

# Can blue-blocking glasses be a treatment for bipolar disorder?

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# Bipolar patients have arrhythmical circadian systems during episodes

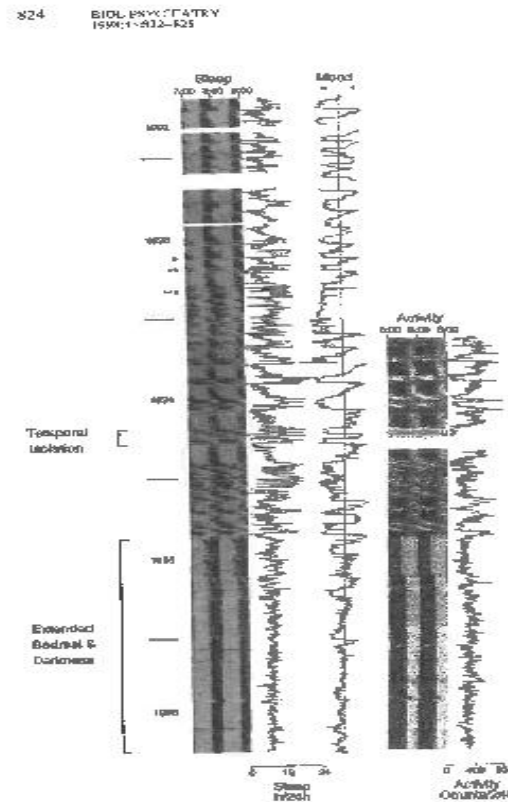
More episodes at spring and autumn equinoxes

Earlier first episode at higher latitudes

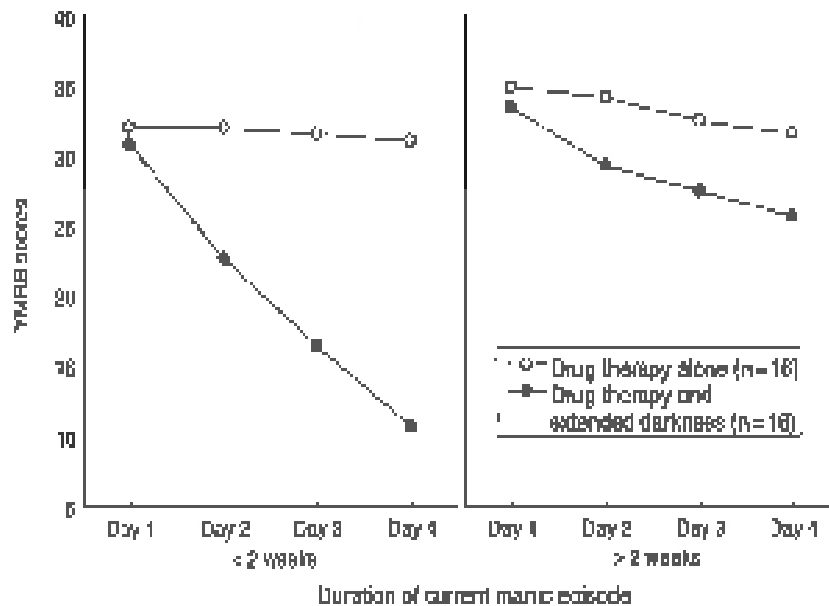
Super-sensitivity to light at night



# Case-report, patient with rapid cycling bipolar disorder treated with extended bed rest and 14 hours of darkness, (Wehr 1998, Biological Psychiatry)



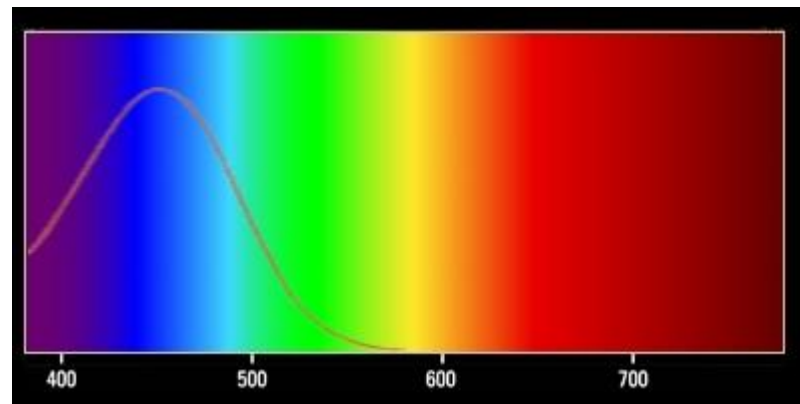
# Dark therapy for mania, pilot study, 14 hours of darkness/ 3 days (Barbini, Benedetti, Bipolar Disorders 2005: 7, 90-101)



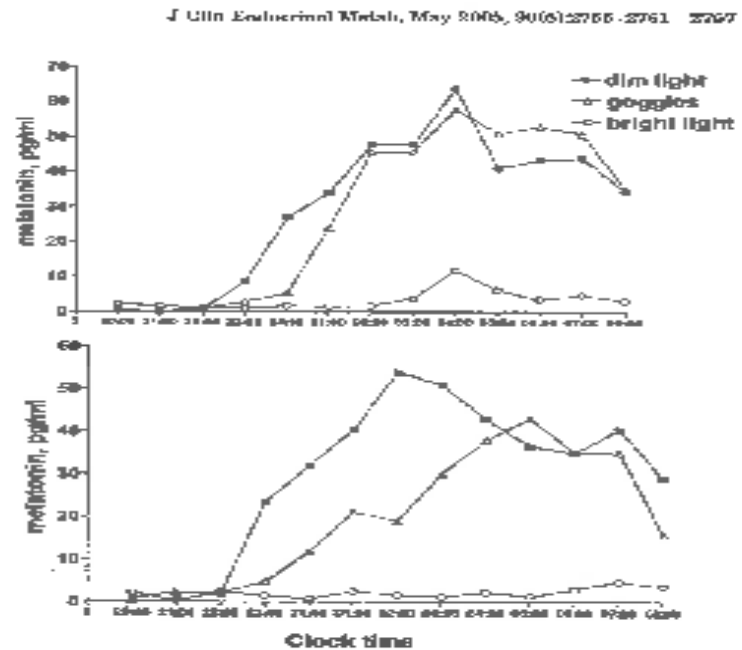
# New photoreceptor discovered

- The intrinsically photo-responsive retinal ganglion cell is solely responsible for the input of day-light signal to the suprachiasmatic nucleus
- Photopigment **melanopsin**.

Maximal sensitivity  
blue frequencies



# Blue-blockers impede the capacity of white light to suppress melatonin, (Sasseville 2006, Kayumov 2009, van de Werken 2013)



# Design of study: RCT

## **Inclusion criteria:**

Inpatients diagnosed with manic states and bipolar disorder

Age between 18 and 70 years

- Written informed (delayed) consent

## **Exclusion criteria :**

- Inability to comply with the study protocol
- Severe retinal damage, cataract or corneal damage on both eyes

## **RCT**

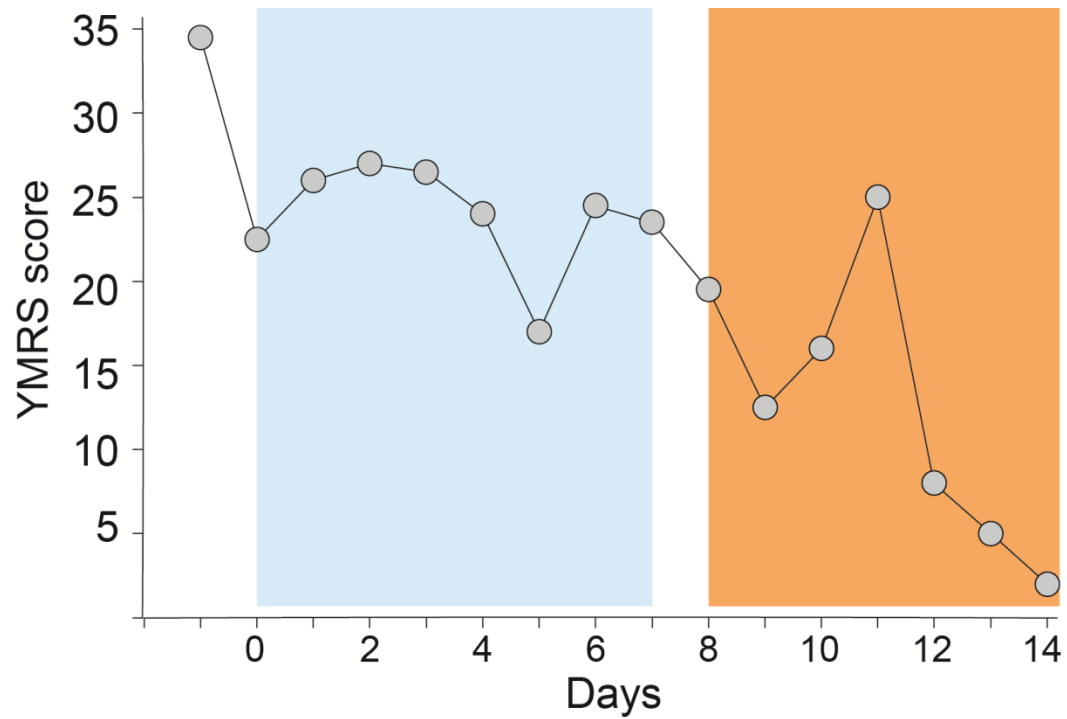
- 13 patients treated with **amber-tinted glasses** as add-on treatment from 6 pm to 8 am for 7 days.
- 11 patients treated with placebo clear-lensed glasses

# Mania

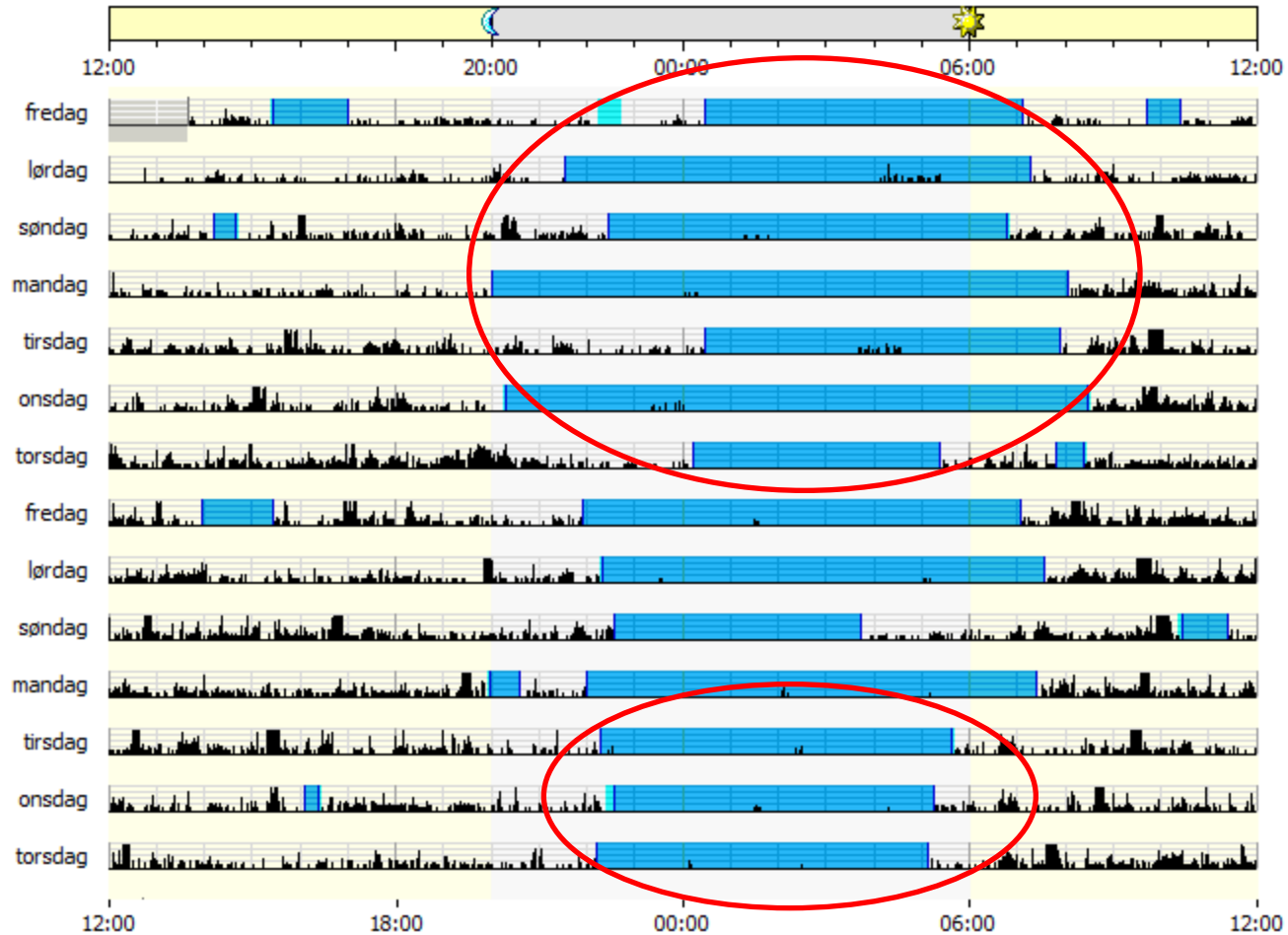




## Blocking blue light during mania - markedly increased regularity of sleep and rapid improvement of symptoms: a case report (Bipolar Disorders 2014)



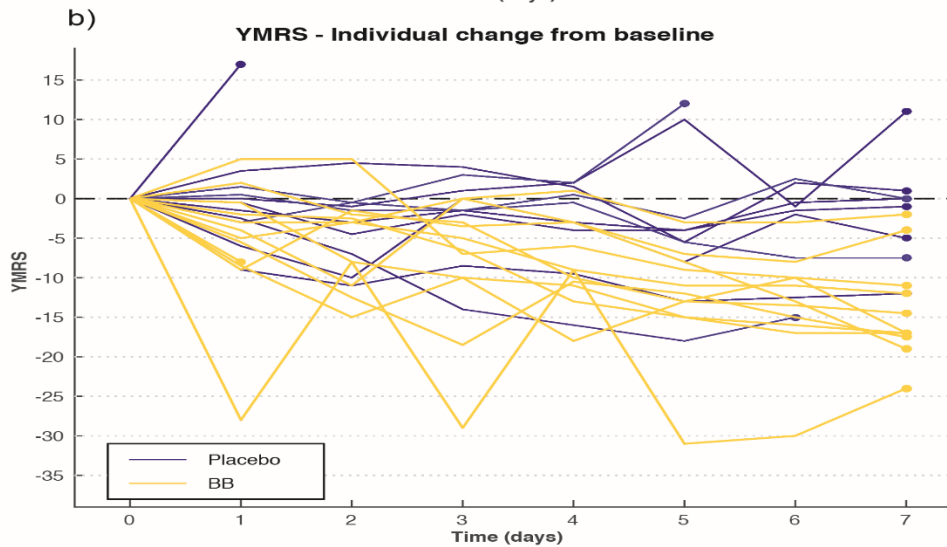
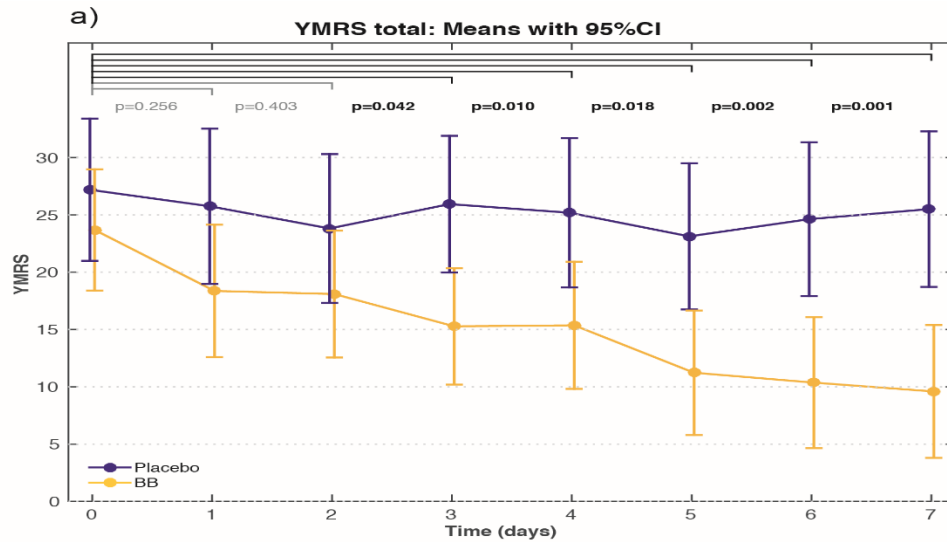
# Actigraphy day 0-14



- Rapid reduction of manic symptoms
- Markedly increased regularity of sleep
- Less activity during sleep

- “I still use the glasses – not regularly, but definitely when I want to rest my brain. What is beyond doubt when it comes to wearing the glasses is that I feel calm when I wear them- and I have good experience from using them during my latest hospital stay in 2013. It was a small wonder to get well so quickly. To be in a manic state is very exhausting – I remember the relief of coming out of it so soon. Before, I was completely worn out and experienced the usual depression afterwards. After the hospital stay I had returned to normal function by the time I got home. This spring too I have had days with energy bordering on mania - in combination with rapidly shifting thoughts - but I have remained in control by means of using the glasses when needed. I have been working without a single day of sick leave and with normal function.

# Results RCT



# Pasienterfaringer fra studien

- «Synes de fungerte veldig godt-merket lettere at jeg var sliten når jeg tok på brillene-da jeg første gang tok på brillene fikk jeg en trang til å gråte-fant dette interessant-ellers er jeg overbevist om at brillene fungerer.»
- «Beroligende syn-gleder meg til å få på brillene»
- «Kvitt lys pleier stresse meg; disse brillene hjalp til å duse ned alle inntrykk og vart lettare å fokusere.»
- «Vil fortsette med briller. Ser lysere på livet, ser klart. Sover godt/djupt. Fant roen på kvelden.»
- «Blei roligere, fikk livligere drømmer.»

# Rats exposed to the wrong light at the wrong time

- Single night exposure, 2 hours  
6 pm- 8 pm

Significant changes in:

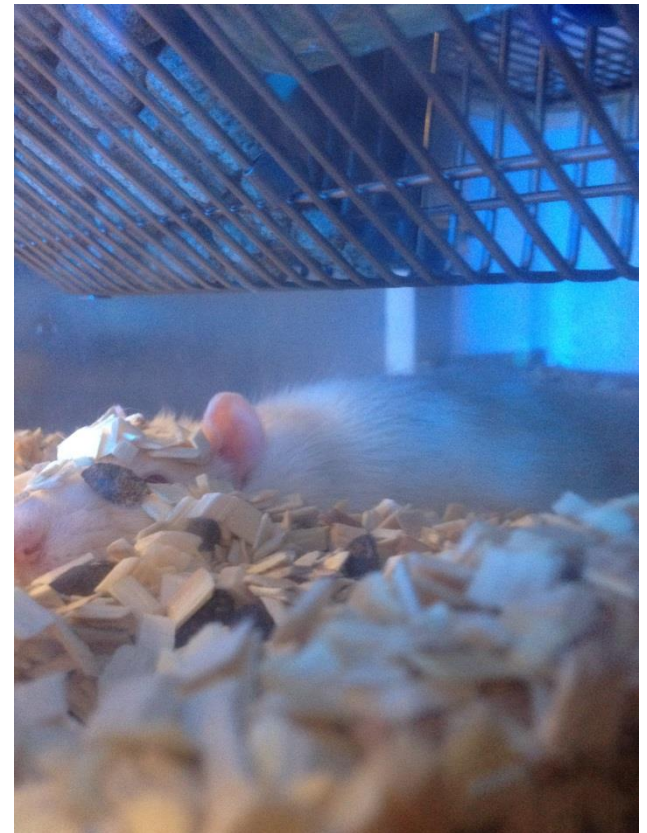
body temperature

heart rate,

NREM-sleep (less)

REM-sleep (less)

Lasting more than 4 days



# Possible mechanisms

- Disruption of light/dark cycle has a profound impact on the body
- Mania maintained by vicious circle of self-exposing to the wrong light at the wrong time?
- Blue-blockers stop vicious circle by separating the effects of wake and light environment



