



## Arthritis Talks

# Medical Cannabis: What Research is Revealing

Dr. Jason McDougall, *Professor, Nova Scotia*

September 15, 2021

# Presenters



**Dr. Siân Bevan**  
Chief Science Officer  
Arthritis Society  
***(Moderator)***



**Dr. Jason McDougall**  
Professor  
Halifax, NS

# Arthritis Awareness Month

We're on a mission to  
**fight the fire**  
of arthritis.

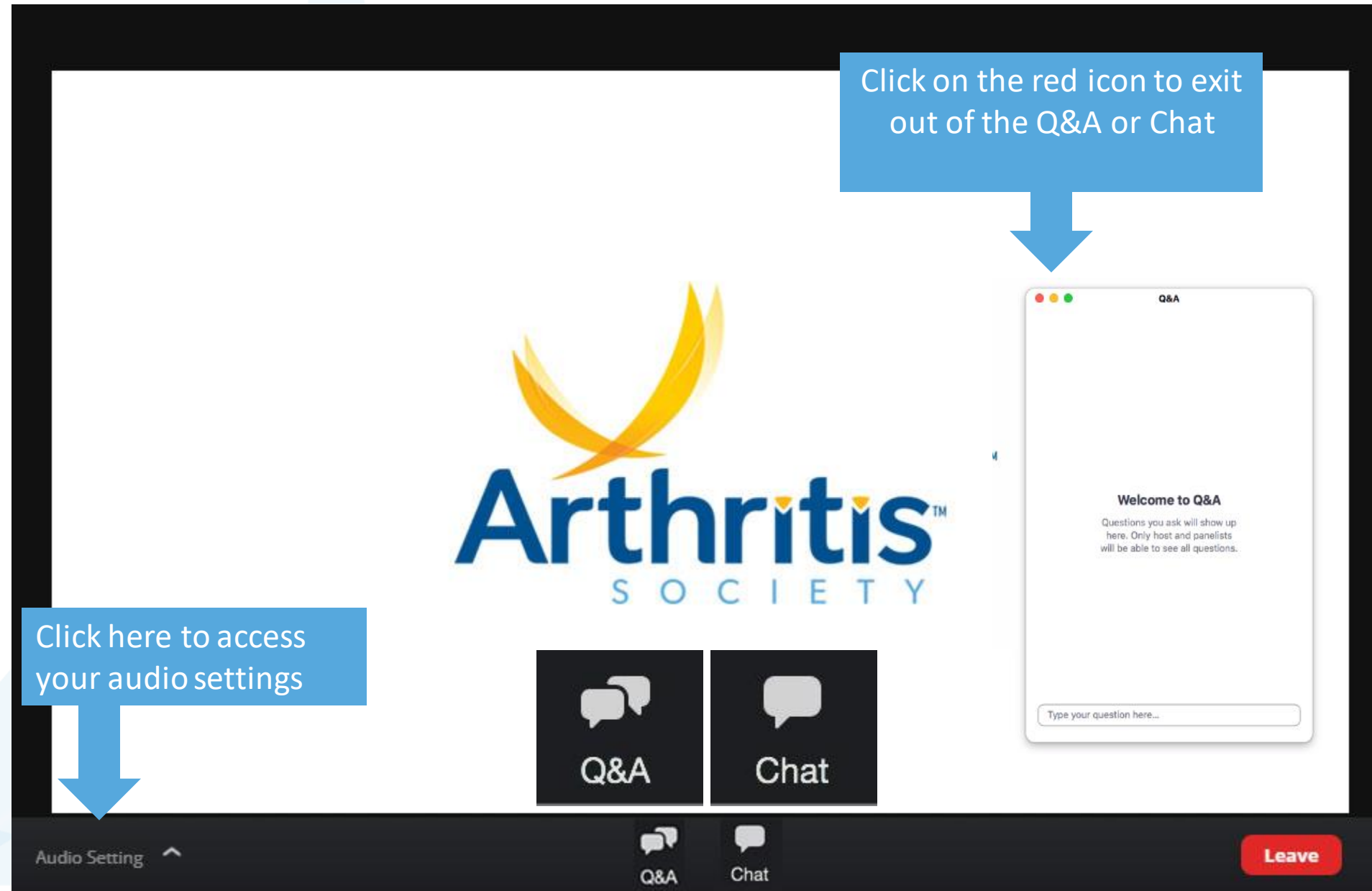


**FIND OUT MORE**

[arthritis.ca/fightthefire](https://arthritis.ca/fightthefire)

# Webinar tips

- ▼ Use the **Q&A** section to ask the presenters your questions. Some of the questions will be chosen for the live question period at the end of the webinar.
- ▼ Click on the **Chat** box to connect with other participants and the Arthritis Society's chat moderator.
- ▼ If you have further issues, email [arthritistalks@arthritis.ca](mailto:arthritistalks@arthritis.ca)



# Overview

[1]

## Medical Cannabis & Arthritis



[2]

## Current Research



[3]

## Future of Cannabis Research



# With thanks to our partners

Exclusive Event Presenting Partner:



Diamond Sponsor



Gold Sponsors



Bronze Sponsors



Friend Sponsor

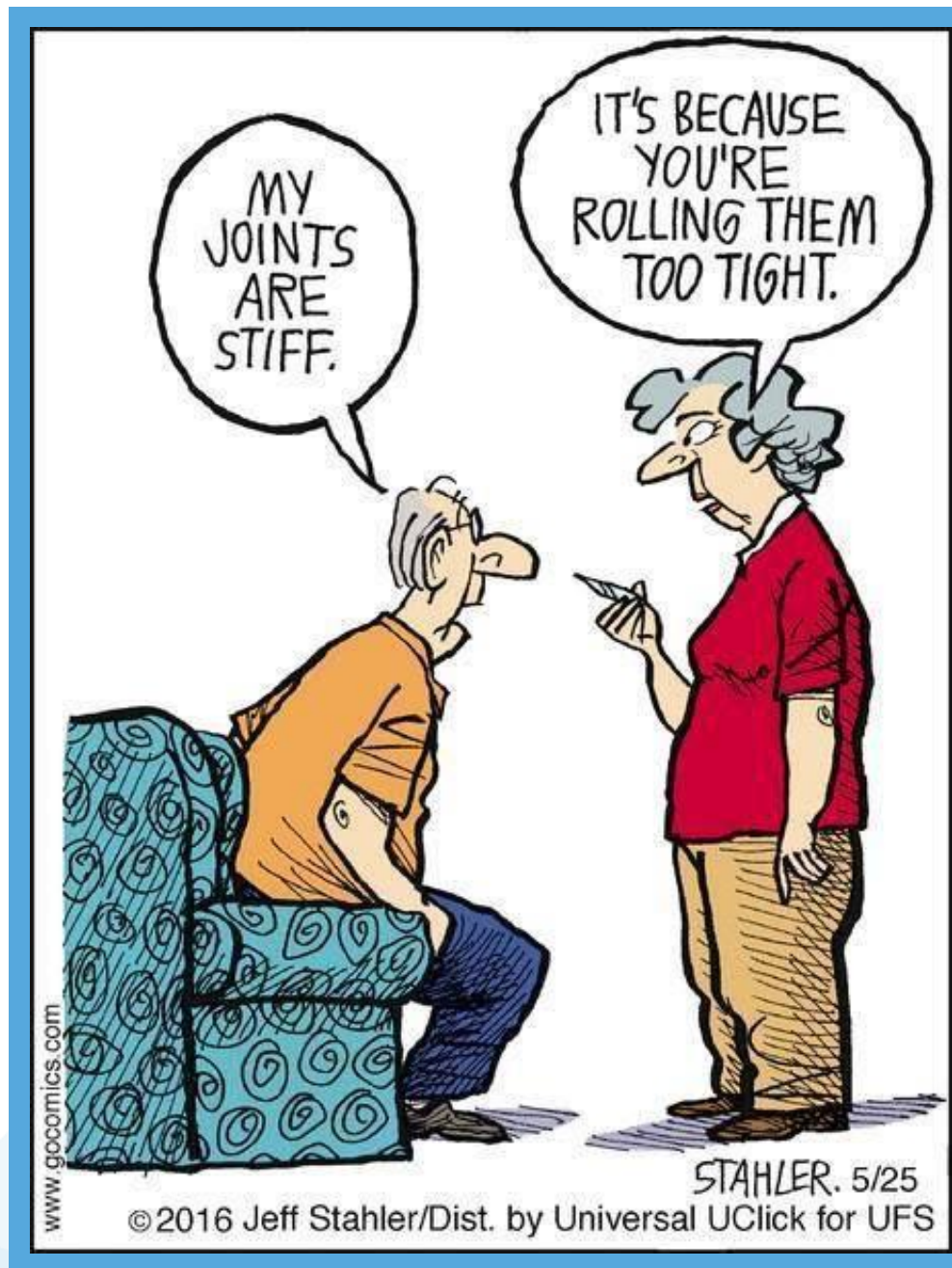




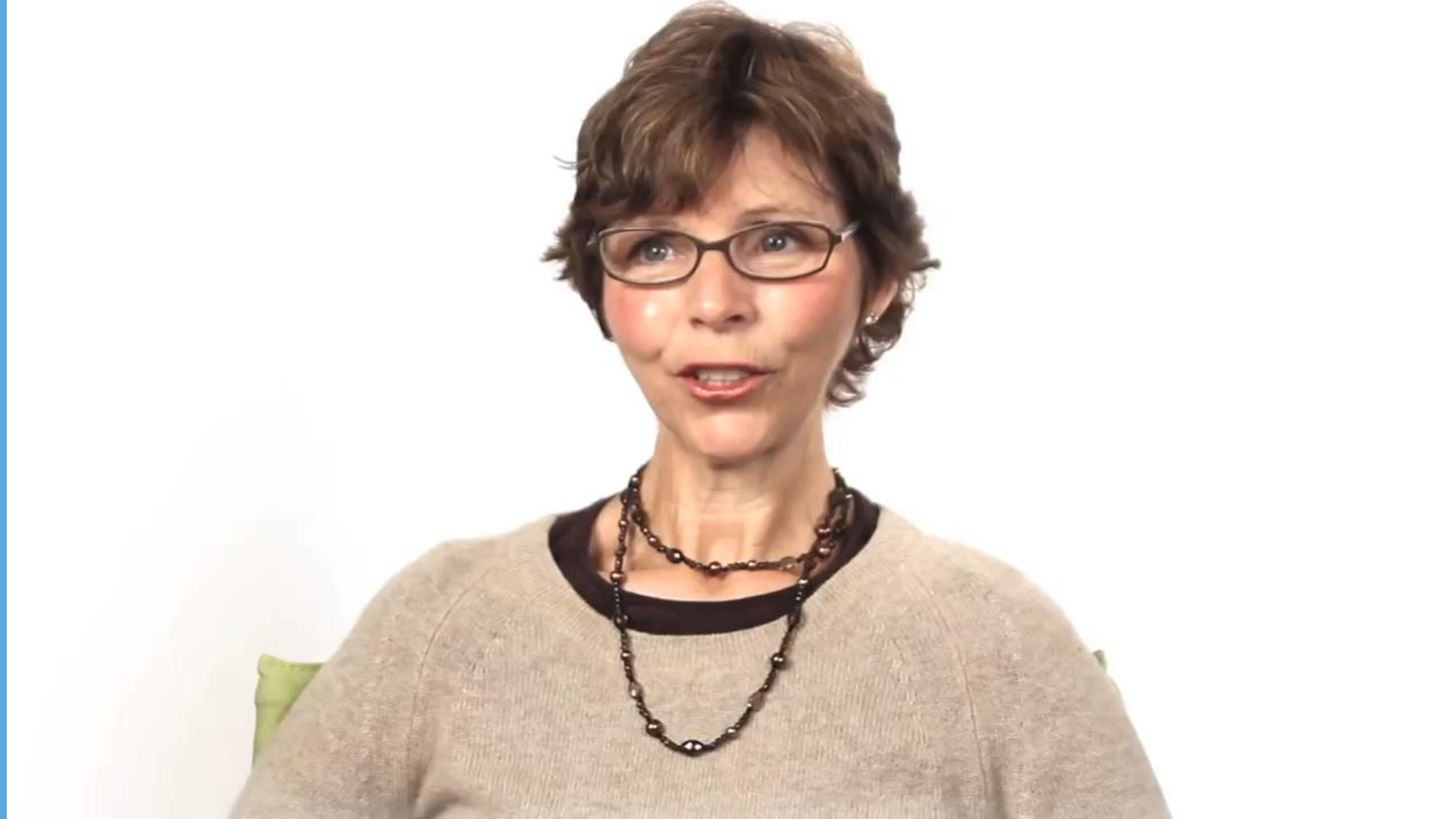
Q

**Why do researchers think medical cannabis may benefit people living with arthritis and how do we know it is safe?**









65 percent of medical marijuana users in Canada use it for severe arthritis.



ERASE THE PAIN

SHARE

Type your question or experience here

140

>>

LOGIN

ABOUT

FAQ

STORIES OF ARTHRITIS

OUR PARTNERS

FRANÇAIS

The Arthritis Society

DONATE NOW

All

Featured

Popular

Topic

+

Arthritis Type

+

cannabis

Q

"I use medical marijuana for my arthritis pain"

★ 41

💬 11

>>

"Has anyone tried medicinal marijuana for arthritis?"

★ 61

💬 6

Heather M

>>

**CannabisStrains** @cannabisstrains 6m  
Did you know that #cannabis has been suggested as an effective #medicinal treatment for Post-Traumatic Arthritis?

**WeedPrayLove** @weedpraylove 39m  
RT THEMMEEXCHANGE: Medicinal Uses of Cannabis

#marijuana #cannabis #cbd #hemoil  
#arthritis #inflammation #treatment...

Infographic illustrating the concept of inflammation as a central factor linked to various diseases. The central box is labeled "INFLAMMATION". Arrows point from this central box to surrounding boxes labeled: Pulmonary diseases, Cancer, Cardiovascular diseases, Neurological diseases, Alzheimer, Autoimmune diseases, Arthritis, and Diabetes II. Below the infographic, text reads: "Tod Mikuliy, MD, a psychiatrist and medical coordinator, stated in the 2002 article 'Medicinal Uses of Cannabis,' 'Clinical interviews of over 5500 members at cannabis buyers clubs and patients in my office provide lead to this generalization: Many illnesses or conditions present with both'".

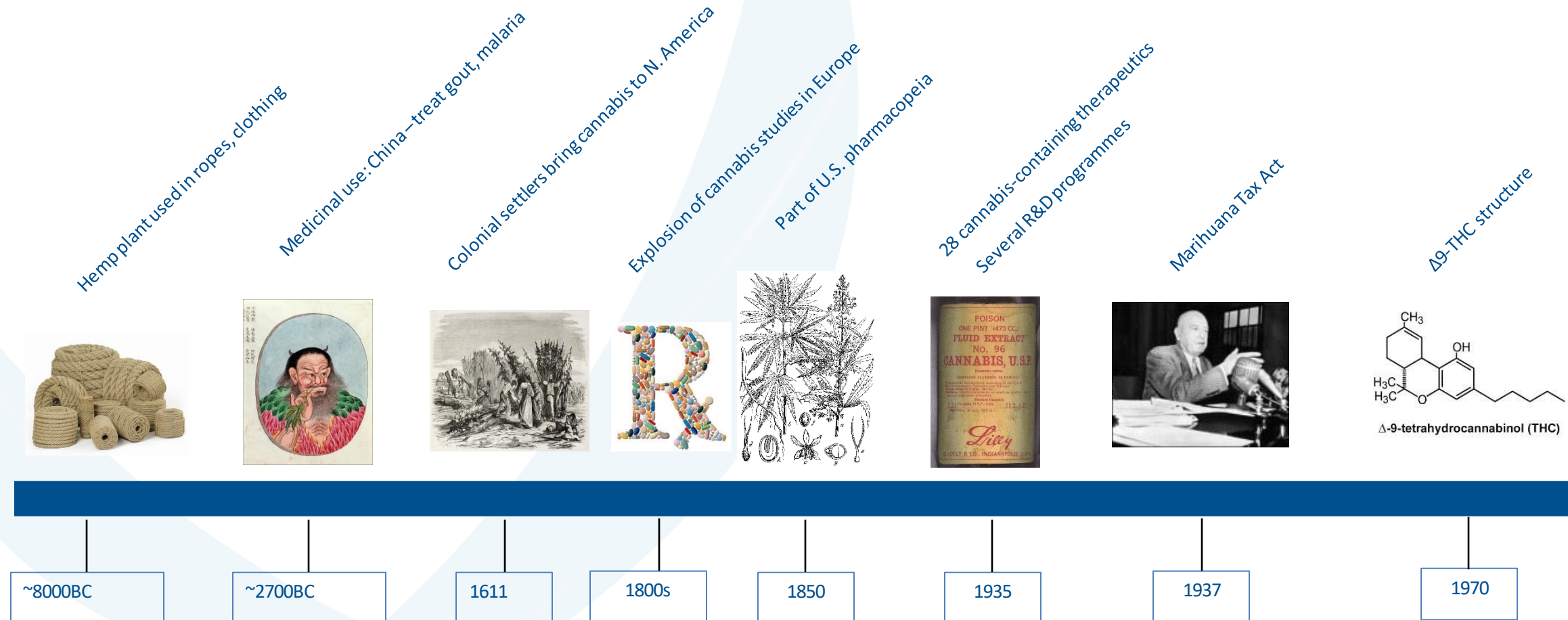
**MME** @MME\_VERMONT  
Cannabis and Arthritis  
[goo.gl/8VyADE](https://goo.gl/8VyADE)

#Cannabis #Arthritis #marijuana #medical  
#pain #thc, #cbd #hempoil

brochure titled "Arthritis and Medical Marijuana": "Cannabis has a demonstrated ability to improve mobility and reduce morning stiffness and inflammation. Research has also shown that patients are able to reduce their usage of potentially harmful Non-Steroidal Anti-Inflammatory drugs (NSAIDs) when using

10

# Cannabis – A Brief History



# What is Cannabis?



- ▼ Flowering plant, 3 species
- ▼ Over 500 chemical entities (cannabinoids, terpenoids, flavonoids)
- ▼ Over 120 different cannabinoids (e.g. D9-THC, cannabidiol)
- ▼ Found in oils secreted by trichomes of female plants
- ▼ Chemicals become active when heated



# Smoked / Vaporization

## ▼ Smoked Cannabis - Advantages

- ▼ Rapid onset of effect
- ▼ Easy to titrate

## ▼ Smoking not safest mode of administration

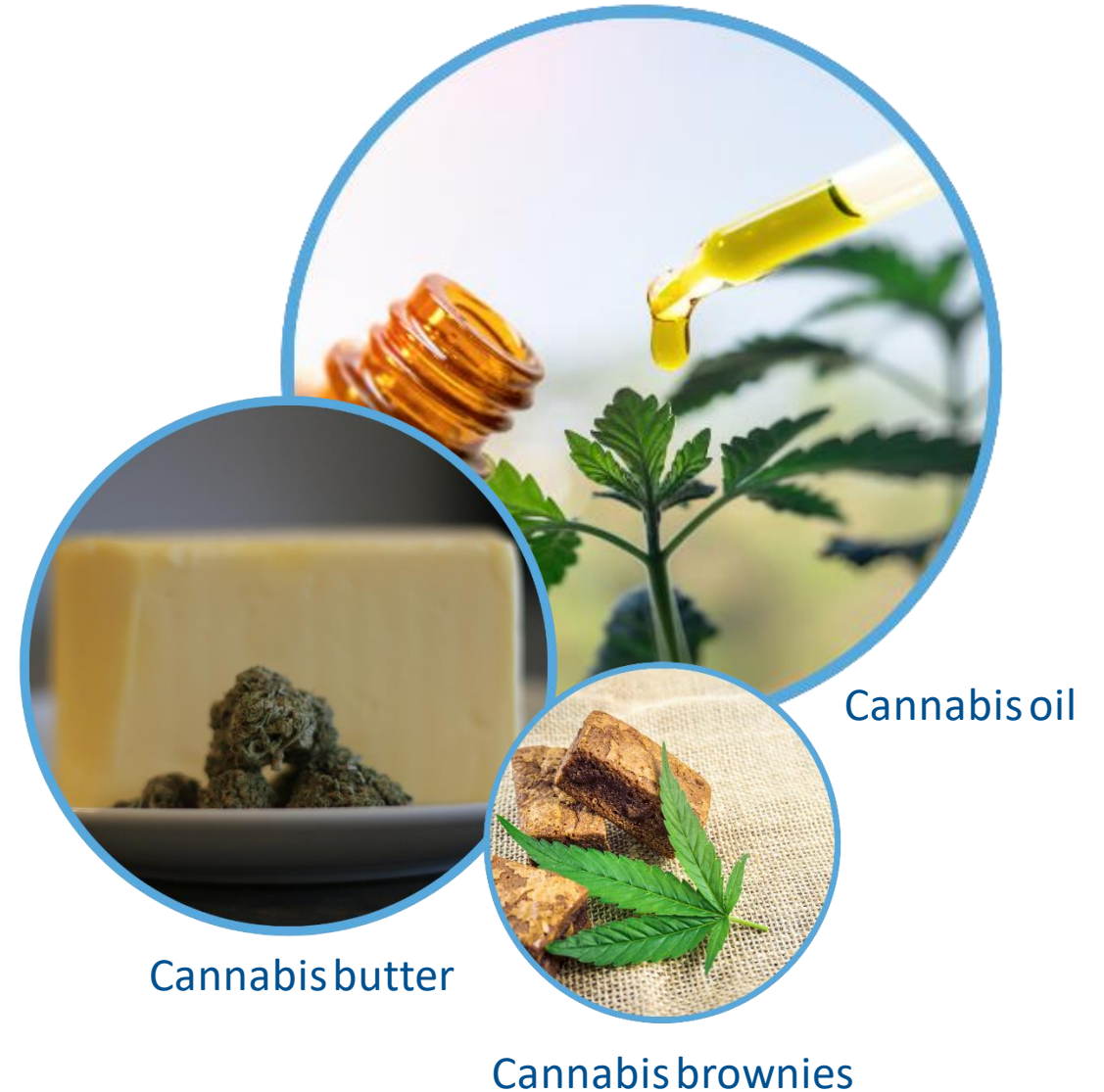
- ▼ Not appropriate for all patients
- ▼ Solvent in vaporizers
- ▼ Dexterity required



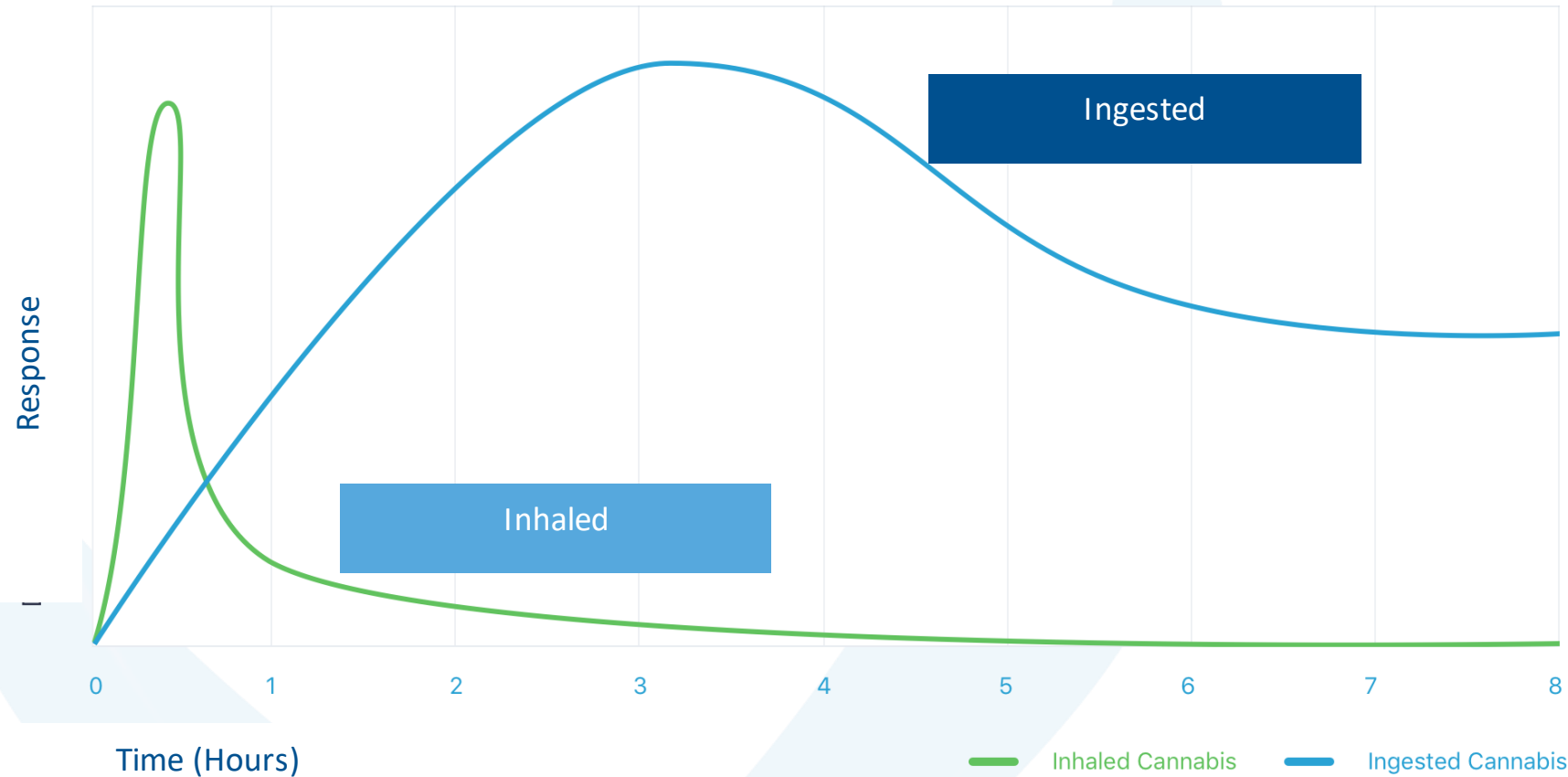


# Ingestion

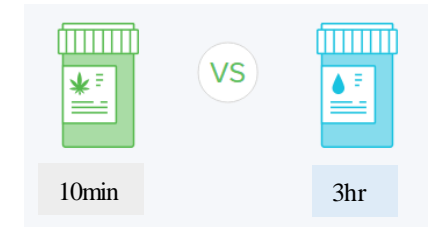
- ▼ Ingested Cannabis - Advantages
  - ▼ Convenient
  - ▼ Odourless
  - ▼ Discrete
- ▼ Ingested Cannabis - Disadvantages
  - ▼ Difficult to titre
  - ▼ Slow absorption
  - ▼ Requires a lot of preparation



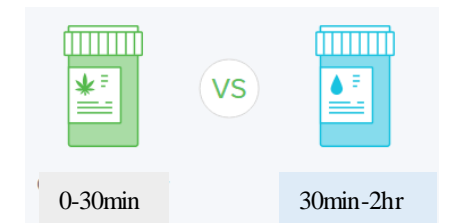
# Ingestion



## Onset of Effects:



## Duration of Effects:



- ▼ No respiratory irritation
- ▼ Slower onset of effect
- ▼ Difficult to titrate best dose

# Topical

## ▼ Topical Cannabis - Advantages

- ▼ Easy to use
- ▼ Less systemic side-effects
- ▼ Applied directly to affected area

## ▼ Topical Cannabis - Disadvantages

- ▼ Variable onset
- ▼ Variable duration
- ▼ Only effective locally
- ▼ Not ideal for whole body pain



# Oromucosal

## ▼ Oromucosal Cannabis - Advantages

- ▼ Rapid onset
- ▼ Convenient
- ▼ Odourless
- ▼ Discrete

## ▼ Oromucosal Cannabis - Disadvantages

- ▼ Dry mouth
- ▼ Bad taste



# Clinical Trial

Blake *et al.* (2006). *Rheumatology*: 45: 50-52

- ▼ Double blind placebo-controlled RCT
- ▼ 58 RA patients given *Sativex* (THC + Cannabidiol)
- ▼ Pain relief & improved sleep
- ▼ Side-effects mild – moderate
- ▼ Need more clinical trials





# Medical Cannabis Use Decreases Prescribed Analgesic Use

**Table 5. Medication Classes Used Before and After Initiation of Cannabis Among the Study Population**

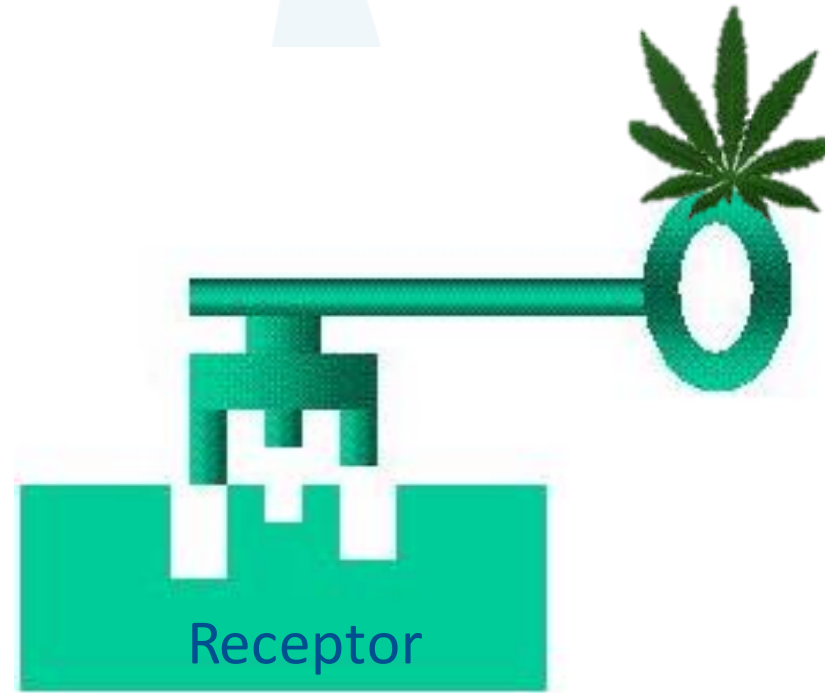
<i>MEDICATION TYPE</i>	<i>USE BEFORE INITIATION OF CANNABIS, n/N (%)</i>	<i>USE AFTER INITIATION OF CANNABIS, n/N (%)</i>
Opioids	119/184 (65)	33/184 (18)
Nonsteroidal anti-inflammatory drugs	115/184 (62)	38/184 (21)
Disease-modifying antirheumatic drugs	15/184 (8)	3/184 (2)
Antidepressants	72/184 (39)	25/184 (14)
Serotonin–norepinephrine reuptake inhibitors	13/184 (7)	3/184 (2)
Selective serotonin reuptake inhibitors	34/184 (18)	8/184 (4)
Other	69/184 (38)	40/184 (22)

NOTE. Study participants reported using fewer medication classes of all categories after initiation of cannabis use.

# Safety Profile of Cannabinoids

Drug-Drug interactions	<ul style="list-style-type: none"><li>▼ Very rare</li><li>▼ Most associated with depressants (e.g. alcohol, narcotics)</li><li>▼ Care with anti-hypertensives</li></ul>
Side-effects	<ul style="list-style-type: none"><li>▼ Euphoria</li><li>▼ Acute memory loss</li><li>▼ Dry mouth (oromucosal sprays)</li><li>▼ Lung irritation (smoking)</li><li>▼ Anxiety</li><li>▼ Hypotension</li><li>▼ Hyperemesis syndrome</li><li>▼ Fatigue</li></ul>
Other safety issues	<ul style="list-style-type: none"><li>▼ Impaired driving</li><li>▼ Psychosis in individual with underlying condition</li><li>▼ Dependence / addiction - low</li></ul>

# Cannabinoid Receptor



Signal

# Cannabinoids

- ▼ Phytocannabinoids – derived from *Cannabis* plant
- ▼ Synthetocannabinoids – man-made
- ▼ Endocannabinoids – present naturally in the body (e.g. Anandamide)
- ▼ 2 cannabinoid receptors:

CB<sub>1</sub>



Located on nerves

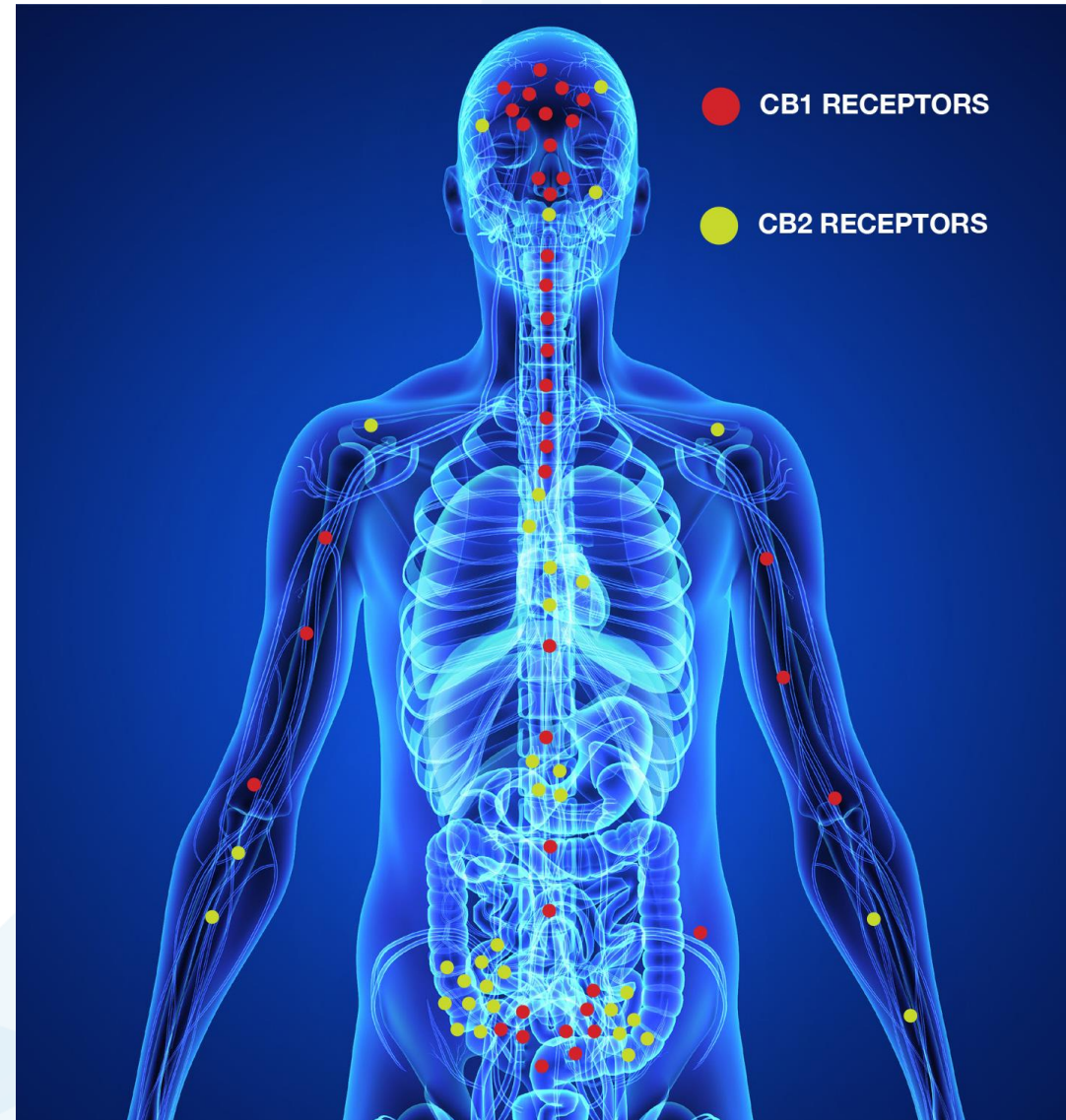
CB<sub>2</sub>



Associated with  
immune cells

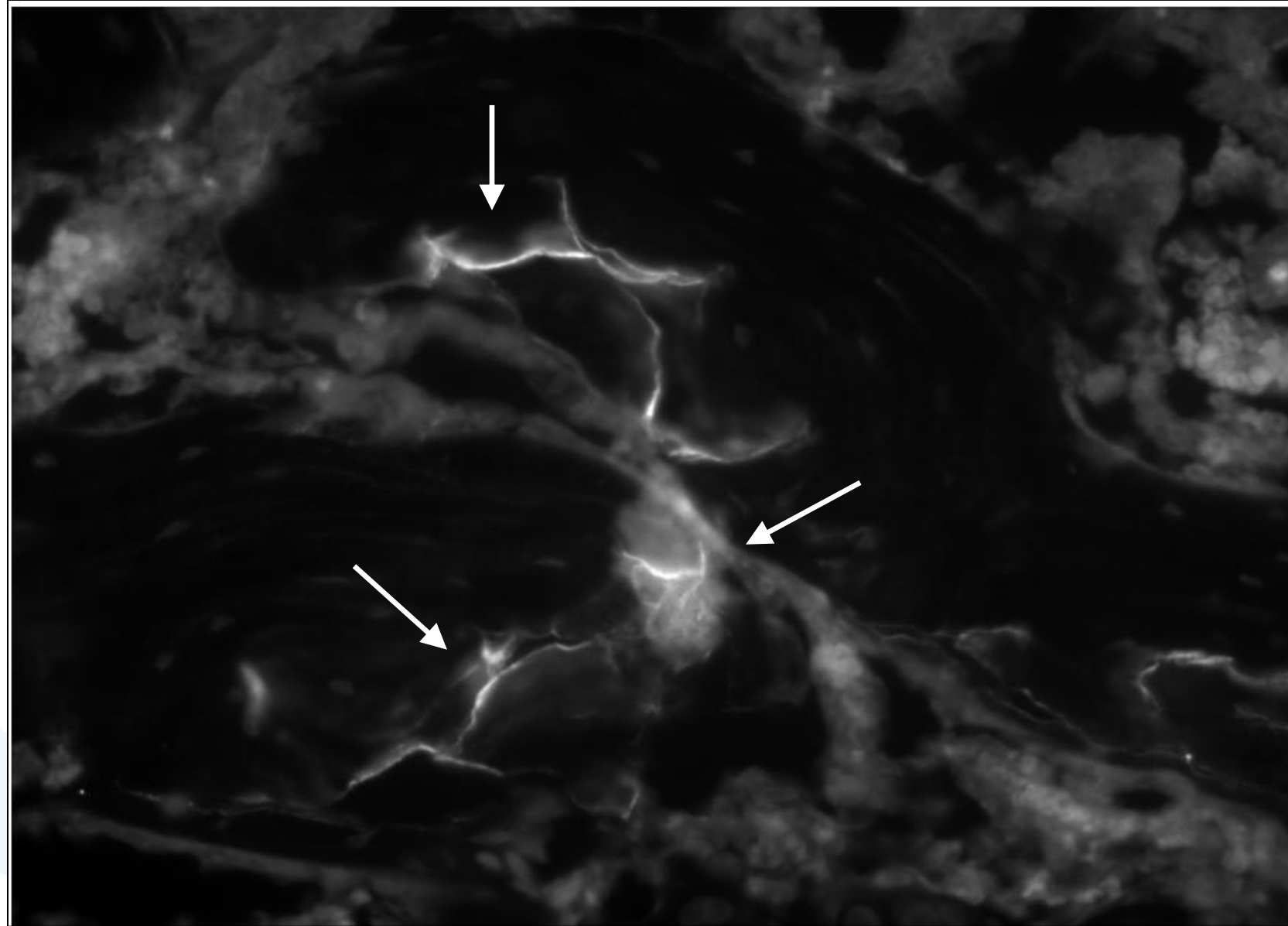


# Cannabinoid Receptors

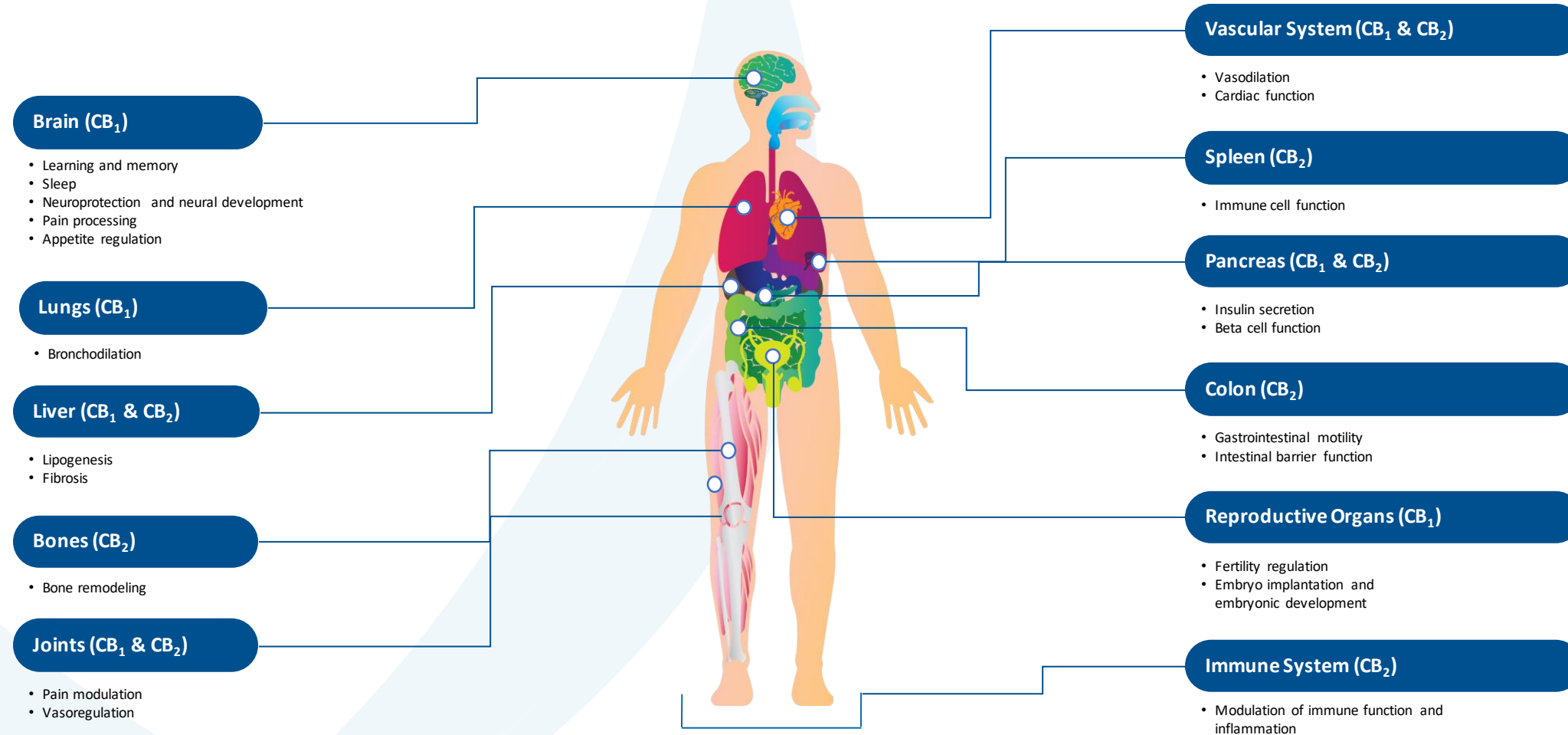




## Localisation of CB<sub>1</sub> Receptors in Joints

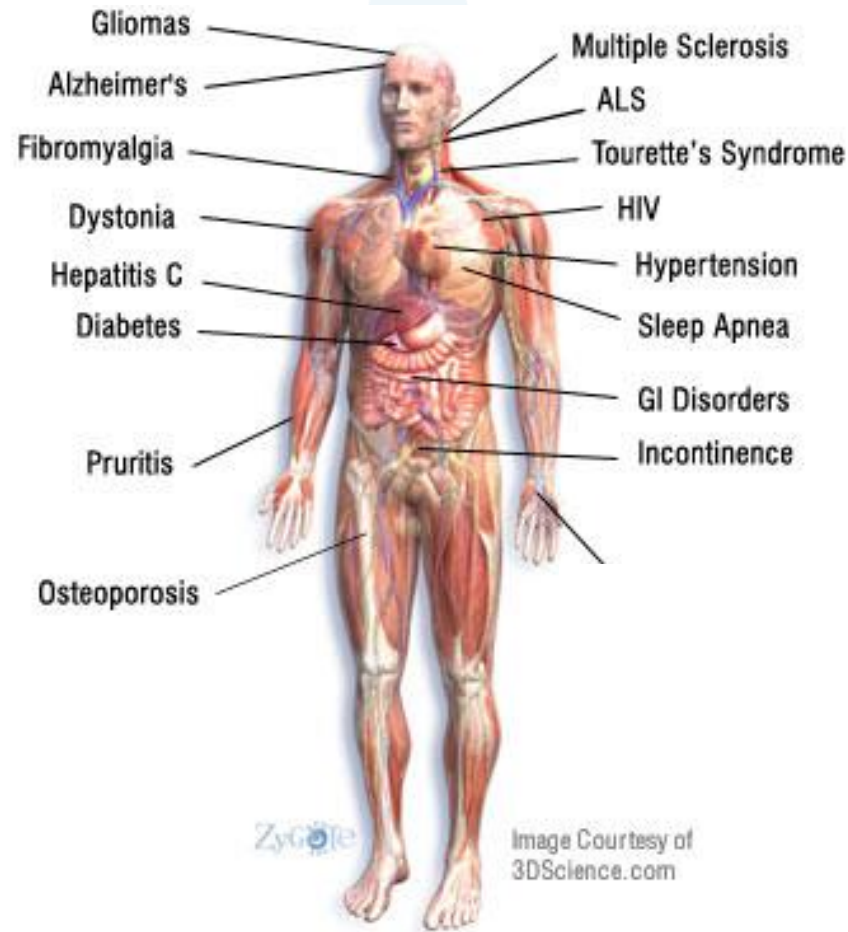


# Role of the Endocannabinoid System



1. Zhou S, Kumar U. *Int. J. Mol. Sci* 2018;19:833–856. 2. Pacher P et al. *Pharmacol Rev* 2006;58(3):389-462.

# Therapeutic Potential of Cannabinoids



**Potential Therapeutic Uses of Medical Marijuana**

## Arthritis?

# Cannabidiol (CBD)

- ▼ Major chemical component of cannabis
- ▼ Amount varies by strain
- ▼ Does not produce euphoria
- ▼ Can cause sleepiness
- ▼ Considered very safe

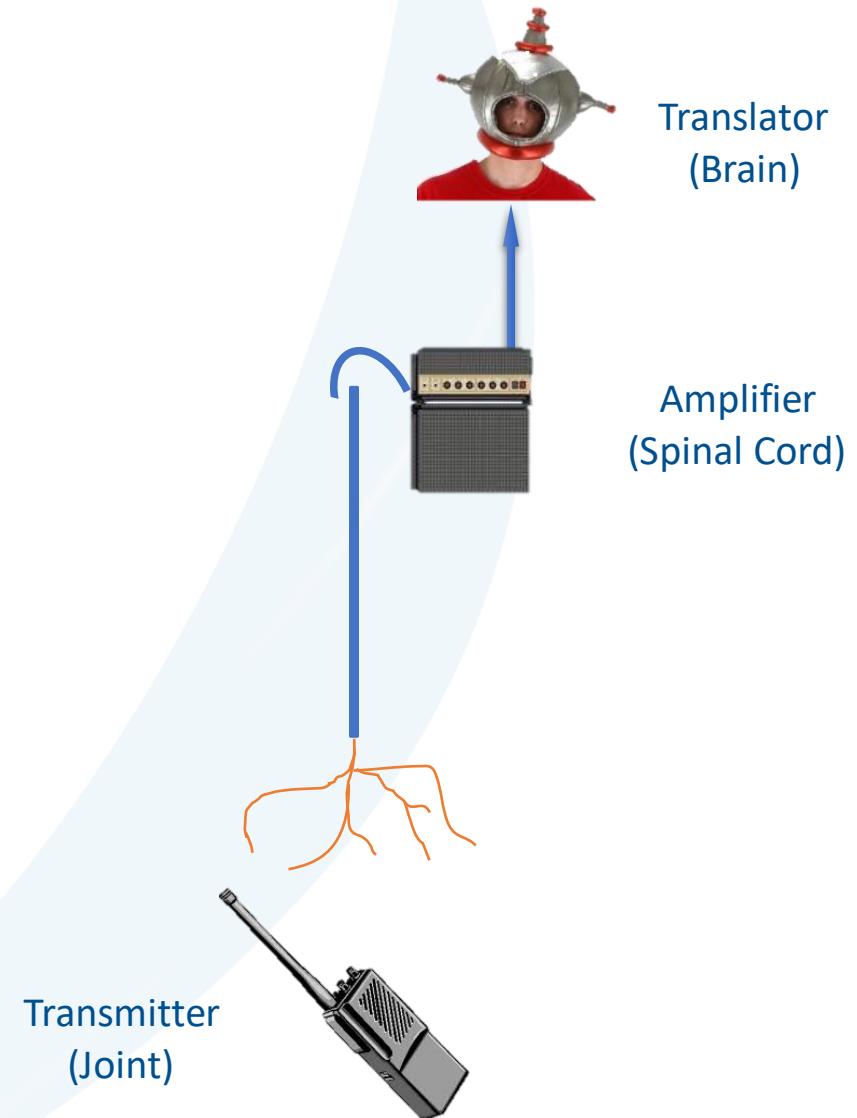


# What effect does cannabidiol have on joint pain?

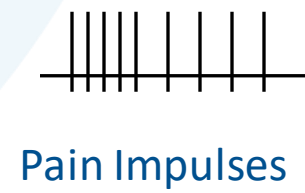
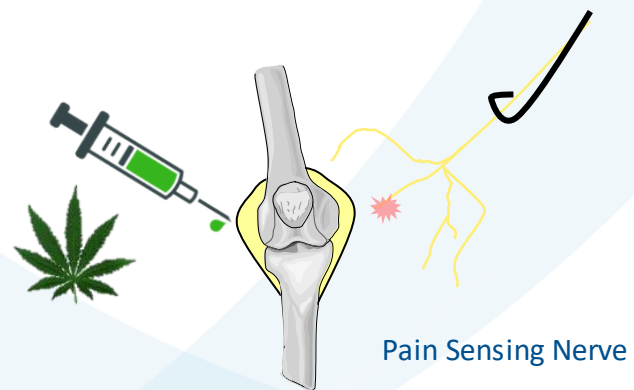
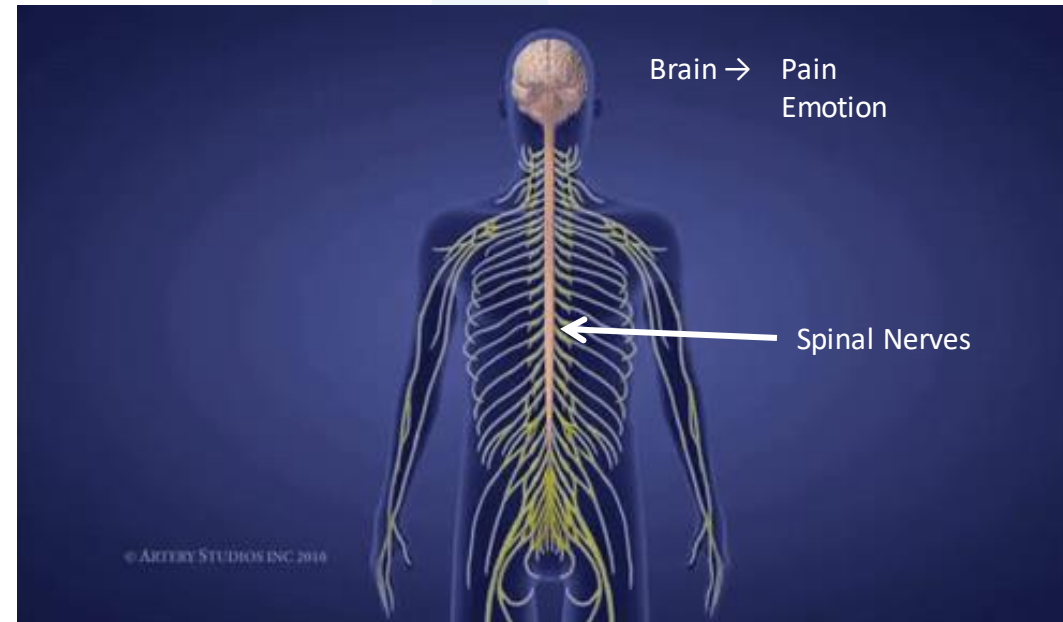




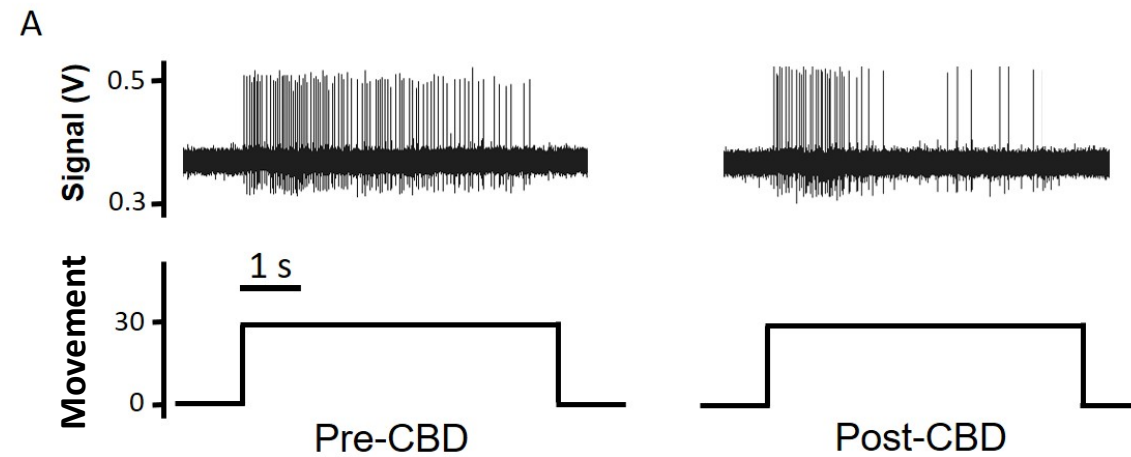
# Pain Sensation



# Pain Sensation



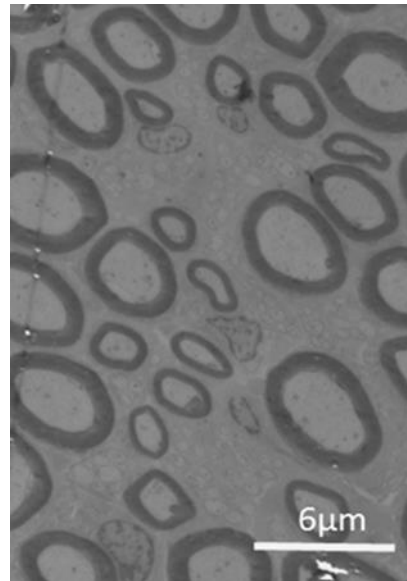
# Cannabidiol Reduces Pain Impulses



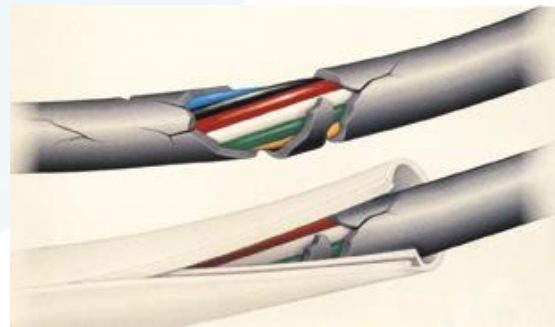
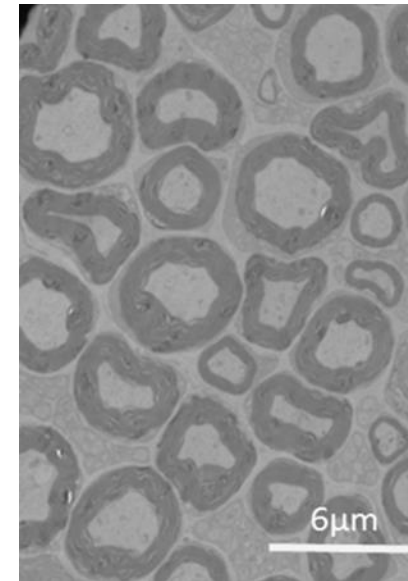
Local Injection of CBD → Reduced Joint Nerve Activity

# Cannabidiol Repairs Joint Nerve Damage

OA



OA + CBD



# Cannabidiol Reduces Joint Pain

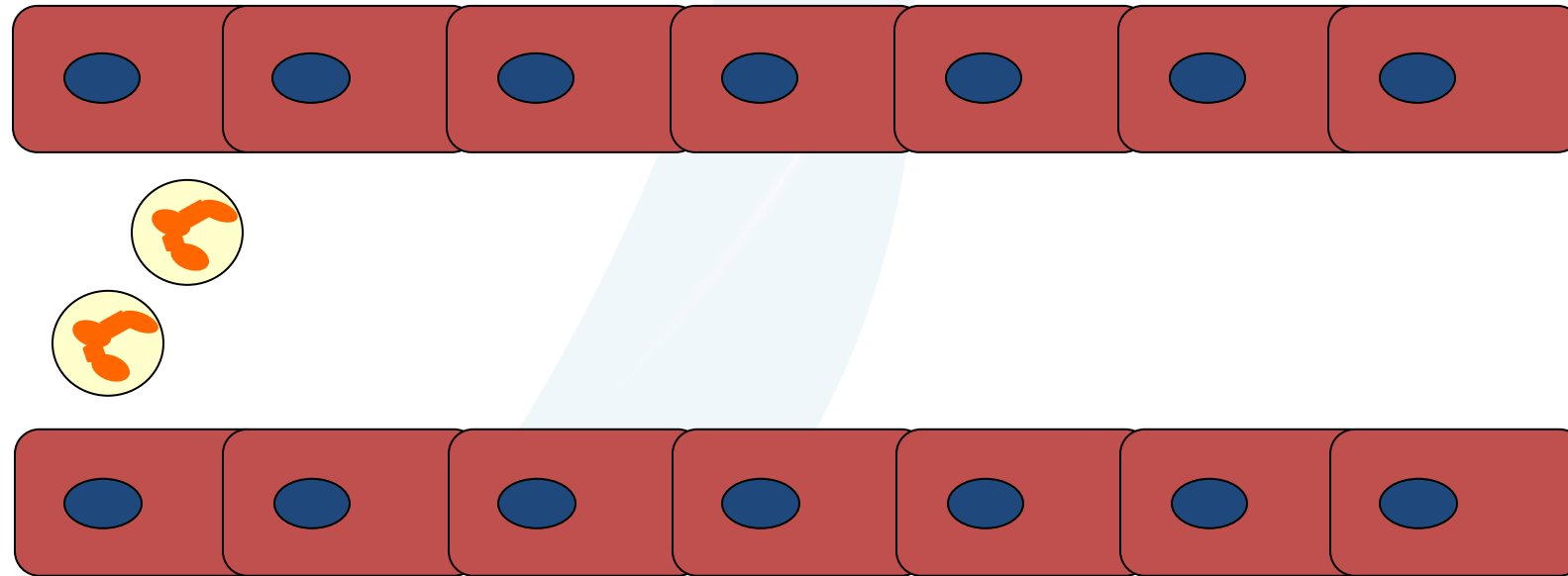




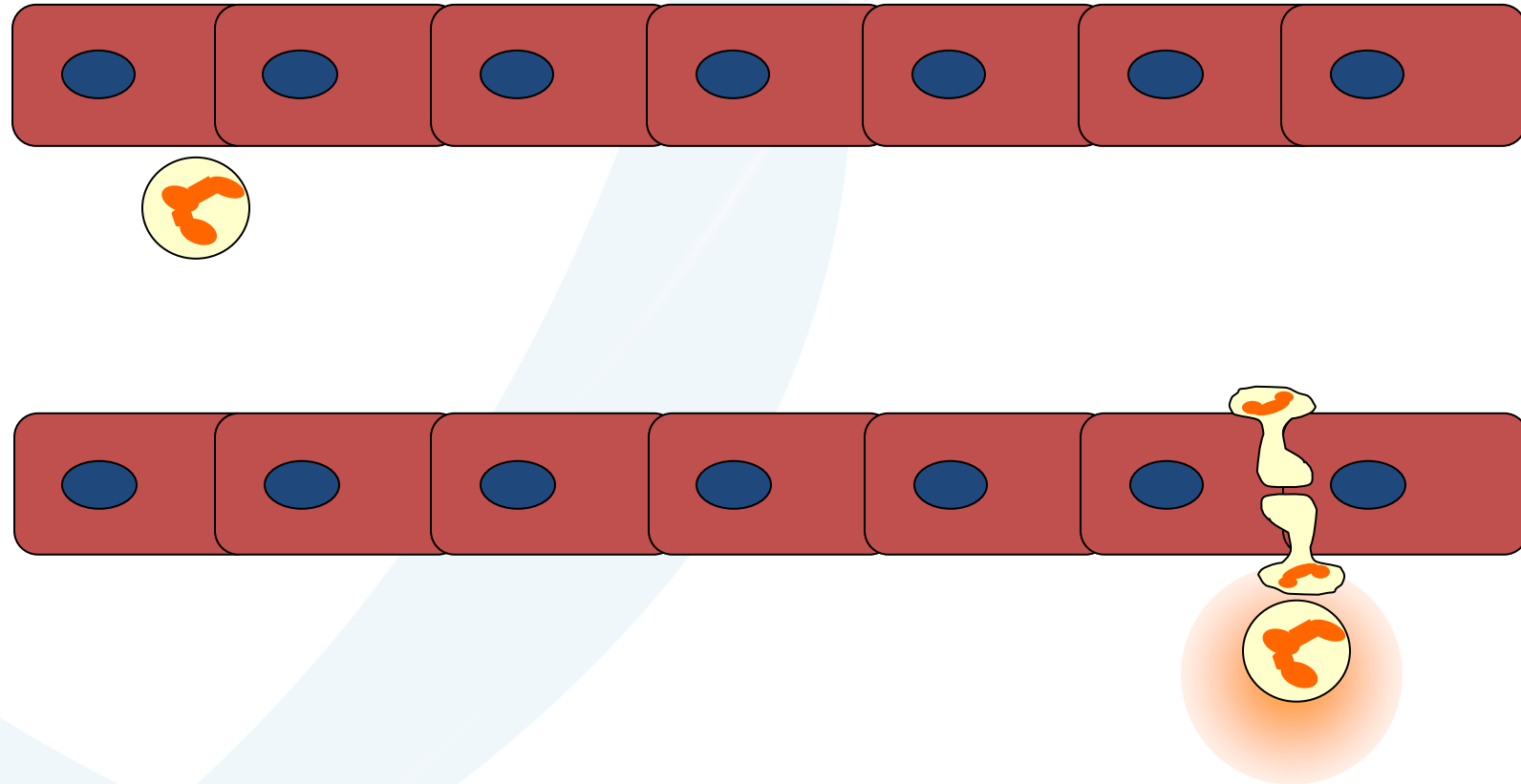
# Can cannabidiol alter joint inflammation?



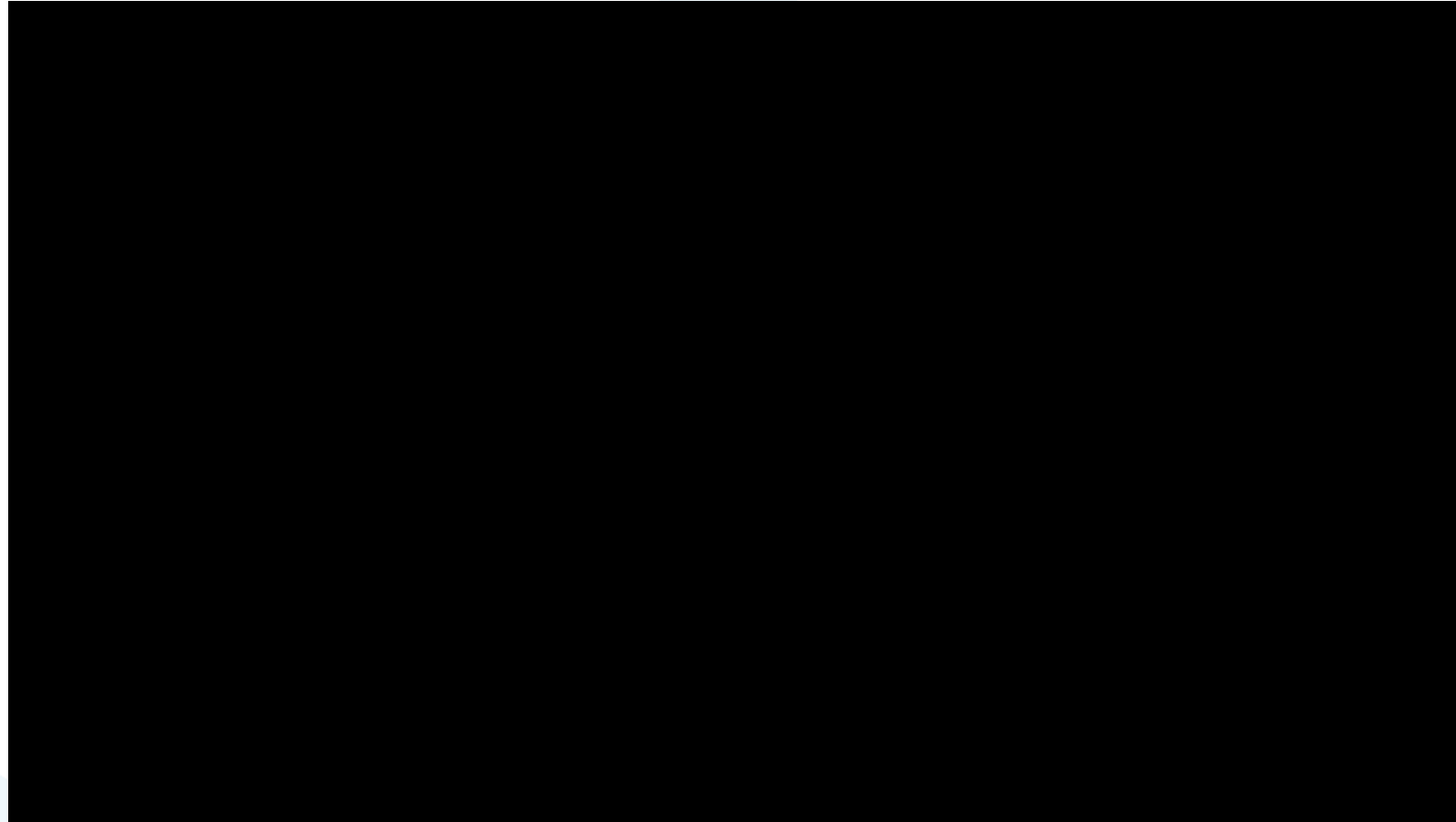
# Leukocyte Trafficking Control Conditions



# Leukocyte Trafficking in Inflammation



# Cannabidiol Reduces Joint Inflammation



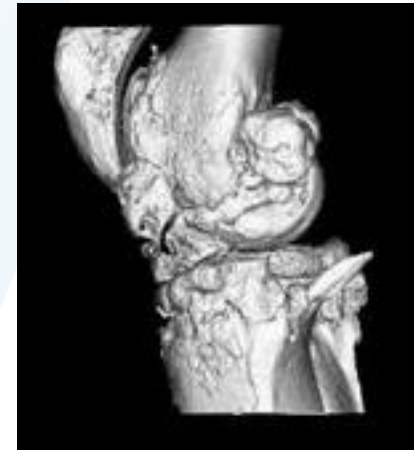
# Can Cannabidiol Inhibit Joint Damage?



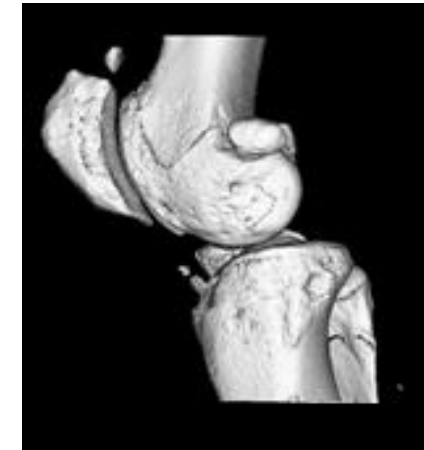


# Cannabidiol Reduces Joint Damage

- ▼ Mice with rheumatoid arthritis
- ▼ Oral cannabidiol daily for 10 days
- ▼ Joint damage scores reduced



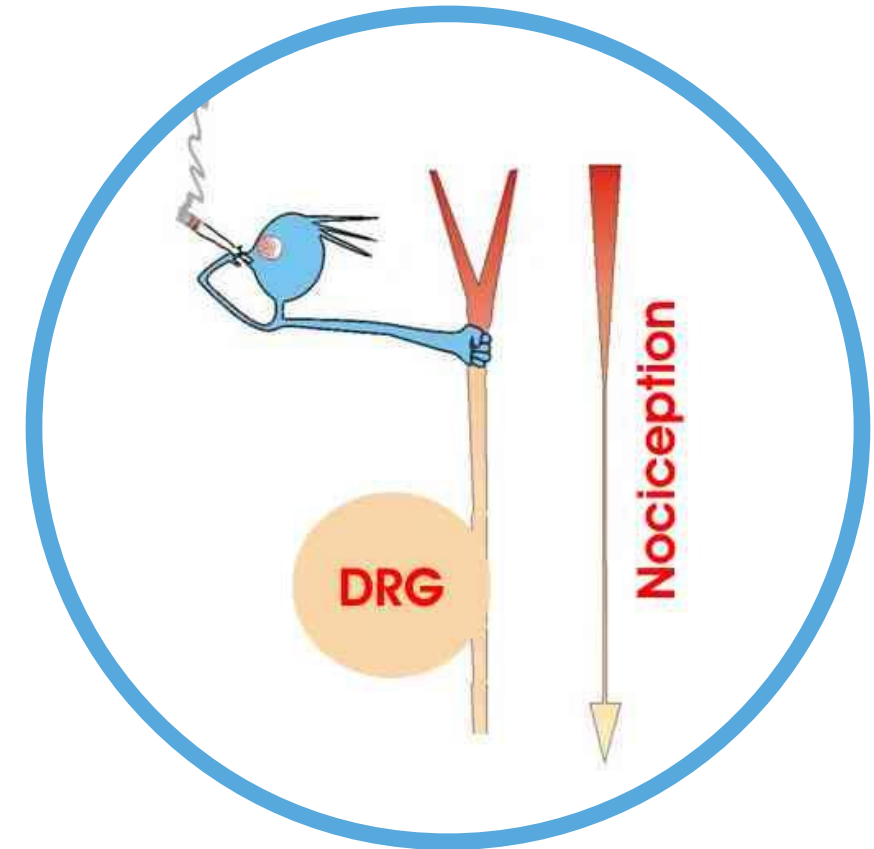
Untreated



Cannabidiol

# Summary

- ▼ Cannabidiol:
  - ▼ Reduces pain
  - ▼ Repairs joint nerves
  - ▼ Is anti-inflammatory
  - ▼ Reduces joint damage

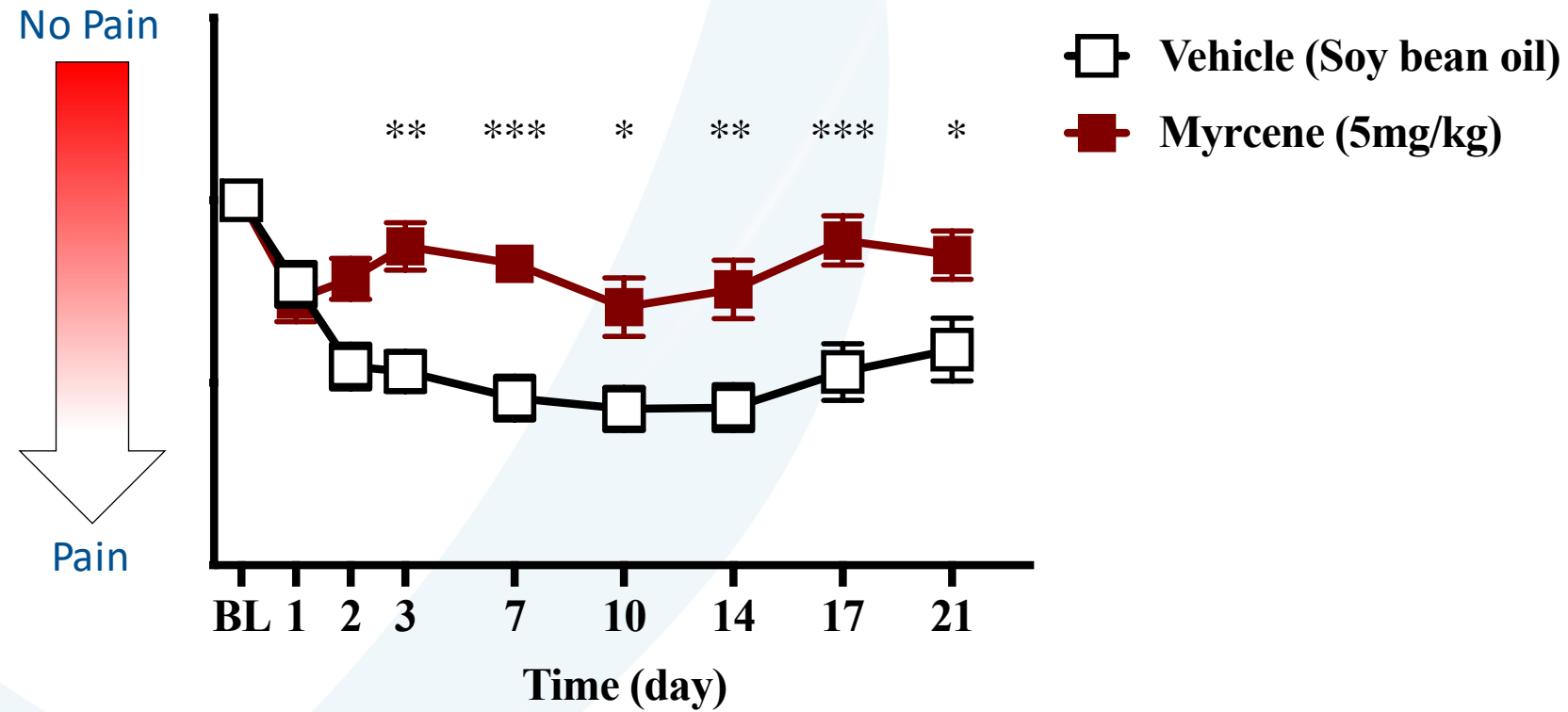


# Beta-Myrcene

- ▼ Found in hops, mangoes, bay leaves, cannabis
- ▼ Most abundant monoterpene in cannabis
- ▼ Turpentine/balsamic aroma
- ▼ Prominent in strains preferred by arthritis patients

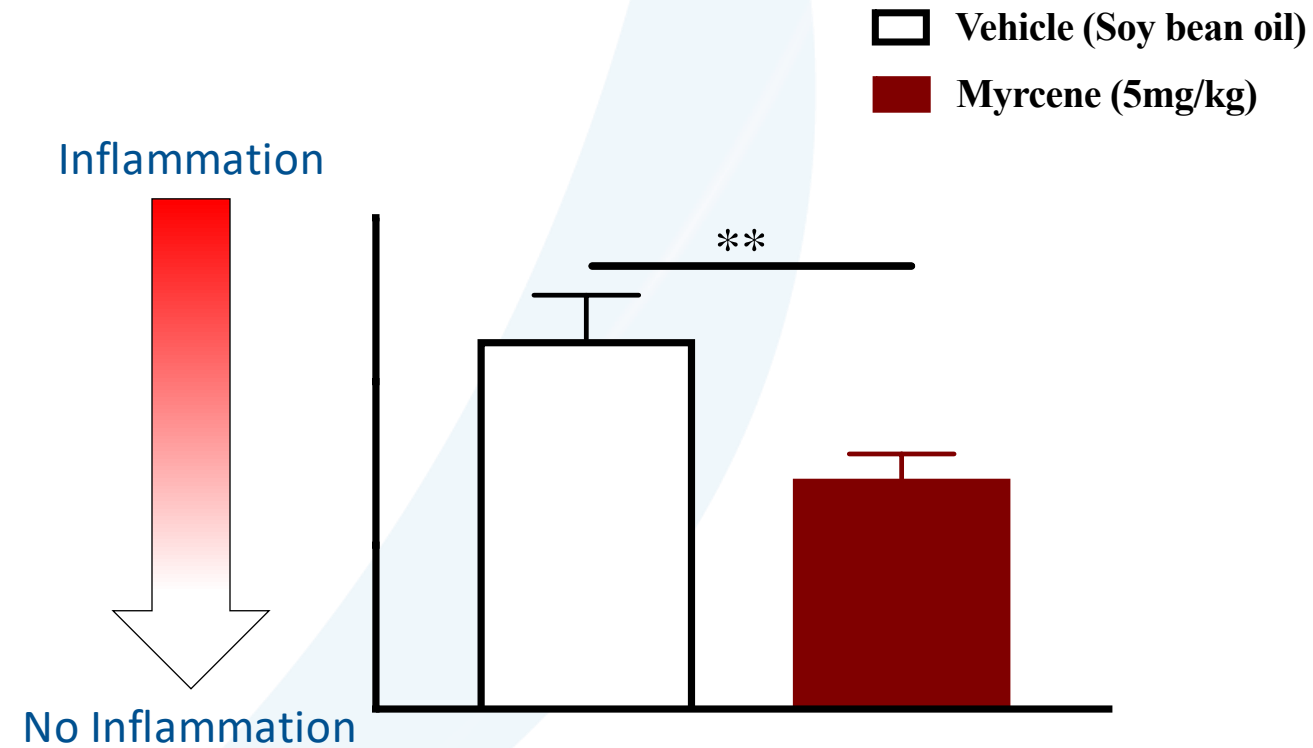


# Effect of Myrcene on Joint Pain



McDougall & McKenna. (In preparation)

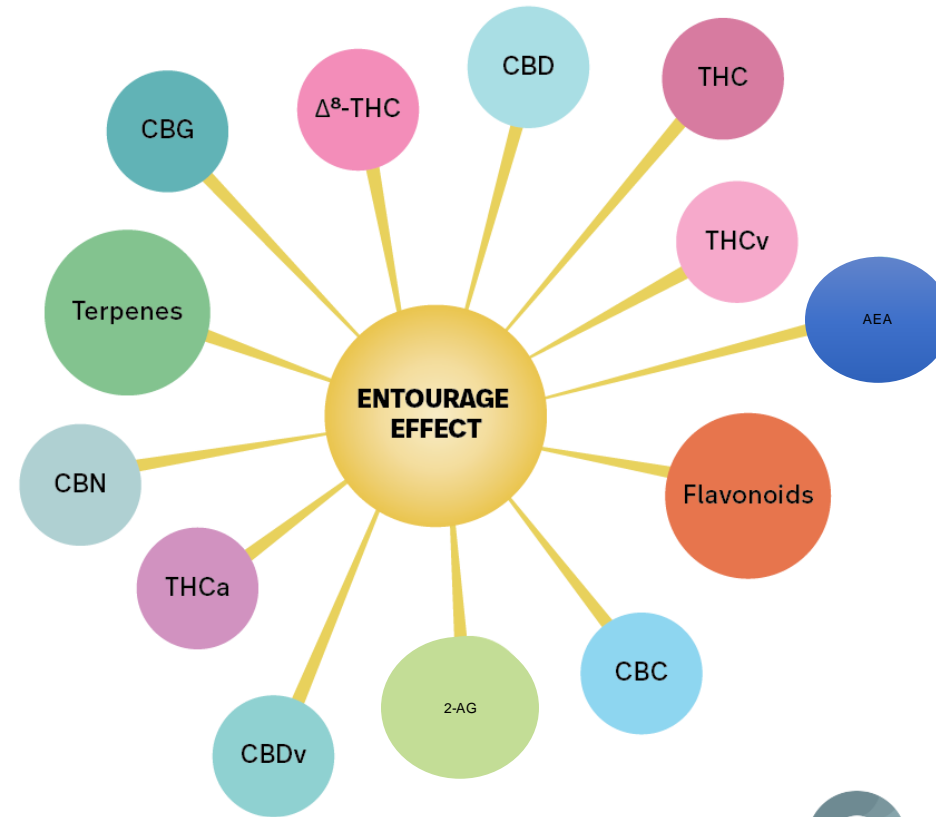
# Effect of Myrcene on Joint Inflammation



McDougall & McKenna. *(In preparation)*



# The Entourage Effect



curepharmaceutical.com

© 2018. Cure Pharmaceutical Corporation. All rights reserved.



▶ How do different cannabis compounds interact?



# Medical Cannabis Looks Promising

- ▼ Good anecdotal evidence
- ▼ Scientific evidence is promising
- ▼ Not suitable for all patients
- ▼ Need better ways to administer CBs
- ▼ Need more research



# Keep Searching for the Answer!



# Acknowledgements

- ▼ McDougall Lab
  - ▼ Holly Philpott
  - ▼ Meagan McKenna
  - ▼ Dr. Melissa O'Brien
  - ▼ Allison Reid
  - ▼ Eugene Krustev
  - ▼ Dr. Milind Muley
  - ▼ Dr. Niklas Schuelert

Tweet: @JasonJMcDougall





# Questions





# Tell us what you think...



# Upcoming Events

Today

Sept.  
15

Visit Medical Cannabis by Shoppers™ information booth



Oct.

6

Rock the Joint:  
*Virtual Music Showcase Edition*



Sept.

29

Arthritis Talks:  
Managing Flares





- ▼ Clinical pharmacist and educator, Michael Boivin, and Medical Cannabis by Shoppers™ lead pharmacist Sanjida Khondaker are available to answer your questions at their virtual information booth immediately after this webinar
- ▼ Link to the virtual information booth is in your reminder email and in today's chat

<https://arthritis.ca/booth>

Exclusive Event Presenting Partner



