

Research Studies List

Yellow = Title / Subject

Green = Publication date

Pink = Other cannabinoids also included in findings (should also be linked to this study)

Blue = Definition for clarity

Cannabis (General)

ALS

- Raman, Chandrasekaran, et al. "Amyotrophic Lateral Sclerosis: Delayed Disease Progression in Mice by Treatment with a Cannabinoid." *Amyotrophic Lateral Sclerosis and Other Motor Neuron Disorders*, vol. 5, no. 1, Mar. 2004, pp. 33–39, <https://doi.org/10.1080/14660820310016813>
- Dash, Raju, et al. "Emerging Potential of Cannabidiol in Reversing Proteinopathies." *Ageing Research Reviews*, vol. 65, 1 Jan. 2021, p. 101209, www.sciencedirect.com/science/article/pii/S1568163720303445
- Lim, Keane, et al. "A Systematic Review of the Effectiveness of Medical Cannabis for Psychiatric, Movement and Neurodegenerative Disorders." *Clinical Psychopharmacology and Neuroscience*, vol. 15, no. 4, 30 Nov. 2017, pp. 301–312, <https://pmc.ncbi.nlm.nih.gov/articles/PMC5678490/>

Arthritis:

- Guillouard, M, et al. "Cannabis Use Assessment and Its Impact on Pain in Rheumatologic Diseases: A Systematic Review and Meta-Analysis." *Rheumatology*, vol. 60, no. 2, 7 Nov. 2020, pp. 549–556, <https://doi.org/10.1093/rheumatology/keaa534>.

Anti-microbial / bacterial:

- Karas, John A., et al. "The Antimicrobial Activity of Cannabinoids." *Antibiotics*, vol. 9, no. 7, 13 July 2020, <https://www.mdpi.com/2079-6382/9/7/406>

Antioxidant:

- "CBG, CBD, Δ9-THC, CBN, CBGA, CBDA and Δ9-THCA as Antioxidant Agents and Their Intervention Abilities in Antioxidant Action." *Fitoterapia*, vol. 152, 1 July 2021, p. 104915, <https://www.sciencedirect.com/science/article/pii/S0367326X21000903?via%3DiDhub#s0090>

Bladder:

- Christie, Stewart, et al. "Endocannabinoids in Bladder Sensory Mechanisms in Health and Diseases." *Frontiers in Pharmacology*, vol. 12, 5 July 2021, <https://pmc.ncbi.nlm.nih.gov/articles/PMC8287826/>
- Tyagi, Pradeep, et al. "Functional Role of Cannabinoid Receptors in Urinary Bladder." *Indian Journal of Urology*, vol. 26, no. 1, 2010, p. 26, <https://pmc.ncbi.nlm.nih.gov/articles/PMC2878434/>
- Ruggieri, Michael R. "Cannabinoids: Potential Targets for Bladder Dysfunction." *Handbook of Experimental Pharmacology*, 2011, pp. 425–451, https://www.researchgate.net/publication/49806835_Cannabinoids_Potential_Targets_for_Bladder_Dysfunction

Bone / Osteo:

- Palmini, Gaia, et al. "Cannabinoids: New Friends in Bone Fracture and in Joint Disease Prevention?" *International Journal of Bone Fragility*, vol. 2, no. 3, 28 Dec. 2022, pp. 84–92, www.journalbonefragility.com/wp-content/uploads/journal/2022/2.3/84-92.pdf
- Idris, Aymen I., and Stuart H. Ralston. "Role of Cannabinoids in the Regulation of Bone Remodeling." *Frontiers in Endocrinology*, vol. 3, 2012, <https://doi.org/10.3389/fendo.2012.00136>.

Crohn's:

- Naftali, Timna, et al. "Treatment of Crohn's Disease with Cannabis: An Observational Study." *The Israel Medical Association Journal: IMAJ*, vol. 13, no. 8, 1 Aug. 2011, pp. 455–458, <https://www.ima.org.il/FilesUploadPublic/IMAJ/0/39/19985.pdf>
- Naftali, Timna, et al. "Cannabis Induces a Clinical Response in Patients with Crohn's Disease: A Prospective Placebo-Controlled Study." *Clinical Gastroenterology and Hepatology: The Official Clinical Practice Journal of the American Gastroenterological Association*, vol. 11, no. 10, 1 Oct. 2013, pp. 1276-1280.e1, <https://doi.org/10.1016/j.cgh.2013.04.034>.

Cancer

- Moreno, Estefanía, et al. "The Interplay between Cancer Biology and the Endocannabinoid System—Significance for Cancer Risk, Prognosis and Response to Treatment." *Cancers*, vol. 12, no. 11, 5 Nov. 2020, p. 3275, res.mdpi.com/d_attachment/cancers/cancers-12-03275/article_deploy/cancers-12-03275-v2.pdf <https://doi.org/10.3390/cancers12113275>.
- Mazuz, Moran, et al. "Synergistic Cytotoxic Activity of Cannabinoids from Cannabis Sativa against Cutaneous T-Cell Lymphoma (CTCL) In-Vitro and Ex-Vivo." *Oncotarget*, vol. 11, no. 13, 31 Mar. 2020, pp. 1141–1156, <https://doi.org/10.18632/oncotarget.27528> (Primarily CBD & THC)

- Ladin, D. A., Soliman, E., Griffin, L., & Van Dross, R. (2016). Preclinical and Clinical Assessment of Cannabinoids as Anti-Cancer Agents. *Frontiers in Pharmacology*, 7, 217542. <https://doi.org/10.3389/fphar.2016.00361>
- Scott, Katherine A., et al. "Anticancer Effects of Phytocannabinoids Used with Chemotherapy in Leukaemia Cells Can Be Improved by Altering the Sequence of Their Administration." *International Journal of Oncology*, vol. 51, no. 1, 29 May 2017, pp. 369–377, <https://doi.org/10.3892/ijo.2017.4022>.
- Kleckner, Amber S., et al. "Opportunities for Cannabis in Supportive Care in Cancer." *Therapeutic Advances in Medical Oncology*, vol. 11, 1 Aug. 2019, https://journals.sagepub.com/doi/epdf/10.1177/1758835919866362?src=getftr&utm_source=tfo&utm_integrator=tfo

Fibromyalgia:

- Sagy, Iftach, et al. "Safety and Efficacy of Medical Cannabis in Fibromyalgia." *Journal of Clinical Medicine*, vol. 8, no. 6, 5 June 2019, p. 807, [www.ncbi.nlm.nih.gov/pmc/articles/PMC6616435/](https://doi.org/10.3390/jcm8060807), <https://doi.org/10.3390/jcm8060807>.
- Habib G;Levinger U. "CHARACTERISTICS of MEDICAL CANNABIS USAGE among PATIENTS with FIBROMYALGIA." *Harefuah*, vol. 159, no. 5, 2020, <https://pubmed.ncbi.nlm.nih.gov/32431124/>
- Chaves, Carolina, et al. "Ingestion of a THC-Rich Cannabis Oil in People with Fibromyalgia: A Randomized, Double-Blind, Placebo-Controlled Clinical Trial." *Pain Medicine*, vol. 21, no. 10, 1 Oct. 2020, pp. 2212–2218, [www.ncbi.nlm.nih.gov/pmc/articles/PMC7593796/](https://doi.org/10.1093/pm/pnaa000)
- Mazza, Manuela. "Medical Cannabis for the Treatment of Fibromyalgia Syndrome: A Retrospective, Open-Label Case Series." *Journal of Cannabis Research*, vol. 3, no. 1, 17 Feb. 2021, <https://doi.org/10.1186/s42238-021-00060-6>.

Gastrointestinal:

- Gyires, Klára, and Zoltán S. Zádori. "Role of Cannabinoids in Gastrointestinal Mucosal Defense and Inflammation." *Current Neuropharmacology*, vol. 14, no. 8, 31 Oct. 2016, pp. 935–951, <https://doi.org/10.2174/1570159x14666160303110150>

Inflammation:

- Anil, S. M., Peeri, H., & Koltai, H. (2022). Medical Cannabis Activity Against Inflammation: Active Compounds and Modes of Action. *Frontiers in Pharmacology*, 13, 908198. <https://doi.org/10.3389/fphar.2022.908198> (THC, CBD, CBG)

- "A Systematic, Integrative Review of the Effects of the Endocannabinoid System on Inflammation and Neurogenesis in Animal Models of Affective Disorders." *Brain, Behavior, and Immunity*, vol. 93, 1 Mar. 2021, pp. 353–367, <https://doi.org/10.1016/j.bbi.2020.12.024>
- Kopustinskiene, Dalia M., et al. "Cannabis Sativa L. Bioactive Compounds and Their Protective Role in Oxidative Stress and Inflammation." *Antioxidants*, vol. 11, no. 4, 29 Mar. 2022, p. 660, <https://doi.org/10.3390/antiox11040660>.

MS / Spasms:

- Pryce, G, and D Baker. "Control of Spasticity in a Multiple Sclerosis Model Is Mediated by CB1, Not CB2, Cannabinoid Receptors." *British Journal of Pharmacology*, vol. 150, no. 4, 29 Jan. 2009, pp. 519–525, <https://doi.org/10.1038/sj.bjp.0707003>
- Malfitano, Anna Maria, et al. "Cannabinoids in the Management of Spasticity Associated with Multiple Sclerosis." *Neuropsychiatric Disease and Treatment*, vol. 4, no. 5, 2008, pp. 847–53, www.ncbi.nlm.nih.gov/pmc/articles/PMC2626929/
- ROG, D, et al. "Oromucosal Δ^9 -Tetrahydrocannabinol/Cannabidiol for Neuropathic Pain Associated with Multiple Sclerosis: An Uncontrolled, Open-Label, 2-Year Extension Trial." *Clinical Therapeutics*, vol. 29, no. 9, Sept. 2007, pp. 2068–2079, <https://doi.org/10.1016/j.clinthera.2007.09.013>

Neuroprotection

- Ramirez, B. G. "Prevention of Alzheimer's Disease Pathology by Cannabinoids: Neuroprotection Mediated by Blockade of Microglial Activation." *Journal of Neuroscience*, vol. 25, no. 8, 23 Feb. 2005, pp. 1904–1913, www.jneurosci.org/content/25/8/1904
- Currais, Antonio, et al. "Amyloid Proteotoxicity Initiates an Inflammatory Response Blocked by Cannabinoids." *Npj Aging and Mechanisms of Disease*, vol. 2, no. 1, 23 June 2016, <https://doi.org/10.1038/npjamd.2016.12>, <https://www.salk.edu/news-release/cannabinoids-remove-plaque-forming-alzheimers-proteins-from-brain-cells/>
- Marchalant, Y., et al. "Anti-Inflammatory Property of the Cannabinoid Agonist WIN-55212-2 in a Rodent Model of Chronic Brain Inflammation." *Neuroscience*, vol. 144, no. 4, Feb. 2007, pp. 1516–1522, <https://doi.org/10.1016/j.neuroscience.2006.11.016>
- Hampson, A. J., et al. "Cannabidiol and (-) 9-Tetrahydrocannabinol Are Neuroprotective Antioxidants." *Proceedings of the National Academy of Sciences*, vol. 95, no. 14, 7 July 1998, pp. 8268–8273, <https://doi.org/10.1073/pnas.95.14.8268>. (CBD, THC)

Opiates (reduction in use):

- Silver, Jacob, et al. "Cannabis Use Is Associated with Decreased Opioid Prescription Fulfillment Following Single Level Anterior Cervical Discectomy and Fusion (ACDF)." *North American Spine Society Journal*, vol. 14, 1 June 2023, p. 100226, <https://pmc.ncbi.nlm.nih.gov/articles/PMC10333711/>
- Renslo, Bryan, et al. "Medical Cannabis Use Reduces Opioid Prescriptions in Patients with Osteoarthritis." *Cureus*, 24 Jan. 2022, <https://doi.org/10.7759/cureus.21564>

Pain

- Wallace, Mark S, et al. "Efficacy of Inhaled Cannabis on Painful Diabetic Neuropathy." *The Journal of Pain : Official Journal of the American Pain Society*, vol. 16, no. 7, 2015, pp. 616–27, <https://pmc.ncbi.nlm.nih.gov/articles/PMC5152762/>
- Wilsey, Barth, et al. "An Exploratory Human Laboratory Experiment Evaluating Vaporized Cannabis in the Treatment of Neuropathic Pain from Spinal Cord Injury and Disease." *The Journal of Pain*, vol. 17, no. 9, Sept. 2016, pp. 982–1000, <https://pmc.ncbi.nlm.nih.gov/articles/PMC5007175/#S34>
- Ware, M. A., et al. "Smoked Cannabis for Chronic Neuropathic Pain: A Randomized Controlled Trial." *Canadian Medical Association Journal*, vol. 182, no. 14, 30 Aug. 2010, pp. E694–E701, <https://www.cmaj.ca/content/cmaj/early/2010/08/30/cmaj.091414.full.pdf>
- Wilsey, Barth, et al. "Low Dose Vaporized Cannabis Significantly Improves Neuropathic Pain." *The Journal of Pain : Official Journal of the American Pain Society*, vol. 14, no. 2, 1 Feb. 2013, pp. 136–148, <https://pmc.ncbi.nlm.nih.gov/articles/PMC3566631/>
- Johnson, Jeremy R., et al. "Multicenter, Double-Blind, Randomized, Placebo-Controlled, Parallel-Group Study of the Efficacy, Safety, and Tolerability of THC:CBD Extract and THC Extract in Patients with Intractable Cancer-Related Pain." *Journal of Pain and Symptom Management*, vol. 39, no. 2, Feb. 2010, pp. 167–179, <https://doi.org/10.1016/j.jpainsymman.2009.06.008>.
- Boehnke, Kevin F., et al. "Medical Cannabis Use Is Associated with Decreased Opiate Medication Use in a Retrospective Cross-Sectional Survey of Patients with Chronic Pain." *The Journal of Pain*, vol. 17, no. 6, June 2016, pp. 739–744, [https://www.jpain.org/article/S1526-5900\(16\)00567-8/fulltext](https://www.jpain.org/article/S1526-5900(16)00567-8/fulltext)
- Rabgay, Karma, et al. "The Effects of Cannabis, Cannabinoids, and Their Administration Routes on Pain Control Efficacy and Safety: A Systematic Review and Network Meta-Analysis." *Journal of the American Pharmacists Association*, vol. 60, no. 1, Jan. 2020, pp. 225-234.e6, <https://doi.org/10.1016/j.japh.2019.07.015>.

- Mücke, Martin, et al. "Cannabis-Based Medicines for Chronic Neuropathic Pain in Adults." *Cochrane Database of Systematic Reviews*, vol. 3, no. 3, 7 Mar. 2018, <https://doi.org/10.1002/14651858.cd012182.pub2>.
- Jaseena Elikottil, et al. "The Analgesic Potential of Cannabinoids." *Journal of Opioid Management*, vol. 5, no. 6, 2024, p. 341, <https://pmc.ncbi.nlm.nih.gov/articles/PMC3728280/#S15>

Sleep:

- Kesner, Andrew J., and David M. Lovinger. "Cannabinoids, Endocannabinoids and Sleep." *Frontiers in Molecular Neuroscience*, vol. 13, no. 125, 22 July 2020, <https://doi.org/10.3389/fnmol.2020.00125>.

General:

- Namdar, Dvora, et al. "Chronological Review and Rational and Future Prospects of Cannabis-Based Drug Development." *Molecules*, vol. 25, no. 20, 20 Oct. 2020, p. 4821, <https://doi.org/10.3390/molecules25204821>.
- Bostwick, J. Michael. "Blurred Boundaries: The Therapeutics and Politics of Medical Marijuana." *Mayo Clinic Proceedings*, vol. 87, no. 2, Feb. 2012, pp. 172–186, [www.mayoclinicproceedings.org/article/S0025-6196\(11\)00021-8/fulltext](http://www.mayoclinicproceedings.org/article/S0025-6196(11)00021-8/fulltext), <https://doi.org/10.1016/j.mayocp.2011.10.003>
- Russo, Ethan B. "Beyond Cannabis: Plants and the Endocannabinoid System." *Trends in Pharmacological Sciences*, vol. 37, no. 7, July 2016, pp. 594–605, <https://mychronicrelief.com/wp-content/uploads/2016/05/Beyond-Cannabis-Plants-and-the-Endocannabinoid-System.pdf>
- Pertwee, Roger G. "Cannabinoid Pharmacology: The First 66 Years." *British Journal of Pharmacology*, vol. 147, no. S1, 2 Feb. 2009, pp. S163–S171, www.ncbi.nlm.nih.gov/pmc/articles/PMC1760722/
- Crocq, Marc-Antoine. "History of Cannabis and the Endocannabinoid System." *Cannabinoids*, vol. 22, no. 3, 22 Sept. 2020, pp. 223–228, www.ncbi.nlm.nih.gov/pmc/articles/PMC7605027/

Websites:

- <https://icrs.co/>

Books:

- O'brien, Kylie, and Philip Blair. *Medicinal Cannabis and CBD in Mental Healthcare*. <https://cannalib.eu/wp-content/uploads/2022/03/Medicinal-Cannabis-and-CBD-in-Mental-Healthcare-2021.pdf>

- Kinghorn, et al. *Progress in the Chemistry of Organic Natural Products*, **Phytocannabinoids: Unraveling the Complex Chemistry and Pharmacology of Cannabis sativa** Volume 103, <https://tech.chemistrydocs.com/Books/Medicinal/Phytocannabinoids-Unraveling-the-Complex-Chemistry-and-Pharmacology-of-Cannabis-sativa-by-A.-Douglas-Kinghorn.pdf>

CBD (cannabidiol)

- Walczyńska-Dragon, Karolina, et al. "**Cannabidiol Intervention for Muscular Tension, Pain, and Sleep Bruxism Intensity**—a Randomized, Double-Blind Clinical Trial." *Journal of Clinical Medicine*, vol. 13, no. 5, 1 Jan. 2024, p. 1417, www.mdpi.com/2077-0383/13/5/1417 (**Sleep Bruxism = teeth grinding**)

Anti-Convulsant / Seizures:

- Jones, N. A., et al. "Cannabidiol Displays **Anti-epileptiform and Antiseizure** Properties in Vitro and in Vivo." *Journal of Pharmacology and Experimental Therapeutics*, vol. 332, no. 2, 11 Nov. 2009, pp. 569–577, <https://doi.org/10.1124/jpet.109.159145>.
- Silvestro, Serena, et al. "Use of Cannabidiol in the Treatment of **Epilepsy**: Efficacy and Security in Clinical Trials." *Molecules*, vol. 24, no. 8, 12 Apr. 2019, p. 1459, www.mdpi.com/1420-3049/24/8/1459?type=check_update&version=2, <https://doi.org/10.3390/molecules24081459>.
- Rosenberg, Evan. *Cannabidiol Modulates Excitatory-Inhibitory Ratio to Counter Hippocampal Hyperactivity*. (**Epileptic Seizures**) *Neuron*, Volume 111, Issue 8, 1282 - 1300.e8, 19 Apr. 2023, [www.cell.com/neuron/fulltext/S0896-6273\(23\)00066-1?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0896627323000661%3Fshowall%3Dtrue](http://www.cell.com/neuron/fulltext/S0896-6273(23)00066-1?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0896627323000661%3Fshowall%3Dtrue).
- Gaston, Tyler E., et al. "Long-Term Safety and Efficacy of Highly Purified Cannabidiol for Treatment Refractory **Epilepsy**." *Epilepsy & Behavior*, vol. 117, Apr. 2021, p. 107862, <https://doi.org/10.1016/j.yebeh.2021.107862>.

Anxiety:

- Blessing, Esther M., et al. "Cannabidiol as a Potential Treatment for **Anxiety Disorders**." *Neurotherapeutics*, vol. 12, no. 4, 4 Sept. 2015, pp. 825–836, link.springer.com/article/10.1007%2Fs13311-015-0387-1, <https://doi.org/10.1007/s13311-015-0387-1>.
- Dahlgren, Mary Kathryn, et al. "Clinical and Cognitive Improvement Following Full-Spectrum, High-Cannabidiol Treatment for **Anxiety**: Open-Label Data from a Two-Stage, Phase 2 Clinical Trial." *Communications Medicine*, vol. 2, no. 1, 2 Nov. 2022, <https://doi.org/10.1038/s43856-022-00202-8>.

- Resstel, Leonardo B.M., et al. "5-HT1A receptors Are Involved in the Cannabidiol-Induced Attenuation of Behavioural and Cardiovascular Responses to Acute Restraint **Stress** in Rats." *British Journal of Pharmacology*, vol. 156, no. 1, Jan. 2009, pp. 181–188, <https://doi.org/10.1111/j.1476-5381.2008.00046.x>.
- Soares, Vanessa de Paula, et al. "Intra-Dorsal Periaqueductal Gray Administration of **Cannabidiol Blocks Panic-like Response** by Activating 5-HT1A Receptors." *Behavioural Brain Research*, vol. 213, no. 2, Dec. 2010, pp. 225–229, <https://doi.org/10.1016/j.bbr.2010.05.004>.

Anti-psychotic:

- Leweke, F M, et al. "Cannabidiol Enhances Anandamide Signaling and **Alleviates Psychotic Symptoms of Schizophrenia**." *Translational Psychiatry*, vol. 2, no. 3, Mar. 2012, pp. e94–e94, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3316151/>

Cancer:

- Massi, Paola, et al. "Cannabidiol as Potential **Anticancer** Drug." *British Journal of Clinical Pharmacology*, vol. 75, no. 2, 10 Jan. 2013, pp. 303–312, <https://doi.org/10.1111/j.1365-2125.2012.04298.x>.
- Ramer, Robert, et al. "Cannabidiol Inhibits **Lung Cancer** Cell Invasion and Metastasis via Intercellular Adhesion Molecule-1." *The FASEB Journal*, vol. 26, no. 4, 23 Dec. 2011, pp. 1535–1548, <https://realmofcaring.org/wp-content/uploads/2020/12/Cannabidiol-inhibits-lung-cancer-cell-invasion-and-metastasis-via-intercellular-adhesion-molecule-1.pdf>
- Bar-Lev Schleider, Lihi, et al. "Prospective Analysis of Safety and Efficacy of Medical Cannabis in Large Unselected Population of Patients with **Cancer**." *European Journal of Internal Medicine*, vol. 49, 1 Mar. 2018, pp. 37–43, pubmed.ncbi.nlm.nih.gov/29482741/, <https://doi.org/10.1016/j.ejim.2018.01.023>.
- Heider, Camren G., et al. "Mechanisms of Cannabidiol (CBD) in **Cancer** Treatment: A Review." *Biology*, vol. 11, no. 6, 26 May 2022, p. 817, www.ncbi.nlm.nih.gov/pmc/articles/PMC9220307/, <https://doi.org/10.3390/biology11060817>.
- O'Brien, Kylie. "Cannabidiol (CBD) in **Cancer** Management." *Cancers*, vol. 14, no. 4, 10 Feb. 2022, p. 885, <https://doi.org/10.3390/cancers14040885>.
- Seltzer, Emily S., et al. "Cannabidiol (CBD) as a Promising **Anti-Cancer** Drug." *Cancers*, vol. 12, no. 11, 30 Oct. 2020, p. 3203, <https://doi.org/10.3390/cancers12113203>.
- Solinas, Marta, et al. "Cannabidiol, a Non-Psychoactive Cannabinoid Compound, **Inhibits Proliferation and Invasion** in U87-MG and T98G Glioma Cells through a Multitarget Effect." *PLoS ONE*, vol. 8, no. 10, 21 Oct. 2013, p. e76918, <https://doi.org/10.1371/journal.pone.0076918>

- Mashabela, Manamele Dannies, and Abidemi Paul Kappo. "Anti-Cancer and Anti-Proliferative Potential of Cannabidiol: A Cellular and Molecular Perspective." *International Journal of Molecular Sciences*, vol. 25, no. 11, 1 Jan. 2024, p. 5659, www.mdpi.com/1422-0067/25/11/5659#:~:text=CBD%20acts%20as%20an%20agonist,https://doi.org/10.3390/ijms25115659
- Shrivastava, Ashutosh, et al. "Cannabidiol Induces Programmed Cell Death in Breast Cancer Cells by Coordinating the Cross-Talk between Apoptosis and Autophagy." *Molecular Cancer Therapeutics*, vol. 10, no. 7, 2011, pp. 1161–72, <https://aacrjournals.org/mct/article/10/7/1161/91099/Cannabidiol-Induces-Programmed-Cell-Death-in>

Depression:

- Zanelati, TV, et al. "Antidepressant-like Effects of Cannabidiol in Mice: Possible Involvement of 5-HT1A Receptors." *British Journal of Pharmacology*, vol. 159, no. 1, 4 Dec. 2009, pp. 122–128, <https://doi.org/10.1111/j.1476-5381.2009.00521.x>.

Digestive / IBD:

- Borrelli, Francesca, et al. "Cannabidiol, a Safe and Non-Psychotropic Ingredient of the Marijuana Plant Cannabis Sativa, Is Protective in a Murine Model of Colitis." *Journal of Molecular Medicine*, vol. 87, no. 11, 20 Aug. 2009, pp. 1111–1121, https://thc-safety.com/wp-content/uploads/2018/12/CBD_Colitis_Protection_2009.pdf
- Capasso, R, et al. "Cannabidiol, Extracted From Cannabis Sativa, Selectively Inhibits Inflammatory Hypermotility in Mice." *British Journal of Pharmacology*, vol. 154, no. 5, July 2008, pp. 1001–1008, <https://doi.org/10.1038/bjp.2008.177>.
- Pagano, E., Capasso, R., Piscitelli, F., Romano, B., Parisi, O. A., Finizio, S., Lauritano, A., Marzo, V. D., Izzo, A. A., & Borrelli, F. (2016). An Orally Active Cannabis Extract with High Content in Cannabidiol attenuates Chemically-induced Intestinal Inflammation and Hypermotility in the Mouse. *Frontiers in Pharmacology*, 7, 222194. <https://doi.org/10.3389/fphar.2016.00341>

Inflammation:

- Atalay, Sinemyiz, et al. "Antioxidative and Anti-Inflammatory Properties of Cannabidiol." *Antioxidants*, vol. 9, no. 1, 25 Dec. 2019, p. 21, www.ncbi.nlm.nih.gov/pmc/articles/PMC7023045/, <https://doi.org/10.3390/antiox9010021>.
- Hegde, Venkatesh L., et al. "Role of Myeloid-Derived Suppressor Cells in Amelioration of Experimental Autoimmune Hepatitis Following Activation of TRPV1 Receptors by Cannabidiol." *PLoS ONE*, vol. 6, no. 4, 1 Apr. 2011, p. e18281, <https://doi.org/10.1371/journal.pone.0018281>

- Ribeiro, Alison, et al. "Cannabidiol, a Non-Psychotropic Plant-Derived Cannabinoid, Decreases Inflammation in a Murine Model of Acute Lung Injury: Role for the Adenosine A2A Receptor." *European Journal of Pharmacology*, vol. 678, no. 1-3, Mar. 2012, pp. 78–85, <https://doi.org/10.1016/j.ejphar.2011.12.043>.
- Lowin, Torsten, et al. "Cannabidiol (CBD): A Killer for Inflammatory Rheumatoid Arthritis Synovial Fibroblasts." *Cell Death & Disease*, vol. 11, no. 8, Aug. 2020, <https://doi.org/10.1038/s41419-020-02892-1>
- Adriana Yndart Arias, et al. "Anti-Inflammatory Effects of CBD in Human Microglial Cell Line Infected with HIV-1." *Scientific Reports*, vol. 13, no. 1, 5 May 2023, <https://doi.org/10.1038/s41598-023-32927-4>.

Nausea:

- Rock, Erin M., et al. "Therapeutic Potential of Cannabidiol, Cannabidiolic Acid, and Cannabidiolic Acid Methyl Ester as Treatments for Nausea and Vomiting." *Cannabis and Cannabinoid Research*, 11 June 2021, <https://doi.org/10.1089/can.2021.0041> (Also includes CBD-A, CBDA-ME, a derivative of CBD-A)
- Rock, EM, et al. "Cannabidiol, a Non-Psychotropic Component of Cannabis, Attenuates Vomiting and Nausea-like Behaviour via Indirect Agonism of 5-HT1A Somatodendritic Autoreceptors in the Dorsal Raphe Nucleus." *British Journal of Pharmacology*, vol. 165, no. 8, 23 Mar. 2012, pp. 2620–2634, <https://bpspubs.onlinelibrary.wiley.com/doi/10.1111/j.1476-5381.2011.01621.x>
- Grimison, P., et al. "Oral THC:CBD Cannabis Extract for Refractory Chemotherapy-Induced Nausea and Vomiting: A Randomised, Placebo-Controlled, Phase II Crossover Trial." *Annals of Oncology*, vol. 31, no. 11, Nov. 2020, pp. 1553–1560, <https://doi.org/10.1016/j.annonc.2020.07.020> (Also includes THC)
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Anti-Convulsant / Seizure:

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Cancer:

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Pain:

- Maione, Sabatino, et al. "Non-Psychoactive Cannabinoids Modulate the Descending Pathway of **Antinociception** in Anaesthetized Rats through Several Mechanisms of Action." *British Journal of Pharmacology*, vol. 162, no. 3, 12 Jan. **2011**, pp. 584–596, <https://doi.org/10.1111/j.1476-5381.2010.01063.x>.
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CBG (cannabigerol)

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Antioxidant:

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Anti-inflammatory:

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- Cuttler, Carrie, et al. "Acute Effects of Cannabigerol on Anxiety, Stress, and Mood: A Double-Blind, Placebo-Controlled, Crossover, Field Trial." *Scientific Reports*, vol. 14, no. 1, 13 July 2024, p. 16163, <https://doi.org/10.1038/s41598-024-66879-0>.

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- De Petrocellis, Luciano, et al. "Effects of Cannabinoids and Cannabinoid-Enriched Cannabis extracts on TRP Channels and Endocannabinoid Metabolic Enzymes." *British Journal of Pharmacology*, vol. 163, no. 7, 12 July 2011, pp. 1479–1494, <https://pmc.ncbi.nlm.nih.gov/articles/PMC3165957/>

Bone-Growth:

- Deepak Kumar Khajuria, et al. "Cannabidiol and Cannabigerol, Nonpsychotropic Cannabinoids, as Analgesics That Effectively Manage Bone Fracture Pain and Promote Healing in Mice." *Journal of Bone and Mineral Research*, 25 Sept. 2023, <https://doi.org/10.1002/jbmr.4902> (Also includes CBD)

Bladder:

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- Borrelli, Francesca, et al. "Colon Carcinogenesis Is Inhibited by the TRPM8 Antagonist Cannabigerol, a Cannabis-Derived Non-Psychotropic Cannabinoid." *Carcinogenesis*, vol. 35, no. 12, 1 Dec. 2014, pp. 2787–2797, <https://pubmed.ncbi.nlm.nih.gov/25269802/>
- Lah, Tamara T., et al. "Cannabigerol Is a Potential Therapeutic Agent in a Novel Combined Therapy for Glioblastoma." *Cells*, vol. 10, no. 2, 5 Feb. 2021, p. 340, <https://pmc.ncbi.nlm.nih.gov/articles/PMC7914500/>

Digestive / IBD:

- Borrelli, Francesca, et al. "Beneficial Effect of the Non-Psychotropic Plant Cannabinoid Cannabigerol on Experimental Inflammatory Bowel Disease." *Biochemical Pharmacology*, vol. 85, no. 9, 1 May 2013, pp. 1306–1316, <https://www.sciencedirect.com/science/article/abs/pii/S0006295213000543?via%3Dihub>
- Anderson, Benjamin D, et al. "High Cannabigerol Hemp Extract Moderates Colitis and Modulates the Microbiome in an Inflammatory Bowel Disease Model." *Journal of Pharmacology and Experimental Therapeutics*, 15 July 2024, p. JPET-002204, <https://jpet.aspetjournals.org/content/390/3/331>

Glaucoma:

- Colasanti, B K, et al. "Intraocular Pressure, Ocular Toxicity and Neurotoxicity after Administration of Cannabinol or Cannabigerol." *Experimental Eye Research*, vol. 39, no. 3, 1 Sept. 1984, pp. 251-259, <https://www.sciencedirect.com/science/article/abs/pii/0014483584900137?via%3Dihub>
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Neuroprotection:

- Gugliandolo, Agnese, et al. "In Vitro Model of Neuroinflammation: Efficacy of Cannabigerol, a Non-Psychoactive Cannabinoid." *International Journal of Molecular Sciences*, vol. 19, no. 7, 1 July 2018, p. 1992, <https://pmc.ncbi.nlm.nih.gov/articles/PMC6073490/>
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- Rodríguez-Cueto, Carmen, et al. "Neuroprotective Effects of the Cannabigerolic Quinone Derivative VCE-003.2 in SOD1G93A Transgenic Mice, an Experimental Model of Amyotrophic Lateral Sclerosis (ALS)." *Biochemical Pharmacology*, vol. 157, Nov. 2018, pp. 217–226, <https://www.sciencedirect.com/science/article/abs/pii/S0006295218303198?via%3Dihub>

Pain:

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Skin Aid:

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- Perez, Eduardo, et al. "In Vitro and Clinical Evaluation of Cannabigerol (CBG) Produced via Yeast Biosynthesis: A Cannabinoid with a Broad Range of Anti-Inflammatory and Skin Health-Boosting Properties." *Molecules*, vol. 27, no. 2, 15 Jan. 2022, pp. 491–491, <https://doi.org/10.3390/molecules27020491>

CBN (Cannabinol)

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Cancer / Tumor:

- Munson, A. E., et al. "Antineoplastic Activity of Cannabinoids." *JNCI: Journal of the National Cancer Institute*, vol. 55, no. 3, Sept. 1975, pp. 597–602, <https://doi.org/10.1093/jnci/55.3.597>, <https://shorturl.at/3QoUE> (THC, CBN)
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Pain:

- Sofia, R. Duane, et al. "Comparative Analgesic Activity of Various Naturally Occurring Cannabinoids in Mice and Rats." *Psychopharmacologia*, vol. 40, no. 4, 1975, pp. 285–295, <https://doi.org/10.1007/bf00421466>. (Also includes THC)
- Wong, Hayes, and Brian E. Cairns. "Cannabidiol, Cannabinol and Their Combinations Act as Peripheral Analgesics in a Rat Model of Myofascial Pain." *Archives of Oral Biology*, vol. 104, 1 Aug. 2019, pp. 33–39, <https://www.sciencedirect.com/science/article/abs/pii/S0003996919302249>

MRSA:

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Neuroprotection:

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- Bonn-Miller, Marcel O., et al. "A Double-Blind, Randomized, Placebo-Controlled Study of the Safety and Effects of CBN with and without CBD on Sleep Quality." *Experimental and Clinical Psychopharmacology*, 5 Oct. 2023, <https://psycnet.apa.org/fulltext/2024-14146-001.html>
- Gannon, William, et al. "Novel Formulation of THC and CBN in a Repeat-Action Tablet Improves Objective and Subjective Measurements of Sleep." *American Journal of Endocannabinoid Medicine I*, vol. 3, Feb 2021, <https://realmofcaring.org/wp-content/uploads/2024/05/Sleep-Study.pdf>

THC (tetrahydrocannabinol)

Alzheimer's / Nuro:

- Eubanks, Lisa M., et al. "A Molecular Link between the Active Component of Marijuana and Alzheimer's Disease Pathology." *Molecular Pharmaceutics*, vol. 3, no. 6, Dec. 2006, pp. 773–777, www.ncbi.nlm.nih.gov/pmc/articles/PMC2562334/
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Appetite / Anorexia:

- Beal, Jeffrey E., et al. "Dronabinol as a Treatment for Anorexia Associated with Weight Loss in Patients with AIDS." *Journal of Pain and Symptom Management*, vol. 10, no. 2, Feb. 1995, pp. 89–97, <https://tinyurl.com/39jkwfcj> (Dronabinol = THC in sesame oil)
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- Moreno-Sanz, Guillermo. "Can You Pass the Acid Test? Critical Review and Novel Therapeutic Perspectives of Δ^9 -Tetrahydrocannabinolic Acid A." *Cannabis and Cannabinoid Research*, vol. 1, no. 1, Dec. 2016, pp. 124–130, <https://doi.org/10.1089/can.2016.0008> (anti-inflammatory, immunomodulatory, neuroprotective, and antineoplastic)

Anti-convulsant:

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Liver Fibrosis (fatty liver disease):

- Carmona-Hidalgo, Beatriz, et al. " Δ^9 -Tetrahydrocannabinolic Acid Markedly Alleviates Liver Fibrosis and Inflammation in Mice." *Phytomedicine*, vol. 81, Jan. 2021, p. 153426, <https://doi.org/10.1016/j.phymed.2020.153426>.

Nausea:

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THC-V (Tetrahydrocannabivarin)

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