



How Short Wavelength Blue Light Affects Hormonal Health

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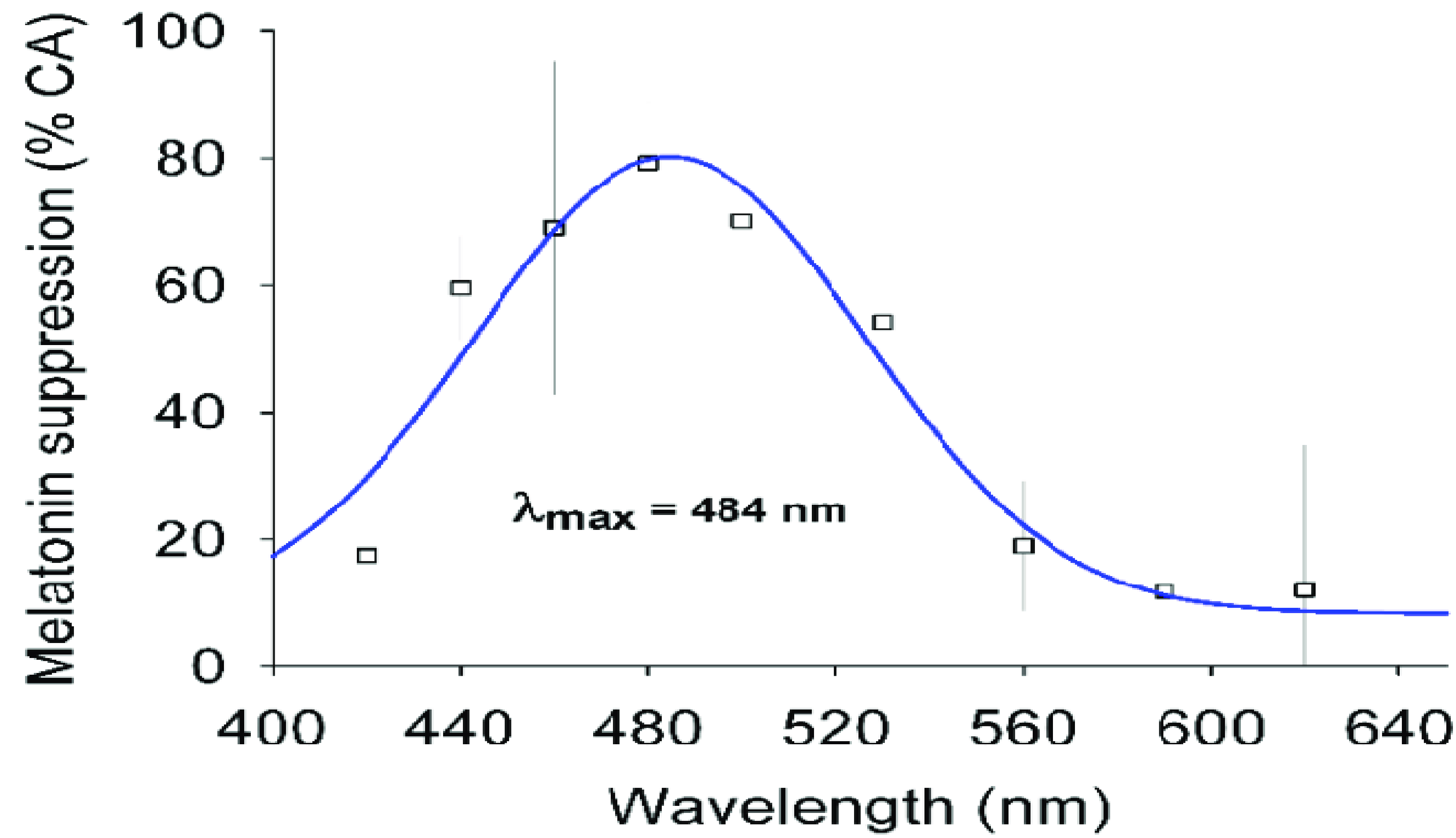
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Introduction

- Recent 2022 studies have found that the Worldwide average time spent on electronic devices is 7 hours per day.
- Current evidence would show that this trend of exposure will continue; so, we wanted to explore the current body of research to identify concerns that short wavelength blue light artificial light has on hormonal and behavioral health.

Objectives

- To examine the effect short wavelength artificial blue light has on melatonin, cortisol, and insulin as the mechanisms of hormonal health
- To examine the effect short wavelength artificial blue light has on the circadian rhythms for sleep, behavior, and metabolism.



Results

- Exposure shortened REM cycles of sleep by average 16 minutes.
- Exposure to Blue Light before bed increased sleep disruptions from average 4.5 to 7.2 times per night.
- Short wavelength blue light 60 minutes before bed led to maximum of 80% Melatonin suppression.
- Induced phase shifts in circadian rhythms, leading to early release of cortisol by 2 hours and delayed suppression by 3.6 hours.
- Can cause metabolic changes at night which increased peak blood glucose levels and insulin resistance.
- Irregularities in circadian rhythms can result in worsening of depressive disorders and anxiety from poor sleep patterns and diet.

Conclusions

- Excessive exposure to short wavelength blue light decreases melatonin, increases cortisol, and increases insulin resistance.
- Exposure disrupts circadian rhythms, resulting in behavioral changes, trouble concentrating, and difficulty with sleep.
- No direct relationship that ocular or neuropsychological diseases were confirmed to be caused or progressed by short wavelength blue light.

Future Work

- Further exploration of the relationship of short wavelength blue light has with Myopia, Macular Degeneration, Parkinson's disease, and ocular oncology.
- Further research on long-term effects of repeated artificial blue light exposure on behavior.

References

- Prayag, Abhishek & Münch, Mirjam & Aeschbach, Daniel & Chellappa, Sarah & Gronfier, Claude. (2019). Light Modulation of Human Clocks, Wake, and Sleep. *Clocks & Sleep*.
- Mason, Grimaldi, Reid, & Zee. (2022, March 14). Light exposure during sleep impairs cardiometabolic function | PNAS. University of California, Retrieved April 2, 2023

Methods

- A literature review of over 50 journals, articles, and research papers was used to conclude the results present here

