

Description of the Group:

Recent work has highlighted the importance of understanding psychiatric disorders as brain based disorders with distinct neurobiological bases. In our group we combine this perspective with a dimensional and transdiagnostic approach to psychopathology to bridge the gap between brain and behavior. Specifically, we make use of the electroencephalogram (EEG) to record brain activity during sleep in order to understand (1) how the internally generated rhythms of sleep map onto dimensional of behavior relevant for psychopathology and (2) to understand whether these rhythms are predictive (biomarkers) of diseases progression.

Responsibilities:

The successful candidate will work on a large project longitudinally measuring sleep and mental health in adolescents. Responsibilities include:

- Data collection and management
- Analysis of sleep EEG, actigraphy, neuropsychological and psychiatric data
- Presentation of results
- Writing of manuscripts

Qualifications:

- Masters degree in psychology, neuroscience, biomedical engineering or related field
- Knowledge of Matlab and/or other programming languages (e.g., Python)
- Experience with time series analyses and signal processing a plus
- Proficiency in German and English
- Willingness to work nights
- Knowledge of experimental methods and statistics
- Ability to work as a team member
- Ability and willingness to work with youth and their families
- Highly motivated

What we offer:

- To work as part of a cooperative team devoted to making progress in our understanding of the role of sleep in mental health
- A competitive salary and social benefits
- A vibrant academic environment with many possibilities for academic exchange within the university campus

Application:

Please send the following information in a single pdf file to: leila.tarokh@upd.unibe.ch

- CV including contact details of three references
- Statement describing motivation and personal qualifications
- A transcript of bachelors and masters level grades

Description of the project:

Mental health disorders are the leading cause of disability and illness in adolescents worldwide. Critical to progress in the prevention and treatment of mental health disorders is (1) understanding the neurobiological mechanism associated with these disorders and (2) identifying biomarkers that may predict disease vulnerability, treatment response and illness course. A powerful index of brain structure and function is the sleep EEG. This project combines sleep EEG measurements with state-of-the-art

deep phenotyping of mental health in a transdiagnostic and dimensional manner. We take an approach in line with the latest view of psychiatric disorders as continuous and dimensional rather than categorical. Almost all psychiatric disorders are accompanied by disrupted sleep and alterations in sleep neurophysiology. Therefore, by taking a dimensional and transdiagnostic view on mental health we can understand why sleep problems and altered sleep neurophysiology are ubiquitous in psychiatric disorders. Our dimensional approach requires that we obtain a distribution of values across psychopathology. Therefore, we will select 150 adolescents from a primary sample of 300 adolescents ensuring an equal distribution of severity of psychopathology. We then deeply phenotype this sample using questionnaires, a clinical interview, and neurocognitive testing and record in home sleep EEG. In order to test whether the sleep EEG is predictive of the course of psychopathology we monitor participants' sleep and mental health for one year. In this second part of the study, participants wear actigraphs (a watch size device that delineates sleep and wake based on motion) for one year during which time we assess mental health *monthly* via online questionnaires. Using this data we examine the temporal association between sleep behavior (as measured via actigraphy) and mental health (online assessment). After a year, we re-assess patients using the same procedures as the first assessment (sleep EEG, questionnaires, interview and neurocognitive testing) to examine whether the change in psychopathology and sleep are associated with one another.