

# Virtually sleepless flies

Tea Talk

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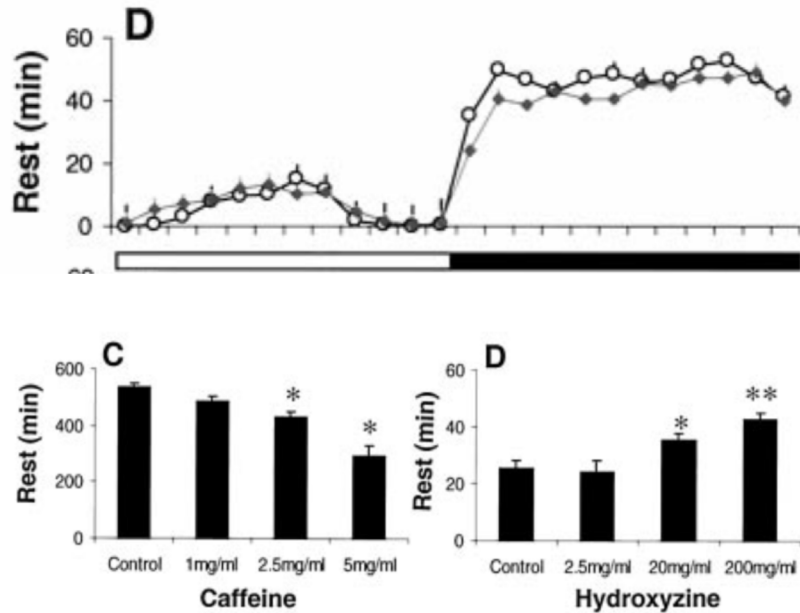
2019-03-20

Reference: Geissmann et al., “Most sleep does not serve a vital function: Evidence from *Drosophila melanogaster*”, *Science Advances*, 2019.

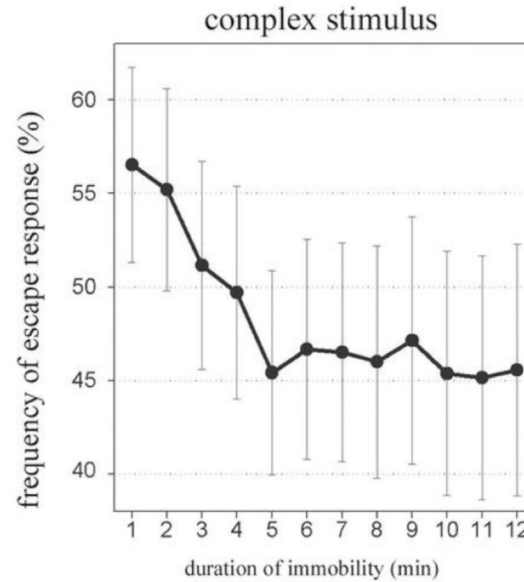
For mammals, sleep is essential for survival.

Fruit flies also sleep (Tononi group, 2000; 2004; 2011).

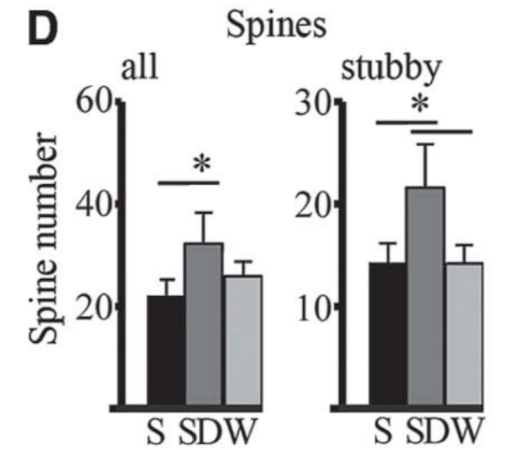
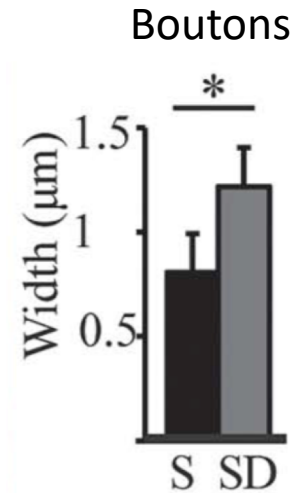
Sleep-like state transition



Low-responsibility



Homeostatic synaptic plasticity



Still, detailed characteristics and functions of sleep for fruit fly are not fully understood.

## Experiment

A consecutive behavioral observation of a large population of flies using auto-tracking

## Main Result

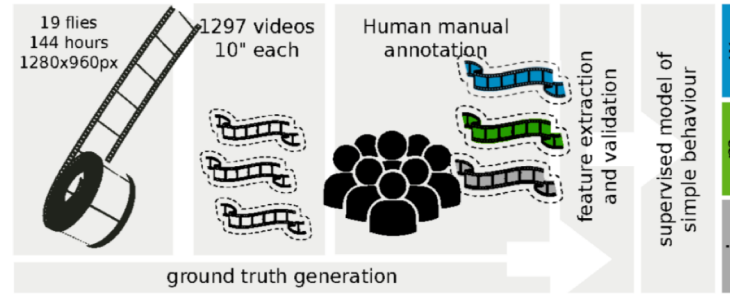
Some female flies are virtually sleepless.

6% of female flies slept less than 72 min per day

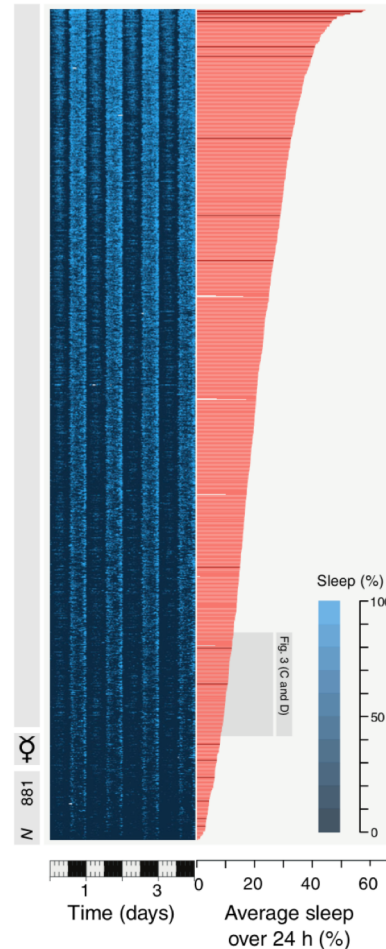
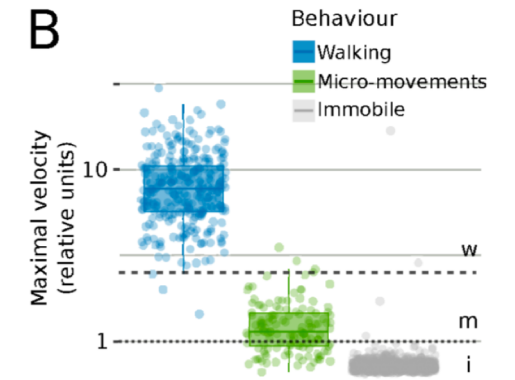
Sleeplessness is endogenous

Virtually sleepless flies

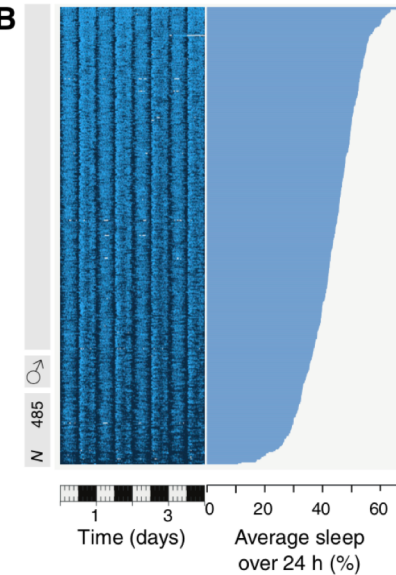
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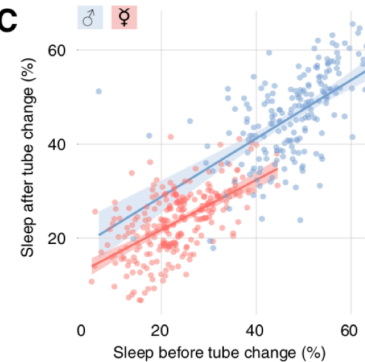
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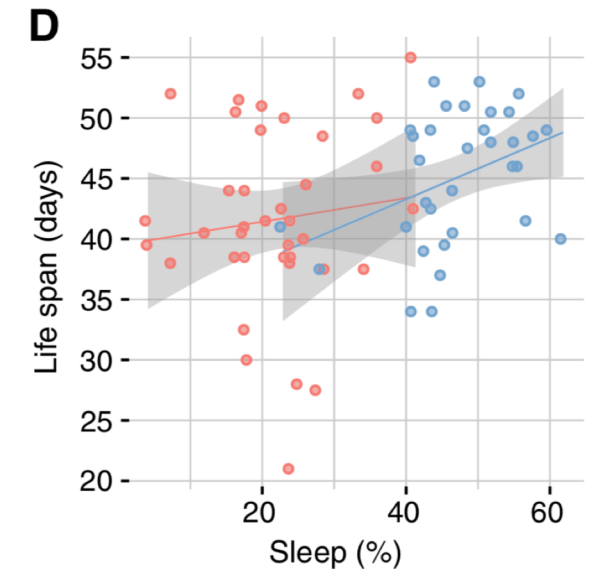
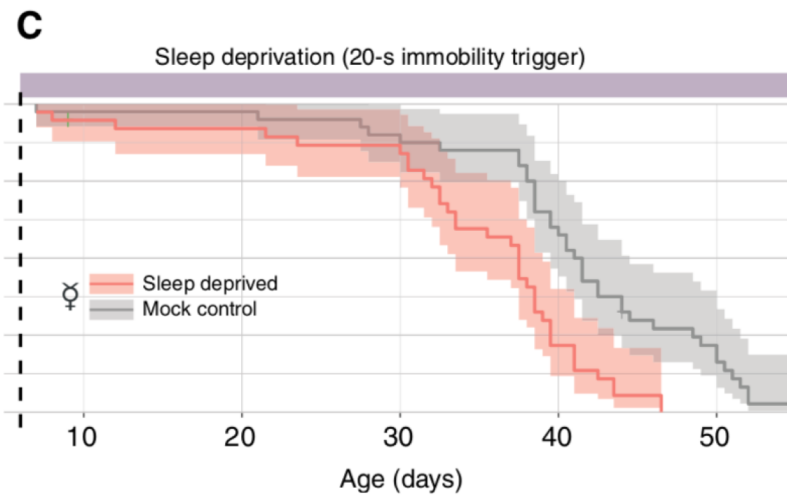
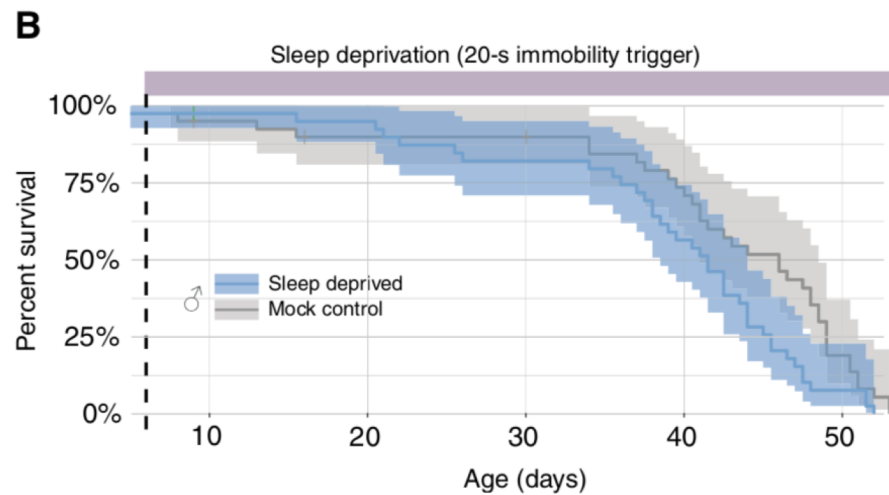
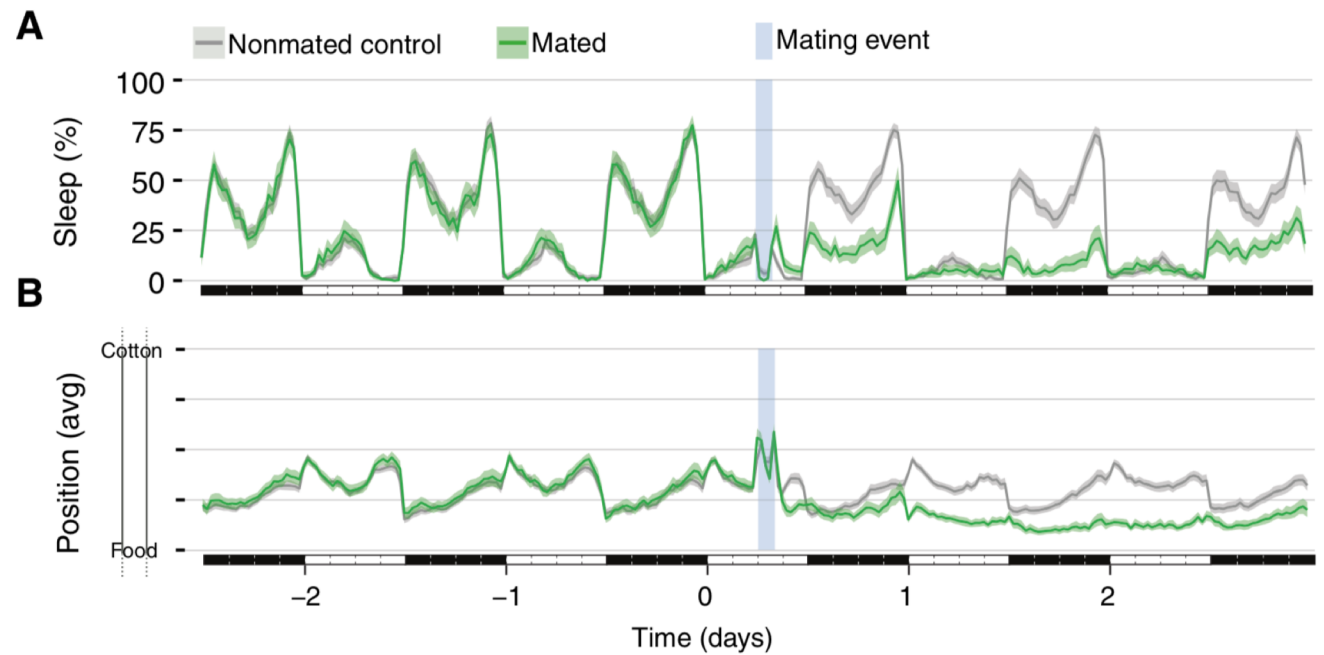


## Why sexually dimorphic?

- Mated female flies sleep further less
- Sleeplessness is correlated with feeding-related behavior.

## Does the sleeplessness harm flies?

- Both artificial and endogenous sleep deprivation are not lethal.



## Summary

- Can an animal able to survive without sleep? –yes, if it's a fly.
- All animals sleep, but some may sleep differently.

## Caveats

- Sleep is not physiologically vital, but can still be cognitively vital.
- Intermittent micro-sleep (< 20 sec) might be enough for flies.