

Wake-sleep Circuitry and Sleep Disturbances in Neurodegeneration vs. Aging: Is There a difference?

April 2

Tuesday, 12:30 pm

Billings Building—Rosedale Room

SPEAKER:



Clifford B. Saper, M.D., Ph.D.

James Jackson Putnam Professor of Neurology and Neuroscience, Harvard Medical School

Department of Neurology, Beth Israel Deaconess Medical Center Boston, MA

Host: Rajiv R. Ratan, M.D., Ph.D.

For more information contact

Darlene White

daw9085@med.cornell.edu

Abstract

Research abstract: Aging is marked by trouble falling asleep, shorter sleep time, sleep fragmentation, and early awakening. Several neurodegenerative disorders have similar features, but the reason for why aging and neurodegeneration affect wake-sleep is not known. We have found in individuals with “healthy aging” that their wake-sleep behavior correlates

with loss of neurons in brain circuitry that is known to regulate wake-sleep in other species. In addition, patients with Alzheimer’s disease have much worse cell loss in wake-sleep regulatory neurons, which may account for their aberrant wake-sleep behavior. We propose that

the wake-sleep system may be a sentinel for several neurodegenerative pathologies, with the wake-sleep regulatory neurons being involved and causing the sleep disorder that we call “normal aging” for up to decades before cognitive or motor signs of neurodegeneration appear.

Publications:

1. AS, Ellison BA, Wang JL, Yu L, Schenider JA, Buchman AS, Bennett DA, Saper CB. (2014) *Sleep is related to neuron numbers in the ventrolateral preoptic/intermediate nucleus in older adults with and without Alzheimer’s disease.* Brain 137:2847-2861.
2. Machado NLS, Todd WD, Kaur S, Saper CB (2022) *Median preoptic GABA and glutamate neurons exert differential control over sleep behavior.* Curr Biol 32:2011-2021.
3. Nardone S, De Luca R, Zito A, Klymko N, Nikoloutsopoulos D, Amsalem O, Brannigan C, Resch JM, Jacobs CL, Pant D, Veregge M, Srinivasan H, Grippo RM, Yang Z, Zeidel ML, Andermann ML, Harris KD, Tsai LT, Arrigoni E, Verstegen AMJ, Saper CB, Lowell BB. (2024) *A spatially-resolved transcriptional atlas of the murine dorsal pons at single cell resolution.* Nat Commun, 15:1966.

