

# FUNCTIONAL ANALYSIS OF SLEEP HOMEOSTASIS IN DROSOPHILA

<https://www.neurodegenerationresearch.eu/survey/functional-analysis-of-sleep-homeostasis-in-drosophila/>

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### Country

USA

## Title of project or programme

FUNCTIONAL ANALYSIS OF SLEEP HOMEOSTASIS IN DROSOPHILA

## Source of funding information

NIH (NIA)

## Total sum awarded (Euro)

€ 1,530,247.71

## Start date of award

01/07/2005

## Total duration of award in years

1

## The project/programme is most relevant to:

Alzheimer's disease & other dementias

## Keywords

Sleep, Drosophila genus, Homeostasis, long term memory, Short-Term Memory

## Research Abstract

DESCRIPTION (provided by applicant): While the function of sleep remains a mystery, many of the most successful theories on sleep function, including synaptic downscaling, memory consolidation, developmental maturation, and even many theories on sleep restoration require

that sleep must substantially influence aspects of brain plasticity. We demonstrate that increasing sleep restores brain functions supporting short-term memory in each of 12 classic memory mutants without specifically rescuing the causal molecular lesion or structural defect. We also demonstrate that sleep can rescue brain functions supporting long-term memory as assessed by courtship conditioning. Elucidating the underlying molecular mechanisms may shed new light on processes related to sleep function and may ultimately provide a roadmap for using sleep as a therapeutic to slow or reverse cognitive decline associated with degenerative disease and perhaps developmental disorders. Thus, in this proposal we will: 1) identify the circuits that are required to support sleep-dependent changes in adaptive behavior, 2) manipulate specific genes to determine if they are required for sleep induced restoration of memory, and 3) Determine whether the therapeutic role of sleep extends to disorders in which species of toxic proteins can actively impair neuronal functions and/or kill neurons.

### **Lay Summary**

**PUBLIC HEALTH RELEVANCE:** We have shown that sleep can restore plasticity to a large collection of well characterized mutants including in a *Drosophila* model of Alzheimer's disease. We propose to determine how sleep can benefit the brain so as to provide insights into how sleep might be used to slow or reverse cognitive decline associated with degenerative disease, psychiatric disorders.

### **Further information available at:**

#### **Types:**

Investments > €500k

#### **Member States:**

United States of America

#### **Diseases:**

Alzheimer's disease & other dementias

#### **Years:**

2016

#### **Database Categories:**

N/A

#### **Database Tags:**

N/A