LIÈGE université
GIGA institute

Liège, December 20th 2019

POST-DOC POSITION AT THE
GIGA - CYCLOTRON RESEARCH CENTRE / IN VIVO IMAGING
UNIVERSITY OF LIEGE, BELGIUM

Sleep quality and quantity has been associated with health outcomes, including cognitive status over lifespan. Fully grasping the modulatory potential of sleep phenotypes on cognitive aging needs a transition from mechanistic in-lab approaches to larger-scale population wide real life data acquisitions. In sleep research, gold standards for the quantification of sleep-wake regulation are performed in the lab and need the access to time consuming protocols, thereby allowing only a relatively low amount of data to be acquired simultaneously. Portable devices such as actigraphs have been used in several recent studies to obtain measures of sleep-wake estimates in older community-dwelling adults. The objective of this project is to assess whether mathematical lab-proofed modelling of physiologically meaningful parameters of sleep-wake regulation can explain rest-activity phenotypes observed in daily life. In a second step, it will be explored whether actigraphy-derived sleep phenotypes have a predictive value for the individual's cognitive and brain aging trajectory by using available high-resolution brain imaging techniques (7T structural MRI) that allow probing in vivo neocortical and subcortical microstructure. The project consists in empowering a field approach with available mechanistic in-lab approaches in the aim to increase validity and inference of future large scale population-based databases.

The candidate will participate to acquisitions and analyses (mathematical modelling of sleep-wake regulation; analysis of structural MRI data) of the data (combination of ambulatory conditions and chronobiology protocols). He/she will use a variety of approaches including actigraphy, EEG, MRI and neuropsychological phenotyping.

Qualifications and requirements. Candidates with a PhD in any disciplines related to the topics of the call can apply (e.g. neurosciences, biomedical engineering, biostatistics etc.). Skills and experience in one or more of the following topics are considered as strength: bio-mathematical modelling, analysis of MRI and/or sleep EEG data. Candidates should be interested in the brain mechanisms of cognition and sleep-wake regulation in aging.

Supervisors. The work will be supervised by Dr. Christina Schmidt at the GIGA - Cyclotron Research Centre / In Vivo Imaging and in collaboration with Prof. Svetlana Postnova from the Brain Dynamics group at the University of Sydney (Australia; a research stay in this lab is planned).

Work environment. Our team has direct access to research-dedicated neuroimaging and electrophysiology equipment including a 3T and 7T MRI scanner, five bedrooms for full polysomnography recordings and neuropsychological testing, and a growing database of participants included in chronobiology protocols. The work will also benefit from the GIGA-CRC in Vivo Imaging

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data processing and radiophysics group headed by Dr. C. Phillips in order to guide the candidate through the appropriate use of brain imaging analysis methods.

Contract duration. The position is advertised for 2-3 years. Monthly salary of bursary will be provided upon request and follows Belgian regulations.

Applications. Applicants are invited to respond as soon as possible and no later than March 1st 2020, by submitting a curriculum vitae (including publication), a one-page summary of research interests and expertise, and names and contact details of two referees to christina.schmidt@uliege.be

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