



Green Light Therapy - Mechanisms of Analgesia

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Conflicts of Interest



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Common Pharmacological Options



**“Each capsule contains your medication,
plus a treatment for each of its side effects.”**

- NSAIDs/acetaminophen → stomach ulcers, liver damage
- Steroids → osteoporosis, weight gain
- SNRIs → nausea, fainting, dizziness
- Opioids → cardiovascular problems, constipation, sleepiness
- Hyaluronase → repeated injections into joint

Non-Pharmacological Therapies



Exercise



Meditation



Massage



Cognitive Based Therapy



Acupuncture

Migraine & Green Light



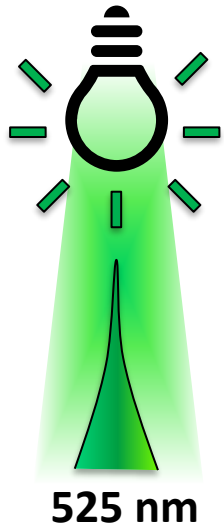
Rami Burstein, PhD



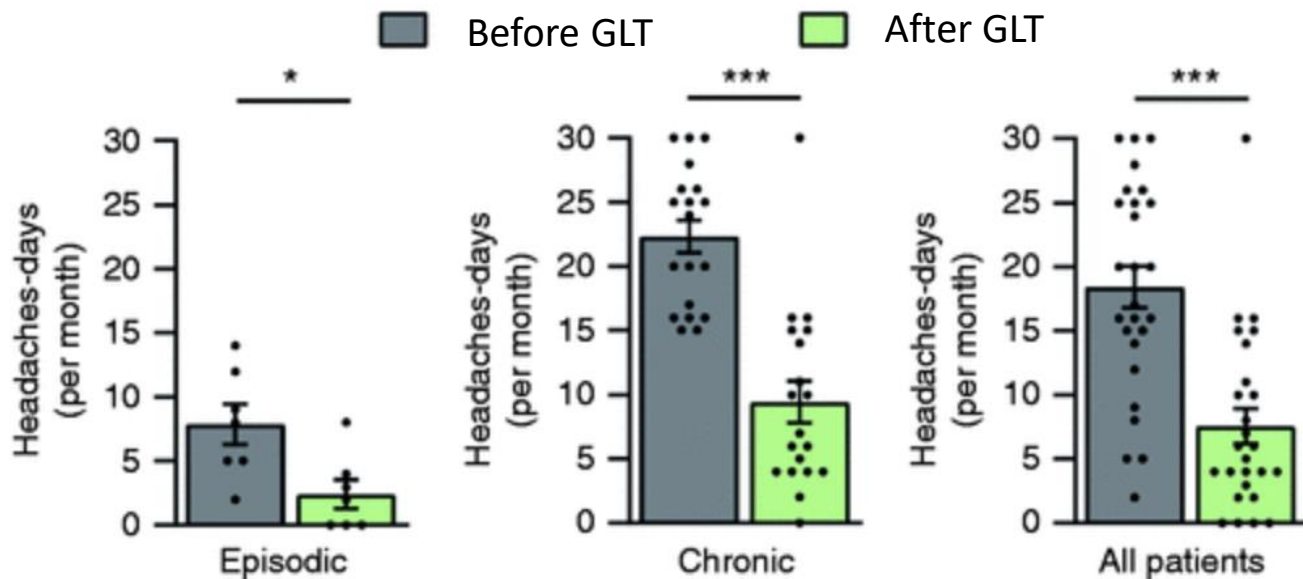
Mohab Ibrahim MD, PhD

- Migraine patients hypersensitive to different colours of light
- Migraine felt better in the countryside
- Green light reduced pain
- Improved sleep, mood, ability to exercise
- No side-effects
- Light must have specific wavelength, brightness, duration, delivery method

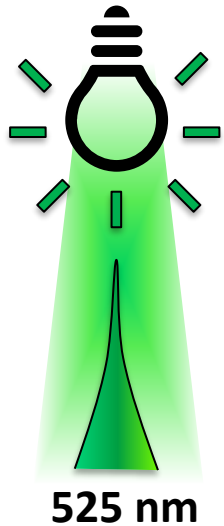
Green Light Therapy Reduced Migraine



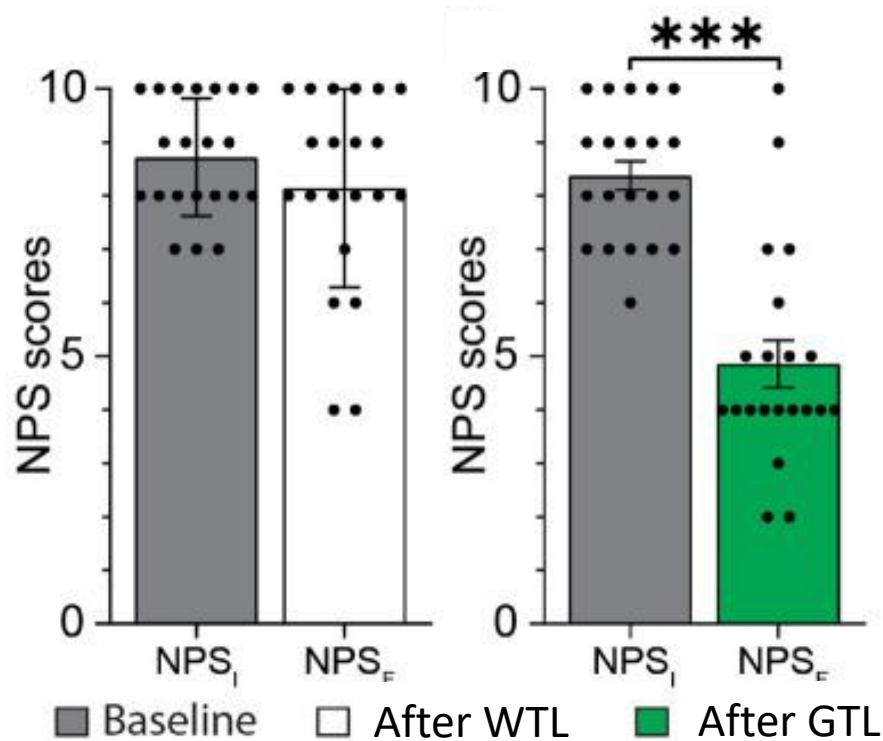
Green light (GLT) 525 nm: 1-2 hours/day for 10 weeks



Green Light Therapy Reduced Fibromyalgia



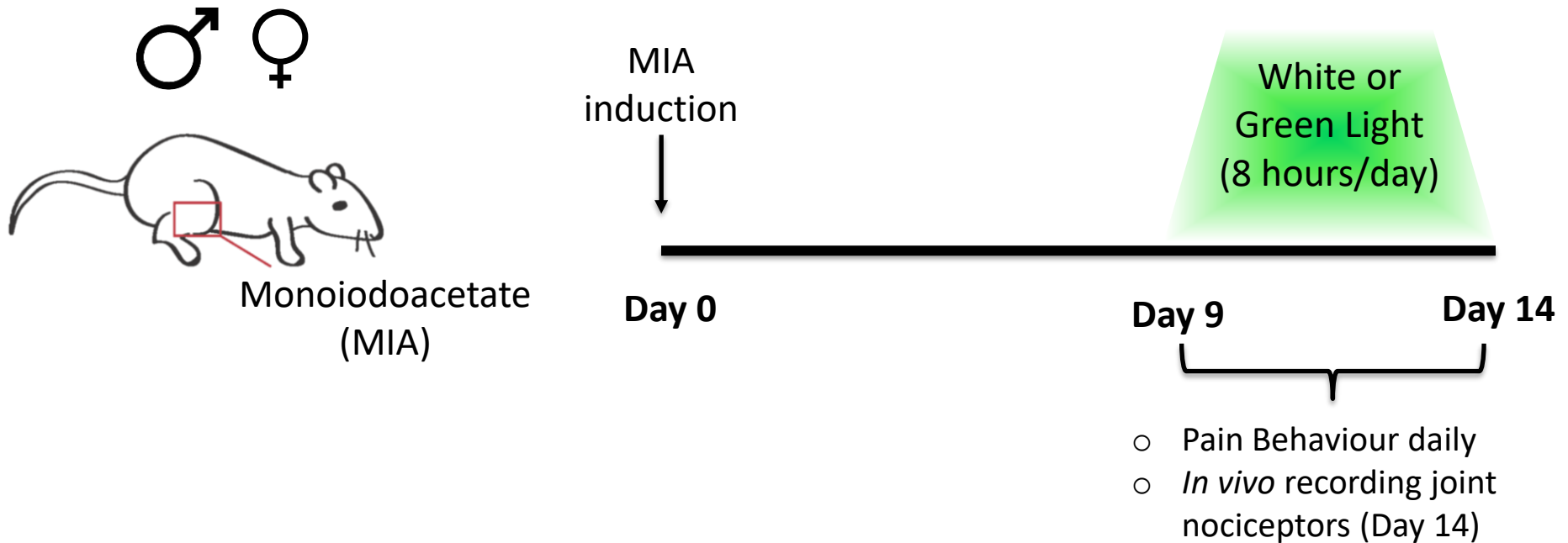
Green light (GLT) 525 nm: 1-2 hours/day for 10 weeks



Can green light reduce arthritis pain?

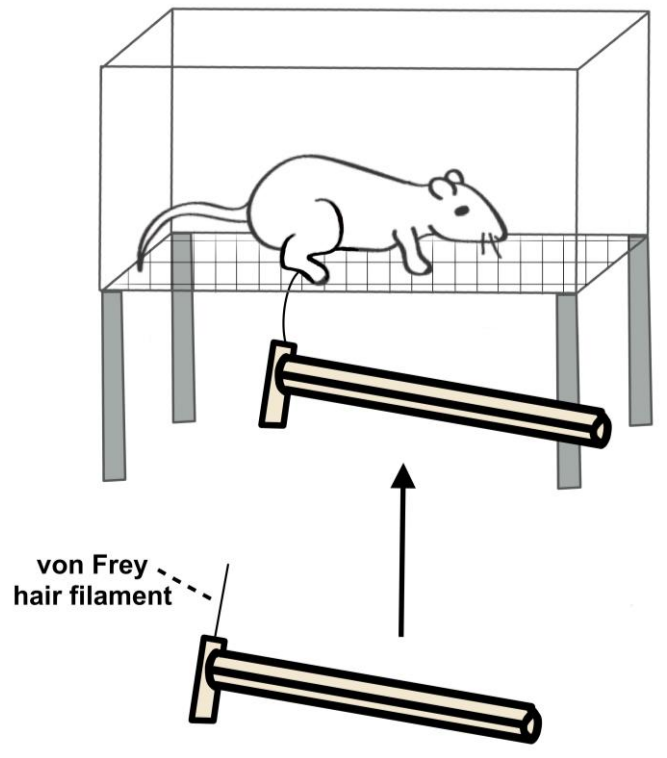


Experimental Protocol



Green Light Reduced Joint Pain

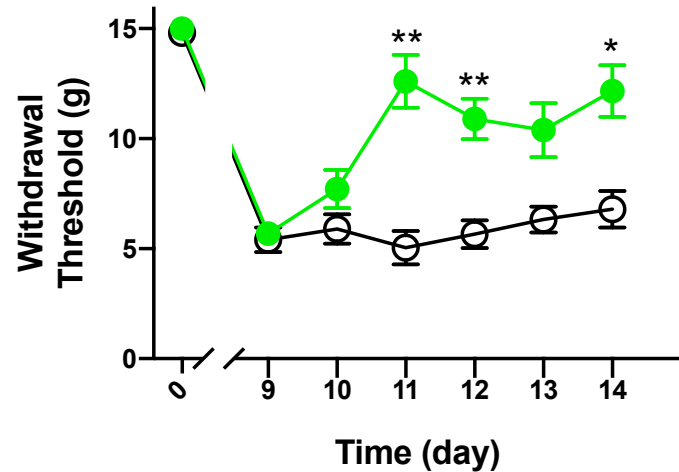
Pain Behaviour:



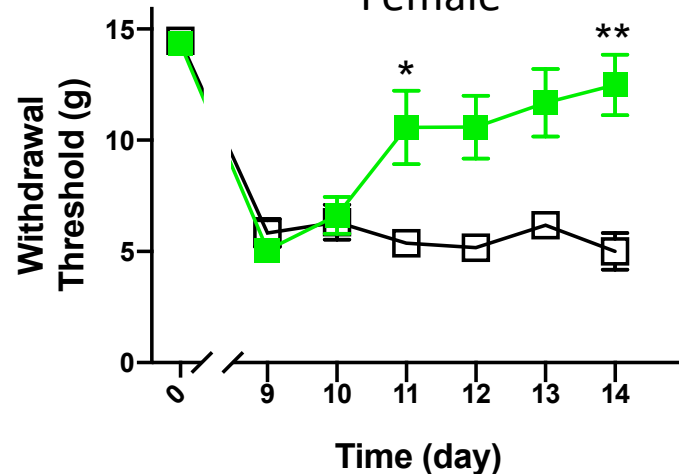
No Pain
Pain

No Pain
Pain

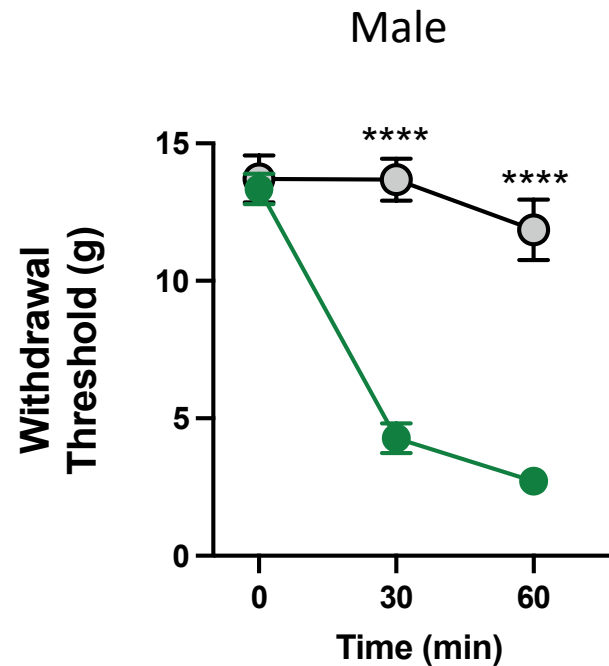
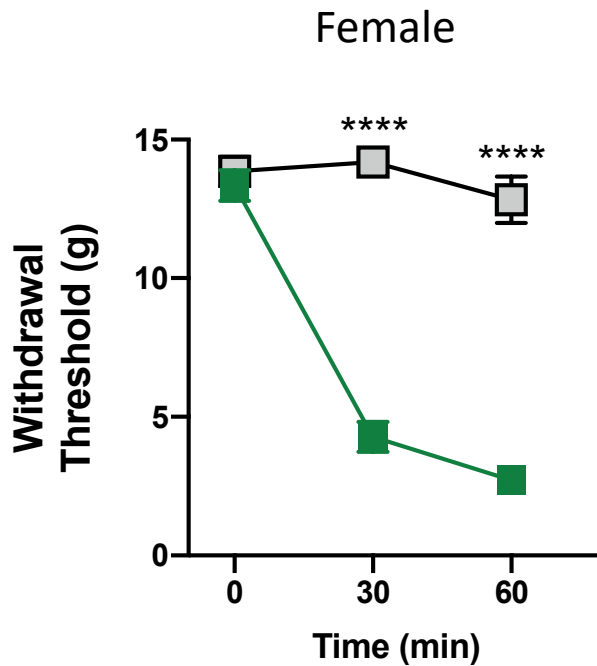
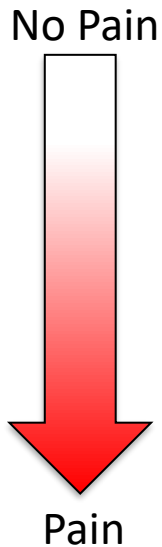
Male



Female



Analgesic Effect Involves CB₁-Receptors



- AM281
- VEHICLE

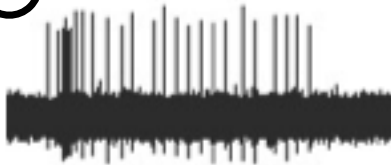
Where along the pain pathway does green light act to reduce arthritis pain?



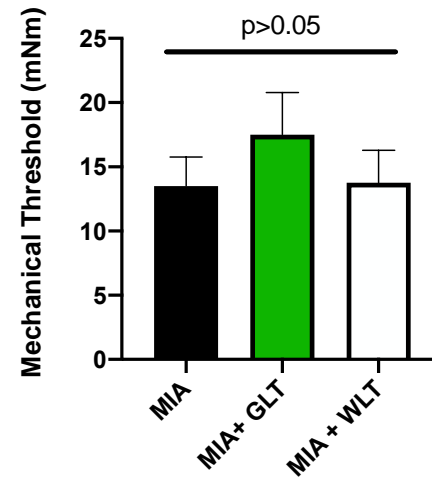
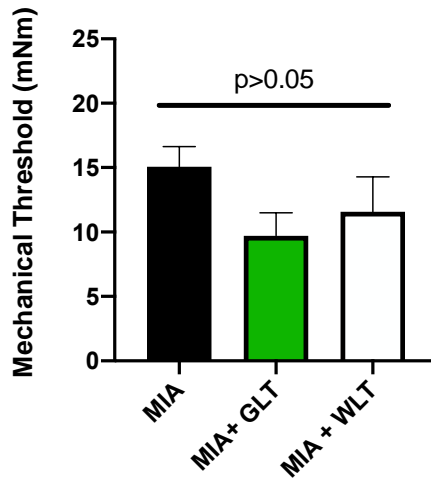
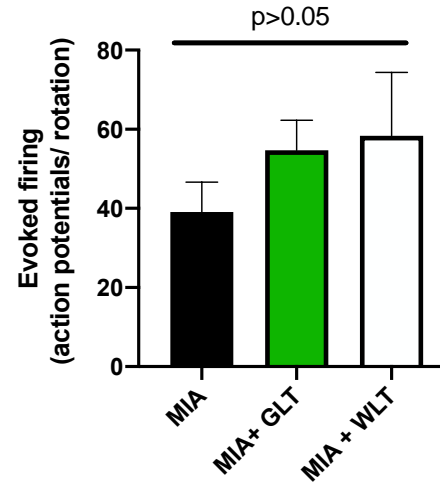
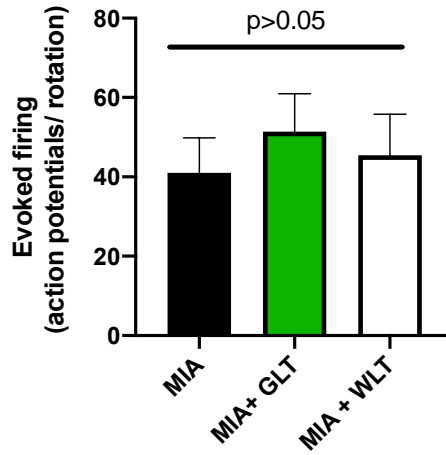
Green Light Has No Effect On Nociceptor Firing

Normal

Osteoarthritis



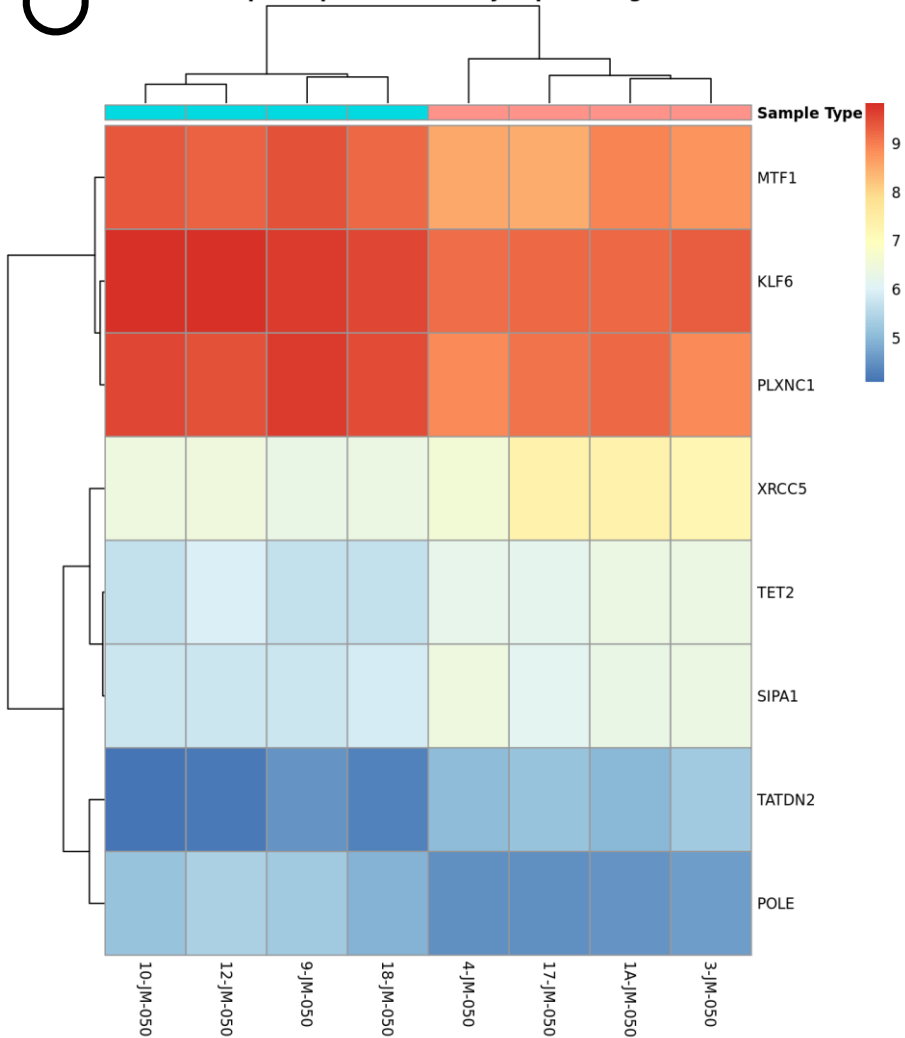
Green Light Has No Effect On Nociceptor Activity



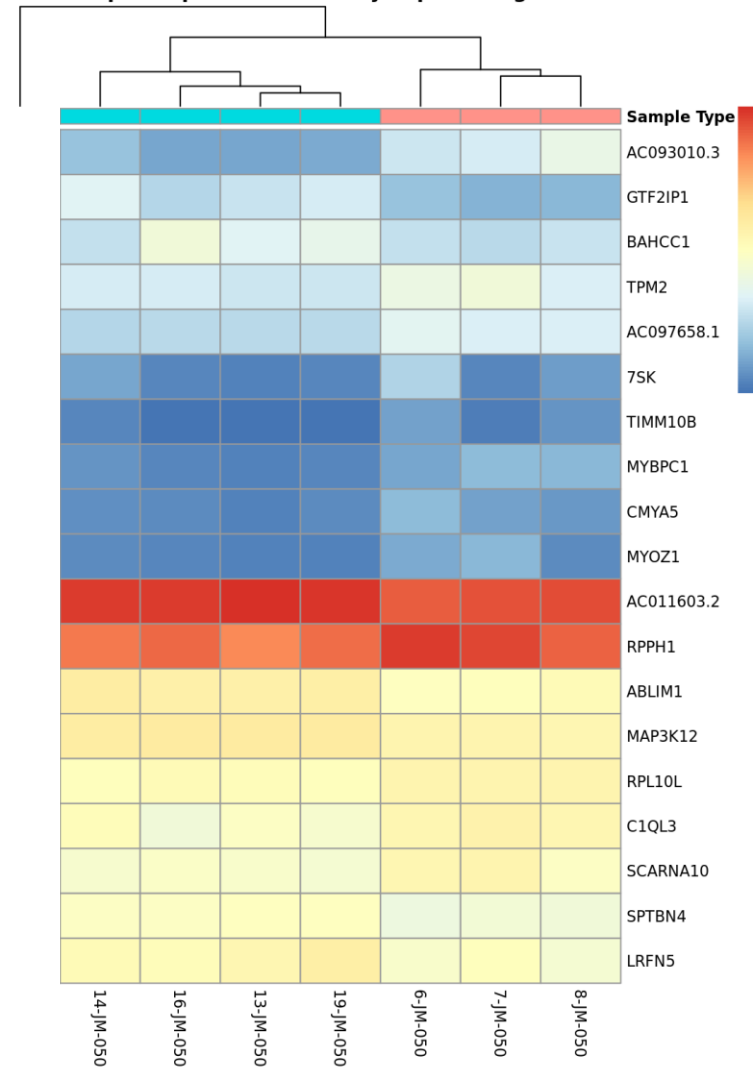
Differentially-Expressed Genes in Dorsal Root Ganglia NOT Related to Pain



Heatmap of top 8 differentially expressed genes



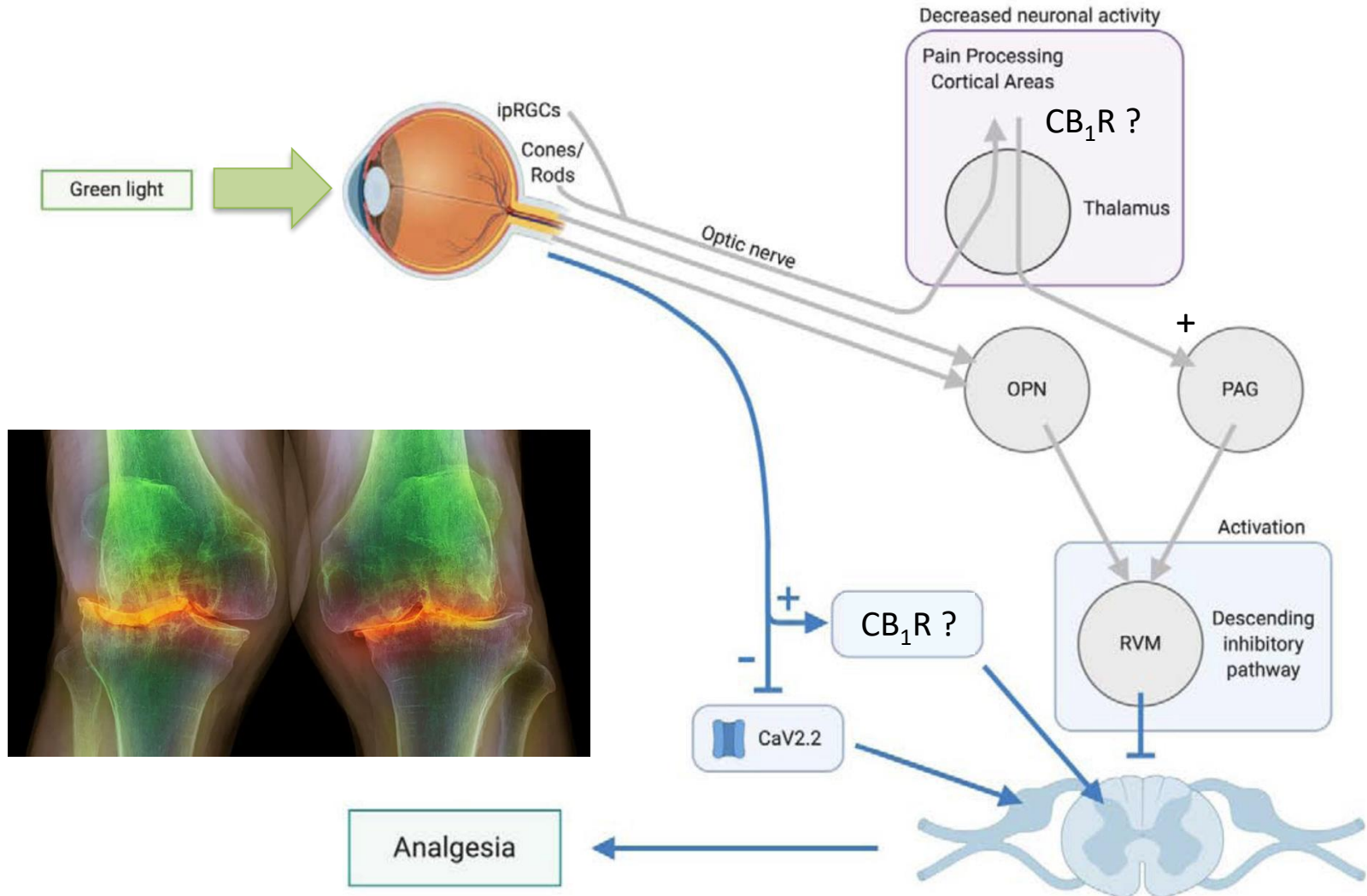
Heatmap of top 19 differentially expressed genes



SUMMARY

- Green light therapy reduces OA-like pain
- Equally effective in ♂ and ♀
- Involves release of endocannabinoids
- Does not affect peripheral nociceptor activity
- Must be a central effect

Putative Mechanism of Green Light Analgesia



Acknowledgements



Melissa O'Brien



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Perioperative Medicine

A Fireside Verse

While walking in the countryside,
My knee felt better, I began to stride.
Green light's the key to my inner peace,
It must be that cannabinoid release.

Where do you act to reduce my pain?
Nociceptor, spine or brain?
Joint nerves are normal, so my guess,
Is that green light calms my CNS.

If your joints hurt, don't stay in the dark,
Go for a walk in your local park.
Sit on a bench, put down your 'phone,
Absorb the light with an eyes green cone.

