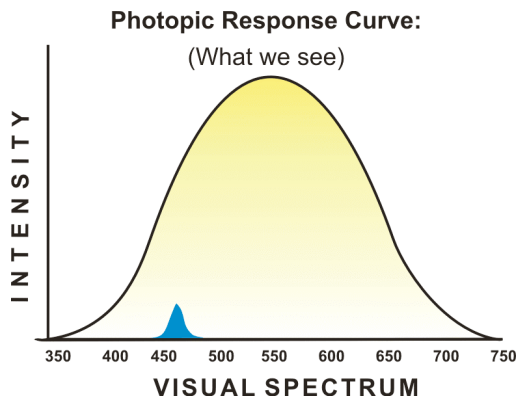


BLUEWAVE® Technology: The future of light therapy

- **SAD is the result of melanopsin photoreceptor deficiency**
- **Melanopsin responds to blue (470 nm) light**
- **Standard light therapy devices do not produce necessary bandwidth**
- **BLUEWAVE Technology is only method which delivers effective bandwidth**

Breakthrough Discovery

We now know what causes SAD and related circadian rhythm problems, and it's not what we thought. A newly discovered photoreceptor, called **melanopsin** is responsible for activating the circadian pathway, and it does not respond to the same light as rod and cone cells. This discovery is changing the way we treat SAD and circadian rhythm disorders.

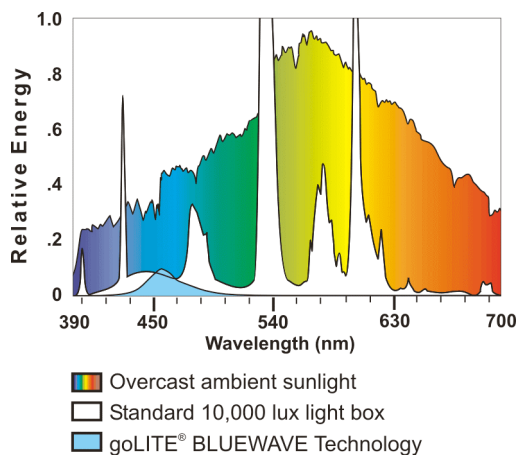


White is Wrong

Researchers used to think the response was through the visual spectrum, known as the photopic response curve, and light boxes were manufactured accordingly. Now we know that the photo-receptors responsible for circadian rhythm problems do **not** respond to the visual response curve, but rather to a very narrow slice or bandwidth of blue light, from 446-477 nm (nanometers). When stimulated by this bandwidth, melanopsin triggers the suprachiasmatic nucleus, or body clock to reset its circadian rhythms and produce the active energetic hormones.

Why We Get SAD

Researchers now believe that SAD and circadian rhythm disorders are caused by a melanopsin deficiency. In addition to responding to blue light, melanopsin cells are responsible for detecting **intensity** changes. If the eye doesn't have enough melanopsin receptors, the body clock can't distinguish daylight signals and can't regulate circadian rhythms and energy, mood and sleep hormones. Those with SAD or similar circadian rhythm disorders have fewer melanopsin receptors and are more dependent on blue light.



Why Current technology falls short

The problem with current lighting technology is that it doesn't naturally produce the effective wavelength of light. When intensity is increased to 10,000 lux, fluorescent sources begin to produce the necessary bandwidth of light. However, at 10,000 lux these sources also produce near UV light as well as 25 times normal intensity.

BLUEWAVE® is Changing Light therapy

In 2001 Apollo began working with researchers to create a new light source that could deliver the necessary blue light without the over-stimulation problems inherent with current technology. The resulting BLUEWAVE® technology was developed through a National Institutes of Health grant. Clinical testing and tens of thousands of products confirm the effectiveness and increased safety of BLUEWAVE®.