



Sleep
Research
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SLEEPJ, 2018, 1–11

doi: 10.1093/sleep/zsy034

Advance Access Publication Date: 10 February 2018

Original Article

ORIGINAL ARTICLE

Myelin modifications after chronic sleep loss in adolescent mice

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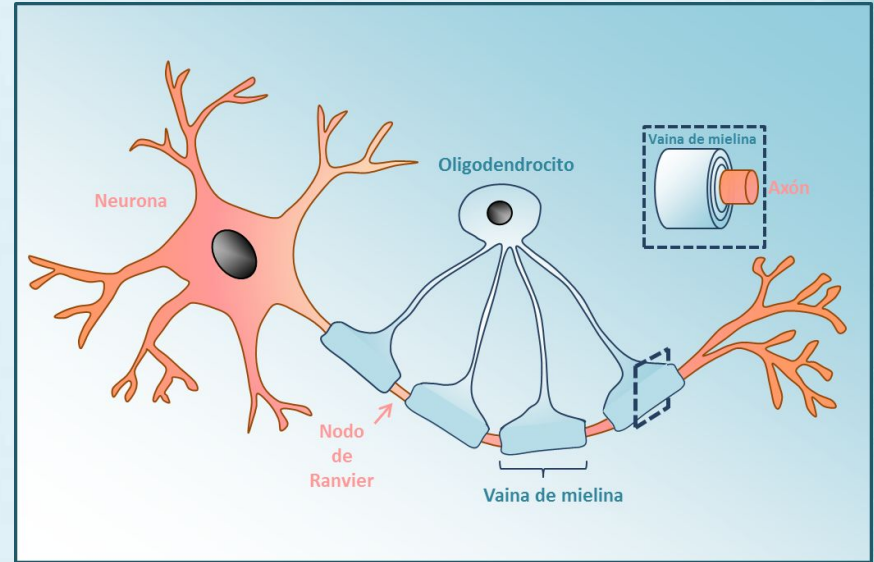
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LUCA VISENTIN & PAULA DEL RÍO

INTRODUCTION

OBJECTS OF STUDY

- MYELIN → g-ratio
- INTERNODAL LENGTH
- CORTICOSTERONE LEVELS

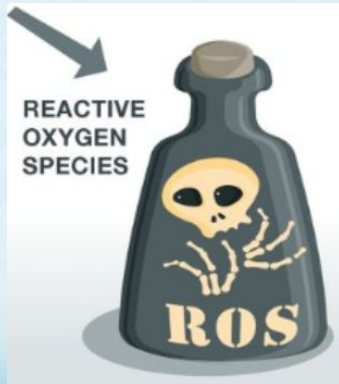
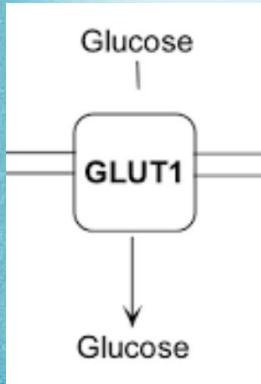


INTRODUCTION

BACKGROUND: MOLECULAR CONSEQUENCES OF SLEEP LOSS

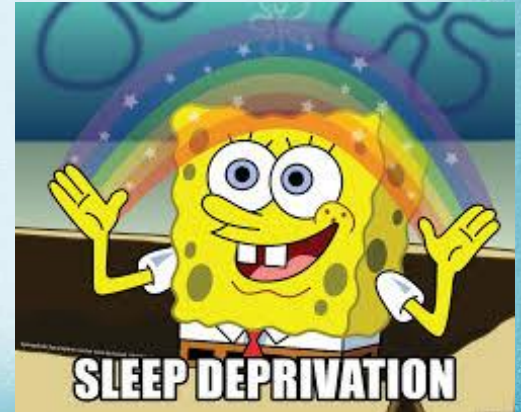
Energy metabolism
& Mitochondrial genes

Protein synthesis:
Unfolded Protein Response



SCIENTIFIC QUESTIONS

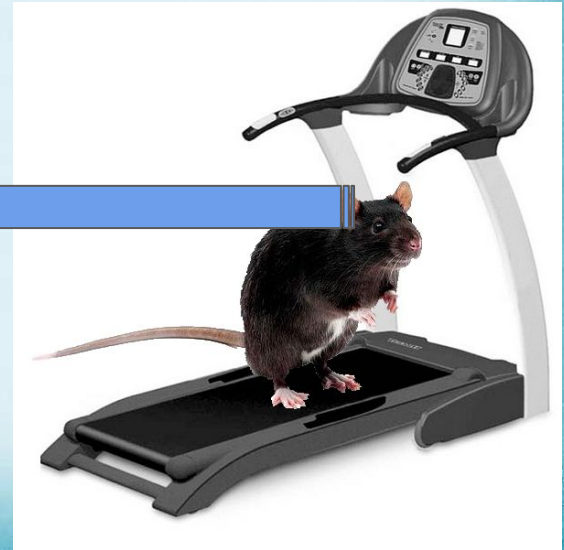
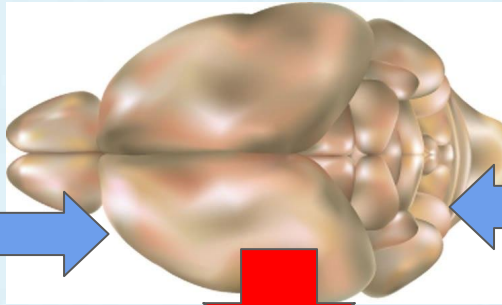
- What are the consequences of sleep deprivation (short and long term) on myelin maintenance in neurons?
- Are there any effects on internodal length?
- Are these changes caused by the alteration of corticosterone levels?



(SLIGHTLY BARBARIC)

METHODS

- Normally sleeping (**S**)
- Sleep Deprived (**SD**)
- Chronic Sleep Restricted (**CSR**)
- Sleep Recovery (**SR**)




Fixing, staining,
sectioning, observation.

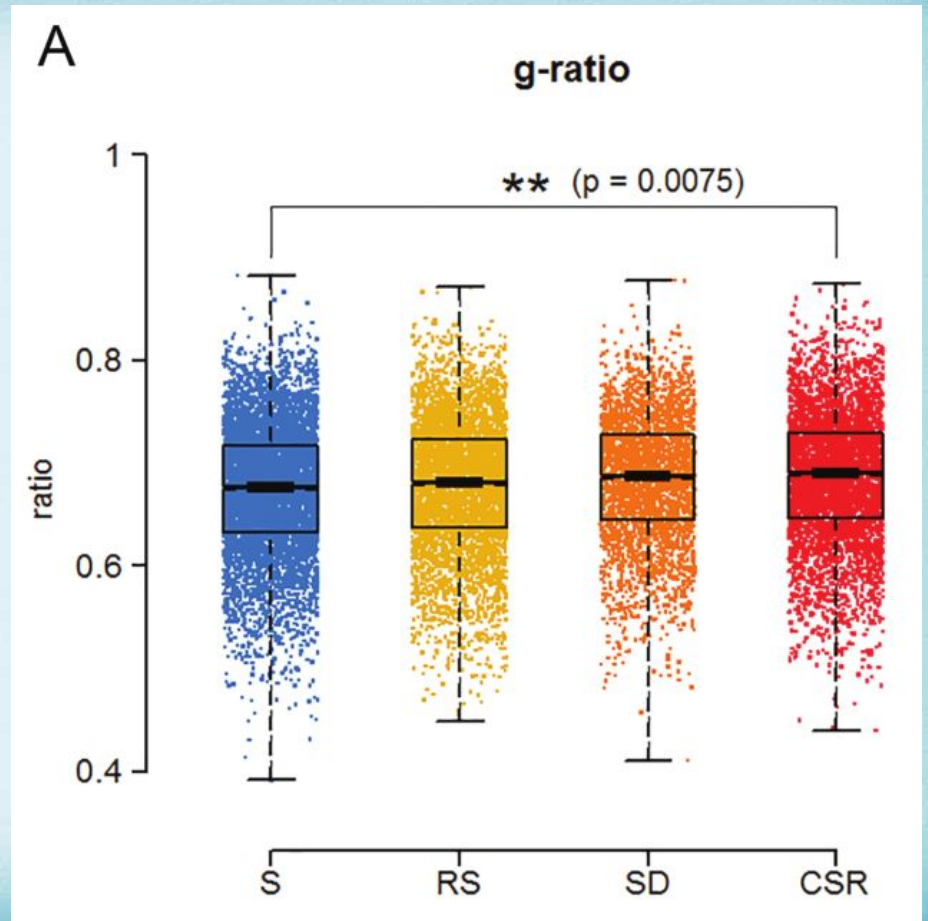
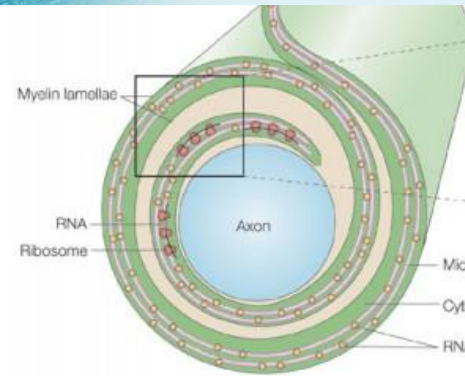
RESULTS 1

G-ratio increases...

**AXONAL
DIAMETER**

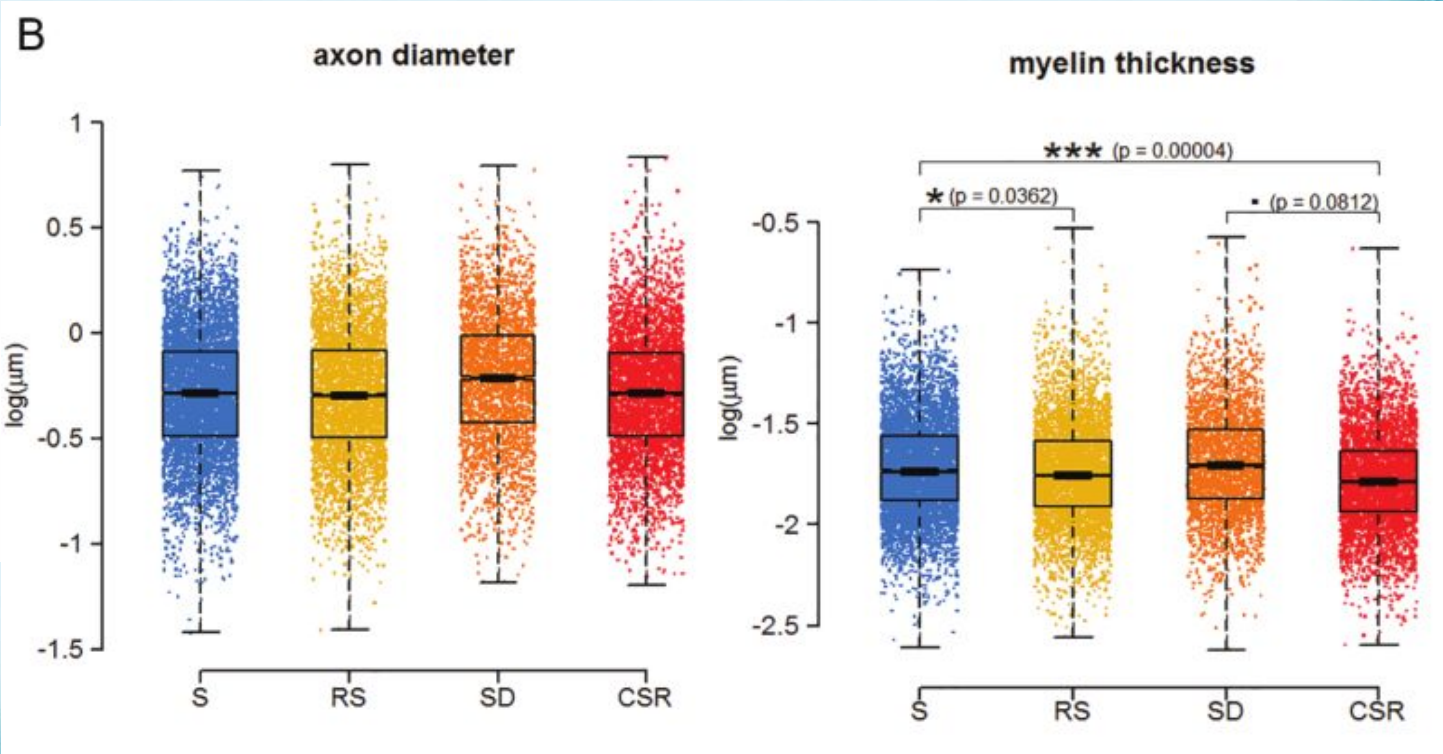
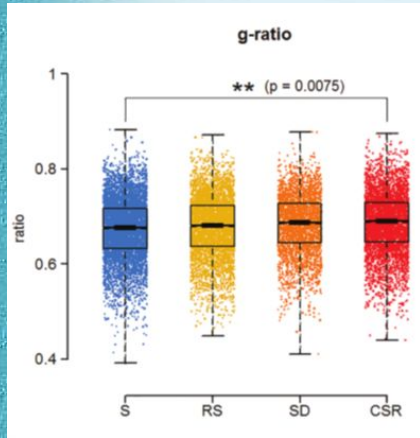
G-ratio = 

**TOTAL
DIAMETER**



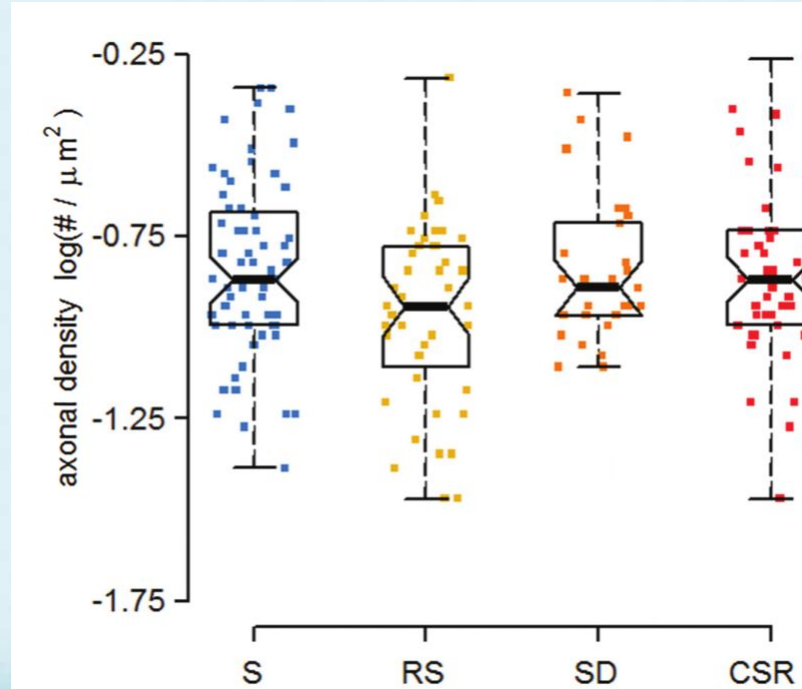
RESULTS 1

Axon diameters do not change, so it is the myelin that causes g-ratio changes.



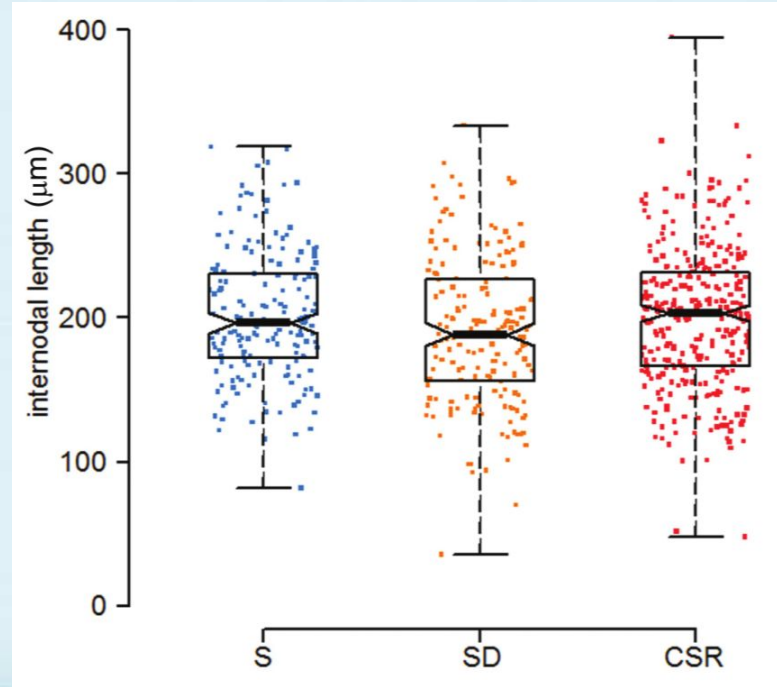
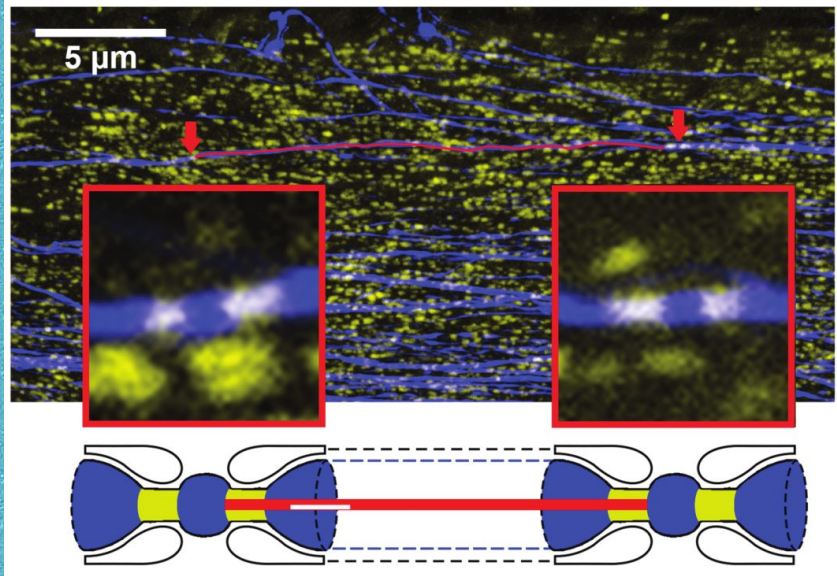
RESULTS 2

No change in axon density or internodal length



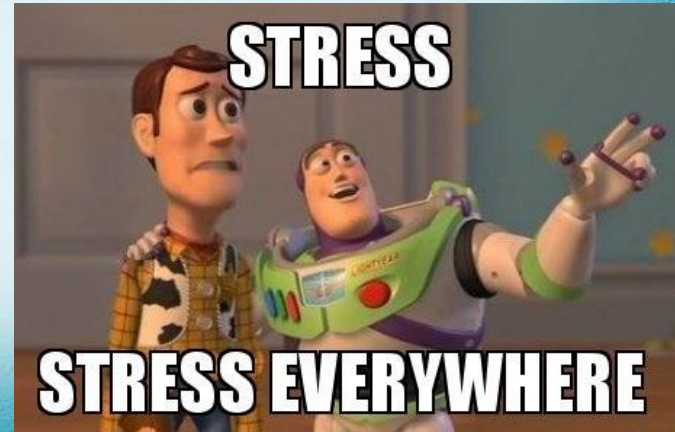
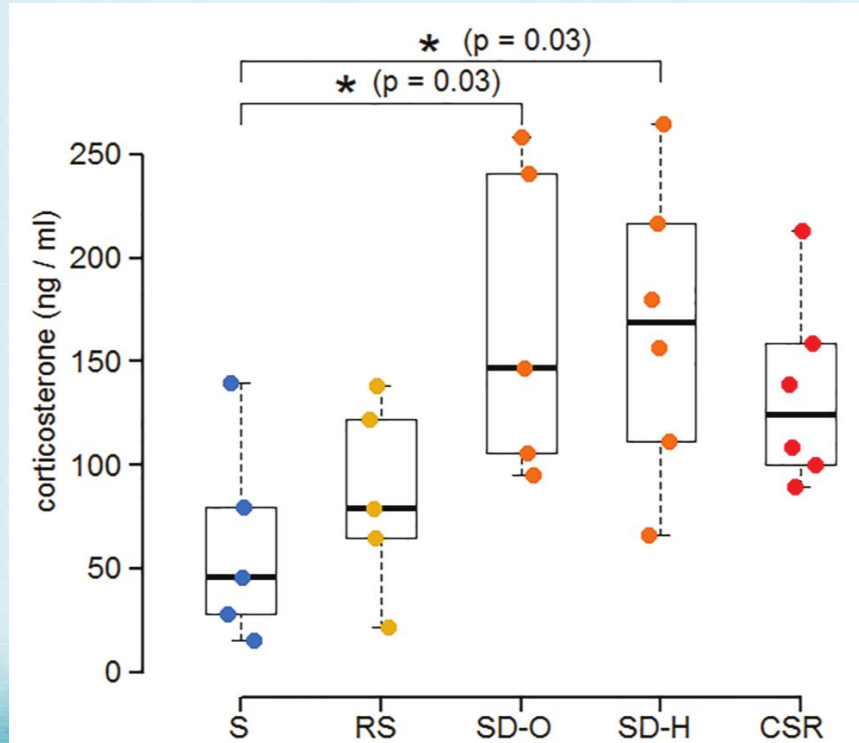
RESULTS 2

No change in axon density or internodal length



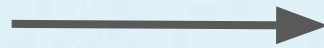
RESULTS 3

Keeping the mice awake leads to **stress**, and a common effect of stress in the **increase of corticosteroids**, and they may have effects on myelination.



DISCUSSION

Sleep Loss



Decrease in myelin thickness

Why?

Different gene transcription



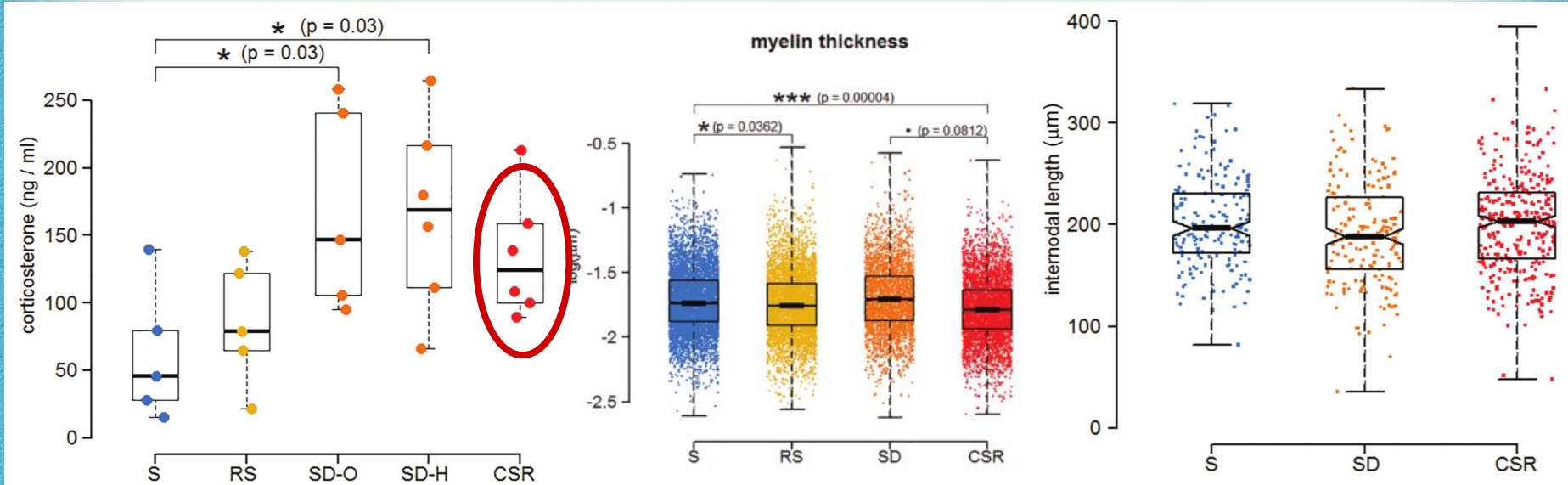
Higher axonal energy demands supplied by oligodendrocytes



These changes need time to both arise and be resolved



OPEN QUESTIONS



Corticosteroids not important? Or just too slow?



Internodal changes not observed. Why? Too little time?

PERSPECTIVES

- How much time does it take for myelin to remodel?
- How do these processes occur in humans?
- How do you feel knowing that you're brain might be suffering because of you watching Netflix series until late?



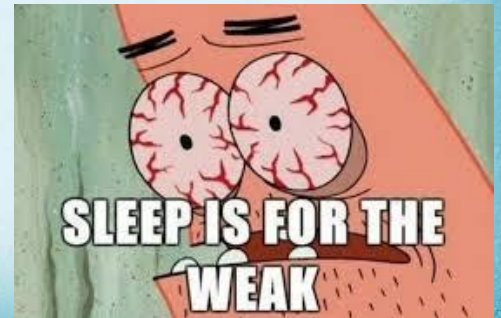
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**THANK YOU FOR YOUR
ATTENTION**



NOW PLEASE CLAP