

PhD position

Title of the position: Interactions between nociceptive and non-nociceptive circuits: intranasal lidocaine to treat primary and secondary headache

Job position: PhD candidate

Deadline of the application: 31.08.2023

Starting date: from now

Contract length: 3y

City: Heidelberg

Country: Germany

Institute: Heidelberg University Hospital

Department: Dept. of Anaesthesiology

Contact details:

Name of the PI: Dr. Beatrice Oehler

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Website of your institute/department:

<https://www.klinikum.uni-heidelberg.de/kliniken-institute/kliniken/klinik-fuer-anaesthesiologie/forschung/sektion-sepsis-systemische-inflammation/translational-research-in-pain>

Description:

1. Project Summary:

Intranasal delivery of lidocaine has been used in clinical studies for the acute management of primary and secondary forms of headache. The success rate varies with trial and aetiology: in primary cluster headache efficacy of intranasal lidocaine for acute relief ranges from 25% up to 90%. We have shown efficacy of intranasal lidocaine in obstetric patients with post dural puncture headache (PDPH) circumventing the need of a more invasive epidural blood patch. The potential utility of intranasal lidocaine is particularly relevant for PDPH in obstetric patients where an iatrogenic aetiology is likely and a rapid, non-invasive and efficacious treatment is a priority for lactating mothers. Currently, there is no consensus on the site or the precise mechanism of action of intranasal lidocaine for acute headache relief. This project sets out to close this gap with clinical monitoring of intranasal efficacy in PDPH patients in parallel with two-photon imaging and electrophysiology in pre-clinical headache models. Through identification of sites and mechanisms of action of intranasal lidocaine including the nasal cavity, cranial meninges and the spinal trigeminal nucleus, we hope to broaden the use of intranasal lidocaine in obstetric PDPH and possibly the scope of headache forms for which intranasal lidocaine may be indicated.

2. References (3-5):
Lloyd JO, Chisholm KI, **Oehler B**, et al., Neurotherapeutics. 17:1973-1987, 2020
Oehler B, et al., Front Mol Neurosci, 2022
Siegler BH, Größ M, **Oehler B**, et al., Anaesthesist. 70:392-397, 2021.
3. Methods that will be used:
In situ multiphoton imaging, calcium imaging, doppler imaging, imaging data analysis and the development of algorithms to facilitate the analysis, immunohistochemistry, mouse headache models, mouse behaviour, mouse breeding and AAV injections, mass spectrometry, sampling of cerebrospinal fluid
4. Cooperation partners:
Richard Carr, Heidelberg (Germany)
Jan Siemens, Heidelberg (Germany)
Amit Agarwal, Heidelberg (Germany)
5. Eligible qualifications:
Scientific university degree in life sciences, molecular medicine, engineering, biochemistry, biophysics, biotechnology, or broadly in the natural or applied science field with interests in Neuroscience
6. Desirable skills:
We are looking for a PhD candidate with an interest in optical tools and their application to biological problems, ideally with a leaning towards understanding biological mechanisms using imaging techniques. Hands-on experience in sample preparation, fluorescence imaging and image analysis is desirable. Skills in at least one scientific programming language (e.g. Matlab, R, Python) and/or experience with ImageJ is preferred. Training for all techniques will be provided during the candidature including technical courses and FELASA accreditation.
The applicant should be flexible, self-reliant, motivated, responsible and organised, having strong social competence, interpersonal skills, excellent English skills; open to discuss new ideas in an interdisciplinary team and being flexible to apply various experimental methods.
7. Key words:
Lidocaine, headache models, in vivo imaging, behaviour
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
9. 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: <https://www.sfb1158.de/index.php/career-eng>