

## **Opening of PhD position in Lyon, France, in cognitive neurosciences.**

**Title: Investigating the neuroimaging correlates of meditation expertise during a socio-affective paradigm.**

Opening of a PhD position in Lyon, France at the Lyon Neuroscience Research Center, DYCOG Team, INSERM U1028 - CNRS UMR5292, under the direction of Dr. Antoine Lutz in the doctoral school Neurosciences and Cognition (ED 476 - NSCO) of Lyon University.

The position is to be filled as soon as November 1<sup>st</sup> 2020 and is for at least one year. The fellowship will involve working on an EC-funded Silver Santé Study –research project investigating the impacts of mental training techniques, such as meditation and language-learning, on mental health and well-being in Europe's ageing population. The 5-year project is led by Dr Gaël Chételat of INSERM in Caen, France. This H2020 European project includes 10 partners in 6 European Countries. The present project will collaborate in particular with the Laboratory for Behavioral Neurology and Imaging of Cognition at the University of Geneva (Prof. Patrik Vuilleumier and Dr. Olga Klimecki, experts in Affective Neuroscience). For further information about the Silver Santé Study visit the project website at [www.silversantestudy.eu](http://www.silversantestudy.eu) or watch the project's 3-minute film at <http://ow.ly/Lhle30lUZqp>. The protocols of the study are described in the manuscripts listed below. In this project, Dr. Lutz is the leader work-package Meditation supervising in particular the meditation interventions and the study of meditation experts.

### **Summary**

The primary goal of this doctoral work is to analyze and publish one datasets of fMRI data on the cross-sectional relationship between meditation training and emotion regulation in brain and behavior collected in a group of expert senior meditators (>10,000 hours of meditation in life, > 65 year old) compared to aged-matched healthy older adults. The aim of this project is to identify the neural signatures of meditation states in senior expert meditators using a fMRI paradigm called the socio-affective video task (SoVT). This paradigm allows to investigate this link between emotion, meditation and aging both on a behavioral and neural level. The main emotional mechanism measured by this task relates to the capacity to regulate responses to aversive situations from daily life, as it exposes participants to video clips of individuals suffering. Resting-state periods distributed throughout the task additionally allow to evaluate emotional recovery from these stressful events, both in terms of brain activity and experienced emotions. A sample of senior expert meditators (n = 27-30 experts) will be examined for this cross-sectional study. Participants will perform the SoVT under two meditation states (mindfulness and compassion, respectively), which will allow to map distinct neural signatures of meditation expertise. Specifically, functional connectivity analyses will allow to determine for the first time the brain networks recruited during emotion regulation as a function of meditation state. Data for this paradigm has already been collected in a sample of 140 healthy seniors novices to meditation and 25 expert meditators. The data have been analyzed for the novices. Following this project, the candidate will have opportunity to work on various research questions/ dataset related either to the Meditaging project or to

another large brain imaging dataset on meditation (ERC consolidator Brain& Mindfulness) using MRI, fMRI, or EEG.

Candidates should have a Master in psychology, or cognitive and/or affective neurosciences. The candidate should have, ideally, previous experiences in analyzing functional neuroimaging using SPM and to be familiar with research on meditation or empathy. Theoretical and practical experiences with the following software will be relevant: Matlab, statistical software (R), standard neuroimaging software (e.g. SPM, freesurfer). Proficiency in written and oral English is required.

The doctoral fellowship could start September 1<sup>st</sup> 2021 or October 1<sup>st</sup> 2021. This 3-year position follows standard French salaries at INSERM. To apply for this position, please send a curriculum vita with references, cover letter describing research interest and experience to Antoine Lutz (antoine.lutz@inserm.fr). Please write in the title (“Application to the MEDITAGEING doctoral fellowship”).

#### BIBLIOGRAPHY:

- Lutz, A., Klimecki, O.M., Collette, F., Poisnel, G., Arenaza-Urquijo, E., Marchant, N.L., De La Sayette, V., Rauchs, G., Salmon, E., Vuilleumier, P., Frison, E., Vivien, D., Chételat, G., Medit-Ageing Research Group, 2018. The Age-Well observational study on expert meditators in the Medit-Ageing European project. *Alzheimers Dement (N Y)* 4, 756–764. <https://doi.org/10.1016/j.trci.2018.11.002>
- Poisnel, G., Arenaza-Urquijo, E., Collette, F., Klimecki, O.M., Marchant, N.L., Wirth, M., de La Sayette, V., Rauchs, G., Salmon, E., Vuilleumier, P., Frison, E., Maillard, A., Vivien, D., Lutz, A., Chételat, G., Medit-Ageing Research Group, 2018. The Age-Well randomized controlled trial of the Medit-Ageing European project: Effect of meditation or foreign language training on brain and mental health in older adults. *Alzheimers Dement (N Y)* 4, 714–723. <https://doi.org/10.1016/j.trci.2018.10.011>