

Functional Analysis of Sleep Promoting Neurons in Health and Disease

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USA

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The project/programme is most relevant to:

Alzheimer's disease & other dementias

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Research Abstract

Sleep, selective-attention and memory consolidation are adversely impacted by many, if not most, neurological conditions. Interestingly, recent studies suggest that neuronal activity during

waking may alter the risk for developing Alzheimer's disease. With this in mind, we have identified a genetically-tractable neural circuit that is impacted by Alzheimer's disease and is also uniquely suited for dissecting the dynamic, bi-directional relationship between sleep and cognition. That is, we are less interested in defining a minimal set of neurons that control a behavior than we are in understanding how these neurons interact (e.g., via a sleep- cognitive connectome). In this proposal we will investigate how connected structures in the fly brain work together to regulate sleep and cognition during health and in the context of Alzheimer's disease. Since we have recently demonstrated that the power of sleep can be harnessed to reverse cognitive impairments in a Drosophila model of Alzheimer's disease, a goal of this proposal will be to define the functional properties of circuits that confer the benefits of sleep to cognitive processes.

Lay Summary

Our data suggest that it may be possible to harness the power of sleep to help restore cognition to humans that suffer from a variety of debilitating neurologic diseases. We propose to better understand the relationship between sleep and cognition by defining a functional- sleep connectome consisting of interacting subsets of cells that regulate sleep, attention and memory.

Further information available at:

Types:

Investments > €500k

Member States:

United States of America

Diseases:

Alzheimer's disease & other dementias

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