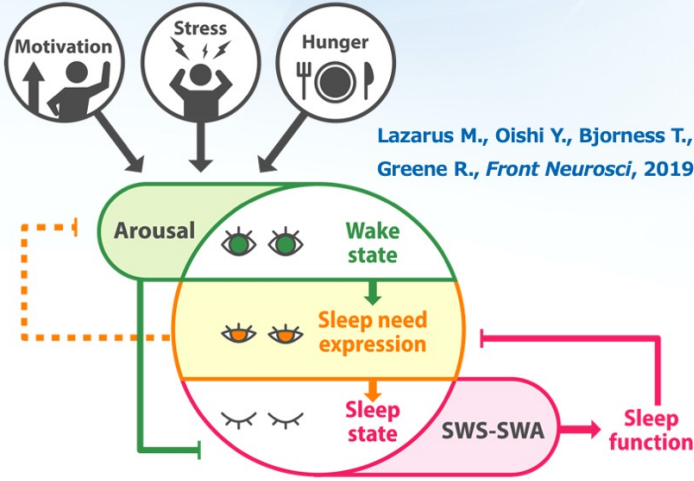




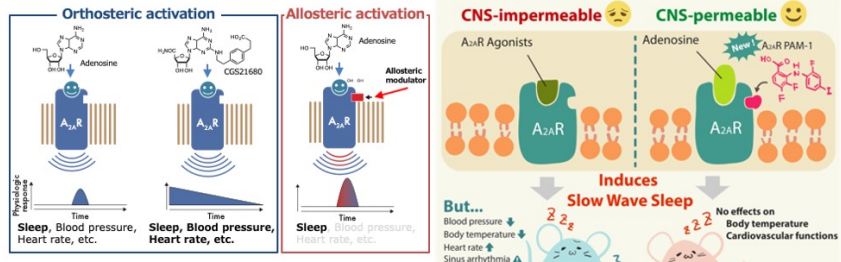
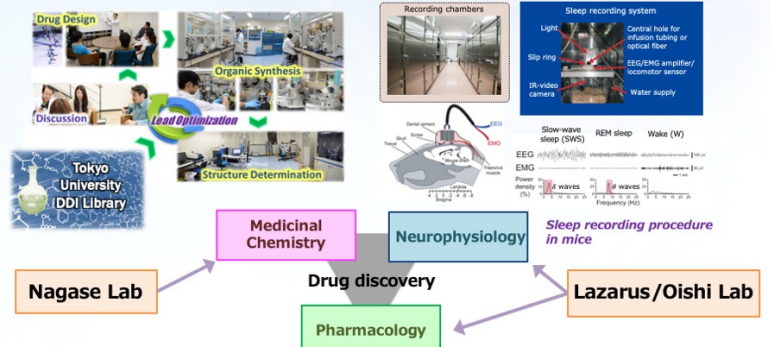
Yo Oishi and Michael Lazarus

Systems Pharmacology, International Institute for Integrative Sleep Medicine (WPI-IIIS)

Regulation of sleep homeostasis by arousal

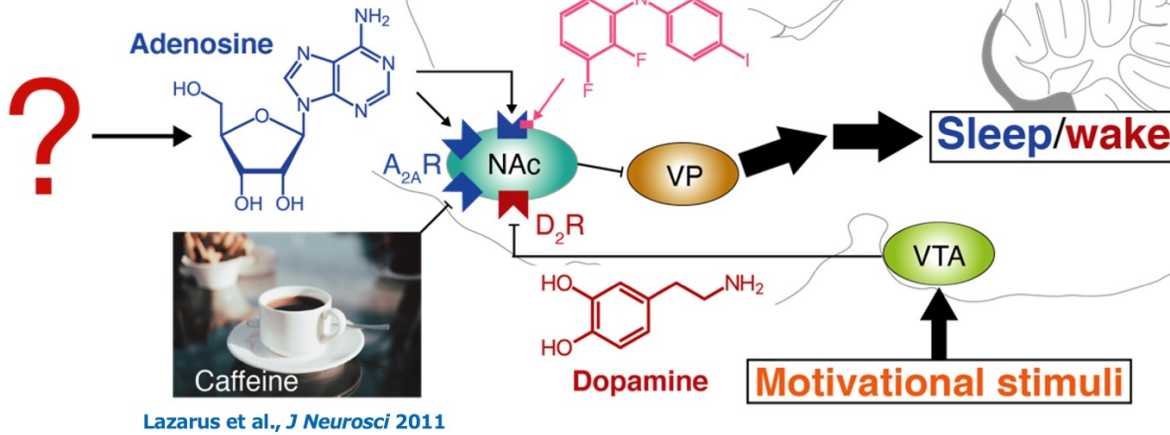


Drug discovery to treat insomnia



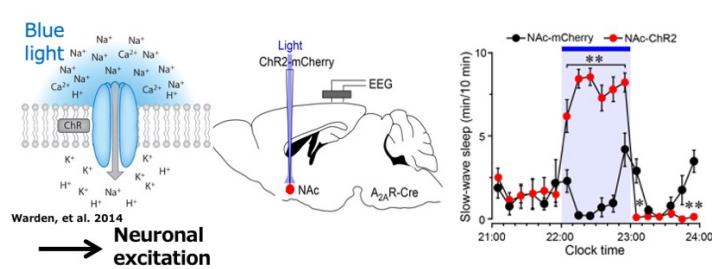
The neural mechanisms of sleepiness are widely unknown. Sleep is established in the absence of arousing inputs, including motivation.

The nucleus accumbens (NAc) and ventral tegmental area (VTA) constitute a well-characterized reward circuit in the brain.

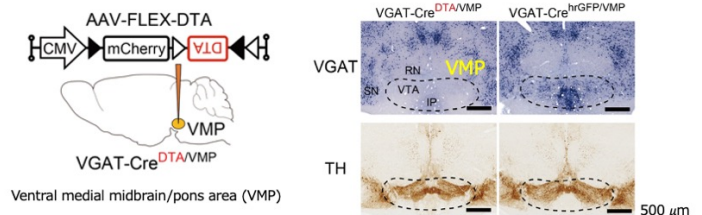


- Oishi et al., *Nat Commun* 2017
- Luo et al., *Nat Commun* 2018
- Zhou et al., *Neurochem Int* 2018
- Oishi et al., *Brain Struct Funct* 2017
- Takata et al., *J Neurosci* 2018
- Honda et al., *iScience* 2020
- Yang et al., *PLoS Biology* 2018

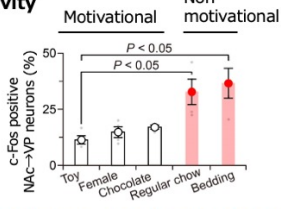
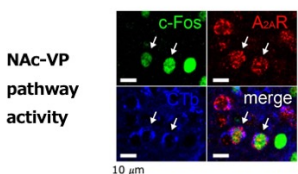
Sleep control by the NAc



"Short-sleeper" mice by neuronal ablation

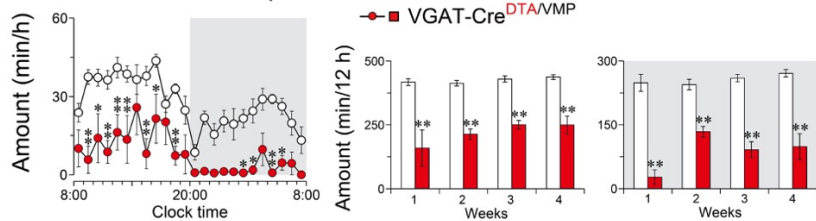


Motivational stimuli regulate NAc activity



Oishi et al. *Nat Commun* 2017

Slow-wave sleep



Takata et al. *J Neurosci* 2018