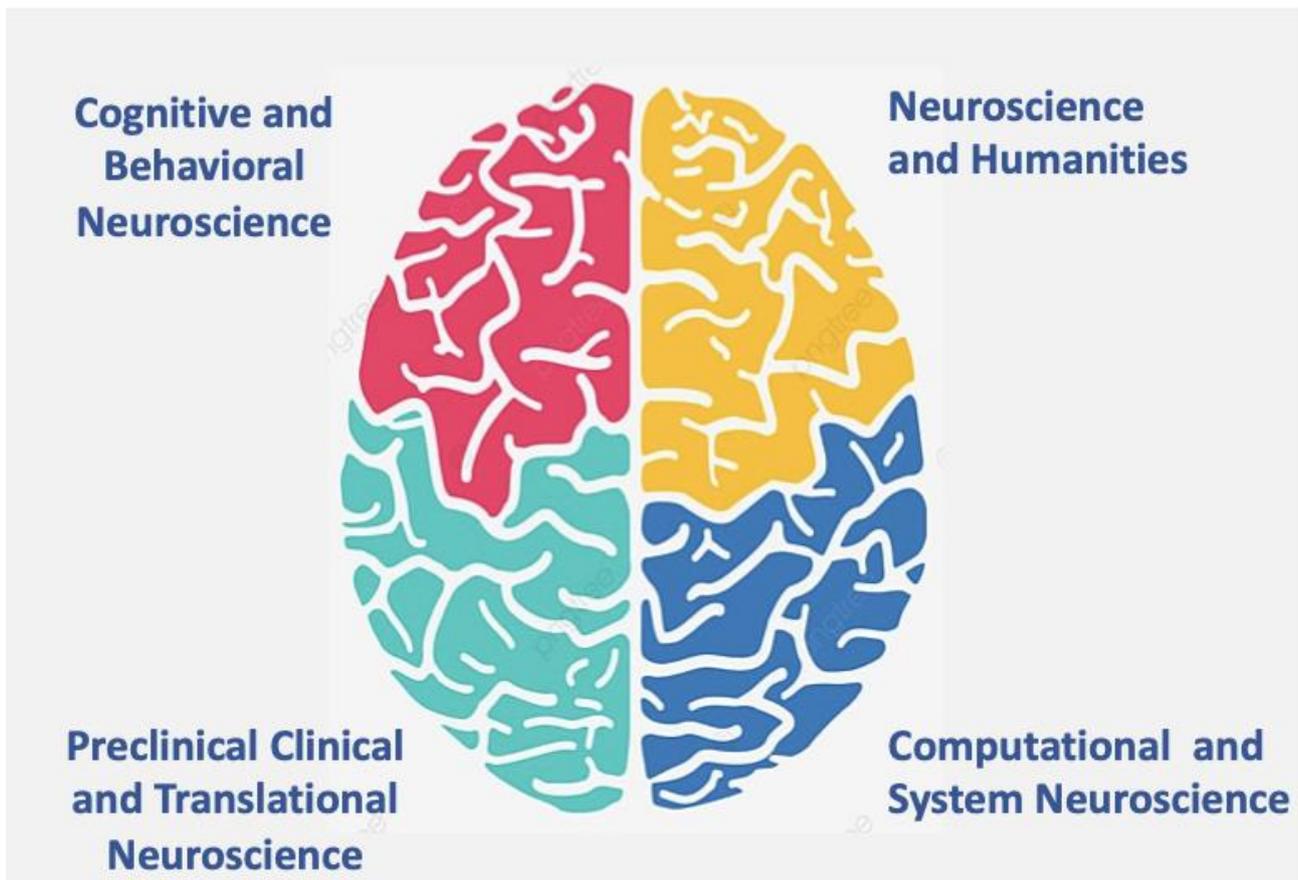


In the context of the Italian PhD program in “Theoretical and Applied Neuroscience” that involves multiple Italian universities and research centers, a position is open for a research project entitled “**Role of sleep in shaping neural circuits and behavior**” at the Brain and Sleep Research Laboratory, University of Camerino.



Project description

Sleep is essential to ensure correct brain functioning and, in the long term, to maintain mental health. Sleep is involved in ameliorating a variety of cognitive processes including emotional regulation and motivated behaviour, but the biological mechanisms linking sleep to maturation of neuronal circuits are still unclear.

The aim of this project is to understand how sleep regulates neuronal activity of key brain regions involved in emotion regulation and motivation. Specifically, the candidate will probe the role of sleep in shaping the structure and function of mesocortical limbic connectivity by using in vivo electrophysiology, calcium imaging and optogenetics in freely behavior rodents. In these brain regions, the candidate will further dissect the cellular pathways modulated by sleep at the molecular level by using single-cell omics techniques to identify potential targetable mechanisms at the basis of behavioral disorders and poor mental health induced by poor sleep during neurodevelopment.



Research team and environment

The lab aims at understanding the functions and mechanisms of sleep in health and disease. Our research combines morphological and functional methods of analysis in both animals and humans to investigate why sleep is beneficial for the brain at the molecular, circuit and behavioral level.

One line of research aims to address the consequences of sleep impairment across the lifecycle and to characterize the interaction between sleep disruption and other environmental and genetic factors. Another research topic focuses on the therapeutic potential of sleep enhancement to improve health and cognition at different levels. The lab explores also scientific questions linking sleep to glial cells, gut microbiome, cellular metabolism, adipose tissue, torpor, etc., thanks to the collaboration with other research groups within the University of Camerino and outside. Relevant publications and key interests of the research group can be found at <https://www.bsr-laboratory.org/>

Facilities available include: 1500m² vivarium fully equipped for rodent breeding, maintenance and behavioral testing (Ethovision and multiple test apparatus), 40 operating chambers, surgery rooms, 2 Open Ephys acquisition boxes for in vivo electrophysiology recordings, 1 miniaturized microscope (Inscopix nVoke), 14 sleep deprivation chambers; equipped histology labs, wet labs with all basic molecular biology and biochemistry equipment including HPLC, plate reader Tecan and multiplex Luminex; Nikon confocal microscope, Zeiss Axio Imager fluorescent microscope, STEM electron microscope Zeiss with Zen connect for CLEM.

Preferred Research Skills and Competences

The ideal candidate has a genuine interest for neuroscience and sleep research, a proactive attitude in studying relevant literature, formulate plausible hypothesis and experiments to test them. Self-motivation and ability to work both alone and in team are essential characteristics. Background in neurophysiology is desirable. An interest in assembling circuits and other electronic components (e.g. Arduino), and basic knowledge of Matlab or Python could be of advantage.

For further information, please contact Luisa de Vivo.

To apply, please visit <https://isas.unicam.it/dni/phd-theoretical-and-applied-neuroscience>