangadharan V., L.L. Tan, C. Körber, H. Li, M. J. Oswald, J. Kang, J.M. Martin-Cortecero, D. Männich, A. Groh, T. Kuner, S. Wieland and Kuner, R. Layer-specific pain relief pathways originating from motor cortex. **Science**, 378(6626):1336-1343, 2022

Oswald MJ, Han Y, Li H, Marashli S, Oglo DN, Ojha B, Naser PV, Gan Z, Kuner R. Cholinergic basal forebrain nucleus of Meynert regulates chronic pain-like behavior via modulation of the prelimbic cortex. **Nature Communications**, 2022, 13(1):5014.

Tan LL, Oswald MJ, Heintz C, Retana Romero OA, Kaushalya SK, Monyer H, Kuner R. Gamma oscillations in somatosensory cortex recruit prefrontal and descending serotonergic pathways in aversion and nociception. **Nature Communications** 28;10(1): 983, 2019

Tan LL, Pelzer P, Heintz C, Tang W, Gangadharan V, Flor H, Sprengel R, Künér T, Künér R. A key role for a mid-cingulate cortex-posterior insula pathway in nociceptive hypersensitivity, **Nature Neuroscience** 20(11):1591-1601, 2017

3. **Methods that will be used:** In vivo electrophysiology in mouse brain (Neuropixel recordings), optogenetic manipulations, in vivo imaging, behavioral analyses in mice
4. **Cooperation partners:** Prof. Thomas Künér (Heidelberg University) and Prof. Markus Plober (TUM, Munich)
5. **Eligibility qualifications:** PhD in neurosciences or associated fields. A strong record in study of brain functions and rodent models is a must. Expertise in electrophysiology is desired.
6. **Desirable skills:** electrophysiological analyses and/or in vivo imaging in rodent brain
7. **Key words:** neurobiology of pain, brain pathways, neural circuits, Neuropixels, tetrode recordings, two-photon imaging
8. **Enclosures:** The following documents must be enclosed with your application as a **single pdf file**: updated CV with publications, motivation letter, copies of degree certificates

Information for the applicant: For any updates and further information (for e.g: change of deadline of the application), please visit the consortium website career section: www.sfb1158.de