



The Dark Side of Energy-Efficient Lighting

We acknowledge the Wurundjeri Woi-wurrung and Bunurong peoples, the Traditional Custodians of the land on which this work was conducted and pay our respects to their Ancestors and their descendants, who continue cultural and spiritual connections to Country.


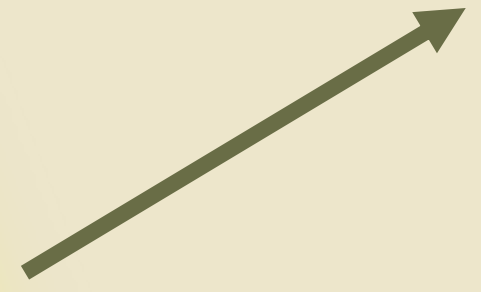
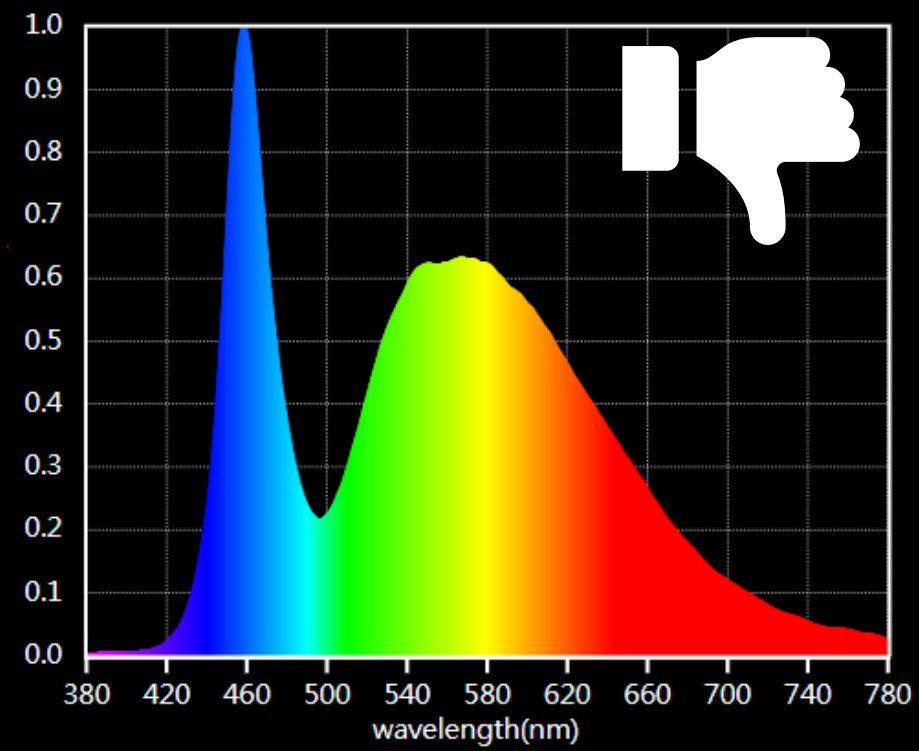




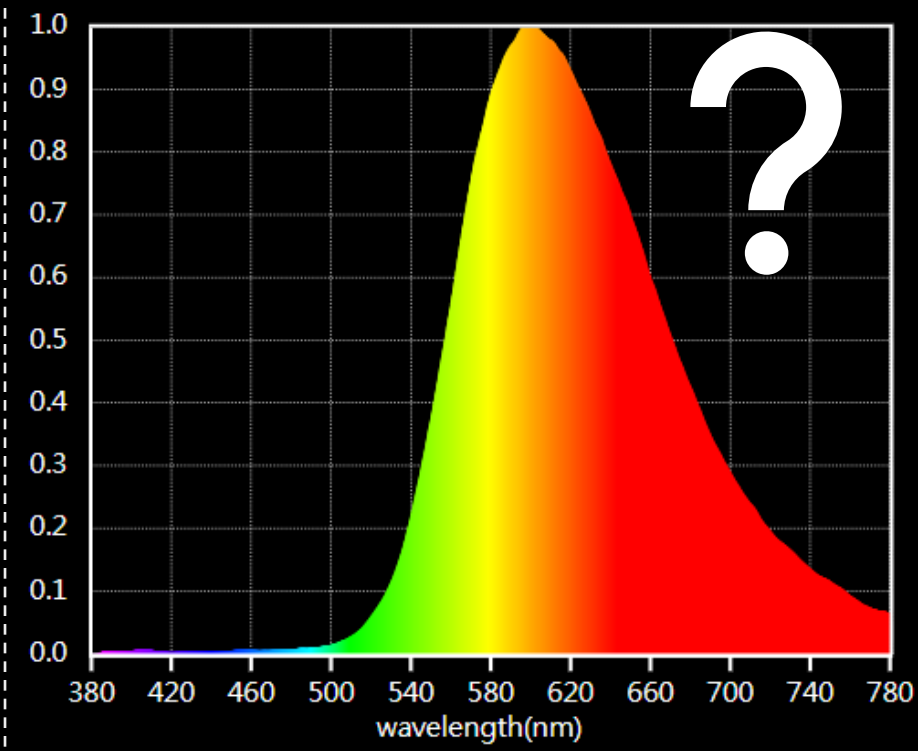


Photo: Getty Images: www.columodwyer.com





Cool white



Amber



Activity & Reproduction

Fat-tailed Dunnart

(Sminthopsis crassicaudata)



Fat-tailed dunnart

- **Trichromatic colour vision**



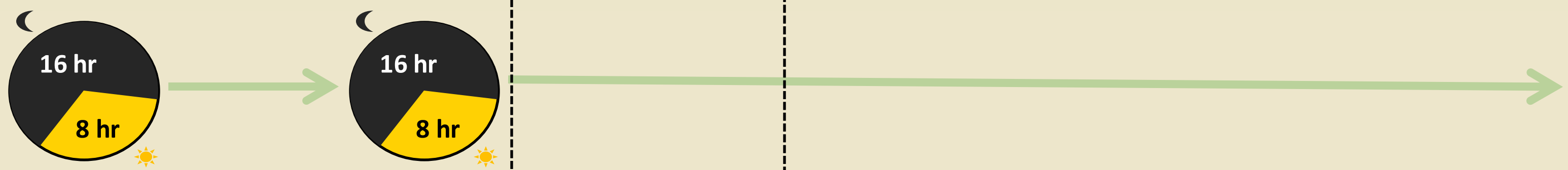
Research questions



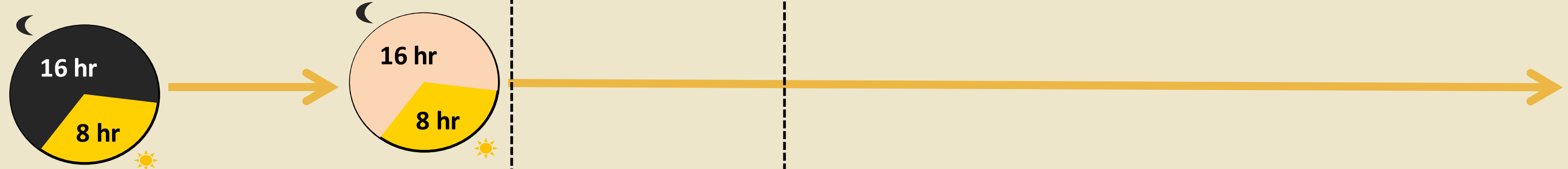
Activity

- **Emergence time**

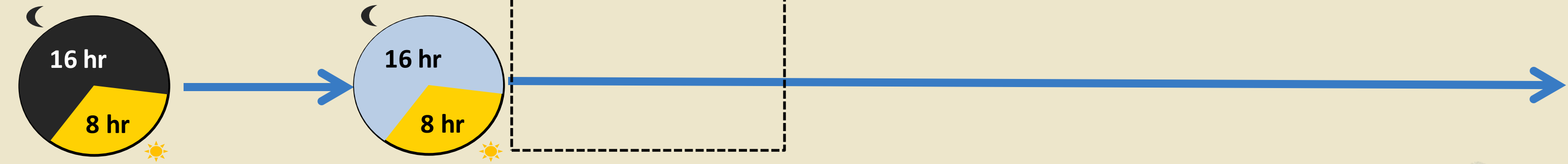
Control



Amber



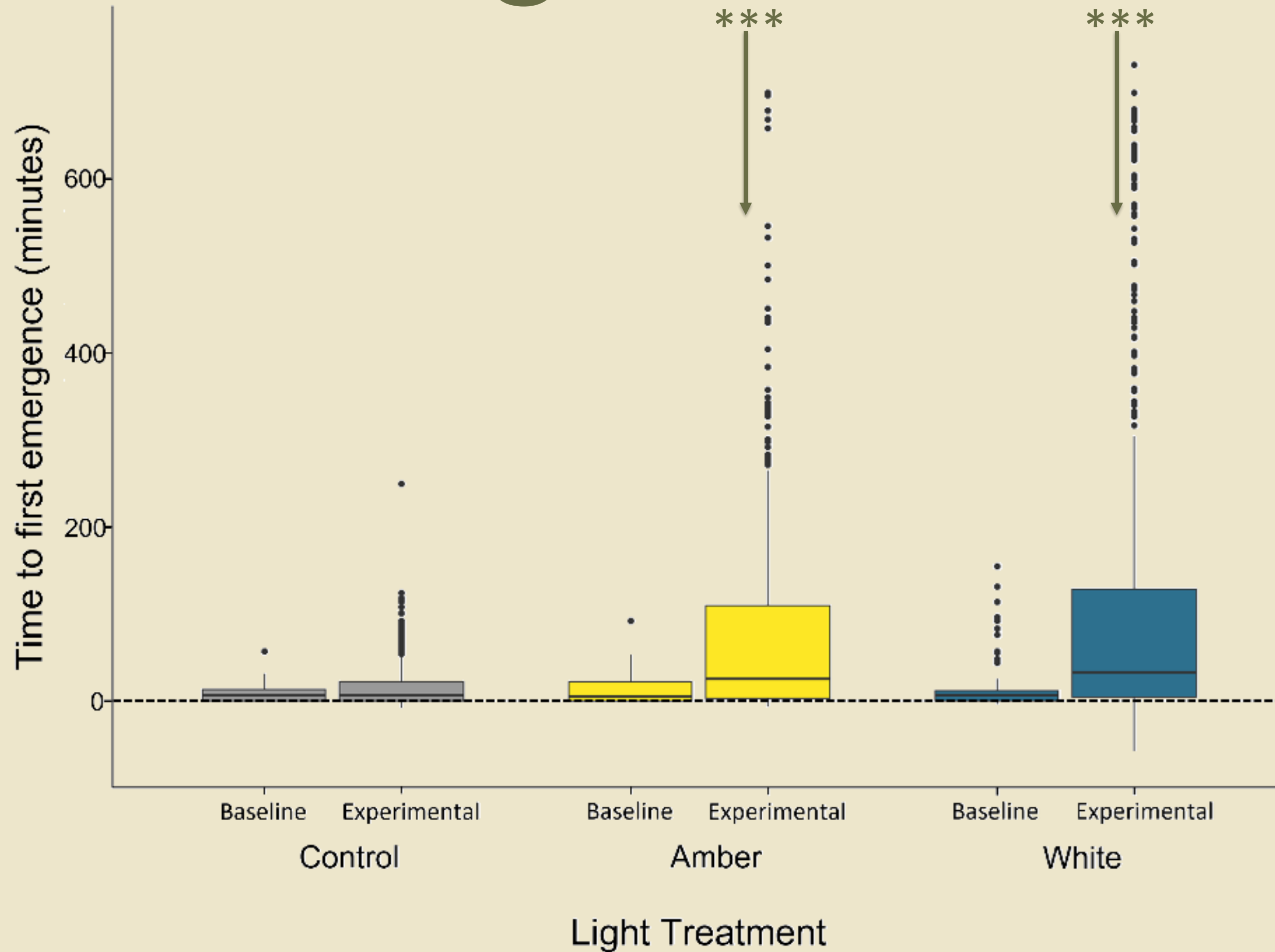
White



Activity



Emergence times





Reproductive activation

Control: No signs of oestrous (n = 4)

Amber:

Oestrous detected in all females

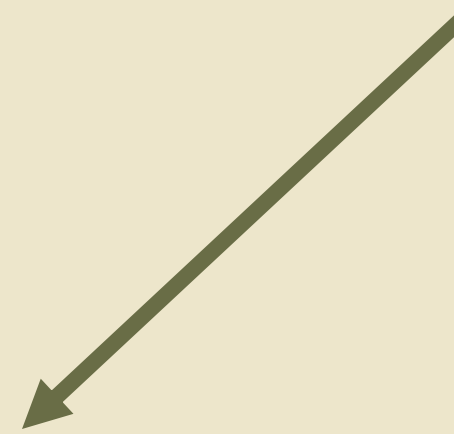
(n = 5 per treatment)

White:

Circadian Hormones



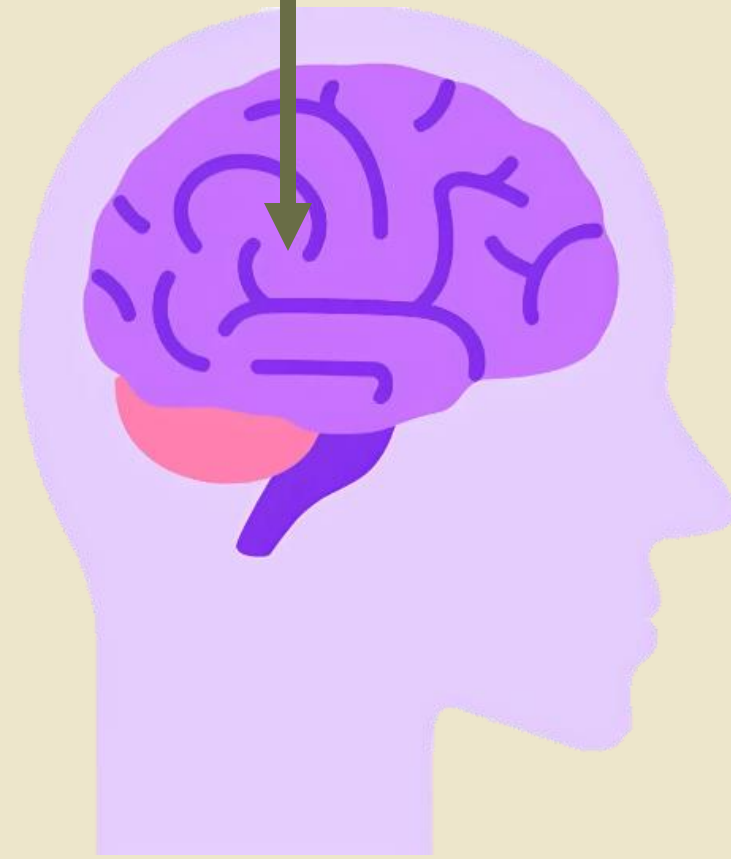
Hormones



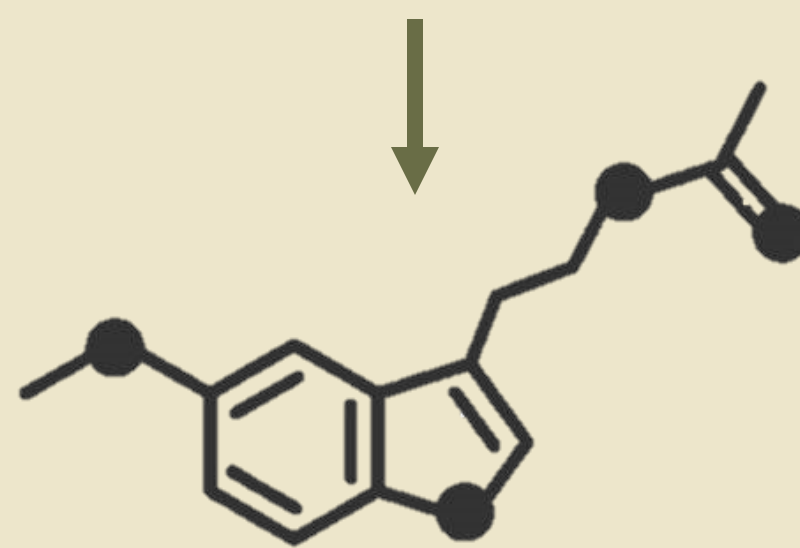
Pineal gland



Inhibition



Stimulation

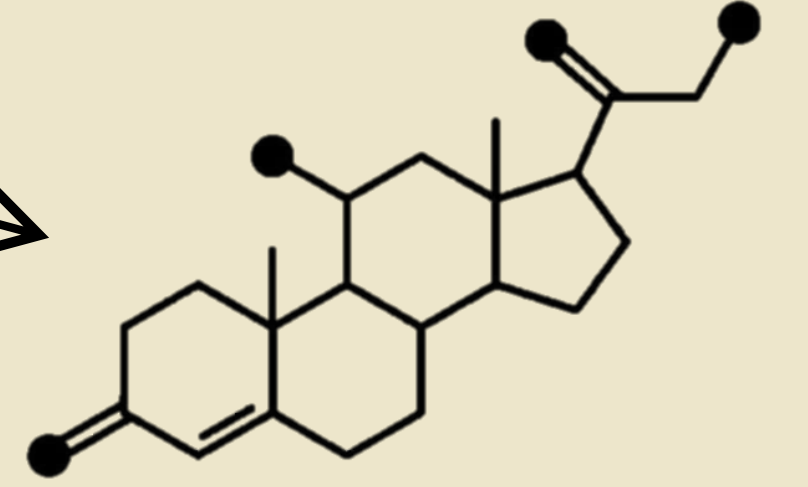
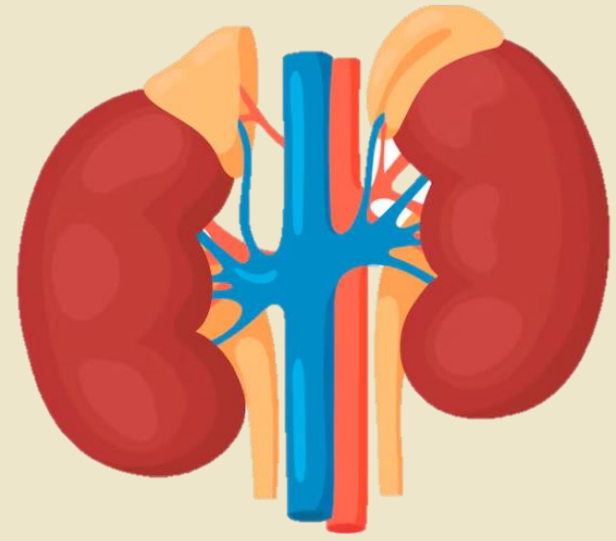


Melatonin

- **Sleep-wake cycles**
- **Circadian rhythms**
- **Energy metabolism**
- **Metabolic demands**
- **Immune function**
- **Antioxidant**



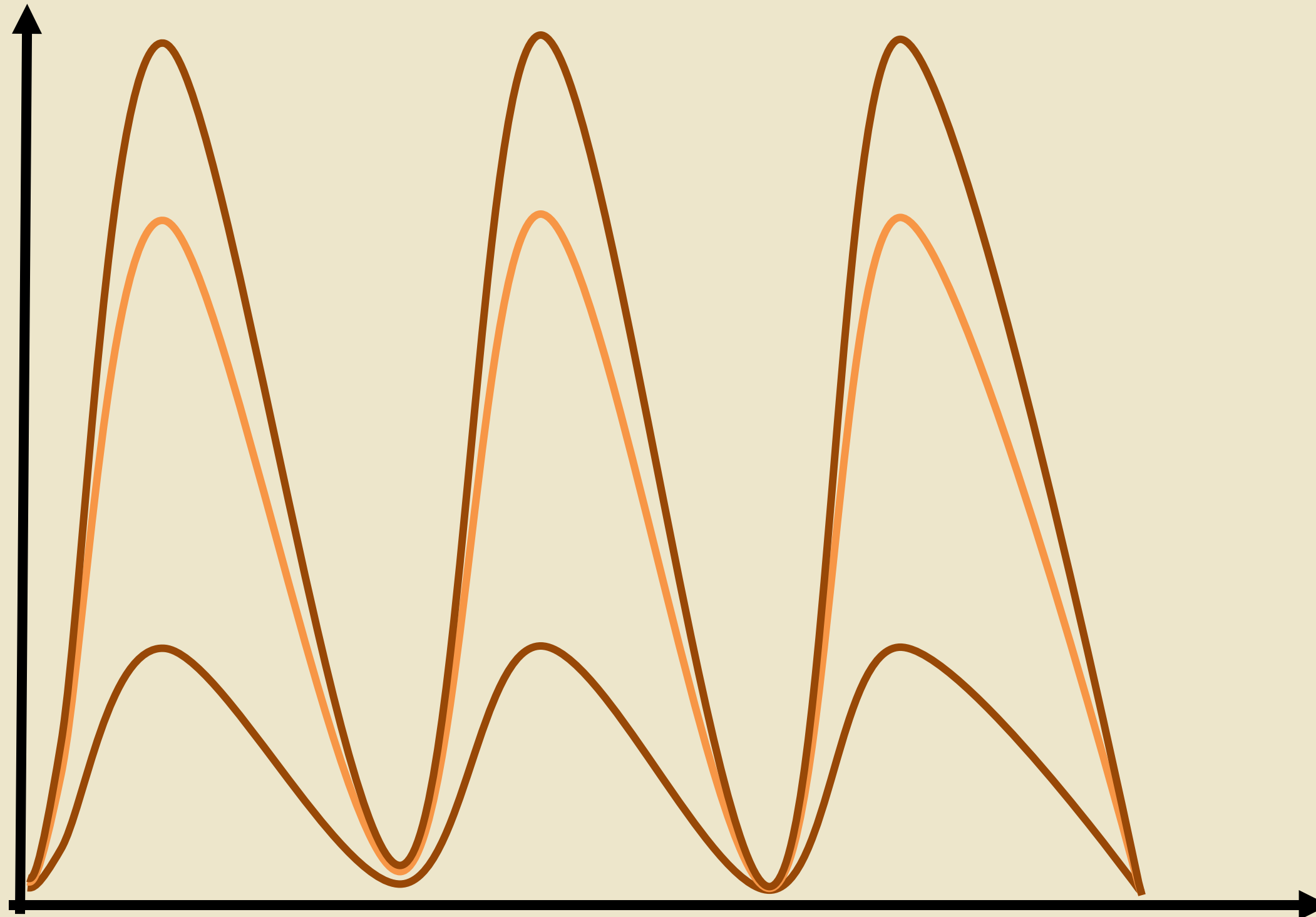
HELP!



Glucocorticoids

- **Acute stress**
- **Circadian rhythms**
- **Seasonal changes**
- **Metabolic demands**
- **Reproductive function**
- **Immune function**

Disrupted expression

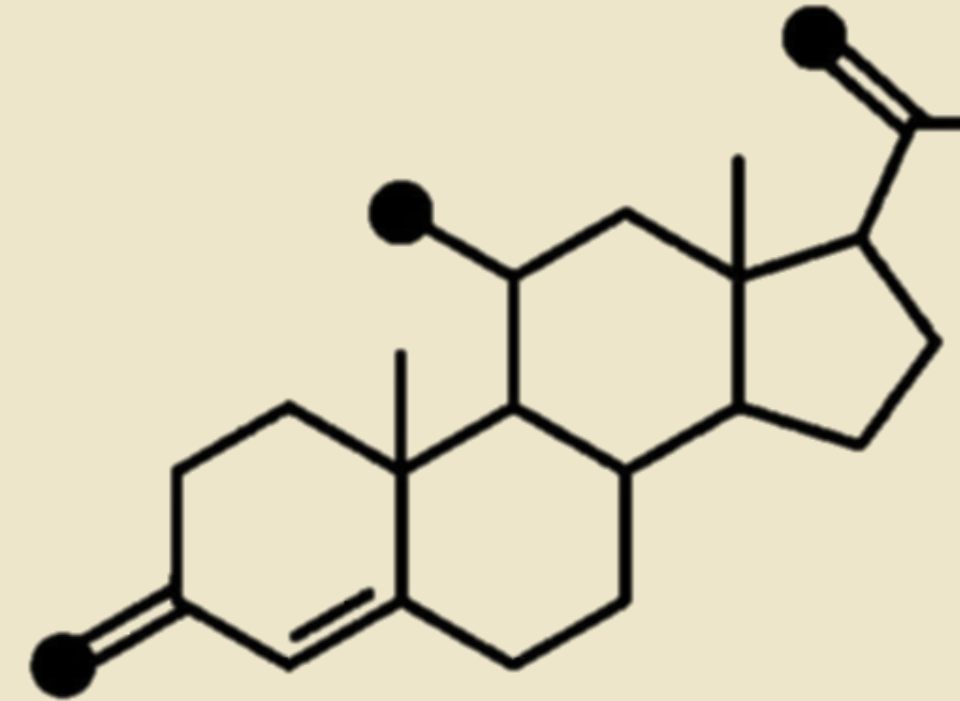
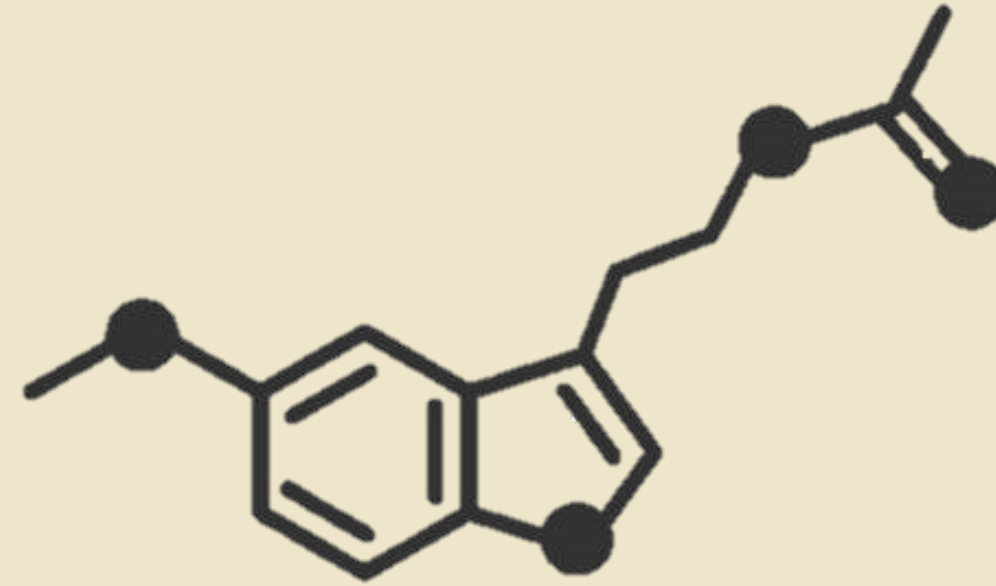


Natural rhythm
Disrupted rhythm



Research Questions

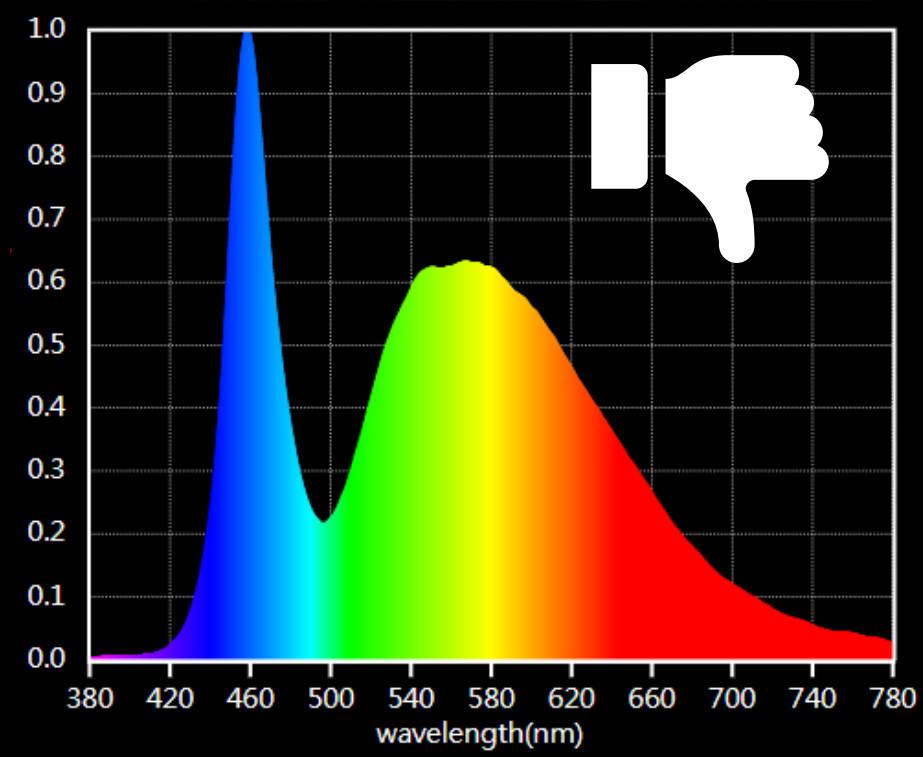
- **Melatonin**
- **Glucocorticoids**



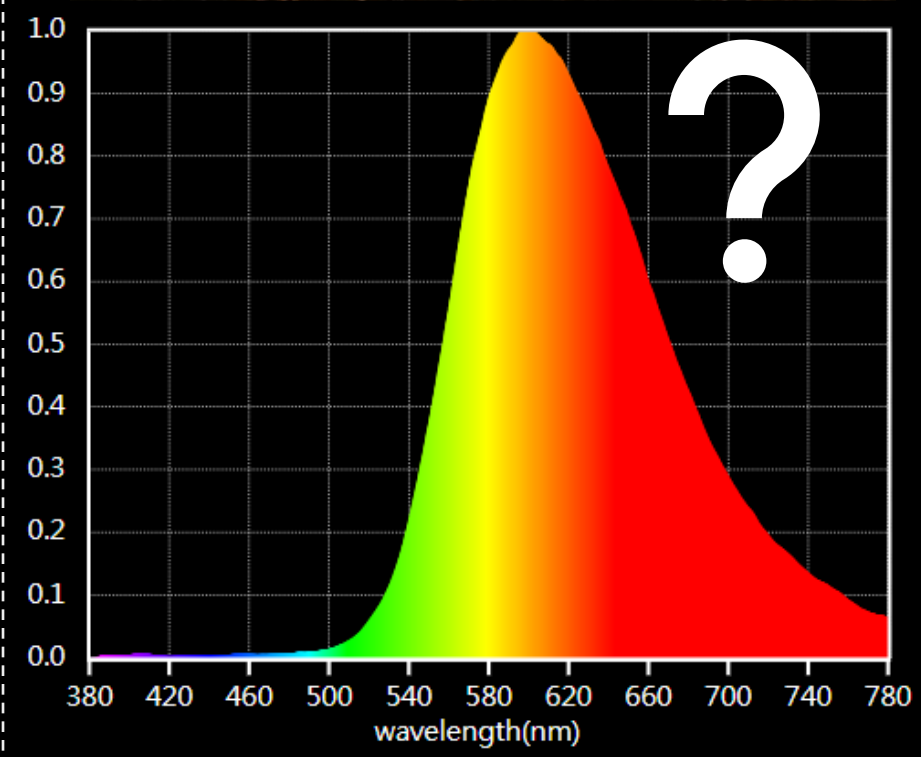
Kreffft's Glider

(Petaurus notatus)





Cool white



Amber

Ambient Night-time

Baseline

Control



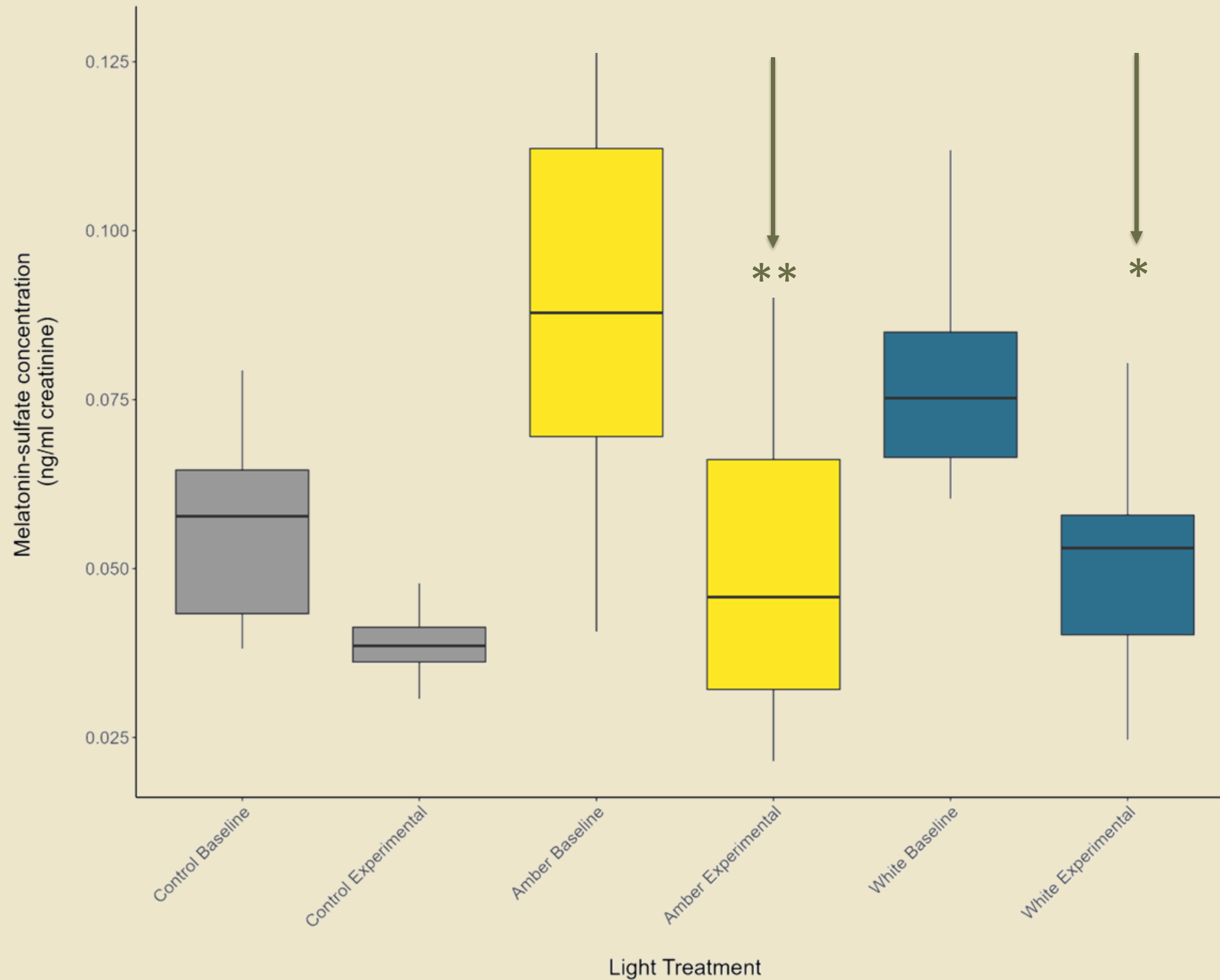
Amber



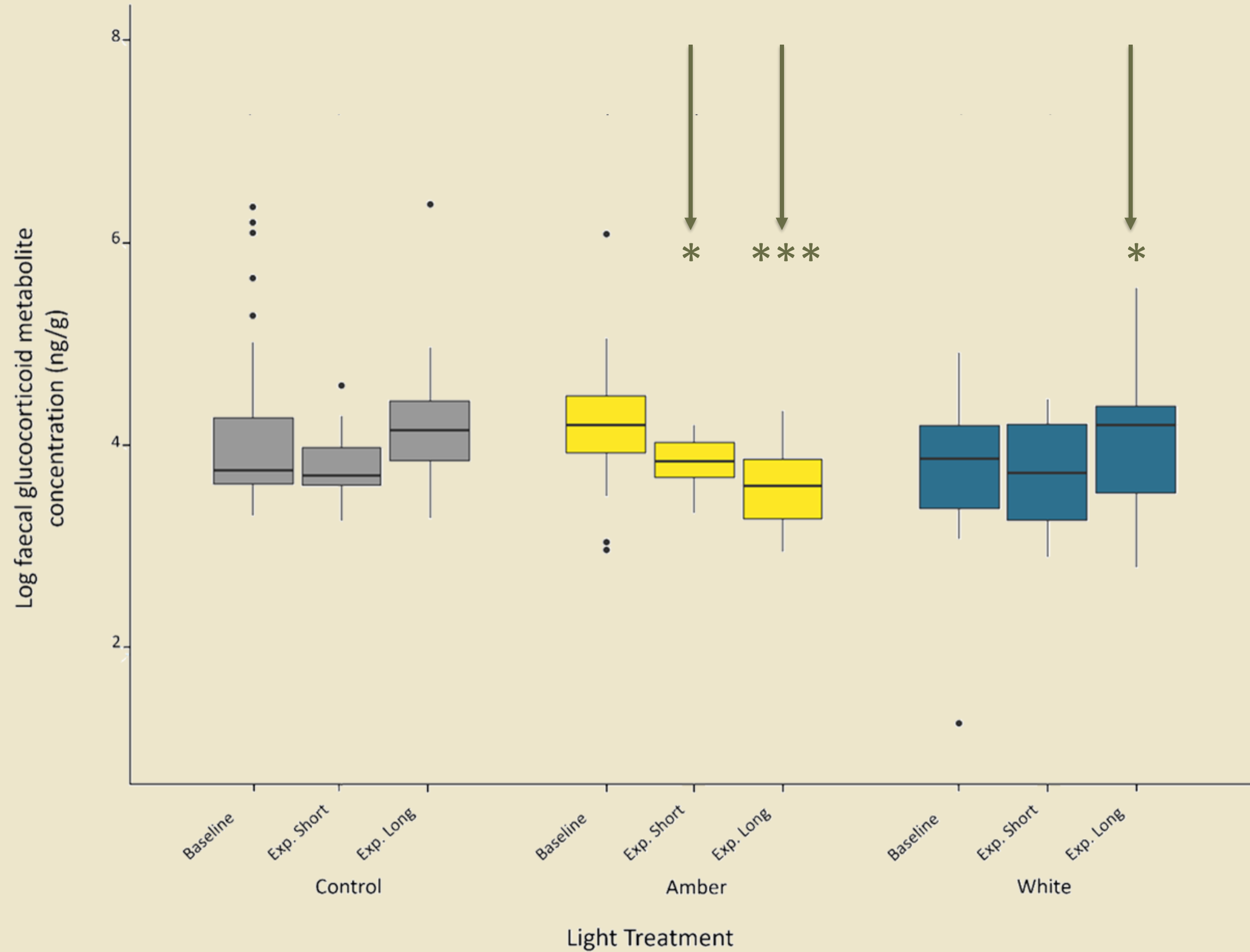
White



Urinary melatonin



Faecal glucocorticoid metabolites



Insights

White & Amber LEDs:



Acknowledgements

Collaborators

- Dr. Kylie Robert
- Dr. Kerry Fanson
- Dr. Amy Edwards

Volunteers and Support

- Reproductive Ecology & Conservation Biology Lab
- Wildlife Conservation & Reproductive Endocrinology Lab

Glider physiology paper



LA TROBE
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FUTURE LANDSCAPES

