

More than meets the eye to staying awake, alert

13 May 2010

Think twice before falling asleep alongside the glare of your computer and TV screens: exposure to dim light from ordinary room lights, computer screens and other electronic devices late at night may be interfering with our circadian rhythms -- making it even harder to get up in the morning.

This is one of the findings of a new study showing that, contrary to what we thought before, the cells in our eyes that help us see things can also be involved in regulating our circadian rhythms and could make a difference in how we design light therapy to treat [sleep disorders](#) or seasonal depression.

Previous studies have shown that there are special non-image forming cells in the eyes of humans and other mammals. These cells are located in a different part of the eye than the rod and [cone cells](#) used for vision and contain melanopsin, a pigment that absorbs blue light to operate some light-regulated processes like resetting sleep-wake cycles, releasing hormones, and alerting the brain.

These melanopsin-containing eye cells have lead many people to believe that only blue light can stimulate non-visual effects, and has spawned numerous devices and techniques for using blue light therapeutically; including the use of blue light boxes and special glasses to block blue light. Now, Joshua Gooley and colleagues show that other types of light may work just as well as or better than blue light, depending on the [lighting conditions](#). In the study, they exposed normal individuals to two different wavelengths of light, one designed to be detected by color-vision cells (green light) and the other by the non-image forming blue-light [receptor cells](#) (blue light).

Rather than the expected result (that the non-image forming responses were induced only by blue-light cells) the researchers surprisingly found that under dim light, or for short periods of time, green light was just as good as the blue light;

indicating that image-forming rod and cones are able to play a role in regulating the circadian system. Hence, improved light therapy approaches should consider not only blue light when predicting the effects of light on our [circadian rhythms](#), hormones and alertness, but other visible wavelengths, especially in dim light environments or for short periods of time.

More information: "Spectral Responses of the Human Circadian System Depend on the Irradiance and Duration of Exposure to Light," by J.J. Gooley et al. Sci Transl Med 12 May 2010: Vol. 2, Issue 31, p. 31ra33 [DOI:10.1126/scitranslmed.3000741](https://doi.org/10.1126/scitranslmed.3000741)

Source: AAAS

APA citation: More than meets the eye to staying awake, alert (2010, May 13) retrieved 14 November 2019 from <https://medicalxpress.com/news/2010-05-eye.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.