



FACULTY OF  
MEDICINE



**Neural Resources  
of Cognition**

## **2 full-time PhD positions available at the CRC 1436 ‘Neural Resources of Cognition’**

2 PhD positions are available from **April 1<sup>st</sup> 2021** in the research groups of Dr. Matthew Betts ([website](#)) and Dr. Dorothea Hämmerer ([website](#)) at the Institute for Cognitive Neurology and Dementia Research (IKND) (<http://www.iknd.ovgu.de/en/>) at the Otto-von-Guericke University Magdeburg.

### **Topic:**

The goal of the project is to obtain a better understanding of the role of the noradrenergic system in healthy ageing. Noradrenaline is one of the main neuromodulators in the brain and has been implicated in learning and memory and may be important for preserving neurovascular health. Furthermore, the noradrenergic system shows particular vulnerability in brain ageing and dementia. The aim of this project is to investigate whether inter-individual differences in the integrity of the noradrenergic system can provide resilience against brain ageing and whether interventions aiming to increase noradrenaline levels (e.g. via cognitive training and pharmacological modulation) can boost brain health and reduce cognitive dysfunction in ageing. The PhD projects will use a combination of high resolution functional and structural MR imaging at 7T, pupillometry, behavioral testing and a pharmacological intervention in healthy older adults.

The PhDs will be part of the newly funded CRC Neuronal Resources of Cognition (SFB1436) including 22 projects spanning molecular, neural and brain systems across a number of species aimed at investigating neural resources of cognition. For more info on the CRC please see [here](#).

The PhD projects offer an exciting research opportunity in novel areas of ageing and dementia research. Magdeburg offers a stimulating working environment with an excellent neuroimaging infrastructure and a vibrant neuroscientific community. The PhD candidates will leave the project with a state-of-the-art skillset relevant for neuroscientific research in ageing and dementia. The candidates are expected to prepare and analyse data for publications and for presentation at international conferences as well as internal meetings at the IKND.

For relevant related research articles please see:

1. Betts MJ, et al. (2019) Locus coeruleus imaging as a biomarker for noradrenergic dysfunction. *Brain* 142: 2558-2571.
2. Liu KY et al. (2019) In vivo visualization of age-related differences in the locus coeruleus. *Neurobiol Aging* 74:101-111.
3. Hämmerer D, et al. (2018) Locus coeruleus integrity in old age is selectively related to memories linked with salient negative events. *Proc Natl Acad Sci USA* 115:2228–2233.
4. Betts MJ et al. (2017) In vivo MRI assessment of the human locus coeruleus along its rostrocaudal extent in young and older adults. *Neuroimage* 163:150–159.

**Your profile:**

Master's degree or equivalent in psychology, neurosciences, biology, medical engineering or related field

Knowledge of relevant statistical analyses and programs such as SPSS, R, SPM or equivalent is advantageous

Programming skills in MatLab, Python or shell is a plus

Experience working with MRI data is a plus

**Position:**

The PhD positions will be supervised by Dr. Matthew Betts and Dr. Dorothea Hämmerer and will be associated with the IKND at the Otto-von-Guericke University of Magdeburg headed by Prof. Emrah Düzel. Each position will be funded for 45 months (3 and ¾ years) and payment will be according to German E13 TV-L (65 %).

Applications will be accepted until the position is filled but should be ideally received before **the 28th of February 2021**. We welcome applications from all sections of the community irrespective of gender, race, ethnic or national origin, religion or belief, sexual orientation, disability or age.

The application must be in English or German and contain the following:

- Cover letter referring specifically to the position (maximum 1 page)
- Curriculum vitae including research experience and any relevant publications
- Relevant diplomas and qualification certificates
- Contact information for up to 3 referees

These documents should be sent as a single PDF file to [matthew.betts@med.ovgu.de](mailto:matthew.betts@med.ovgu.de) or [dorothea.haemmerer@med.ovgu.de](mailto:dorothea.haemmerer@med.ovgu.de). For further information please email us.