

参考文献

- Abame, M. A., Y. He, S. Wu, Z. Xie, J. Zhang, X. Gong, C. Wu, and J. Shen. 2021. "Chronic administration of synthetic cannabidiol induces antidepressant effects involving modulation of serotonin and noradrenaline levels in the hippocampus." *Neurosci Lett* 744: 135594. doi:10.1016/j.neulet.2020.135594.
- Abraham, A. D., E. J. Y. Leung, B. A. Wong, Z. M. G. Rivera, L. C. Kruse, J. J. Clark, and B. B. Land. 2019. "Orally consumed cannabinoids provide long-lasting relief of allodynia in a mouse model of chronic neuropathic pain." *Neuropsychopharmacology* 45: 1105–1114. doi:10.1038/s41386-019-0585-3.
- Adams, R., M. Hunt, and J. H. Clark. 1940. "Structure of cannabidiol, a product isolated from the marihuana extract of Minnesota wild hemp." *J Amer Chem Soc* 62: 196–200.
- Aguirell, S., S. Carlsson, J. E. Lindgren, A. Ohlsson, H. Gillespie, and L. Hollister. 1981. "Interactions of delta 1-tetrahydrocannabinol with cannabinol and cannabidiol following oral administration in man: Assay of cannabinol and cannabidiol by mass fragmentography." *Experientia* 37 (10): 1090–1092. doi:10.1007/bf02085029.
- Ahmed, A., M. A. van der Marck, G. van den Elsen, and M. Olde Rikkert. 2015. "Cannabinoids in late-onset Alzheimer's disease." *Clinical Pharmacology and Therapeutics* 97: 597–606.
- Ahmed, S. A., S. A. Ross, D. Slade, M. M. Radwan, F. Zulfiqar, R. R. Matsumoto, Y. T. Xu, E. Viard, R. C. Speth, V. T. Karamyan, and M. A. ElSohly. 2008. "Cannabinoid ester constituents from high-potency *Cannabis sativa*." *J Nat Prod* 71 (4): 536–542. doi:10.1021/np070454a.
- Alhamoruni, A., A. C. Lee, K. L. Wright, M. Larvin, and S. E. O'Sullivan. 2010. "Pharmacological effects of cannabinoids on the Caco-2 cell culture model of intestinal permeability." *J Pharmacol Exp Ther* 335 (1): 92–102. doi:10.1124/jpet.110.168237.
- Alhamoruni, A., K. L. Wright, M. Larvin, and S. E. O'Sullivan. 2012. "Cannabinoids mediate opposing effects on inflammation-induced intestinal permeability." *Br J Pharmacol* 165 (8): 2598–610. doi:10.1111/j.1476-5381.2011.01589.x.
- Allen, J. H., G. M. de Moore, R. Heddle, and J. C. Twartz. 2004. "Cannabinoid hyperemesis: Cyclical hyperemesis in association with chronic cannabis abuse." *Gut* 53 (11): 1566–1570. doi:10.1136/gut.2003.036350.
- Allsop, D. J., J. Copeland, N. Lintzeris, A. J. Dunlop, M. Montebello, C. Sadler, G. R. Rivas, R. M. Holland, P. Muhleisen, M. M. Norberg, J. Booth, and I. S. McGregor. 2014. "Nabiximols as an agonist replacement therapy during cannabis withdrawal: A randomized clinical trial." *JAMA Psychiatry* 71 (3): 281–291. doi:10.1001/jamapsychiatry.2013.3947.
- Almeida, V., R. Levin, F. F. Peres, S. T. Niigaki, M. B. Calzavara, A. W. Zuardi, J. E. Hallak, J. A. Crippa, and V. C. Abilio. 2013. "Cannabidiol exhibits anxiolytic but not antipsychotic property evaluated in the social interaction test." *Prog Neuropsychopharmacol Biol Psychiatry* 41: 30–35. doi:10.1016/j.pnpbp.2012.10.024.
- Alvarez, F. J., H. Lafuente, M. C. Rey-Santano, V. E. Mielgo, E. Gastiasoro, M. Rueda, R. G. Pertwee, A. I. Castillo, J. Romero, and J. Martinez-Orgado. 2008. "Neuroprotective effects of the nonpsychoactive cannabinoid cannabidiol in hypoxic-ischemic newborn piglets." *Pediatr Res* 64 (6): 653–658. doi:10.1203/PDR.0b013e318186e5dd.
- Ames, F. R., and S. Cridland. 1986. "Anticonvulsant effect of cannabidiol." *S Afr Med J* 69 (1): 14.
- Anderson, L. L., N. L. Absalom, S. V. Abelev, I. K. Low, P. T. Doohan, L. J. Martin, M. Chebib, I. S. McGregor, and J. C. Arnold. 2019. "Coadministered cannabidiol and clobazam: Preclinical evidence for both

- pharmacodynamic and pharmacokinetic interactions.” *Epilepsia* 60 (11): 2224–2234. doi:10.1111/epi.16355.
- Andries, A., J. Frystyk, A. Flyvbjerg, and R. K. Støving. 2014. “Dronabinol in severe, enduring anorexia nervosa: A randomized controlled trial.” *Int J Eat Disord* 47 (1): 18–23. doi:10.1002/eat.22173.
- Andries, A., J. Frystyk, A. Flyvbjerg, and R. K. Støving. 2015. “Changes in IGF-I, urinary free cortisol and adipokines during dronabinol therapy in anorexia nervosa: Results from a randomised, controlled trial.” *Growth Horm IGF Res* 25 (5): 247–252. doi:10.1016/j.ghir.2015.07.006.
- Anil, S. M., N. Shalev, A. C. Vinayaka, S. Nadarajan, D. Namdar, E. Belausov, I. Shoval, K. A. Mani, G. Mechrez, and H. Kolai. 2021. “Cannabis compounds exhibit anti-inflammatory activity in vitro in COVID-19-related inflammation in lung epithelial cells and pro-inflammatory activity in macrophages.” *Sci Rep* 11 (1): 1462. doi:10.1038/s41598-021-81049-2.
- Appiah-Kusi, E., N. Petros, R. Wilson, M. Colizzi, M. G. Bossong, L. Valmaggia, V. Mondelli, P. McGuire, and S. Bhattacharyya. 2020. “Effects of short-term cannabidiol treatment on response to social stress in subjects at clinical high risk of developing psychosis.” *Psychopharmacology (Berl)* 237: 1121–1130. doi:10.1007/s00213-019-05442-6.
- Arciniegas, D. B. 2015. “Psychosis.” *Continuum (Minneapolis Minn)* 21 (3 Behavioral Neurology and Neuropsychiatry): 715–736. doi:10.1212/01.CON.0000466662.89908.e7.
- Arkell, T. R., R. C. Kevin, J. Stuart, N. Lintzeris, P. S. Haber, J. G. Ramaekers, and I. S. McGregor. 2019. “Detection of delta(9) THC in oral fluid following vaporized cannabis with varied cannabidiol (CBD) content: An evaluation of two point-of-collection testing devices.” *Drug Test Anal* 11 (10): 1486–1497. doi:10.1002/DTA.2687.
- Arkell, T. R., N. Lintzeris, R. C. Kevin, J. G. Ramaekers, R. Vandrey, C. Irwin, P. S. Haber, and I. S. McGregor. 2019. “Cannabidiol (CBD) content in vaporized cannabis does not prevent tetrahydrocannabinol (THC)-induced impairment of driving and cognition.” *Psychopharmacology (Berl)* 236 (9): 2713–2724. doi:10.1007/s00213-019-05246-8.
- Arndt, D. L., and H. de Wit. 2017. “Cannabidiol does not dampen responses to emotional stimuli in healthy adults.” *Cannabis Cannabinoid Res* 2 (1): 105–113. doi:10.1089/can.2017.0014.
- Arout, C. A., M. Haney, E. S. Herrmann, G. Bedi, and Z. D. Cooper. 2021. “The dose-dependent analgesic effects, abuse liability, safety and tolerability of oral cannabidiol in healthy humans.” *Br J Clin Pharmacol* doi:10.1111/bcp.14973.
- Ashton, C. H., P. B. Moore, P. Gallagher, and A. H. Young. 2005. “Cannabinoids in bipolar affective disorder: A review and discussion of their therapeutic potential.” *J Psychopharmacol* 19 (3): 293–300. doi:10.1177/0269881105051541.
- Aso, E., A. Sanchez-Pla, E. Vegas-Lozano, R. Maldonado, and I. Ferrer. 2015. “Cannabis-based medicine reduces multiple pathological processes in AbetaPP/PS1 mice.” *J Alzheimer’s Dis* 43 (3): 977–991. doi:10.3233/JAD-141014.
- Atalay, S., A. Gegotek, A. Wronski, P. Domigues, and E. Skrzylowska. 2021. “Therapeutic application of cannabidiol on UVA and UVB irradiated rat skin. A proteomic study.” *J Pharm Biomed Anal* 192: 113656. doi:10.1016/j.jpba.2020.113656.
- Atsmon, J., D. Heffetz, L. Deutsch, F. Deutsch, and H. Sacks. 2018. “Single-dose pharmacokinetics of oral cannabidiol following administration of PTL101: A new formulation based on gelatin matrix pellets technology.” *Clin Pharmacol Drug Dev* 7 (7): 751–758. doi:10.1002/cpdd.408.
- Aviram, J., G. M. Lewitus, Y. Vysotski, A. Uribayev, S. Procaccia, I. Cohen, A. Leibovici, M. Abo-Amna, L. Akria, D. Goncharov, N. Mativ, A. Kauffman, A. Shai, O. Hazan, G. Bar-Sela, and D. Meiri. 2020. “Short-term medical cannabis treatment regimens produced beneficial effects among palliative cancer patients.” *Pharmaceuticals* 13 (12): 435. doi:10.3390/ph13120435.

- Aymerich, M. S., E. Aso, M. A. Abellanas, R. M. Tonlon, Ramos J. A., I. Ferrer, J. Romero, and J. Fernandez-Ruiz. 2018. "Cannabinoid pharmacology/therapeutics in chronic degenerative disorders affecting the nervous system." *Biochemical Pharmacology* 157: 67–84. doi:10.1016/j.bcp.2018.08.016.
- Baek, S. H., M. Srebnik, and R. Mechoulam. 1985. "Borotrifluoride on alumina-a modified Lewis acid reagent. An improved synthesis of cannabidiol." *Tetrahedron Lett* 26:1083–1086.
- Balachandran, P., M. Elsohly, and K. P. Hill. 2021. "Cannabidiol interactions with medications, illicit substances, and alcohol: A comprehensive review." *J Gen Intern Med* 36: 2074–2084. doi:10.1007/s11606-020-06504-8.
- Bandelow, B., S. Michaelis, and D. Wedekind. 2017. "Treatment of anxiety disorders." *Dialogues in Clinical Neuroscience* 19 (2): 93–107. doi:10.31887/DCNS.2017.19.2/bbandelow.
- Bandelow, B., U. Seidler-Brandler, A. Becker, D. Wedekind, and E. Rüther. 2007. "Meta-analysis of randomized controlled comparisons of psychopharmacological and psychological treatments for anxiety disorders." *World Journal of Biological Psychiatry*. 8 (3): 175–187. doi:10.1080/1562297060110273.
- Bar-Sela, G., D. Zalman, V. Semenysty, and E. Ballan. 2019. "The effects of dosage-controlled cannabis capsules on cancer-related cachexia and anorexia syndrome in advanced cancer patients: Pilot study." *Integr Cancer Ther* 18: 1534735419881498. doi:10.1177/1534735419881498.
- Barata, L., L. Arruza, M. J. Rodriguez, E. Aleo, E. Vierge, E. Criado, E. Sobrino, C. Vargas, M. Ceprian, A. Gutierrez-Rodriguez, W. Hind, and J. Martinez-Orgado. 2019. "Neuroprotection by cannabidiol and hypothermia in a piglet model of newborn hypoxic-ischemic brain damage." *Neuropharmacology* 146: 1–11. doi:10.1016/j.neuropharm.2018.11.020.
- Baron, E. P., P. Lucas, J. Eades, and O. Hogue. 2018. "Patterns of medicinal cannabis use, strain analysis, and substitution effect among patients with migraine, headache, arthritis, and chronic pain in a medicinal cannabis cohort." *J Headache Pain* 19 (1): 37. doi:10.1186/s10194-018-0862-2.
- Bartner, L. R., S. McGrath, S. Rao, L. K. Hyatt, and L. A. Wittenburg. 2018. "Pharmacokinetics of cannabidiol administered by 3 delivery methods at 2 different dosages to healthy dogs." *Can J Vet Res* 82 (3): 178–183.
- Beale, C., S. J. Broyd, Y. Chye, C. Suo, M. Schira, P. Galettis, J. H. Martin, M. Yucel, and N. Solowij. 2018. "Prolonged cannabidiol treatment effects on hippocampal subfield volumes in current cannabis users." *Cannabis Cannabinoid Res* 3 (1): 94–107. doi:10.1089/can.2017.0047.
- Bebee, B., D. M. Taylor, E. Bourke, K. Pollack, L. Foster, M. Ching, and A. Wong. 2021. "The CANBACK trial: A randomised, controlled clinical trial of oral cannabidiol for people presenting to the emergency department with acute low back pain." *Med J Aust* 214 (8): 370–375. doi:10.5694/mja2.51014.
- Belendiuk, K. A., K. A. Babson, R. Vandrey, and M. O. Bonn-Miller. 2015. "Cannabis species and cannabinoid concentration preference among sleep-disturbed medicinal cannabis users." *Addict Behav* 50: 178–181. doi:10.1016/j.addbeh.2015.06.032.
- Belgrave, B. E., K. D. Bird, G. B. Chesher, D. M. Jackson, K. E. Lubbe, G. A. Starmer, and R. K. Teo. 1979. "The effect of cannabidiol, alone and in combination with ethanol, on human performance." *Psychopharmacology (Berl)* 64 (2): 243–246. doi:10.1007/bf00496070.
- Bergmann, K. T., K. Broekhuizen, and G. J. Groeneuveld. 2020. "Clinical trial simulations of the interaction between cannabidiol and clobazam and effect on drop-seizure frequency." *Br J Clin Pharmacol* 86 (2): 380–385. doi:10.1111/bcpt.14158.
- Bergamaschi, M. M., R. H. Queiroz, M. H. Chagas, D. C. de Oliveira, B. S. De Martinis, F. Kapczinski, J. Quevedo, R. Roesler, N. Schroder, A. E. Nardi, R. Martin-Santos, J. E. Hallak, A. W. Zuardi, and J. A. Crippa. 2011. "Cannabidiol reduces the anxiety induced by simulated public speaking in treatment-naïve social phobia patients." *Neuropsychopharmacology* 36 (6): 1219–1226. doi:10.1038/npp.2011.6.
- Bergamaschi, M. M., R. H. Queiroz, A. W. Zuardi, and J. A. Crippa. 2011. "Safety and side effects of cannabidiol, a cannabis sativa constituent." *Curr Drug Saf* 6 (4): 237–249. doi:10.2174/157488611798280924.

- Bhargava, H. N. 1976. "Effect of some cannabinoids on naloxone-precipitated abstinence in morphine dependent mice." *Psychopharmacology* 49: 267–270. doi:10.1007/BF00426828.
- Bhaskar, A., A. Bell, M. Boivin, W. Briques, M. Brown, H. Clarke, C. Cyr, E. Eisenberg, R. F. de Oliveira Silva, e. Frohlich, P. Georgius, M. Hogg, T. I. Horsted, C. A. MacCallum, K. R. Müller-Vahl, C. O'Connell, R. Sealey, M. Seibold, A. Sihota, B. K. Smith, D. Sulak, A. Vigano, and D. E. Moulin. 2021. "Consensus recommendations on dosing and administration of medical cannabis to treat chronic pain: Results of a modified Delphi process." *Journal of Cannabis Research* 3 (1): 22. doi:10.1186/s42238-021-00073-1
- Bhattacharyya, S., J. A. Crippa, P. Allen, R. Martin-Santos, S. Borgwardt, P. Fusar-Poli, K. Rubia, J. Kambeitz, C. O'Carroll, M. L. Seal, V. Giampietro, M. Brammer, A. W. Zuardi, Z. Atakan, and P. K. McGuire. 2012. "Induction of psychosis by delta-9-tetrahydrocannabinol reflects modulation of prefrontal and striatal function during attentional salience processing." *Arch Gen Psychiatry* 69 (1): 27–36. doi:10.1001/archgenpsychiatry.2011.161.
- Bhattacharyya, S., P. D. Morrison, P. Fusar-Poli, R. Martin-Santos, S. Borgwardt, T. Winton-Brown, C. Nosarti, C. M. O'Carroll, M. Seal, P. Allen, M. A. Mehta, J. M. Stone, N. Tunstall, V. Giampietro, S. Kapur, R. M. Murray, A. W. Zuardi, J. A. Crippa, Z. Atakan, and P. K. McGuire. 2010. "Opposite effects of delta-9-tetrahydrocannabinol and cannabidiol on human brain function and psychopathology." *Neuropsychopharmacology* 35 (3): 764–774. doi:10.1038/npp.2009.184.
- Bhattacharyya, S., R. Wilson, E. Appiah-Kusi, A. O'Neill, M. Brammer, J. Perez, R. Murray, P. Allen, M. G. Bossong, and P. McGuire. 2018. "Effect of cannabidiol on medial temporal, midbrain, and striatal dysfunction in people at clinical high risk of psychosis: A randomized clinical trial." *JAMA Psychiatry* 75 (11): 1107–1117. doi:10.1001/jamapsychiatry.2018.2309.
- Billig, I., B. J. Yates, and L. Rinaman. 2001. "Plasma hormone levels and central c-Fos expression in ferrets after systemic administration of cholecystokinin." *Am J Physiol Regul Integr Comp Physiol* 281 (4): R1243–1255. doi:10.1152/ajpregu.2001.281.4.R1243.
- Bird, K. D., T. Boleyn, G. B. Chesher, D. M. Jackson, G. A. Starmer, and Teo R. K. 1980. "Intercannabinoid and cannabnoid-ethanol interactions on human performance." *Psychopharmacology* 71: 181–188. doi:10.1007/BF00434409.
- Birnbaum, A. K., A. Karanam, S. E. Marino, C. M. Barkley, R. P. Remmel, M. Roslawski, M. Gramling-Aden, and I. E. Leppik. 2019. "Food effect on pharmacokinetics of cannabidiol oral capsules in adult patients with refractory epilepsy." *Epilepsia* 60 (8): 1586–1592. doi:10.1111/epi.16093.
- Bisogno, T., L. Hanus, L. De Petrocellis, S. Tchilibon, D. E. Pondevi, I. Brandi, A. S. Moriello, J. B. Davis, R. Mechoulam, and V. Di Marzo. 2001. "Molecular targets for cannabidiol and its synthetic analogues: Effect on vanilloid VR1 receptors and on the cellular uptake and enzymatic hydrolysis of anandamide." *Br J Pharmacol* 134 (4): 845–852. doi:10.1038/sj.bjp.0704327.
- Bitencourt, R. M., F. A. Pamplona, and R. N. Takahashi. 2008. "Facilitation of contextual fear memory extinction and anti-anxiogenic effects of AM404 and cannabidiol in conditioned rats." *Eur Neuropsychopharmacol* 18 (12): 849–859. doi:10.1016/j.euroneuro.2008.07.001.
- Blake, D. R., P. Robson, M. Ho, R. W. Jubb, and C. S. McCabe. 2006. "Preliminary assessment of the efficacy, tolerability and safety of a cannabis-based medicine (Sativex) in the treatment of pain caused by rheumatoid arthritis." *Rheumatology (Oxford)* 45 (1): 50–52. doi:10.1093/rheumatology/kei183.
- Blessing, E. M., M. M. Steenkamp, J. Manzanares, and C. R. Marmar. 2015. "Cannabidiol as a potential treatment for anxiety disorders." *Neurotherapeutics* 12 (4): 825–836. doi:10.1007/s13311-015-0387-x.
- Blier, P., G. Pineyro, M. el Mansari, R. Bergeron, and C. de Montigny. 1998. "Role of somatodendritic 5-HT autoreceptors in modulating 5-HT neurotransmission." *Annals of the New York Academy of Sciences* 861: 204–216. doi:10.1111/j.1749-6632.1998.tb10192.x.

- Blount, B. C., M. P. Karwowski, P. G. Shields, M. Morel-Espinosa, L. Valentin-Blasini, M. Gardner, M. Braselton, C. R. Brosius, K. T. Caron, D. Chambers, J. Corstvet, E. Cowan, V. R. De Jesus, P. Espinosa, C. Fernandez, C. Holder, Z. Kuklenyik, J. D. Kusovschi, C. Newman, G. B. Reis, J. Rees, C. Reese, L. Silva, T. Seyler, M. A. Song, C. Sosnoff, C. R. Spitzer, D. Tevis, L. Wang, C. Watson, M. D. Wewers, B. Xia, D. T. Heitkemper, I. Ghinai, J. Layden, P. Briss, B. A. King, L. J. Delaney, C. M. Jones, G. T. Baldwin, A. Patel, D. Meaney-Delman, D. Rose, V. Krishnasamy, J. R. Barr, J. Thomas, J. L. Pirkle, and Group Lung Injury Response Laboratory Working. 2020. "Vitamin E acetate in bronchoalveolar-lavage fluid associated with EVALI." *N Engl J Med* 382 (8): 697–705. doi:10.1056/NEJMoa1916433.
- Bluett, R. J., J. C. Gamble-George, D. J. Hermanson, N. D. Hartley, L. J. Marnett, and S. Patel. 2014. "Central anandamide deficiency predicts stress-induced anxiety: behavioral reversal through endocannabinoid augmentation." *Transl Psychiatry* 4 (7): e408. doi:10.1038/tp.2014.53.
- Boehnke, K. F., J. J. Gagnier, L. Matallana, and D. A. Williams. 2021. "Substituting cannabidiol for opioids and pain medications among individuals with fibromyalgia: A large online survey." *J Pain* 22 (11): 1418–1428. doi:10.1016/j.jpain.2021.04.011.
- Boggs, D. L., J. D. Nguyen, D. Morgenson, M. A. Taffe, and M. Ranganathan. 2018. "Clinical and preclinical evidence for functional interactions of cannabidiol and delta-(9)-tetrahydrocannabinol." *Neuropsychopharmacology* 43 (1): 142–154. doi:10.1038/npp.2017.209.
- Boggs, D. L., T. Surti, A. Gupta, S. Gupta, M. Niciu, B. Pittman, A. M. Schnakenberg Martin, H. Thurnauer, A. Davies, D. C. D'Souza, and M. Ranganathan. 2018. "The effects of cannabidiol (CBD) on cognition and symptoms in outpatients with chronic schizophrenia: A randomized placebo controlled trial." *Psychopharmacology (Berl)* 235 (7): 1923–1932. doi:10.1007/s00213-018-4885-9.
- Bolognini, D., E. M. Rock, N. L. Cluny, M. G. Cascio, C. L. Limebeer, M. Duncan, C. G. Stott, F. A. Javid, L. A. Parker, and R. G. Pertwee. 2013. "Cannabidiolic acid prevents vomiting in *Suncus murinus* and nausea-induced behaviour in rats by enhancing 5-HT1A receptor activation." *Br J Pharmacol* 168 (6): 1456–1470. doi:10.1111/bph.12043.
- Bolsoni, L. M., T. D. A. da Silva, S. M. Quintana, M. de Castro, J. A. Crippa, and A. W. Zuardi. 2019. "Changes in cortisol awakening response before and after development of posttraumatic stress disorder, which cannot be avoided with use of cannabidiol: A case report." *Perm J* 23:18.300. doi:10.7812/TPP/18.300.
- Bonn-Miller, M. O., S. L. Banks, and T. Sebree. 2017. "Conversion of cannabidiol following oral administration: Authors' response to Grotenhermen et al." *Cannabis Cannabinoid Res* 2 (1): 5–7. doi:10.1089/can.2016.0038.
- Bonn-Miller, M. O., M. J. E. Loflin, B. F. Thomas, J. P. Marcu, T. Hyke, and R. Vandrey. 2017. "Labeling accuracy of cannabidiol extracts sold online." *JAMA* 318 (17): 1708–1709. doi:10.1001/jama.2017.11909.
- Bonn-Miller, M. O., S. Sisley, P. Riggs, B. Yazar-Klosinski, J. B. Wang, M. J. E. Loflin, B. Shechet, C. Hennigan, R. Matthews, A. Emerson, and R. Doblin. 2021. "The short-term impact of 3 smoked cannabis preparations versus placebo on PTSD symptoms: A randomized cross-over clinical trial." *PLoS One* 16 (3): e0246990. doi:10.1371/journal.pone.0246990.
- Booker, L., P. S. Naidu, R. K. Razdan, A. Mahadevan, and A. H. Lichtman. 2009. "Evaluation of prevalent phytocannabinoids in the acetic acid model of visceral nociception." *Drug Alcohol Depend* 105 (1–2): 42–47. doi:10.1016/j.drugalcdep.2009.06.009.
- Bornheim, L. M., and M. A. Correia. 1989. "Effect of cannabidiol on cytochrome P-450 isozymes." *Biochem Pharmacol* 38 (17): 2789–2794. doi:10.1016/0006-2952(89)90432-2.
- Borrelli, F., G. Aviello, B. Romano, P. Orlando, R. Capasso, F. Maiello, F. Guadagno, S. Petrosino, F. Capasso, V. Di Marzo, and A. A. Izzo. 2009. "Cannabidiol, a safe and non-psychotropic ingredient of the marijuana plant *Cannabis sativa*, is protective in a murine model of colitis." *J Mol Med (Berl)* 87 (11): 1111–121. doi:10.1007/s00109-009-0512-x.

- Bourin, M., and M. Hascoet. 2003. "The mouse light/dark box test." *Eur J Pharmacol* 463 (1–3): 55–65. doi:10.1016/s0014-2999(03)01274-3.
- Bowe, A., and R. Rosenheck. 2015. "PTSD and substance use disorder among veterans: Characteristics, service utilization and pharmacotherapy." *Journal of Dual Diagnosis* 11 (1): 22–32. doi:10.1080/15504263.2014.989653.
- Bowers, M. E., and K. J. Ressler. 2015. "An overview of translationally informed treatments for posttraumatic stress disorder: Animal models of Pavlovian fear conditioning to human clinical trials." *Biol Psychiatry* 78 (5): E15–27. doi:10.1016/j.biopsych.2015.06.008.
- Braida, D., S. Pegorini, M. V. Arcidiacono, G. G. Consalez, L. Croci, and M. Sala. 2003. "Post-ischemic treatment with cannabidiol prevents electroencephalographic flattening, hyperlocomotion and neuronal injury in gerbils." *Neurosci Lett* 346 (1–2): 61–64. doi:10.1016/s0304-3940(03)00569-x.
- Breuer, A., C. G. Haj, M. V. Fogaca, F. V. Gomes, N. R. Silva, J. F. Pedrazzi, E. A. Del Bel, J. C. Hallak, J. A. Crippa, A. W. Zuardi, R. Mechoulam, and F. S. Guimaraes. 2016. "Fluorinated cannabidiol derivatives: Enhancement of activity in mice models predictive of anxiolytic, antidepressant and antipsychotic effects." *PLoS One* 11 (7): e0158779. doi:10.1371/journal.pone.0158779.
- Brierley, D. I., J. Samuels, M. Duncan, B. J. Whalley, and C. M. Williams. 2016. "Neuromotor tolerability and behavioural characterisation of cannabidiolic acid, a phytocannabinoid with therapeutic potential for anticipatory nausea." *Psychopharmacology (Berl)* 233 (2): 243–254. doi:10.1007/s00213-015-4100-1.
- Britch, S. C., S. Babalonis, and S. L. Walsh. 2021. "Cannabidiol: Pharmacology and therapeutic targets." *Psychopharmacology (Berl)* 238 (1): 9–28. doi:10.1007/s00213-020-05712-8.
- Britch, S., A. Goodman, J. Wiley, A. Pondelick, and R. Craft. 2020. "Antinociceptive and immune effects of delta-9-tetrahydrocannabinol or cannabidiol in male versus female rats with persistent inflammatory pain." *J Pharmacol Exp Ther* 373 (3): 416–428. doi:10.1124/jpet.119.263319.
- Britch, S. C., J. L. Wiley, Z. Yu, B. H. Clowers, and R. M. Craft. 2017. "Cannabidiol-delta(9)-tetrahydrocannabinol interactions on acute pain and locomotor activity." *Drug Alcohol Depend* 175: 187–197. doi:10.1016/j.drugalcdep.2017.01.046.
- Brown, J. D. 2020. "Cannabidiol as prophylaxis for SARS-CoV-2 and COVID-19? Unfounded claims versus potential risks of medications during the pandemic." *Research in Social and Administrative Pharmacy* 17 (1): 2053. doi:10.1016/j.sapharm.2020.03.020.
- Brunt, T. M., M. van Genugten, K. Honer-Snoeken, M. J. van de Velde, and R. J. Niesink. 2014. "Therapeutic satisfaction and subjective effects of different strains of pharmaceutical-grade cannabis." *J Clin Psychopharmacol* 34 (3): 344–349. doi:10.1097/JCP.0000000000000129.
- Calpe-López, C., M. P. García-Pardo, and M. A. Aguilar. 2019. "Cannabidiol treatment might promote resilience to cocaine and methamphetamine use disorders: A review of possible mechanisms." *Molecules* 24 (14): 2583. doi:10.3390/molecules24142583.
- Calpe-López, C., A. Gasparyan, F. Navarrete, J. Manzanares, J. Miñarro, and M. A. Aguilar. 2021. "Cannabidiol prevents priming- and stress-induced reinstatement of the conditioned place preference induced by cocaine in mice." *J Psychopharmacol* 35 (7): 864–874. doi:10.1177/0269881120965952.
- Campos, A. C., and F. S. Guimaraes. 2008. "Involvement of 5HT1A receptors in the anxiolytic-like effects of cannabidiol injected into the dorsolateral periaqueductal gray of rats." *Psychopharmacology (Berl)* 199 (2): 223–230. doi:10.1007/s00213-008-1168-x.
- Campos, A. C., and F. S. Guimaraes. 2009. "Evidence for a potential role for TRPV1 receptors in the dorsolateral periaqueductal gray in the attenuation of the anxiolytic effects of cannabinoids." *Prog Neuropsychopharmacol Biol Psychiatry* 33 (8): 1517–1521. doi:10.1016/j.pnpbp.2009.08.017.
- Capano, A., R. Weaver, and E. Burkman. 2020. "Evaluation of the effects of CBD hemp extract on opioid use and

- quality of life indicators in chronic pain patients: A prospective cohort study." *Postgrad Med* 132 (1): 56–61. doi :10.1080/00325481.2019.1685298.
- Careaga, M. B. L., C. E. N. Girardi, and D. Schecki. 2016. "Understanding posttraumatic stress disorder through fear conditioning, extinction and reconsolidation." *Neurosci Biobehav Rev* 71: 48–57. doi:10.1016/j.neubiorev.2016.08.023.
- Carlini, E. A., and J. M. Cunha. 1981. "Hypnotic and antiepileptic effects of cannabidiol." *J Clin Pharmacol* 21 (S1): 417S–427S. doi:10.1002/j.1552-4604.1981.tb02622.x.
- Casares, L., V. Garcia, M. Garrido-Rodriguez, E. Millan, J. A. Collado, A. Garcia-Martin, J. Penarando, M. A. Calzado, L. de la Vega, and E. Munoz. 2020. "Cannabidiol induces antioxidant pathways in keratinocytes by targeting BACH1." *Redox Biol* 28: 101321. doi:10.1016/j.redox.2019.101321.
- Casey, S. L., N. Atwal, and C. W. Vaughan. 2017. "Cannabis constituent synergy in a mouse neuropathic pain model." *Pain* 158 (12): 2452–2460. doi:10.1097/j.pain.0000000000001051.
- Ceprián, M., C. Vargas, L. García-Toscano, F. Penna, L. Jiménez-Sánchez, S. Achicallende, I. Elezgarai, P. Grandes, W. Hind, M. R. Pazos, and J. Martínez-Orgado. 2019. "Cannabidiol administration prevents hypoxia-ischemia-induced hypomyelination in newborn rats." *Front Pharmacol* 10: 1131. doi:10.3389/fphar.2019.01131.
- Chagas, M. H., J. A. Crippa, A. W. Zuardi, J. E. Hallak, J. P. Machado-de-Sousa, C. Hirotsu, L. Maia, S. Tufik, and M. L. Andersen. 2013. "Effects of acute systemic administration of cannabidiol on sleep-wake cycle in rats." *J Psychopharmacol* 27 (3): 312–316. doi:10.1177/0269881112474524.
- Chagas, M. H., A. L. Eckeli, A. W. Zuardi, M. A. Pena-Pereira, M. A. Sobreira-Neto, E. T. Sobreira, M. R. Camilo, M. M. Bergamaschi, C. H. Schenck, J. E. Hallak, V. Tumas, and J. A. Crippa. 2014. "Cannabidiol can improve complex sleep-related behaviours associated with rapid eye movement sleep behaviour disorder in Parkinson's disease patients: A case series." *J Clin Pharm Ther* 39 (5): 564–566. doi:10.1111/jcpt.12179.
- Chaves, Y. C., K. Genaro, J. A. Crippa, J. M. da Cunha, and J. M. Zanolini. 2021. "Cannabidiol induces antidepressant and anxiolytic-like effects in experimental type-1 diabetic animals by multiple sites of action." *Metab Brain Dis* 36 (4): 639–652. doi:10.1007/s11011-020-00667-3.
- Chaves, Y. C., K. Genaro, C. A. Stern, G. de Oliveira Guaita, J. A. de Souza Crippa, J. M. da Cunha, and J. M. Zanolini. 2020. "Two-weeks treatment with cannabidiol improves biophysical and behavioral deficits associated with experimental type-1 diabetes." *Neurosci Lett* 729: 135020. doi:10.1016/j.neulet.2020.135020.
- Chesher, G. B., C. J. Dahl, M. Everingham, D. M. Jackson, H. Marchant-Williams, and G. A. Starmer. 1973. "The effect of cannabinoids on intestinal motility and their antinociceptive effect in mice." *Br J Pharmacol* 49 (4): 588–594. doi:10.1111/j.1476-5381.1973.tb08534.x.
- Chesher, G. B., and D. M. Jackson. 1985. "The quasi-morphine withdrawal syndrome: Effect of cannabinol, cannabidiol and tetrahydrocannabinol." *Pharmacol Biochem Behav* 23 (1): 13–15. doi:10.1016/0091-3057(85)90122-4.
- Chesney, E., D. Oliver, A. Green, S. Sovi, J. Wilson, A. Englund, T. P. Freeman, and P. McGuire. 2020. "Adverse effects of cannabidiol: A systematic review and meta-analysis of randomized clinical trials." *Neuropsychopharmacology*. 45 (11): 1799–1806. doi:10.1038/s41386-020-0667-2.
- Chesney E, D. Oliver, P. McGuire. 2021 "Cannabidiol (CBD as a novel treatment in the early phases of psychosis." *Psychopharmacology*, online ahead of print. doi: 10.1007/s00213-021-05905-9.
- Cipriani, A., T. A. Furukawa, G. Salanti, A. Chaimani, L. Z. Atkinson, Y. Ogawa, S. Leucht, H. G. Ruhe, E. H. Turner, J. P. T. Higgins, M. Egger, N. Takeshima, Y. Hayasaka, H. Imai, K. Shinohara, A. Tajika, J. P. A. Ioannidis, and J. R. Geddes. 2018. "Comparative efficacy and acceptability of 21 antidepressant drugs for the acute treatment of adults with major depressive disorder: A systematic review and network meta-analysis." *Focus (Am Psychiatr Publ)* 16 (4): 420–429. doi:10.1176/appi.focus.16407.

- Cluny, N. L., R. J. Naylor, B. A. Whittle, and F. A. Javid. 2008. "The effects of cannabidiol and tetrahydrocannabinol on motion-induced emesis in *Suncus murinus*." *Basic Clin Pharmacol Toxicol* 103 (2): 150–156. doi:10.1111/j.1742-7843.2008.00253.x.
- Colasanti, B. K., C. Lindamood III, and C. R. Craig. 1982. "Effects of marihuana cannabinoids on seizure activity in cobalt-epileptic rats." *Pharmacol Biochem Behav* 16 (4): 573–578. doi:10.1016/0091-3057(82)90418-x.
- Coles, M., G. Watt, F. Kreilaus, and T. Karl. 2020. "Medium-dose chronic cannabidiol treatment reverses object recognition memory deficits of APP Swe /PS1DeltaE9 transgenic female mice." *Front Pharmacol* 11: 587604. doi:10.3389/fphar.2020.587604.
- Collin, C., E. Ehler, G. Waberzinek, Z. Alsindi, P. Davies, K. Powell, W. Notcutt, C. O'Leary, S. Ratcliffe, I. Novakova, O. Zapletalova, J. Pikova, and Z. Ambler. 2010. "A double-blind, randomized, placebo-controlled, parallel-group study of Sativex, in subjects with symptoms of spasticity due to multiple sclerosis." *Neurol Res* 32 (5): 451–459. doi:10.1179/016164109X12590518685660.
- Comelli, F., G. Giagnoni, I. Bettoni, M. Colleoni, and B. Costa. 2008. "Antihyperalgesic effect of a *Cannabis sativa* extract in a rat model of neuropathic pain: Mechanisms involved." *Phytother Res* 22 (8): 1017–1024. doi:10.1002/ptr.2401.
- Consroe, P., E. A. Carlini, A. P. Zwicker, and L. A. Lacerda. 1979. "Interaction of cannabidiol and alcohol in humans." *Psychopharmacology (Berl)* 66 (1): 45–50. doi:10.1007/bf00431988.
- Consroe, P., J. Laguna, J. Allender, S. Snider, L. Stern, R. Sandyk, K. Kennedy, and K. Schram. 1991. "Controlled clinical trial of cannabidiol in Huntington's disease." *Pharmacol Biochem Behav* 40 (3): 701–708. doi:10.1016/0091-3057(91)90386-g.
- Cordova, T., D. Ayalon, N. Lander, R. Mechoulam, I. Nir, M Puder, and H. R. Lindner. 1980. "The ovulation blocking effect of cannabinoids: Structure-activity relationships." *Psychoneuroendocrinology* 5: 53–62. doi:10.1016/0306-4530(80)90009-8.
- Corroon, J., and J. A. Phillips. 2018. "A cross-sectional study of cannabidiol users." *Cannabis Cannabinoid Res* 3 (1):152–161. doi:10.1089/can.2018.0006.
- Costa, B., M. Colleoni, S. Conti, D. Parolari, C. Franke, A. E. Trovato, and G. Giagnoni. 2004. "Oral anti-inflammatory activity of cannabidiol, a non-psychoactive constituent of cannabis, in acute carrageenan-induced inflammation in the rat paw." *Naunyn Schmiedebergs Arch Pharmacol* 369 (3): 294–299. doi:10.1007/s00210-004-0871-3.
- Costa, B., G. Giagnoni, C. Franke, A. E. Trovato, and M. Colleoni. 2004. "Vanilloid TRPV1 receptor mediates the antihyperalgesic effect of the nonpsychoactive cannabinoid, cannabidiol, in a rat model of acute inflammation." *Br J Pharmacol* 143 (2): 247–250. doi:10.1038/sj.bjp.0705920.
- Costa, B., A. E. Trovato, F. Comelli, G. Giagnoni, and M. Colleoni. 2007. "The non-psychoactive cannabis constituent cannabidiol is an orally effective therapeutic agent in rat chronic inflammatory and neuropathic pain." *Eur J Pharmacol* 556 (1–3): 75–83. doi:10.1016/j.ejphar.2006.11.006.
- Costiniuk, C. T., and M. A. Jenabian. 2020. "Acute inflammation and pathogenesis of SARS-CoV-2 infection: Cannabidiol as a potential anti-inflammatory treatment?" *Cytokine Growth Factor Rev.* 53: 63–65. doi:10.1016/j.cytofr.2020.05.008.
- Costiniuk, C. T., Z. Saneei, J. P. Routy, S. Margolese, E. Mandarino, J. Singer, B. Lebouche, J. Cox, J. Szabo, M. J. Brouillette, M. B. Klein, N. Chomont, and M. A. Jenabian. 2019. "Oral cannabinoids in people living with HIV on effective antiretroviral therapy: CTN PT028-study protocol for a pilot randomised trial to assess safety, tolerability and effect on immune activation." *BMJ Open* 9 (1): e024793. doi:10.1136/bmjopen-2018-024793.
- Couch, D. G., H. Cook, C. Ortori, D. Barrett, J. N. Lund, and S. E. O'Sullivan. 2019. "Palmitoylethanolamide and cannabidiol prevent inflammation-induced hyperpermeability of the human gut in vitro and in vivo:

- A randomized, placebo-controlled, double-blind controlled trial.” *Inflamm Bowel Dis* 25 (6): 1006–1018. doi:10.1093/ibd/izz017.
- Couch, D. G., C. Tasker, E. Theophilidou, J. N. Lund, and S. E. O’Sullivan. 2017. “Cannabidiol and palmitoylethanolamide are anti-inflammatory in the acutely inflamed human colon.” *Clin Sci (Lond)* 131 (21): 2611–2626. doi:10.1042/CS20171288.
- Cousens, K., and A. DiMascio. 1973. “(–) Delta 9 THC as an hypnotic. An experimental study of three dose levels.” *Psychopharmacologia* 33 (4): 355–464. doi:10.1007/bf00437513.
- Crawley, J., and F. K. Goodwin. 1980. “Preliminary report of a simple animal behavior model for the anxiolytic effects of benzodiazepines.” *Pharmacol Biochem Behav* 13 (2): 167–170. doi:10.1016/0091-3057(80)90067-2.
- Crippa, J. A., G. N. Derenussun, T. B. Ferrari, L. Wichert-Ana, F. L. Duran, R. Martin-Santos, M. V. Simoes, S. Bhattacharyya, P. Fusar-Poli, Z. Atakan, A. Santos Filho, M. C. Freitas-Ferrari, P. K. McGuire, A. W. Zuardi, G. F. Busatto, and J. E. Hallak. 2011. “Neural basis of anxiolytic effects of cannabidiol (CBD) in generalized social anxiety disorder: A preliminary report.” *J Psychopharmacol* 25 (1): 121–130. doi:10.1177/0269881110379283.
- Crippa, J. A., J. E. Hallak, J. P. Machado-de-Sousa, R. H. Queiroz, M. Bergamaschi, M. H. Chagas, and A. W. Zuardi. 2013. “Cannabidiol for the treatment of cannabis withdrawal syndrome: A case report.” *J Clin Pharm Ther* 38 (2): 162–164. doi:10.1111/jcpt.12018.
- Crippa, J. A. S., A. W. Zuardi, F. S. Guimarães, A. C. Campos, F. de Lima Osório, S. R. Loureiro, R. G. Dos Santos, J. D. S. Souza, J. M. Ushirohira, J. C. Pacheco, R. R. Ferreira, K. C. Mancini Costa, D. S. Scomparin, F. F. Scarante, I. Pires-Dos-Santos, R. Mechoulam, F. Kapczinski, B. A. L. Fonseca, D. L. A. Esposito, K. Pereira-Lima, S. Sen, M. H. Andraus, and J. E. C. Hallak. 2021. “Efficacy and safety of cannabidiol plus standard care vs standard care alone for the treatment of emotional exhaustion and burnout among frontline health care workers during the COVID-19 pandemic: A randomized clinical trial.” *JAMA Netw Open* 4 (8): e2120603. doi:10.1001/jamanetworkopen.2021.20603.
- Crippa, J. A., A. W. Zuardi, G. E. Garrido, L. Wichert-Ana, R. Guarneri, L. Ferrari, P. M. Azevedo-Marques, J. E. Hallak, P. K. McGuire, and G. Filho Busatto. 2004. “Effects of cannabidiol (CBD) on regional cerebral blood flow.” *Neuropsychopharmacology* 29 (2): 417–426. doi:10.1038/sj.npp.1300340.
- Crippa, J. A. S., A. W. Zuardi, J. E. C. Hallak, S. A. Miyazawa, S. A. Bernardo, C. M. Donaduzzi, S. Guzzi, W. A. J. Favreto, A. Campos, M. E. C. Queiroz, F. S. Guimarães, P. M. da Rosa Zimmermann, L. M. Rechia, V. Jose Tondo Filho, and L Brum Junior. 2020. “Oral cannabidiol does not convert to delta-8-THC or delta-9-THC in humans: A pharmacokinetic study in healthy subjects.” *Cannabis Cannabinoid Res* 5 (5): 89–98. doi:10.1089/can.2019.0024.
- Crippa, J. A., A. W. Zuardi, R. Martin-Santos, S. Bhattacharyya, Z. Atakan, P. McGuire, and P. Fusar-Poli. 2009. “Cannabis and anxiety: A critical review of the evidence.” *Hum Psychopharmacol* 24 (7): 515–523. doi:10.1002/hup.1048.
- Criscuolo, E., M. DeSciscio, F. Fezza, and M. Marrarrone. 2020. “In silico and in vitro analysis of major cannabis-derived compounds as fatty acid amide hydrolase inhibitors.” *Molecules (Basel, Switzerland)* 26 (1): 48. doi:10.3390/molecules26010048.
- Crockett, J., D. Critchley, B. Tayo, J. Berwaerts, and G. Morrison. 2020. “A phase 1, randomized, pharmacokinetic trial of the effect of different meal compositions, whole milk, and alcohol on cannabidiol exposure and safety in healthy subjects.” *Epilepsia* 61 (2): 267–277. doi:10.1111/epi.16419.
- Cunetti, L., L. Manzo, R. Peyraube, J. Arnaiz, L. Curi, and S. Orihuela. 2018. “Chronic pain treatment with cannabidiol in kidney transplant patients in Uruguay.” *Transplant Proc* 50 (2): 461–464. doi:10.1016/j.transproceed.2017.12.042.

- Cunha, J. M., E. A. Carlini, A. E. Pereira, O. L. Ramos, C. Pimentel, R. Gagliardi, W. L. Sanvito, N. Lander, and R. Mechoulam. 1980. "Chronic administration of cannabidiol to healthy volunteers and epileptic patients." *Pharmacology* 21 (3): 175–185. doi:10.1159/000137430.
- Cuttler, C., E. M. LaFrance, and R. M. Craft. 2020. "A large-scale naturalistic examination of the acute effects of cannabis on pain." *Cannabis Cannabinoid Res.* Online ahead of print. doi:10.1089/can.2020.0068.
- Cuttler, C., E. M. LaFrance, and A. Stueber. 2021. "Acute effects of high-potency cannabis flower and cannabis concentrates on everyday life memory and decision making." *Scientific Reports* 11:13784. https://doi.org/10.1038/s41598-021-93198-5
- D'Souza, D. C., E. Perry, L. MacDougall, Y. Ammerman, T. Cooper, Y. T. Wu, G. Braley, R. Gueorguieva, and J. H. Krystal. 2004. "The psychotomimetic effects of intravenous delta-9-tetrahydrocannabinol in healthy individuals: Implications for psychosis." *Neuropsychopharmacology* 29 (8): 1558–1572. doi:10.1038/sj.npp.1300496.
- Dall'Stella, P. B., M. F. L. Docema, M. V. C. Maldaun, O. Feher, and C. L. P. Lancellotti. 2019. "Case report: Clinical outcome and image response of two patients with secondary high-grade glioma treated with chemoradiation, PCV, and cannabidiol." *Frontiers in Oncology* 8: 643. doi:10.3389/fonc.2018.00643.
- Dalton, W. S., R. Martz, L. Lemberger, B. E. Rodda, and R. B. Forney. 1976. "Influence of cannabidiol on delta-9-tetrahydrocannabinol effects." *Clin Pharmacol Ther* 19 (3): 300–309. doi:10.1002/cpt1976193300.
- Das, R. K., S. K. Kamboj, M. Ramadas, K. Yogan, V. Gupta, E. Redman, H. V. Curran, and C. J. Morgan. 2013. "Cannabidiol enhances consolidation of explicit fear extinction in humans." *Psychopharmacology (Berl)* 226 (4): 781–792. doi:10.1007/s00213-012-2955-y.
- Davies, C., and S. Bhattacharyya. 2019. "Cannabidiol as a potential treatment for psychosis." *Ther Adv Psychopharmacol* 9: 2045125319881916. doi:10.1177/2045125319881916.
- de Almeida, C. M. O., M. M. C. Brito, N. B. Bosaipo, A. V. Pimentel, V. Tumas, A. W. Zuardi, J. A. S. Crippa, J. E. C. Hallak, and A. L. Eckeli. 2021. "Cannabidiol for rapid eye movement sleep behavior disorder." *Mov Disord.* 36 (7): 1711–1715. doi:10.1002/mds.28577.
- de Faria, S. M., D. de Moraes Fabricio, V. Tumas, P. C. Castro, M. A. Ponti, J. E. Hallak, A. W. Zuardi, J. A. S. Crippa, and M. H. N. Chagas. 2020. "Effects of acute cannabidiol administration on anxiety and tremors induced by a simulated public speaking test in patients with Parkinson's disease." *J Psychopharmacol* 34 (2): 189–196. doi:10.1177/0269881119895536.
- De Filippis, D., G. Esposito, C. Cirillo, M. Cipriano, B. Y. De Winter, C. Scuderi, G. Sarnelli, R. Cuomo, L. Steardo, J. G. De Man, and T. Iuvone. 2011. "Cannabidiol reduces intestinal inflammation through the control of neuroimmune axis." *PLoS One* 6 (12): e28159. doi:10.1371/journal.pone.0028159.
- De Gregorio, D., R. J. McLaughlin, L. Posa, R. Ochoa-Sanchez, J. Enns, M. Lopez-Canul, M. Aboud, S. Maione, S. Comai, and G. Gobbi. 2019. "Cannabidiol modulates serotonergic transmission and reverses both allodynia and anxiety-like behavior in a model of neuropathic pain." *Pain* 160 (1): 136–150. doi:10.1097/j.pain.0000000000001386.
- De Petrocellis, L. P. Orlando, A. S. Moriello, G. Aviello, C. Stott, A. A. Izzo, and V. Di Marzo. 2012. "Cannabinoid actions at TRPV channels: Effects on TRPV3 and TRPV4 and their potential relevance to gastrointestinal inflammation." *Acta Physiol (Oxf)* 204 (2): 255–266. doi:10.1111/j.1748-1716.2011.02338.x.
- De Ternay, J., M. Naassila, M. Nourredine, A. Louvet, F. Bailly, G. Sescoisse, P. Maurage, O. Cottencin, P. M. Carrieri, and B. Rolland. 2019. "Therapeutic prospects of cannabidiol for alcohol use disorder and alcohol-related damages on the liver and the brain." *Front Pharmacol* 10: 627. doi:10.3389/fphar.2019.00627.
- DeJesus, E., B. M. Rodwick, D. Bowers, C. J. Cohen, and D. Pearce. 2007. "Use of dronabinol improves appetite and reverses weight loss in HIV/AIDS-INFECTED PATIENTs." *J Int Assoc Physicians AIDS Care (Chic)* 6 (2): 95–100. doi:10.1177/1545109707300157.

- Devane, W. A., L. Hanus, A. Breuer, R. G. Pertwee, L. A. Stevenson, G. Griffin, D. Gibson, A. Mandelbaum, A. Etinger, and R. Mechoulam. 1992. "Isolation and structure of a brain constituent that binds to the cannabinoid receptor." *Science* 258 (5090): 1946–1949. doi:10.1126/science.1470919.
- Devinsky, O., M. R. Cilio, H. Cross, J. Fernandez-Ruiz, J. French, C. Hill, R. Katz, V. Di Marzo, D. Jutras-Aswad, W. G. Notcutt, J. Martinez-Orgado, P. J. Robson, B. G. Rohrback, E. Thiele, B. Whalley, and D. Friedman. 2014. "Cannabidiol: Pharmacology and potential therapeutic role in epilepsy and other neuropsychiatric disorders." *Epilepsia* 55 (6): 791–802. doi:10.1111/epi.12631.
- Devinsky, O., J. H. Cross, L. Laux, E. Marsh, I. Miller, R. Nabuiss, I. E. Scheffer, E. A. Thiele, S. Wright, and Group Cannabidiol in Dravet Syndrome Study. 2017. "Trial of cannabidiol for drug-resistant seizures in the Dravet syndrome." *N Engl J Med* 376 (21): 2011–2020. doi:10.1056/NEJMoa1611618.
- Devinsky, O., E. Marsh, D. Friedman, E. Thiele, L. Laux, J. Sullivan, I. Miller, R. Flaminii, A. Wilfong, F. Filloux, M. Wong, N. Tilton, P. Bruno, J. Bluvstein, J. Hedlund, R. Kamens, J. Maclean, S. Nangia, N. S. Singhal, C. A. Wilson, A. Patel, and M. R. Cilio. 2016. "Cannabidiol in patients with treatment-resistant epilepsy: An open-label interventional trial." *Lancet Neurol* 15 (3): 270–278. doi:10.1016/S1474-4422(15)00379-8.
- Devinsky, O., A. D. Patel, J. H. Cross, V. Villanueva, E. C. Wirrell, M. Privitera, S. M. Greenwood, C. Roberts, D. Checkett, K. E. VanLandingham, and S. M. Zuberi. 2018. "Effect of cannabidiol on drop seizures in the Lennox-Gastaut syndrome." *N Engl J Med* 378 (20): 1888–1897. doi:10.1056/NEJMoa1714631.
- Devinsky, O., A. D. Patel, J. H. Cross, V. Villanueva, E. C. Wirrell, M. Privitera, S. M. Greenwood, C. Roberts, D. Checkett, K. E. VanLandingham, S. M. Zuberi, and Gwpcare Study Group. 2018. "Effect of cannabidiol on drop seizures in the Lennox-Gastaut syndrome." *N Engl J Med* 378 (20): 1888–1897. doi:10.1056/NEJMoa1714631.
- Devinsky, O., A. D. Patel, E. A. Thiele, M. H. Wong, R. Appleton, C. L. Harden, S. Greenwood, G. Morrison, K. Sommerville, and Gwpcare Part A Study Group. 2018. "Randomized, dose-ranging safety trial of cannabidiol in Dravet syndrome." *Neurology* 90 (14): e1204–e1211. doi:10.1212/WNL.0000000000005254.
- De Vita, M. J., S. A. Maisto, C. E. Gilmour, L. McGuire, E. Tarvin, and D. Moskal. 2021. "The effects of cannabidiol and analgesic expectancies on experimental pain reactivity in healthy adults: A balanced placebo design trial." *Exp Clin Psychopharmacol* doi:10.1037/ph0000465.
- DeVuono, M. V., O. La Caprara, G. N. Petrie, C. L. Limebeer, E. M. Rock, M. N. Hill, and L. A. Parker. 2020. "Cannabidiol interferes with establishment of $\Delta 9$ -tetrahydrocannabinol-induced nausea through a 5-HT 1A mechanism." *Cannabis and Cannabinoid Research*. Online ahead of print. doi:10.1089/can.2020.0083.
- DeVuono, M. V., and L. A. Parker. 2020. "Cannabinoid hyperemesis syndrome: A review of potential mechanisms." *Cannabis and Cannabinoid Research*. 5 (2): 132–144. doi:10.1089/can.2019.0059.
- Dezieck, L., Z. Hafez, A. Conicella, E. Blohm, M. J. O'Connor, E. S. Schwarz, and M. E. Mullins. 2017. "Resolution of cannabis hyperemesis syndrome with topical capsaicin in the emergency department: A case series." *Clinical Toxicology* 55 (8): 908–913. doi:10.1080/15563650.2017.1324166.
- Di Forti, M., C. Morgan, P. Dazzan, C. Pariante, V. Mondelli, T. R. Marques, R. Handley, S. Luzi, M. Russo, A. Paparelli, A. Butt, S. A. Stilo, B. Wiffen, J. Powell, and R. M. Murray. 2009. "High-potency cannabis and the risk of psychosis." *Br J Psychiatry* 195 (6): 488–491. doi:10.1192/bjp.bp.109.064220.
- di Giacomo, V., A. Chiavaroli, G. Orlando, A. Cataldi, M. Rapino, V. Di Valerio, S. Leone, L. Brunetti, L. Menghini, L. Recinella, and C. Ferrante. 2020. "Neuroprotective and neuromodulatory effects induced by cannabidiol and cannabigerol in rat hypo-E22 cells and isolated hypothalamus." *Antioxidants (Basel)* 9 (1): 71. doi:10.3390/antiox9010071.
- Do Monte, F. H., R. R. Souza, R. M. Bitencourt, J. A. Kroon, and R. N. Takahashi. 2013. "Infusion of cannabidiol into infralimbic cortex facilitates fear extinction via CB1 receptors." *Behav Brain Res* 250: 23–27. doi:10.1016/j.bbr.2013.04.045.

- Duran, M., E. Perez, S. Abanades, X. Vidal, C. Saura, M. Majem, E. Arriola, M. Rabanal, A. Pastor, M. Farre, N. Rams, J. R. Laporte, and D. Capella. 2010. "Preliminary efficacy and safety of an oromucosal standardized cannabis extract in chemotherapy-induced nausea and vomiting." *Br J Clin Pharmacol* 70 (5): 656–663. doi:10.1111/j.1365–2125.2010.03743.x.
- Durst, R., H. Danenberg, R. Gallily, R. Mechoulam, K. Meir, E. Grad, R. Beeri, T. Pugatsch, E. Tarshish, and C. Lotan. 2007. "Cannabidiol, a nonpsychoactive cannabis constituent, protects against myocardial ischemic reperfusion injury." *Am J Physiol Heart Circ Physiol* 293 (6): H3602–607. doi:10.1152/ajpheart.00098.2007.
- Edery, H., Y. Grunfeld, G. Porath, Z. Ben-Zvi, A. Shani, and R. Mechoulam. 1972. "Structure-activity relationships in the tetrahydrocannabinol series. Modifications on the aromatic ring and in the side-chain." *Arzneimittelforschung* 22 (11): 1995–2003.
- El-Alfy, A. T., K. Ivey, K. Robinson, S. Ahmed, M. Radwan, D. Slade, I. Khan, M. ElSohly, and S. Ross. 2010. "Antidepressant-like effect of delta9-tetrahydrocannabinol and other cannabinoids isolated from *Cannabis sativa L.*" *Pharmacol Biochem Behav* 95 (4): 434–442. doi:10.1016/j.pbb.2010.03.004.
- Elms, L., S. Shannon, S. Hughes, and N. Lewis. 2019. "Cannabidiol in the treatment of post-traumatic stress disorder: A case series." *J Altern Complement Med* 25 (4): 392–397. doi:10.1089/acm.2018.0437.
- ElSohly, M. A., S. Chandra, M. Radwan, C. G. Majumdar, and J. C. Church. 2021. "A comprehensive review of cannabis potency in the United States in the last decade." *Biol Psychiatry Cogn Neurosci Neuroimaging*. 6 (6): 603–606. doi:10.1016/j.bpsc.2020.12.016.
- ElSohly, M. A., Z. Mehmedic, S. Foster, C. Gon, S. Chandra, and J. C. Church. 2016. "Changes in cannabis potency over the last 2 decades (1995–2014): Analysis of current data in the United States." *Biol Psychiatry* 79 (7): 613–619. doi:10.1016/j.biopsych.2016.01.004.
- ElSohly, M., and W. Gul. 2014. "Constituents of *Cannabis sativa*." In *Handbook of Cannabis*, edited by Roger G. Pertwee, 3–22. Oxford: Oxford University Press.
- Englund, A., T. P. Freeman, R. M. Murray, and P. McGuire. 2017. "Can we make cannabis safer?" *Lancet Psychiatry* 4 (8): 643–648. doi:10.1016/S2215–0366(17)30075–5.
- Englund, A., P. D. Morrison, J. Nottage, D. Hague, F. Kane, S. Bonaccorso, J. M. Stone, A. Reichenberg, R. Brenneisen, D. Holt, A. Feilding, L. Walker, R. M. Murray, and S. Kapur. 2013. "Cannabidiol inhibits THC-elicited paranoid symptoms and hippocampal-dependent memory impairment." *J Psychopharmacol* 27 (1): 19–27. doi:10.1177/0269881112460109.
- Eskander, J. P., J. Spall, A. Spall, R. V. Shah, and A. D. Kaye. 2020. "Cannabidiol (CBD) as a treatment of acute and chronic back pain: A case series and literature review." *J Opioid Manag* 16 (3): 215–218. doi:10.5055/jom.2020.0570.
- Evans, M. A., R. Martz, B. E. Rodda, L. Lemberger, and R. B. Forney. 1976. "Effects of marihuana-dextroamphetamine combination." *Clin Pharmacol Ther* 20 (3): 350–358. doi:10.1002/cpt1976203350.
- Fallon, M. T., E. Albert Lux, R. McQuade, S. Rossetti, R. Sanchez, W. Sun, S. Wright, A. H. Lichtman, and E. Kornyejyeva. 2017. "Sativex oromucosal spray as adjunctive therapy in advanced cancer patients with chronic pain unalleviated by optimized opioid therapy: Two double-blind, randomized, placebo-controlled phase 3 studies." *Br J Pain* 11 (3): 119–133. doi:10.1177/2049463717710042.
- Farrimond, J. A., B. J. Whalley, and C. M. Williams. 2012. "Cannabinol and cannabidiol exert opposing effects on rat feeding patterns." *Psychopharmacology (Berl)* 223 (1): 117–129. doi:10.1007/s00213-012-2697-x.
- Feng, Y., F. Chen, T. Yin, Q. Xia, Y. Liu, G. Huang, J. Zhang, R. Oyen, and Y. Ni. 2015. "Pharmacologic effects of cannabidiol on acute reperfused myocardial infarction in rabbits: Evaluated with 3.0T cardiac magnetic resonance imaging and histopathology." *J Cardiovasc Pharmacol* 66 (4): 354–363. doi:10.1097/FJC.0000000000000287.
- Fernández-Ruiz, J., E. de Lago, M. G. ómez-Ruiz, C. García, O. Sagredo, and M. García-Arencibia. 2014.

- “Neurodegenerative disorders other than multiple sclerosis.” In *Handbook of Cannabis*, edited by Roger G. Pertwee, 505–525. Oxford: Oxford University Press.
- Ferre, L., A. Nuara, G. Pavan, M. Radaelli, L. Moiola, M. Rodegher, B. Colombo, I. J. Keller Sarmiento, V. Martinelli, L. Leocani, F. Martinelli Boneschi, G. Comi, and F. Esposito. 2016. “Efficacy and safety of nabiximols (Sativex) on multiple sclerosis spasticity in a real-life Italian monocentric study.” *Neurol Sci* 37 (2): 235–242. doi:10.1007/s10072-015-2392-x.
- Finn, D. P., S. R. Beckett, C. H. Roe, A. Madjd, K. C. Fone, D. A. Kendall, C. A. Marsden, and V. Chapman. 2004. “Effects of coadministration of cannabinoids and morphine on nociceptive behaviour, brain monoamines and HPA axis activity in a rat model of persistent pain.” *Eur J Neurosci* 19 (3): 678–686. doi:10.1111/j.0953-816x.2004.03177.x.
- Flachenecker, P., T. Henze, and U. K. Zettl. 2014. “Nabiximols (THC/CBD oromucosal spray, Sativex®) in clinical practice—results of a multicenter, non-interventional study (MOVE 2) in patients with multiple sclerosis spasticity.” *Eur Neurol* 71 (5–6): 271–279. doi:10.1159/000357427.
- Florensa-Zanuy, E., E. Garro-Martínez, A. Adell, E. Castro, Á. Díaz, Á. Pazos, K. S. Mac-Dowell, D. Martín-Hernández, and F. Pilar-Cuéllar. 2021. “Cannabidiol antidepressant-like effect in the lipopolysaccharide model in mice: Modulation of inflammatory pathways.” *Biochem Pharmacol* 185: 114433. doi:10.1016/j.bcp.2021.114433.
- Fogaca, M. V., F. M. Reis, A. C. Campos, and F. S. Guimaraes. 2014. “Effects of intra-prelimbic prefrontal cortex injection of cannabidiol on anxiety-like behavior: Involvement of 5HT1A receptors and previous stressful experience.” *Eur Neuropsychopharmacol* 24 (3): 410–419. doi:10.1016/j.euroneuro.2013.10.012.
- Forget, B., K. M. Coen, and B. LeFoll. 2009. “Inhibition of fatty acid amide hydrolase reduces reinstatement of nicotine seeking but not break point for nicotine self-administration—comparison with CB1 receptor blockade.” *Psychopharmacology* 205 (4): 613–624. doi:10.1007/s00213-009-1569-5.
- Formukong, E. A., A. T. Evans, and F. J. Evans. 1988. “Analgesic and antiinflammatory activity of constituents of *Cannabis sativa L.*” *Inflammation* 12 (4): 361–371. doi:10.1007/bf00915771.
- Foss, J. D., D. J. Farkas, L. M. Huynh, W. A. Kinney, D. E. Brenneman, and S. J. Ward. 2021. “Behavioural and pharmacological effects of cannabidiol (CBD) and the cannabidiol analogue KLS-13019 in mouse models of pain and reinforcement.” *Br J Pharmacol* 178 (15): 3067–3078. doi:10.1111/bph.15486.
- Fouad, A. A., A. S. Al-Mulhim, and W. Gomaa. 2013. “Protective effect of cannabidiol against cadmium hepatotoxicity in rats.” *J Trace Elem Med Biol* 27 (4): 355–363. doi:10.1016/j.jtemb.2013.07.001.
- Freeman, A. M., K. Petrilli, R. Lees, C. Hindocha, C. Mokrysz, H. V. Curran, R. Saunders, and T. P. Freeman. 2019. “How does cannabidiol (CBD) influence the acute effects of delta-9-tetrahydrocannabinol (THC) in humans? A systematic review.” *Neurosci Biobehav Rev* 107: 696–712. doi:10.1016/j.neubiorev.2019.09.036.
- Freeman, T. P., R. A. Pope, M. B. Wall, J. A. Bisby, M. Luijten, C. Hindocha, C. Mokrysz, W. Lawn, A. Moss, M. A. P. Bloomfield, C. J. A. Morgan, D. J. Nutt, and H. V. Curran. 2018. “Cannabis dampens the effects of music in brain regions sensitive to reward and emotion.” *Int J Neuropsychopharmacol* 21 (1): 21–32. doi:10.1093/ijnp/pyx082.
- French, E. D., K. Dillon, and X. Wu. 1997. “Cannabinoids excite dopamine neurons in the ventral tegmentum and substantia nigra.” *Neuroreport* 8 (3): 649–652. doi:10.1097/00001756-199702100-00014.
- Fride, E., C. Feigin, D. E. Ponde, A. Breuer, L. Hanus, N. Arshavsky, and R. Mechoulam. 2004. “(+)-Cannabidiol analogues which bind cannabinoid receptors but exert peripheral activity only.” *Eur J Pharmacol* 506 (2): 179–188. doi:10.1016/j.ejphar.2004.10.049.
- Friedman, D., J. A. French, and M. Maccarrone. 2019. “Safety, efficacy, and mechanisms of action of cannabinoids in neurological disorders.” *Lancet Neurol* 18 (5): 504–512. doi:10.1016/S1474-4422(19)30032-8.
- Fu, B., X. Xu, and H. Wei. 2020. “Why tocilizumab could be an effective treatment for severe COVID-19?”

- Journal of Translational Medicine* 18 (1): 164. doi:10.1186/s12967-020-02339-3.
- Fusar-Poli, P., P. Allen, S. Bhattacharyya, J. A. Crippa, A. Mechelli, S. Borgwardt, R. Martin-Santos, M. L. Seal, C. O'Carrol, Z. Atakan, A. W. Zuardi, and P. McGuire. 2010. "Modulation of effective connectivity during emotional processing by delta 9-tetrahydrocannabinol and cannabidiol." *Int J Neuropsychopharmacol* 13 (4): 421–432. doi:10.1017/S1461145709990617.
- Fusar-Poli, P., J. A. Crippa, S. Bhattacharyya, S. J. Borgwardt, P. Allen, R. Martin-Santos, M. Seal, S. A. Surguladze, C. O'Carrol, Z. Atakan, A. W. Zuardi, and P. K. McGuire. 2009. "Distinct effects of {delta}9-tetrahydrocannabinol and cannabidiol on neural activation during emotional processing." *Arch Gen Psychiatry* 66 (1): 95–105. doi:10.1001/archgenpsychiatry.2008.519.
- Galaj, E., G. H. Bi, H. J. Yang, and Z. X. Xi. 2020. "Cannabidiol attenuates the rewarding effects of cocaine in rats by CB2, 5-HT1A and TRPV1 receptor mechanisms." *Neuropharmacology* 167: 107740. doi:10.1016/j.neuropharm.2019.107740.
- Gallily, R., T. Even-Chena, G. Katzavian, D. Lehmann, A. Dagan, and R. Mechoulam. 2003. "Gamma-irradiation enhances apoptosis induced by cannabidiol, a non-psychotropic cannabinoid, in cultured HL-60 myeloblastic leukemia cells." *Leuk Lymphoma* 44 (10): 1767–173. doi:10.1080/1042819031000103917.
- Gamble, L. J., J. M. Boesch, C. W. Frye, W. S. Schwark, S. Mann, L. Wolfe, H. Brown, E. S. Berthelsen, and J. J. Wakshlag. 2018. "Pharmacokinetics, safety, and clinical efficacy of cannabidiol treatment in osteoarthritic dogs." *Front Vet Sci* 5: 165. doi:10.3389/fvets.2018.00165.
- Gaoni, Y., and R. Mechoulam. 1964. "Hashish. III. Isolation, structure, and partial synthesis of an active constituent of hashish." *Journal of the American Chemical Society* 86: 1646–1647.
- Gaoni, Y., and R. Mechoulam. 1966a. "The isomerization of cannabidiol to tetrahydrocannabinols." *Tetrahedron* 22: 1481–1488.
- Gaoni, Y., and R. Mechoulam. 1966b. "Concerning the isomerization of delta1 to delta6-tetrahydrocannabinol." *J Amer Chem Soc* 88: 5673–5675. doi:10.1089/can.2019.0024.
- Gaston, T. E., E. M. Bebin, G. R. Cutter, S. B. Ampah, Y. Liu, L. P. Grayson, J. P. Szaflarski, and UAB CBD Program. 2019. "Drug-drug interactions with cannabidiol (CBD) appear to have no effect on treatment response in an open-label expanded access program." *Epilepsy Behav* 98 (Pt. A): 201–206. doi:10.1016/j.yebeh.2019.07.008.
- Gaston, T. E., E. M. Bebin, G. R. Cutter, Y. Liu, J. P. Szaflarski, and UAB CBD Program. 2017. "Interactions between cannabidiol and commonly used antiepileptic drugs." *Epilepsia* 58 (9): 1586–1592. doi:10.1111/epi.13852.
- Geffrey, A. L., S. F. Pollack, P. L. Bruno, and E. A. Thiele. 2015. "Drug-drug interaction between clobazam and cannabidiol in children with refractory epilepsy." *Epilepsia* 56 (8): 1246–1251. doi:10.1111/epi.13060.
- Genaro, K., D. Fabris, A. L. F. Arantes, A. W. Zuardi, J. A. S. Crippa, and W. A. Prado. 2017. "Cannabidiol is a potential therapeutic for the affective-motivational dimension of incision pain in rats." *Front Pharmacol* 8: 391. doi:10.3389/fphar.2017.00391.
- Ghabrash, M. F., S. Coronado-Montoya, J. Aoun, A. A. Gagne, F. Mansour, C. Ouellet-Plamondon, A. Trepanier, and D. Jutras-Aswad. 2020. "Cannabidiol for the treatment of psychosis among patients with schizophrenia and other primary psychotic disorders: A systematic review with a risk of bias assessment." *Psychiatry Res* 286: 112890. doi:10.1016/j.psychres.2020.112890.
- Giacoppo, S., M. Galuppo, F. Pollastro, G. Grassi, P. Bramanti, and E. Mazzon. 2015. "A new formulation of cannabidiol in cream shows therapeutic effects in a mouse model of experimental autoimmune encephalomyelitis." *Daru* 23: 48. doi:10.1186/s40199-015-0131-8.
- Giuffrida, A., F. M. Leweke, C. W. Gerth, D. Schreiber, D. Koethe, J. Faulhaber, J. Klosterkötter, and D. Piomelli. 2004. "Cerebrospinal anandamide levels are elevated in acute schizophrenia and are inversely correlated with

- psychotic symptoms.” *Neuropsychopharmacology* 29 (11): 2108–2114. doi:10.1038/sj.npp.1300558.
- Goldstein, R. B., S. M. Smith, S. P. Chou, T. D. Saha, J. Jung, H. Zhang, R. P. Pickering, W. J. Ruan, B. Huang, and B. F. Grant. 2016. “The epidemiology of DSM-5 posttraumatic stress disorder in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions—III.” *Soc Psychiatry Psychiatr Epidemiol* 51 (8): 1137–1148. doi:10.1007/s00127-016-1208-5.
- Gomes, F. V., E. A. Del Bel, and F. S. Guimaraes. 2013. “Cannabidiol attenuates catalepsy induced by distinct pharmacological mechanisms via 5-HT1A receptor activation in mice.” *Prog Neuropsychopharmacol Biol Psychiatry* 46: 43–47. doi:10.1016/j.pnpbp.2013.06.005.
- Gomes, F. V., A. C. Issy, F. R. Ferreira, M. P. Viveros, E. A. Del Bel, and F. S. Guimaraes. 2014. “Cannabidiol attenuates sensorimotor gating disruption and molecular changes induced by chronic antagonism of NMDA receptors in mice.” *Int J Neuropsychopharmacol* 18 (5): pyu041. doi:10.1093/ijnp/pyu041.
- Gomes, F. V., D. G. Reis, F. H. Alves, F. M. Correa, F. S. Guimaraes, and L. B. Resstel. 2012. “Cannabidiol injected into the bed nucleus of the stria terminalis reduces the expression of contextual fear conditioning via 5-HT1A receptors.” *J Psychopharmacol* 26 (1): 104–113. doi:10.1177/0269881110389095.
- Gomes, F. V., L. B. Resstel, and F. S. Guimaraes. 2011. “The anxiolytic-like effects of cannabidiol injected into the bed nucleus of the stria terminalis are mediated by 5-HT1A receptors.” *Psychopharmacology (Berl)* 213 (2–3): 465–473. doi:10.1007/s00213-010-2036-z.
- Gonzalez-Cuevas, G., R. Martin-Fardon, T. M. Kerr, D. G. Stouffer, L. H. Parsons, D. C. Hammell, S. L. Banks, A. L. Stinchcomb, and F. Weiss. 2018. “Unique treatment potential of cannabidiol for the prevention of relapse to drug use: Preclinical proof of principle.” *Neuropsychopharmacology* 43 (10): 2036–2045. doi:10.1038/s41386-018-0050-8.
- Good, P. D., R. M. Greer, G. E. Huggett, and J. R. Hardy. 2020. “An open-label pilot study testing the feasibility of assessing total symptom burden in trials of cannabinoid medications in palliative care.” *Journal of Palliative Medicine* 23 (5): 650–655. doi:10.1089/jpm.2019.0540.
- Greene, N. Z., J. L. Wiley, Z. Yu, B. H. Clowers, and R. M. Craft. 2018. “Cannabidiol modulation of antinociceptive tolerance to delta(9)-tetrahydrocannabinol.” *Psychopharmacology (Berl)* 235 (11): 3289–3302. doi:10.1007/s00213-018-5036-z.
- Grill, H. J., and R. Norgren. 1978. “The taste reactivity test. I. Mimetic responses to gustatory stimuli in neurologically normal rats.” *Brain Res* 143 (2): 263–279.
- Grim, T. W., S. Ghosh, K. L. Hsu, B. F. Cravatt, S. G. Kinsey, and A. H. Lichtman. 2014. “Combined inhibition of FAAH and COX produces enhanced anti-allodynic effects in mouse neuropathic and inflammatory pain models.” *Pharmacol Biochem Behav* 124: 405–411. doi:10.1016/j.pbb.2014.07.008.
- Grimison, P., A. Mersiades, A. Kirby, N. Lintzeris, R. Morton, P. Haber, I. Olver, A. Walsh, I. McGregor, Y. Cheung, A. Tognela, C. Hahn, K. Briscoe, M. Aghmesheh, P. Fox, E. Abdi, S. Clarke, S. Della-Fiorentina, J. Shannon, C. Gedye, S. Begbie, J. Simes, and M. Stockler. 2020. “Oral THC:CBD cannabis extract for refractory chemotherapy-induced nausea and vomiting: A randomised, placebo-controlled, phase II crossover trial.” *Ann Oncol* 31 (11): 1553–1560. doi:10.1016/j.annonc.2020.07.020.
- Grotenhermen, F. 2003. “Pharmacokinetics and pharmacodynamics of cannabinoids.” *Clin Pharmacokinet* 42 (4): 327–360. doi:10.2165/00003088-200342040-00003.
- Grotenhermen, F., E. Russo, and A. W. Zuardi. 2017. “Even high doses of oral cannabidiol do not cause THC-like Effects in humans: Comment on Merrick et al. cannabis and cannabinoid research 2016;1(1): 102–112; DOI:10.1089/can.2015.0004.” *Cannabis Cannabinoid Res* 2 (1): 1–4. doi:10.1089/can.2016.0036.
- Guimaraes, F. S., T. M. Chiaretti, F. G. Graeff, and A. W. Zuardi. 1990. “Antianxiety effect of cannabidiol in the elevated plus-maze.” *Psychopharmacology (Berl)* 100 (4): 558–559.
- Gulbransen, G., W. Xu, and B. Arroll. 2020. “Cannabidiol prescription in clinical practice: An audit on the first

- 400 patients in New Zealand.” *BJGP Open* 4 (1): bjgpopen20X101010. doi:10.3399/bjgpopen20X101010.
- Gururajan, A., and D. T. Malone. 2016. “Does cannabidiol have a role in the treatment of schizophrenia?” *Schizophr Res* 176 (2–3): 281–290. doi:10.1016/j.schres.2016.06.022.
- Guy, G. W., Robson, P. J. 2003. “A phase I, double blind, three-way crossover study to assess the pharmacokinetic profile of cannabis-based medicine extract (CBME) administered sublingually in variant cannabinoid ratios in normal healthy male volunteers (GWPK0215).” *J Cannabis Ther* 3: 121–152. doi:10.1300/J175v03n04_02
- Hacke, A. C. M., D. Lima, F. de Costa, K. Deshmukh, N. Li, A. M. Chow, J. A. Marques, R. P. Pereira, and K. Kerman. 2019. “Probing the antioxidant activity of delta(9)-tetrahydrocannabinol and cannabidiol in *Cannabis sativa* extracts.” *Analyst* 144 (16): 4952–4961. doi:10.1039/c9an00890j.
- Halladay, J. E., J. MacKillip, C. Munn, S. M. Jack, and K. Georgiades. 2020. “Cannabis use as a risk factor for depression, anxiety, and suicidality: Epidemiological associations and implications for nurses.” *J Addict Nurs* 31 (2): 92–101. doi:10.1097/jan.0000000000000334.
- Hamelink, C., A. Hampson, D. A. Wink, L. E. Eiden, and R. L. Eskay. 2005. “Comparison of cannabidiol, antioxidants, and diuretics in reversing binge ethanol-induced neurotoxicity.” *J Pharmacol Exp Ther* 314 (2): 780–788. doi:10.1124/jpet.105.085779.
- Hammell, D. C., L. P. Zhang, F. Ma, S. M. Abshire, S. L. McIlwraith, A. L. Stinchcomb, and K. N. Westlund. 2016. “Transdermal cannabidiol reduces inflammation and pain-related behaviours in a rat model of arthritis.” *Eur J Pain* 20 (6): 936–948. doi:10.1002/ejp.818.
- Hampson, A. J., M. Grimaldi, J. Axelrod, and D. Wink. 1998. “Cannabidiol and (−)delta9-tetrahydrocannabinol are neuroprotective antioxidants.” *Proc Natl Acad Sci USA* 95 (14): 8268–8273. doi:10.1073/pnas.95.14.8268.
- Hampson, A. J., M. Grimaldi, M. Lolic, D. Wink, R. Rosenthal, and J. Axelrod. 2000. “Neuroprotective antioxidants from marijuana.” *Ann NY Acad Sci* 899: 274–282.
- Haney, M. 2020. “Perspectives on cannabis research-barriers and recommendations.” *JAMA Psychiatry* 77: 994–995. doi:10.1001/jamapsychiatry.2020.103.
- Haney, M., E. W. Gunderson, J. Rabkin, C. L. Hart, S. K. Vosburg, S. D. Comer, and R. W. Foltin. 2007. “Dronabinol and marijuana in HIV-positive marijuana smokers. Caloric intake, mood, and sleep.” *J Acquir Immune Defic Syndr* 45 (5): 545–554. doi:10.1097/QAI.0b013e31811ed205.
- Haney, M., R. J. Malcolm, S. Babalonis, P. A. Nuzzo, Z. D. Cooper, G. Bedi, K. M. Gray, A. McRae-Clark, M. R. Lofwall, S. Sparenborg, and S. L. Walsh. 2016. “Oral cannabidiol does not alter the subjective, reinforcing or cardiovascular effects of smoked cannabis.” *Neuropsychopharmacology* 41 (8): 1974–1982. doi:10.1038/npp.2015.367.
- Haney, M., J. Rabkin, E. Gunderson, and R. W. Foltin. 2005. “Dronabinol and marijuana in HIV(+) marijuana smokers: Acute effects on caloric intake and mood.” *Psychopharmacology (Berl)* 181 (1): 170–178. doi:10.1007/s00213-005-2242-2.
- Hanus, L. O., S. Tchilibon, D. E. Ponde, A. Breuer, E. Fride, and R. Mechoulam. 2005. “Enantiomeric cannabidiol derivatives: Synthesis and binding to cannabinoid receptors.” *Org Biomol Chem* 3 (6): 1116–1123. doi:10.1039/b416943c.
- Hao, E., P. Mukhopadhyay, Z. Cao, K. Erdelyi, E. Holovac, L. Liaudet, W. S. Lee, G. Hasko, R. Mechoulam, and P. Pacher. 2015. “Cannabidiol protects against doxorubicin-induced cardiomyopathy by modulating mitochondrial function and biogenesis.” *Mol Med* 21: 38–45. doi:10.2119/molmed.2014.00261.
- Harris, H. M., K. J. Sufka, W. Gul, and M. A. ElSohly. 2016. “Effects of delta-9-tetrahydrocannabinol and cannabidiol on cisplatin-induced neuropathy in mice.” *Planta Med* 82 (13): 1169–1172. doi:10.1055/s-0042-106303.
- Haupts, M., C. Vila, A. Jonas, K. Witte, and L. Alvarez-Ossorio. 2016. “Influence of previous failed antispasticity therapy on the efficacy and tolerability of THC:CBD oromucosal spray for multiple sclerosis spasticity.” *Eur*

- Neurol* 75 (5–6): 236–243. doi:10.1159/000445943.
- Hay, G. L., S. J. Baracz, N. A. Everett, J. Roberts, P. A. Costa, J. C. Arnold, I. S. McGregor, and J. L. Cornish. 2018. “Cannabidiol treatment reduces the motivation to self-administer methamphetamine and methamphetamine-primed relapse in rats.” *J Psychopharmacol* 32 (12): 1369–1378. doi:10.1177/0269881118799954.
- Hayakawa, K., K. Mishima, K. Irie, M. Hazekawa, S. Mishima, M. Fujioka, K. Orito, N. Egashira, S. Katsurabayashi, K. Takasaki, K. Iwasaki, and M. Fujiwara. 2008. “Cannabidiol prevents a post-ischemic injury progressively induced by cerebral ischemia via a high-mobility group box1-inhibiting mechanism.” *Neuropharmacology* 55 (8): 1280–1286. doi:10.1016/j.neuropharm.2008.06.040.
- Hayakawa, K., K. Mishima, M. Nozako, A. Ogata, M. Hazekawa, A. X. Liu, M. Fujioka, K. Abe, N. Hasebe, N. Egashira, K. Iwasaki, and M. Fujiwara. 2007. “Repeated treatment with cannabidiol but not delta9-tetrahydrocannabinol has a neuroprotective effect without the development of tolerance.” *Neuropharmacology* 52 (4): 1079–1087. doi:10.1016/j.neuropharm.2006.11.005.
- Hegde, V. L., P. S. Nagarkatti, and M. Nagarkatti. 2011. “Role of myeloid-derived suppressor cells in amelioration of experimental autoimmune hepatitis following activation of TRPV1 receptors by cannabidiol.” *PLoS One* 6 (4): e18281. doi:10.1371/journal.pone.0018281.
- Hen-Shoval, D., S. Amar, L. Shapiro, R. Smoum, C. G. Haj, R. Mechoulam, G. Zalsman, A. Weller, and G. Shoval. 2018. “Acute oral cannabidiolic acid methyl ester reduces depression-like behavior in two genetic animal models of depression.” *Behav Brain Res* 351: 1–3. doi:10.1016/j.bbr.2018.05.027.
- Herlopian, A., E. J. Hess, J. Barnett, A. L. Geffrey, S. F. Pollack, L. Skirvin, P. Bruno, J. Sourbron, and E. A. Thiele. 2020. “Cannabidiol in treatment of refractory epileptic spasms: An open-label study.” *Epilepsy Behav* 106: 106988. doi:10.1016/j.yebeh.2020.106988.
- Hickok, J. T., J. A. Roscoe, G. R. Morrow, D. K. King, J. N. Atkins, and T. R. Fitch. 2003. “Nausea and emesis remain significant problems of chemotherapy despite prophylaxis with 5-hydroxytryptamine-3 antiemetics: A University of Rochester James P. Wilmot Cancer Center Community Clinical Oncology Program Study of 360 cancer patients treated in the community.” *Cancer* 97 (11): 2880–2886. doi:10.1002/cncr.11408.
- Hightet, B. H., E. R. Lesser, P. W. Johnson, and J. S. Kaur. 2020. “Tetrahydrocannabinol and cannabidiol use in an outpatient palliative medicine population.” *American Journal of Hospice and Palliative Medicine* 37 (8): 589–593. doi:10.1177/1049909119900378.
- Hill, A. J., M. S. Mercier, T. D. Hill, S. E. Glyn, N. A. Jones, Y. Yamasaki, T. Futamura, M. Duncan, C. G. Stott, G. J. Stephens, C. M. Williams, and B. J. Whalley. 2012. “Cannabidiol is anticonvulsant in mouse and rat.” *Br J Pharmacol* 167 (8): 1629–1642. doi:10.1111/j.1476-5381.2012.02207.x.
- Hill, K. P. 2020. “Cannabinoids and the coronavirus.” *Cannabis and Cannabinoid Research*. 5 (2): 118–120. doi:10.1089/can.2020.0035.
- Hindocha, C., T. P. Freeman, M. Grabski, J. B. Stroud, H. Crudgington, A. C. Davies, R. K. Das, W. Lawn, C. J. A. Morgan, and H. V. Curran. 2018. “Cannabidiol reverses attentional bias to cigarette cues in a human experimental model of tobacco withdrawal.” *Addiction*. 113 (9): 1696–1705. doi:10.1111/add.14243.
- Hindocha, C., T. P. Freeman, G. Schafer, C. Gardener, R. K. Das, C. J. Morgan, and H. V. Curran. 2015. “Acute effects of delta-9-tetrahydrocannabinol, cannabidiol and their combination on facial emotion recognition: A randomised, double-blind, placebo-controlled study in cannabis users.” *Eur Neuropsychopharmacol* 25 (3): 325–334. doi:10.1016/j.euroneuro.2014.11.014.
- Hine, B., E. Friedman, M. Torrello, and S. Gershon. 1975. “Morphine-dependent rats: Blockade of precipitated abstinence by tetrahydrocannabinol.” *Science* 187 (4175): 443–445. doi:10.1126/science.1167428.
- Hine, B., M. Torrello, and S. Gershon. 1975. “Interactions between cannabidiol and delta9-THC during abstinence in morphine-dependent rats.” *Life Sci* 17 (6): 851–857. doi:10.1016/0024-3205(75)90435-x.
- Hirvonen, J., R. S. Goodwin, C. T. Li, G. E. Terry, S. S. Zoghbi, C. Morse, V. W. Pike, N. D. Volkow, M. A.

- Huestis, and R. B. Innis. 2012. "Reversible and regionally selective downregulation of brain cannabinoid CB1 receptors in chronic daily cannabis smokers." *Mol Psychiatry* 17 (6): 642–649. doi:10.1038/mp.2011.82.
- Hobbs, J. M., A. R. Vazquez, N. D. Remijan, R. E. Trotter, T. V. McMillan, K. E. Freedman, Y. Wei, K. A. Woelfel, O. R. Arnold, L. M. Wolfe, S. A. Johnson, and T. L. Weir. 2020. "Evaluation of pharmacokinetics and acute anti-inflammatory potential of two oral cannabidiol preparations in healthy adults." *Phytother Res.* 34 (7): 1696–1703. doi:10.1002/ptr.6651.
- Hoggart, B., S. Ratcliffe, E. Ehler, K. H. Simpson, J. Hovorka, J. Lejcko, L. Taylor, H. Lauder, and M. Serpell. 2015. "A multicentre, open-label, follow-on study to assess the long-term maintenance of effect, tolerance and safety of THC/CBD oromucosal spray in the management of neuropathic pain." *J Neurol* 262 (1): 27–40. doi:10.1007/s00415-014-7502-9.
- Holmes, A. 2001. "Targeted gene mutation approaches to the study of anxiety-like behavior in mice." *Neurosci Biobehav Rev* 25 (3): 261–273. doi:10.1016/s0149-7634(01)00012-4.
- Howes, O. D., R. McCutcheon, M. J. Owen, and R. M. Murray. 2017. "The role of genes, stress, and dopamine in the development of schizophrenia." *Biol Psychiatry* 81 (1): 9–20. doi:10.1016/j.biopsych.2016.07.014.
- Hsiao, Y. T., P. L. Yi, C. L. Li, and F. C. Chang. 2012. "Effect of cannabidiol on sleep disruption induced by the repeated combination tests consisting of open field and elevated plus-maze in rats." *Neuropharmacology* 62 (1): 373–384. doi:10.1016/j.neuropharm.2011.08.013.
- Hudson, R., J. Renard, C. Norris, W. J. Rushlow, and S. R. Laviolette. 2019. "Cannabidiol counteracts the psychotropic side-effects of delta-9-tetrahydrocannabinol in the ventral hippocampus through bidirectional control of ERK1–2 phosphorylation." *J Neurosci* 39 (44): 8762–8777. doi:10.1523/JNEUROSCI.0708–19.2019.
- Hundal, H., R. Lister, N. Evans, A. Antley, A. Englund, R. M. Murray, D. Freeman, and P. D. Morrison. 2018. "The effects of cannabidiol on persecutory ideation and anxiety in a high trait paranoid group." *J Psychopharmacol* 32 (3): 276–282. doi:10.1177/0269881117737400.
- Hunt, C. A., R. T. Jones, R. I. Herning, and J. Bachman. 1981. "Evidence that cannabidiol does not significantly alter the pharmacokinetics of tetrahydrocannabinol in man." *J Pharmacokinet Biopharm* 9 (3): 245–260. doi:10.1007/bf01059266.
- Hurd, Y. L., S. Spriggs, J. Alishayev, G. Winkel, K. Gurgov, C. Kudrich, A. M. Oprescu, and E. Salsitz. 2019. "Cannabidiol for the reduction of cue-induced craving and anxiety in drug-abstinent individuals with heroin use disorder: A double-blind randomized placebo-controlled trial." *Am J Psychiatry* 176 (11): 911–922. doi:10.1176/appi.ajp.2019.18101191.
- Hurd, Y. L., M. Yoon, A. F. Manini, S. Hernandez, R. Olmedo, M. Ostman, and D. Jutras-Aswad. 2015. "Early phase in the development of cannabidiol as a treatment for addiction: Opioid relapse takes initial center stage." *Neurotherapeutics* 12 (4): 807–815. doi:10.1007/s13311-015-0373-7.
- Iffland, K., and F. Grotenhermen. 2017. "An update on safety and side effects of cannabidiol: A review of clinical data and relevant animal studies." *Cannabis Cannabinoid Res* 2 (1): 139–154. doi:10.1089/can.2016.0034.
- Ignatowska-Jankowska, B., M. M. Jankowski, and A. H. Swiergiel. 2011. "Cannabidiol decreases body weight gain in rats: Involvement of CB2 receptors." *Neurosci Lett* 490 (1): 82–84. doi:10.1016/j.neulet.2010.12.031.
- Irving, P. M., T. Iqbal, C. Nwokolo, S. Subramanian, S. Bloom, N. Prasad, A. Hart, C. Murray, J. O. Lindsay, A. Taylor, R. Barron, and S. Wright. 2018. "A randomized, double-blind, placebo-controlled, parallel-group, pilot study of cannabidiol-rich botanical extract in the symptomatic treatment of ulcerative colitis." *Inflamm Bowel Dis* 24 (4): 714–724. doi:10.1093/ibd/izy002.
- Izquierdo, I., O. A. Orsingher, and A. C. Berardi. 1973. "Effect of cannabidiol and of other Cannabis sativa compounds on hippocampal seizure discharges." *Psychopharmacologia* 28 (1): 95–102. doi:10.1007/bf00413961.

- Izzo, A. A., F. Borrelli, R. Capasso, V. Di Marzo, and R. Mechoulam. 2009. "Non-psychotropic plant cannabinoids: New therapeutic opportunities from an ancient herb." *Trends Pharmacol Sci* 30 (10): 515–527. doi:10.1016/j.tips.2009.07.006.
- Jacobs, A., and A. R. Todd. 1940. "Cannabidiol and cannabiol, constituents of *Cannabis indica* resin." *Nature* 145: 350.
- Jacobs, D. S., S. J. Kohut, S. Jiang, S. P. Nikas, A. Makriyannis, and J. Bergman. 2016. "Acute and chronic effects of cannabidiol on delta(9)-tetrahydrocannabinol (delta(9)-THC)-induced disruption in stop signal task performance." *Exp Clin Psychopharmacol* 24 (5): 320–330. doi:10.1037/ph0000081.
- Jacobsen, L. K., S. M. Southwick, and T. R. Kosten. 2001. "Substance use disorders in patients with posttraumatic stress disorder: A review of the literature." *Am J Psychiatry* 158 (8): 1184–1190. doi:10.1176/appi.ajp.158.8.1184.
- Jacobsson, S. O., E. Rongard, M. Stridh, G. Tiger, and C. J. Fowler. 2000. "Serum-dependent effects of tamoxifen and cannabinoids upon C6 glioma cell viability." *Biochem Pharmacol* 60 (12): 1807–1813. doi:10.1016/s0006-2952(00)00492-5.
- Jamontt, J. M., A. Molleman, R. G. Pertwee, and M. E. Parsons. 2010. "The effects of delta-tetrahydrocannabinol and cannabidiol alone and in combination on damage, inflammation and in vitro motility disturbances in rat colitis." *Br J Pharmacol* 160 (3): 712–723. doi:10.1111/j.1476-5381.2010.00791.x.
- Jarocka-Karpowicz, I., M. Biernacki, A. Wronski, A. Gegotek, and E. Skrzypkowska. 2020. "Cannabidiol effects on phospholipid metabolism in keratinocytes from patients with psoriasis vulgaris." *Biomolecules* 10 (3): 367. doi:10.3390/biom10030367.
- Jastrzab, A., A. Gegotek, and E. Skrzypkowska. 2019. "Cannabidiol regulates the expression of keratinocyte proteins involved in the inflammation process through transcriptional regulation." *Cells* 8 (8): 827. doi:10.3390/cells8080827.
- Jefferson, D. A., H. E. Harding, S. O. Cawich, and A. Jackson-Gibson. 2013. "Postoperative analgesia in the Jamaican cannabis user." *J Psychoactive Drugs* 45 (3): 227–232. doi:10.1080/02791072.2013.803644.
- Jennings, J. M., M. R. Angerame, C. L. Eschen, A. J. Phocas, and D. A. Dennis. 2019. "Cannabis use does not affect outcomes after total knee arthroplasty." *J Arthroplasty* 34 (8): 1667–1669. doi:10.1016/j.arth.2019.04.015.
- Jesus, C. H. A., D. D. B. Redivo, A. T. Gasparin, B. B. Sotomaior, M. C. de Carvalho, K. Genaro, A. W. Zuardi, J. E. C. Hallak, J. A. Crippa, J. M. Zanoveli, and J. M. da Cunha. 2019. "Cannabidiol attenuates mechanical allodynia in streptozotocin-induced diabetic rats via serotonergic system activation through 5-HT1A receptors." *Brain Res* 1715: 156–164. doi:10.1016/j.brainres.2019.03.014.
- Jhawar, N., E. Schoenberg, J. V. Wang, and N. Saedi. 2019. "The growing trend of cannabidiol in skincare products." *Clin Dermatol* 37 (3): 279–281. doi:10.1016/j.cldermatol.2018.11.002.
- Jiang, R., S. Yamaori, Y. Okamoto, I. Yamamoto, and K. Watanabe. 2013. "Cannabidiol is a potent inhibitor of the catalytic activity of cytochrome P450 2C19." *Drug Metab Pharmacokinet* 28 (4): 332–338. doi:10.2133/dmpk.dmpk-12-rg-129.
- Jiang, R., S. Yamaori, S. Takeda, I. Yamamoto, and K. Watanabe. 2011. "Identification of cytochrome P450 enzymes responsible for metabolism of cannabidiol by human liver microsomes." *Life Sci* 89 (5–6): 165–170. doi:10.1016/j.lfs.2011.05.018.
- Johnson, J. R., M. Burnell-Nugent, D. Lossignol, E. D. Ganae-Motan, R. Potts, and M. T. Fallon. 2010. "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." *J Pain Symptom Manage* 39 (2): 167–179. doi:10.1016/j.jpainsymman.2009.06.008.
- Johnson, J. R., D. Lossignol, M. Burnell-Nugent, and M. T. Fallon. 2013. "An open-label extension study to

- investigate the long-term safety and tolerability of THC/CBD oromucosal spray and oromucosal THC spray in patients with terminal cancer-related pain refractory to strong opioid analgesics.” *J Pain Symptom Manage* 46 (2): 207–218. doi:10.1016/j.jpainsyman.2012.07.014.
- Jones, A. B., M. A. Elsohly, J. A. Bedford, and C. E. Turner. 1981. “Determination of cannabidiol in plasma by electron-capture gas chromatography.” *J Chromatogr* 226 (1): 99–105. doi:10.1016/s0378-4347(00)84210-3.
- Jones, G., and R. G. Pertwee. 1972. “A metabolic interaction in vivo between cannabidiol and 1-tetrahydrocannabinol.” *Br J Pharmacol* 45 (2): 375–377. doi:10.1111/j.1476-5381.1972.tb08092.x.
- Jones, N. A., A. J. Hill, I. Smith, S. A. Bevan, C. M. Williams, B. J. Whalley, and G. J. Stephens. 2010. “Cannabidiol displays antiepileptiform and antiseizure properties in vitro and in vivo.” *J Pharmacol Exp Ther* 332 (2): 569–577. doi:10.1124/jpet.109.159145.
- Jones, P. G., L. Flavello, O. Kennard, G. M. Sheldrick, and R. Mechoulam. 1977. “Cannabidiol.” *Acta Cryst* B33: 3211–3214.
- Juknat, A., E. Kozela, N. Kaushansky, R. Mechoulam, and Z. Vogel. 2016. “Anti-inflammatory effects of the cannabidiol derivative dimethylheptyl-cannabidiol—studies in BV-2 microglia and encephalitogenic T cells.” *J Basic Clin Physiol Pharmacol* 27 (3): 289–296. doi:10.1515/jbcpp-2015-0071.
- Jung, B., J. K. Lee, J. Kim, E. K. Kang, S. Y. Han, H. Y. Lee, and I. S. Choi. 2019. “Synthetic strategies for (−)-cannabidiol and its structural analogs.” *Chem Asian J* 14 (21): 3749–3762. doi:10.1002/asia.201901179.
- Jurkus, R., H. L. Day, F. S. Guimaraes, J. L. Lee, L. J. Bertoglio, and C. W. Stevenson. 2016. “Cannabidiol regulation of learned fear: Implications for treating anxiety-related disorders.” *Front Pharmacol* 7: 454. doi:10.3389/fphar.2016.00454.
- Kaczkurkin, A. N., and E. B. Foa. 2015. “Cognitive-behavioral therapy for anxiety disorders: An update on the empirical evidence.” *Dialogues in Clinical Neuroscience* 17 (3): 337–346. doi:10.31887/DCNS.2015.17.3/akaczkurkin.
- Kaplan, J. S., J. K. Wagner, K. Reid, F. McGuinness, S. Arvila, M. Brooks, H. Stevenson, J. Jones, B. Risch, T. McGillis, R. Budinich, E. Gambell, and B. Predovich. 2021. “Cannabidiol exposure during the mouse adolescent period is without harmful behavioral effects on locomotor activity, anxiety, and spatial memory.” *Front Behav Neurosci* 15: 711639. doi:10.3389/fnbeh.2021.711639.
- Kapur, S., and G. Remington. 2001. “Dopamine D(2) receptors and their role in atypical antipsychotic action: Still necessary and may even be sufficient.” *Biol Psychiatry* 50 (11): 873–883. doi:10.1016/s0006-3223(01)01251-3.
- Karler, R., and S. A. Turkanis. 1980. “Subacute cannabinoid treatment: anticonvulsant activity and withdrawal excitability in mice.” *Br J Pharmacol* 68 (3): 479–484. doi:10.1111/j.1476-5381.1980.tb14562.x.
- Karler, R., W. Cely, and S. A. Turkanis. 1973. “The anticonvulsant activity of cannabidiol and cannabinol.” *Life Sci* 13 (11): 1527–1531. doi:10.1016/0024-3205(73)90141-0.
- Karniol, I. G., and E. A. Carlini. 1973. “Pharmacological interaction between cannabidiol and 89-tetrahydrocannabinol.” *Psychopharmacologia* 33 (1): 53–70. doi:10.1007/BF00428793.
- Karniol, I. G., I. Shirakawa, N. Kasinski, A. Pfeferman, and E. A. Carlini. 1974. “Cannabidiol interferes with the effects of delta 9-tetrahydro cannabinol in man.” *Eur J Pharmacol* 28 (1): 172–177. doi:10.1016/0014-2999(74)90129-0.
- Karschner, E. L., W. D. Darwin, R. S. Goodwin, S. Wright, and M. A. Huestis. 2011. “Plasma cannabinoid pharmacokinetics following controlled oral delta9-tetrahydrocannabinol and oromucosal cannabis extract administration.” *Clin Chem* 57 (1): 66–75. doi:10.1373/clinchem.2010.152439.
- Karschner, E. L., W. D. Darwin, R. P. McMahon, F. Liu, S. Wright, R. S. Goodwin, and M. A. Huestis. 2011. “Subjective and physiological effects after controlled Sativex and oral THC administration.” *Clin Pharmacol Ther* 89 (3): 400–407. doi:10.1038/cpt.2010.318.

- Katona, I. 2015. "Cannabis and endocannabinoid signaling in epilepsy." *Handb Exp Pharmacol* 231: 285–316. doi:10.1007/978-3-319-20825-1_10.
- Katsidoni, V., I. Anagnostou, and G. Panagis. 2013. "Cannabidiol inhibits the reward-facilitating effect of morphine: Involvement of 5-HT1A receptors in the dorsal raphe nucleus." *Addict Biol* 18 (2): 286–296. doi:10.1111/j.1369-1600.2012.00483.x.
- Katz-Talmon, D., S. Kivity, M. Blank, I. Katz, O. Perry, A. Volkov, I. Barshack, H. Amital, and Y. Shoenfeld. 2018. "Cannabidiol treatment in a murine model of systemic lupus erythematosus accelerates proteinuria development." *Isr Med Assoc J* 20 (12): 741–745.
- Katzman, M. A., P. Bleau, P. Blier, P. Chokka, K. Kjernisted, M. Van Ameringen, M. M. Antony, S. Bouchard, A. Brunet, M. Flament, S. Grigoriadis, S. Mendlowitz, K. O'Connor, K. Rabheru, P. M. Richter, M. Robichaud, and J. R. Walker. 2014. "Canadian clinical practice guidelines for the management of anxiety, posttraumatic stress and obsessive-compulsive disorders." *BMC Psychiatry* 14 Suppl. 1: S1. doi:10.1186/1471-244X-14-s1-s1.
- Kedzior, K. K., and L. T. Laeber. 2014. "A positive association between anxiety disorders and cannabis use or cannabis use disorders in the general population—a meta-analysis of 31 studies." *BMC Psychiatry* 14: 136. doi:10.1186/1471-244X-14-136.
- Kenyon, J., W. Liu, and A. Dalgleish. 2018. "Report of objective clinical responses of cancer patients to pharmaceutical-grade synthetic cannabidiol." *Anticancer Res* 38 (10): 5831–5835. doi:10.21873/anticanres.12924.
- Kessler, R. C., N. A. Sampson, P. Berglund, M. J. Gruber, A. Al-Hamzawi, L. Andrade, B. Bunting, K. Demyttenaere, S. Florescu, G. de Girolamo, O. Gureje, Y. He, C. Hu, Y. Huang, E. Karam, V. Kovess-Masfety, S. Lee, D. Levinson, M. E. Medina Mora, J. Moskalewicz, Y. Nakamura, F. Navarro-Mateu, M. A. Browne, M. Piazza, J. Posada-Villa, T. Slade, M. Ten Have, Y. Torres, G. Vilagut, M. Xavier, Z. Zarkov, V. Shahly, and M. A. Wilcox. 2015. "Anxious and non-anxious major depressive disorder in the World Health Organization World Mental Health Surveys." *Epidemiol Psychiatr Sci* 24 (3): 210–226. doi:10.1017/s2045796015000189.
- Khodadadi, H., E. L. Salles, A. Jarrahi, F. Chibane, V. Costigliola, J. C. Yu, K. Vaibhav, D. C. Hess, K. M. Dhandapani, and B. Baban. 2020. "Cannabidiol modulates cytokine storm in acute respiratory distress syndrome induced by simulated viral infection using synthetic RNA." *Cannabis Cannabinoid Res* 5 (3): 197–201. doi:10.1089/can.2020.0043.
- King, K. M., A. M. Myers, A. J. Soroka-Monzo, R. F. Tuma, R. J. Tallarida, E. A. Walker, and S. J. Ward. 2017. "Single and combined effects of delta(9)-tetrahydrocannabinol and cannabidiol in a mouse model of chemotherapy-induced neuropathic pain." *Br J Pharmacol* 174 (17): 2832–2841. doi:10.1111/bph.13887.
- Kintz, P. 2021. "Vaping pure cannabidiol e-cigarettes does not produce detectable amount of 9-THC in human blood." *J Anal Toxicol.* 44 (9): e1–e2. doi:10.1093/jat/bkaa008.
- Klein, C., E. Karanges, A. Spiro, A. Wong, J. Spencer, T. Huynh, N. Gunasekaran, T. Karl, L. E. Long, X. F. Huang, K. Liu, J. C. Arnold, and I. S. McGregor. 2011. "Cannabidiol potentiates delta(9)-tetrahydrocannabinol (THC) behavioural effects and alters THC pharmacokinetics during acute and chronic treatment in adolescent rats." *Psychopharmacology (Berl)* 218 (2): 443–457. doi:10.1007/s00213-011-2342-0.
- Kogan, N. M., R. Rabinowitz, P. Levi, D. Gibson, P. Sandor, M. Schlesinger, and R. Mechoulam. 2004. "Synthesis and antitumor activity of quinonoid derivatives of cannabinoids." *J Med Chem* 47 (15): 3800–3806. doi:10.1021/jm040042o.
- Kogan, N. M., M. Schlesinger, M. Peters, G. Marincheva, R. Beeri, and R. Mechoulam. 2007. "A cannabinoid anticancer quinone, HU-331, is more potent and less cardiotoxic than doxorubicin: A comparative in vivo study." *J Pharmacol Exp Ther* 322 (2): 646–653. doi:10.1124/jpet.107.120865.

- Kogan, N. M., M. Schlesinger, E. Priel, R. Rabinowitz, E. Berenshtein, M. Chevion, and R. Mechoulam. 2007. "HU-331, a novel cannabinoid-based anticancer topoisomerase II inhibitor." *Mol Cancer Ther* 6 (1): 173–183. doi:10.1158/1535-7163.MCT-06-0039.
- Koob, G. F., and N. Volkow. 2010. "Neurocircuitry of addiction." *Neuropsychopharmacology* 35 (1): 217–238. doi:10.1038/npp.2009.110.
- Kosogodage, U. S., R. Mould, A. B. Henley, A. V. Nunn, G. W. Guy, E. L. Thomas, J. M. Inal, J. D. Bell, and S. Lange. 2018. "Cannabidiol (CBD) is a novel inhibitor for exosome and microvesicle (EMV) release in cancer." *Front Pharmacol* 9: 889. doi:10.3389/fphar.2018.00889.
- Kosogodage, U. S., P. Uysal-Onganer, A. MacLatchy, R. Mould, A. V. Nunn, G. W. Guy, I. Kraev, N. P. Chatterton, E. L. Thomas, J. M. Inal, J. D. Bell, and S. Lange. 2019. "Cannabidiol affects extracellular vesicle release, miR21 and miR126, and reduces prohibitin protein in glioblastoma multiforme cells." *Transl Oncol* 12 (3): 513–522. doi:10.1016/j.tranon.2018.12.004.
- Kosiba, J. D., S. A. Maisto, and J. W. Ditre. 2019. "Patient-reported use of medical cannabis for pain, anxiety, and depression symptoms: Systematic review and meta-analysis." *Soc Sci Med* 233: 181–192. doi:10.1016/j.socscimed.2019.06.005.
- Kovalchuk, O., and I. Kovalchuk. 2020. "Cannabinoids as anticancer therapeutic agents." *Cell Cycle* 19 (9): 961–989. doi:10.1080/15384101.2020.1742952.
- Kucerova, J., K. Tabiova, F. Drago, and V. Micale. 2014. "Therapeutic potential of cannabinoids in schizophrenia." *Recent Pat CNS Drug Discov* 9 (1): 13–25. doi:10.2174/157488980966140307115532.
- Kwiatkowska, M., L. A. Parker, P. Burton, and R. Mechoulam. 2004. "A comparative analysis of the potential of cannabinoids and ondansetron to suppress cisplatin-induced emesis in the *Suncus murinus* (house musk shrew)." *Psychopharmacology (Berl)* 174 (2): 254–259. doi:10.1007/s00213-003-1739-9.
- Laczkovics, C., O. D. Kothgassner, A. Felnhofer, and C. M. Klier. 2020. "Cannabidiol treatment in an adolescent with multiple substance abuse, social anxiety and depression." *Neuropsychiatr* 35 (1): 31–34 doi:10.1007/s40211-020-00334-0.
- Lafuente, H., F. J. Alvarez, M. R. Pazos, A. Alvarez, M. C. Rey-Santano, V. Mielgo, X. Murgia-Esteve, E. Hilario, and J. Martinez-Orgado. 2011. "Cannabidiol reduces brain damage and improves functional recovery after acute hypoxia-ischemia in newborn pigs." *Pediatr Res* 70 (3): 272–277. doi:10.1203/PDR.0b013e3182276b11.
- Lafuente, H., M. R. Pazos, A. Alvarez, N. Mohammed, M. Santos, M. Arizti, F. J. Alvarez, and J. A. Martinez-Orgado. 2016. "Effects of cannabidiol and hypothermia on short-term brain damage in new-born piglets after acute hypoxia-ischemia." *Front Neurosci* 10: 323. doi:10.3389/fnins.2016.00323.
- Lander, N., Z. Ben-Zvi, R. Mechoulam, B. Martin, M. Nordqvist, and S. Agurell. 1976. "Total synthesis of cannabidiol and delta1-tetrahydro cannabinol metabolites." *J Chem Soc Perkin* 1 (1): 8–16.
- Langford, R. M., J. Mares, A. Novotna, M. Vachova, I. Novakova, W. Notcutt, and S. Ratcliffe. 2013. "A double-blind, randomized, placebo-controlled, parallel-group study of THC/CBD oromucosal spray in combination with the existing treatment regimen, in the relief of central neuropathic pain in patients with multiple sclerosis." *J Neurol* 260 (4): 984–997. doi:10.1007/s00415-012-6739-4.
- Laprairie, R. B., A. M. Bagher, M. E. Kelly, and E. M. Denovan-Wright. 2015. "Cannabidiol is a negative allosteric modulator of the cannabinoid CB1 receptor." *Br J Pharmacol* 172 (20): 4790–4805. doi:10.1111/bph.13250.
- Leas, Eric C., Erik M. Hendrickson, Alicia L. Nobles, Rory Todd, Davey M. Smith, Mark Dredze, and John W. Ayers. 2020. "Self-reported cannabidiol (CBD) use for conditions with proven therapies." *JAMA Network Open* 3 (10): e2020977–e2020977. doi:10.1001/jamanetworkopen.2020.20977.
- Leas, E. C., A. L. Nobles, T. L. Caputi, M. Dredze, D. M. Smith, and J. W. Ayers. 2019. "Trends in Internet

- searches for cannabidiol (CBD) in the United States.” *JAMA Netw Open* 2 (10): e1913853. doi:10.1001/jamanetworkopen.2019.13853.
- LeDoux, J. E. 2000. “Emotion circuits in the brain.” *Annu Rev Neurosci* 23: 155–184. doi:10.1146/annurev.neuro.23.1.155.
- Lee, C. M., C. Neighbors, and B. A. Woods. 2007. “Marijuana motives: Young adults’ reasons for using marijuana.” *Addict Behav* 32 (7): 1384–1394. doi:10.1016/j.addbeh.2006.09.010.
- Lee, C. Y., S. P. Wey, M. H. Liao, W. L. Hsu, H. Y. Wu, and T. R. Jan. 2008. “A comparative study on cannabidiol-induced apoptosis in murine thymocytes and EL-4 thymoma cells.” *Int Immunopharmacol* 8 (5): 732–740. doi:10.1016/j.intimp.2008.01.018.
- Lee, J. L. C., L. J. Bertoglio, F. S. Guimaraes, and C. W. Stevenson. 2017. “Cannabidiol regulation of emotion and emotional memory processing: Relevance for treating anxiety-related and substance abuse disorders.” *Br J Pharmacol* 174 (19): 3242–3256. doi:10.1111/bph.13724.
- Lee, W. S., K. Erdelyi, C. Matyas, P. Mukhopadhyay, Z. V. Varga, L. Liaudet, G. Hasku, D. Cihakova, R. Mechoulam, and P. Pacher. 2016. “Cannabidiol limits T cell-mediated chronic autoimmune myocarditis: Implications to autoimmune disorders and organ transplantation.” *Mol Med* 22: 136–146. doi:10.2119/molmed.2016.00007.
- Leehey, M. A., Y. Liu, F. Hart, C. Epstein, M. Cook, S. Sillau, J. Klawitter, H. Newman, C. Sempio, L. Forman, L. Seegerber, O. Kleptsikaya, Z. Baud, and J. Bainbridge. 2020. “Safety and tolerability of cannabidiol in Parkinson disease: An open label, dose-escalation study.” *Cannabis Cannabinoid Res* 5 (4): 326–336. doi:10.1089/can.2019.0068.
- Lehmann, C., N. B. Fisher, B. Tugwell, A. Szczesniak, M. Kelly, and J. Zhou. 2016. “Experimental cannabidiol treatment reduces early pancreatic inflammation in type 1 diabetes.” *Clin Hemorheol Microcirc* 64 (4): 655–662. doi:10.3233/CH-168021.
- Leite, J. R., E. A. Carlini, N. Lander, and R. Mechoulam. 1982. “Anticonvulsant effects of the (−) and (+)isomers of cannabidiol and their dimethylheptyl homologs.” *Pharmacology* 24 (3): 141–146. doi:10.1159/000137588.
- Lemos, J. I., L. B. Resstel, and F. S. Guimaraes. 2010. “Involvement of the prelimbic prefrontal cortex on cannabidiol-induced attenuation of contextual conditioned fear in rats.” *Behav Brain Res* 207 (1): 105–111. doi:10.1016/j.bbr.2009.09.045.
- Levin, R., V. Almeida, F. F. Peres, M. B. Calzavara, N. D. da Silva, M. A. Suiama, S. T. Niigaki, A. W. Zuardi, J. E. Hallak, J. A. Crippa, and V. C. Abilio. 2012. “Antipsychotic profile of cannabidiol and rimonabant in an animal model of emotional context processing in schizophrenia.” *Curr Pharm Des* 18 (32): 4960–4965. doi:10.2174/138161212802884735.
- Levin, R., F. F. Peres, V. Almeida, M. B. Calzavara, A. W. Zuardi, J. E. Hallak, J. A. Crippa, and V. C. Abilio. 2014. “Effects of cannabinoid drugs on the deficit of prepulse inhibition of startle in an animal model of schizophrenia: The SHR strain.” *Front Pharmacol* 5: 10. doi:10.3389/fphar.2014.00010.
- Leweke, F. M., D. Piomelli, F. Pahlisch, D. Muhl, C. W. Gerth, C. Hoyer, J. Klosterkötter, M. Hellmich, and D. Koethe. 2012. “Cannabidiol enhances anandamide signaling and alleviates psychotic symptoms of schizophrenia.” *Transl Psychiatry* 2: e94. doi:10.1038/tp.2012.15.
- Leweke, F. M., C. Rohleder, C. W. Gerth, M. Hellmich, R. Pukrop, and D. Koethe. 2021. “Cannabidiol and amisulpride improve cognition in acute schizophrenia in an explorative, double-blind, active-controlled, randomized clinical trial.” *Front Pharmacol* 12:614811. doi:10.3389/fphar.2021.614811.
- Leweke, F. M., U. Schneider, M. Radwan, E. Schmidt, and H. M. Emrich. 2000. “Different effects of nabilone and cannabidiol on binocular depth inversion in man.” *Pharmacol Biochem Behav* 66 (1): 175–181.
- Li, H., W. Kong, C. R. Chambers, D. Yu, D. Ganea, R. F. Tuma, and S. J. Ward. 2018. “The non-psychoactive phytocannabinoid cannabidiol (CBD) attenuates pro-inflammatory mediators, T cell infiltration, and thermal

- sensitivity following spinal cord injury in mice.” *Cell Immunol* 329: 1–9. doi:10.1016/j.cellimm.2018.02.016.
- Lichtman, A. H., E. A. Lux, R. McQuade, S. Rossetti, R. Sanchez, W. Sun, S. Wright, E. Kornyejewa, and M. T. Fallon. 2018. “Results of a double-blind, randomized, placebo-controlled study of nabiximols oromucosal spray as an adjunctive therapy in advanced cancer patients with chronic uncontrolled pain.” *J Pain Symptom Manage* 55 (2): 179–188 e1. doi:10.1016/j.jpainsympman.2017.09.001.
- Ligresti, A., L. De Petrocellis, and V. Di Marzo. 2016. “From phytocannabinoids to cannabinoid receptors and endocannabinoids: Pleiotropic physiological and pathological roles through complex pharmacology.” *Physiol Rev* 96: 1593–1659. doi:10.1152/physrev.00002.2016.
- Ligresti, A., A. S. Moriello, K. Starowicz, I. Matias, S. Pisanti, L. De Petrocellis, C. Laizza, G. Portella, M. Bifulco, and V. Di Marzo. 2006. “Antitumor activity of plant cannabinoids with emphasis on the effect of cannabidiol on human breast carcinoma.” *J Pharmacol Exp Ther* 318 (3): 1375–1387. doi:10.1124/jpet.106.105247.
- Lim, S. Y., S. Sharan, and S. Woo. 2020. “Model-based analysis of cannabidiol dose: Exposure relationship and bioavailability.” *Pharmacotherapy* 40 (4): 291–300. doi:10.1002/phar.2377.
- Limebeer, C. L., J. P. Krohn, S. Cross-Mellor, D. E. Litt, K. P. Ossenkopp, and L. A. Parker. 2008. “Exposure to a context previously associated with nausea elicits conditioned gaping in rats: A model of anticipatory nausea.” *Behav Brain Res* 187 (1): 33–40. doi:10.1016/j.bbr.2007.08.024.
- Limebeer, C. L., E. M. Rock, K. A. Sharkey, and L. A. Parker. 2018. “Nausea-induced 5-HT release in the interoceptive insular cortex and regulation by monoacylglycerol lipase (MAGL) inhibition and cannabidiol.” *eNeuro* 5 (4): ENEURO.0256-18.2018. doi:10.1523/ENEURO.0256-18.2018.
- Linares, I. M. P., F. S. Guimaraes, A. Eckeli, A. C. S. Crippa, A. W. Zuardi, J. D. S. Souza, J. E. Hallak, and J. A. S. Crippa. 2018. “No acute effects of cannabidiol on the sleep-wake cycle of healthy subjects: A randomized, double-blind, placebo-controlled, crossover study.” *Front Pharmacol* 9: 315. doi:10.3389/fphar.2018.00315.
- Linares, I. M., A. W. Zuardi, L. C. Pereira, R. H. Queiroz, R. Mechoulam, F. S. Guimaraes, and J. A. Crippa. 2019. “Cannabidiol presents an inverted U-shaped dose-response curve in a simulated public speaking test.” *Braz J Psychiatry* 41 (1): 9–14. doi:10.1590/1516-4446-2017-0015.
- Linge, R., L. Jimenez-Sanchez, L. Campa, F. Pilar-Cuellar, R. Vidal, A. Pazos, A. Adell, and A. Diaz. 2016. “Cannabidiol induces rapid-acting antidepressant-like effects and enhances cortical 5-HT/glutamate neurotransmission: role of 5-HT1A receptors.” *Neuropharmacology* 103: 16–26. doi:10.1016/j.neuropharm.2015.12.017.
- Linher-Melville, K., Y. F. Zhu, J. Sidhu, N. Parzei, A. Shahid, G. Seesankar, D. Ma, Z. Wang, N. Zacal, M. Sharma, V. Parihar, R. Zacharias, and G. Singh. 2020. “Evaluation of the preclinical analgesic efficacy of naturally derived, orally administered oil forms of Δ9-tetrahydrocannabinol(THC), cannabidiol(CBD), and their 1:1 combination.” *PLoS One* 15 (6): e0234176. doi:10.1371/journal.pone.0234176.
- Lintzeris, N., A. Bhardwaj, L. Mills, A. Dunlop, J. Copeland, I. McGregor, R. Bruno, J. Gugusheff, N. Phung, M. Montebello, T. Chan, A. Kirby, M. Hall, M. Jefferies, J. Luksza, M. Shanahan, R. Kevin, D. Allsop, and Group Agonist Replacement for Cannabis Dependence study. 2019. “Nabiximols for the treatment of cannabis dependence: A randomized clinical trial.” *JAMA Intern Med.* 179 (9): 1242–1253. doi:10.1001/jamainternmed.2019.1993.
- Liput, D. J., D. C. Hammell, A. L. Stinchcomb, and K. Nixon. 2013. “Transdermal delivery of cannabidiol attenuates binge alcohol-induced neurodegeneration in a rodent model of an alcohol use disorder.” *Pharmacol Biochem Behav* 111: 120–127. doi:10.1016/j.pbb.2013.08.013.
- Lodzki, M., B. Godin, L. Rakou, R. Mechoulam, R. Gallily, and E. Touitou. 2003. “Cannabidiol-transdermal delivery and anti-inflammatory effect in a murine model.” *J Control Release* 93 (3): 377–387. doi:10.1016/j.jconrel.2003.09.001.

- Long, L. E., R. Chesworth, X. F. Huang, I. S. McGregor, J. C. Arnold, and T. Karl. 2010. "A behavioural comparison of acute and chronic delta9-tetrahydrocannabinol and cannabidiol in C57BL/6JArc mice." *Int J Neuropsychopharmacol* 13 (7): 861–876. doi:10.1017/S1461145709990605.
- Long, L. E., D. T. Malone, and D. A. Taylor. 2006. "Cannabidiol reverses MK-801-induced disruption of prepulse inhibition in mice." *Neuropsychopharmacology* 31 (4): 795–803. doi:10.1038/sj.npp.1300838.
- Lopez-Sendon Moreno, J. L., J. Garcia Caldente, P. Trigo Cubillo, C. Ruiz Romero, G. Garcia Ribas, M. A. Alonso Arias, M. J. Garcia de Yebenes, R. M. Tolon, I. Galve-Roperh, O. Sagredo, S. Valdeolivas, E. Resel, S. Ortega-Gutierrez, M. L. Garcia-Bermejo, J. Fernandez Ruiz, M. Guzman, and J. Garcia de Yebenes Prous. 2016. "A double-blind, randomized, cross-over, placebo-controlled, pilot trial with Sativex in Huntington's disease." *J Neurol* 263 (7): 1390–1400. doi:10.1007/s00415-016-8145-9.
- Lowe, H. I., N. J. Toyang, and W. McLaughlin. 2017. "Potential of cannabidiol for the treatment of viral hepatitis." *Pharmacognosy Res* 9 (1): 116–118. doi:10.4103/0974–8490.199780.
- Lujan, M. A., A. Castro-Zavala, L. Alegre-Zurano, and O. Valverde. 2018. "Repeated Cannabidiol treatment reduces cocaine intake and modulates neural proliferation and CB1R expression in the mouse hippocampus." *Neuropharmacology* 143: 163–175. doi:10.1016/j.neuropharm.2018.09.043.
- Machado Rocha, F. C., S. C. Stefano, R. De Cassia Haiek, L. M. Rosa Oliveira, and D. X. Da Silveira. 2008. "Therapeutic use of *Cannabis sativa* on chemotherapy-induced nausea and vomiting among cancer patients: Systematic review and meta-analysis." *European Journal of Cancer Care* 17 (5): 431–443. doi:10.1111/j.1365–2354.2008.00917.x.
- Madden, K., K. Tanco, and E. Bruera. 2020. "Clinically significant drug-drug interaction between methadone and cannabidiol." *Pediatrics* 145 (6): e20193256. doi:10.1542/peds.2019–3256.
- Magen, I., Y. Avraham, Z. Ackerman, L. Vorobiev, R. Mechoulam, and E. M. Berry. 2009. "Cannabidiol ameliorates cognitive and motor impairments in mice with bile duct ligation." *J Hepatol* 51 (3): 528–534. doi:10.1016/j.jhep.2009.04.021.
- Mahmud, A., S. Gallant, F. Sedki, T. D'Cunha, and U. Shalev. 2017. "Effects of an acute cannabidiol treatment on cocaine self-administration and cue-induced cocaine seeking in male rats." *J Psychopharmacol* 31 (1): 96–104. doi:10.1177/0269881116667706.
- Maida, V., and P. J. Daeninck. 2016. "A user's guide to cannabinoid therapies in oncology." *Curr Oncol* 23 (6): 398–406. doi:10.3747/co.23.3487.
- Maione, S., F. Piscitelli, L. Gatta, D. Vita, L. De Petrocellis, E. Palazzo, V. de Novellis, and V. Di Marzo. 2011. "Non-psychoactive cannabinoids modulate the descending pathway of antinociception in anaesthetized rats through several mechanisms of action." *Br J Pharmacol* 162 (3): 584–596. doi:10.1111/j.1476–5381.2010.01063.x.
- Malfait, A. M., R. Gallily, P. F. Sumariwalla, A. S. Malik, E. Andreakos, R. Mechoulam, and M. Feldmann. 2000. "The nonpsychoactive cannabis constituent cannabidiol is an oral anti-arthritis therapeutic in murine collagen-induced arthritis." *Proc Natl Acad Sci USA* 97 (17): 9561–9566. doi:10.1073/pnas.160105897.
- Malinowska, B., M. Baranowska-Kuczko, A. Kicman, and E. Schlicker. 2021. "Opportunities, challenges and pitfalls of using cannabidiol as an adjuvant drug in COVID-19." *Int J Mol Sci* 22 (4): 1986. doi:10.3390/ijms22041986.
- Malone, D. T., D. Jongejan, and D. A. Taylor. 2009. "Cannabidiol reverses the reduction in social interaction produced by low dose delta(9)-tetrahydrocannabinol in rats." *Pharmacol Biochem Behav* 93 (2): 91–96. doi:10.1016/j.pbb.2009.04.010.
- Mamber, S. W., S. Krakowka, J. Osborn, L. Saberski, R. G. Rhodes, A. E. Dahlberg, S. Pond-Tor, K. Fitzgerald, N. Wright, S. Beseme, and J. McMichael. 2020. "Can unconventional immunomodulatory agents help alleviate COVID-19 symptoms and severity?" *mSphere* 5 (3): e00288-20. doi:10.1128/mSphere.00288–20.

- Manini, A. F., G. Yiannoulos, M. M. Bergamaschi, S. Hernandez, R. Olmedo, A. J. Barnes, G. Winkel, R. Sinha, D. Jutras-Aswad, M. A. Huestis, and Y. L. Hurd. 2015. "Safety and pharmacokinetics of oral cannabidiol when administered concomitantly with intravenous fentanyl in humans." *J Addict Med* 9 (3): 204–210. doi:10.1097/ADM.0000000000000118.
- Mao, J., D. D. Price, J. Lu, L. Keniston, and D. J. Mayer. 2000. "Two distinctive antinociceptive systems in rats with pathological pain." *Neurosci Lett* 280 (1): 13–16. doi:10.1016/s0304-3940(99)00998-2.
- Maren, S., and G. J. Quirk. 2004. "Neuronal signalling of fear memory." *Nat Rev Neurosci* 5 (11): 844–852. doi:10.1038/nrn1535.
- Markova, J., U. Essner, B. Akmaz, M. Marinelli, C. Trompke, A. Lentschat, and C. Vila. 2019. "Sativex as add-on therapy versus further optimized first-line antispastics (SAVANT) in resistant multiple sclerosis spasticity: A double-blind, placebo-controlled randomised clinical trial." *Int J Neurosci* 129 (2): 119–128. doi:10.1080/00207454.2018.1481066.
- Martell, K., A. Fairchild, B. LeGerrier, R. Sinha, S. Baker, H. Liu, A. Ghose, I. A. Olivotto, and M. Kerba. 2018. "Rates of cannabis use in patients with cancer." *Current Oncology* 25 (3): 219–225. doi:10.3747/co.25.3983.
- Martin, B. R., D. J. Harvey, and W. D. Paton. 1977. "Biotransformation of cannabidiol in mice: Identification of new acid metabolites." *Drug Metab Dispos* 5 (3): 259–267.
- Martin-Moreno, A. M., D. Reigada, B. G. Ramirez, R. Mechoulam, N. Innamorato, A. Cuadrado, and M. L. de Ceballos. 2011. "Cannabidiol and other cannabinoids reduce microglial activation in vitro and in vivo: Relevance to Alzheimer's disease." *Mol Pharmacol* 79 (6): 964–973. doi:10.1124/mol.111.071290.
- Martin-Santos, R., J. A. Crippa, A. Batalla, S. Bhattacharyya, Z. Atakan, S. Borgwardt, P. Allen, M. Seal, K. Langohr, M. Farre, A. W. Zuardi, and P. K. McGuire. 2012. "Acute effects of a single, oral dose of d9-tetrahydrocannabinol (THC) and cannabidiol (CBD) administration in healthy volunteers." *Curr Pharm Des* 18 (32): 4966–4979.
- Martinez-Pinilla, E., K. Varani, I. Reyes-Resina, E. Angelats, F. Vincenzi, C. Ferreiro-Vera, J. Oyarzabal, E. I. Canela, J. L. Lanciego, X. Nadal, G. Navarro, P. A. Borea, and R. Franco. 2017. "Binding and signaling studies disclose a potential allosteric site for cannabidiol in cannabinoid CB2 receptors." *Front Pharmacol* 8: 744. doi:10.3389/fphar.2017.00744.
- Massi, P., M. Solinas, V. Cinquina, and D. Parolaro. 2013. "Cannabidiol as potential anticancer drug." *Br J Clin Pharmacol* 75 (2): 303–312. doi:10.1111/j.1365-2125.2012.04298.x.
- Massi, P., A. Vaccani, S. Bianchetti, B. Costa, P. Macchi, and D. Parolaro. 2006. "The non-psychoactive cannabidiol triggers caspase activation and oxidative stress in human glioma cells." *Cell Mol Life Sci* 63 (17): 2057–2066. doi:10.1007/s00018-006-6156-x.
- Massi, P., A. Vaccani, S. Ceruti, A. Colombo, M. P. Abbracchio, and D. Parolaro. 2004. "Antitumor effects of cannabidiol, a nonpsychoactive cannabinoid, on human glioma cell lines." *J Pharmacol Exp Ther* 308 (3): 838–845. doi:10.1124/jpet.103.061002.
- Mbachi, C., B. Attar, O. Oyenubi, W. Yuchen, A. Efesomwan, I. Paintsil, M. Madhu, O. Ajiboye, C. R. Simons-Linares, W. E. Trick, and V. Kotwal. 2019. "Association between cannabis use and complications related to ulcerative colitis in hospitalized patients: A propensity matched retrospective cohort study." *Medicine (Baltimore)* 98 (32): e16551. doi:10.1097/md.00000000000016551.
- McAllister, S. D., R. T. Christian, M. P. Horowitz, A. Garcia, and P. Y. Desprez. 2007. "Cannabidiol as a novel inhibitor of Id-1 gene expression in aggressive breast cancer cells." *Mol Cancer Ther* 6 (11): 2921–2927. doi:10.1158/1535-7163.MCT-07-0371.
- McCartney, D., R. C. Kevin, A.S.Suraev, C. Irwin, R.R. Grunstein, C. M. Hoyos, I. McGregor. 2021. "Orally administered cannabidiol does not produce false-positive tests for Δ9-tetrahydrocannabinol on the Securetec DrugWipe® 5S or Dräger DrugTest® 5000." *Drug Testing and Analysis*, 1–7. doi:10.1002/dta.3153.

- McGuire, P., P. Robson, W. J. Cubala, D. Vasile, P. D. Morrison, R. Barron, A. Taylor, and S. Wright. 2018. "Cannabidiol (CBD) as an adjunctive therapy in schizophrenia: A multicenter randomized controlled trial." *Am J Psychiatry* 175 (3): 225–231. doi:10.1176/appi.ajp.2017.17030325.
- McKallip, R. J., W. Jia, J. Schlomer, J. W. Warren, P. S. Nagarkatti, and M. Nagarkatti. 2006. "Cannabidiol-induced apoptosis in human leukemia cells: A novel role of cannabidiol in the regulation of p22phox and Nox4 expression." *Mol Pharmacol* 70 (3): 897–908. doi:10.1124/mol.106.023937.
- Mechoulam, R. 1986. "Interview with Prof. Raphael Mechoulam, codiscoverer of THC: Interview by Stanley Einstein." *Int J Addict* 21 (4–5): 579–587. doi:10.3109/10826088609083542.
- Mechoulam, R., and E. A. Carlini. 1978. "Toward drugs derived from cannabis." *Naturwissenschaften* 65 (4): 174–179. doi:10.1007/bf00450585.
- Mechoulam, R., and Y. Gaoni. 1967a. "The absolute configuration of delta-1-tetrahydrocannabinol, the major active constituent of hashish." *Tetrahedron Lett* 12: 1109–1111. doi:10.1016/s0040-4039(00)90646-4.
- Mechoulam, R., and Y. Gaoni. 1967b. "Recent advances in the chemistry of hashish." *Fortschr Chem Org Naturst* 25: 175–213. doi:10.1007/978-3-7091-8164-5_6.
- Mechoulam, R., and L. Hanus. 2002. "Cannabidiol: An overview of some chemical and pharmacological aspects. Part I: Chemical aspects." *Chem Phys Lipids* 121 (1–2): 35–43. doi:10.1016/s0009-3084(02)00144-5.
- Mechoulam, R., L. O. Hanus, R. Pertwee, and A. C. Howlett. 2014. "Early phytocannabinoid chemistry to endocannabinoids and beyond." *Nat Rev Neurosci* 15 (11): 757–764. doi:10.1038/nrn3811.
- Mechoulam, R., and L. A. Parker. 2013. "The endocannabinoid system and the brain." *Annu Rev Psychol* 64: 21–47. doi:10.1146/annurev-psych-113011-143739.
- Mechoulam, R., L. A. Parker, and R. Gallily. 2002. "Cannabidiol: An overview of some pharmacological aspects." *J Clin Pharmacol* 42 (S1): 11S–19S. doi:10.1002/j.1552-4604.2002.tb05998.x.
- Mechoulam, R., and Y. Shvo. 1963. "Hashish. I. The structure of cannabidiol." *Tetrahedron* 19 (12): 2073–2078. doi:10.1016/0040-4020(63)85022-x.
- Mehta, P., D. F. McAuley, M. Brown, E. Sanchez, R. S. Tattersall, and J. J. Manson. 2020. "COVID-19: Consider cytokine storm syndromes and immuno suppression." *Lancet* 395 (10229): 1033–1034. doi:10.1016/S0140-6736(20)30628-0.
- Mejia, S., F. M. Duerr, G. Griffenhagen, and S. McGrath. 2021. "Evaluation of the effect of cannabidiol on naturally occurring osteoarthritis-associated pain: A pilot study in dogs." *J Am Anim Hosp Assoc* 57 (2): 81–90. doi:10.5326/jaha-ms-7119.
- Melas, P. A., M. Scherma, W. Fratta, C. Cifani, and P. Fadda. 2021. "Cannabidiol as a potential treatment for anxiety and mood disorders: Molecular targets and epigenetic insights from preclinical research." *Int J Mol Sci* 22 (4): 1863. doi:10.3390/ijms22041863.
- Merrick, J., B. Lane, T. Sebree, T. Yaksh, C. O'Neill, and S. L. Banks. 2016. "Identification of psychoactive degradants of cannabidiol in simulated gastric and physiological fluid." *Cannabis Cannabinoid Res* 1 (1): 102–112. doi:10.1089/can.2015.0004.
- Meuth, S. G., T. Henze, U. Essner, C. Trompke, and C. Vila Silvan. 2020. "Tetrahydrocannabinol and cannabidiol oromucosal spray in resistant multiple sclerosis spasticity: Consistency of response across subgroups from the SAVANT randomized clinical trial." *Int J Neurosci* 130 (12): 1199–1205. doi:10.1080/00207454.2020.1730832.
- Miller, I., I. E. Scheffer, B. Gunning, R. Sanchez-Carpintero, A. Gil-Nagel, M. S. Perry, R. P. Saneto, D. Checketts, E. Dunayevich, V. Knappertz, and Gwpcare Study Group. 2020. "Dose-ranging effect of adjunctive oral cannabidiol vs placebo on convulsive seizure frequency in Dravet syndrome: A randomized clinical trial." *JAMA Neurol.* 77(5): 613–621. doi:10.1001/jamaneurol.2020.0073.
- Mishima, K., K. Hayakawa, K. Abe, T. Ikeda, N. Egashira, K. Iwasaki, and M. Fujiwara. 2005. "Cannabidiol

- prevents cerebral infarction via a serotonergic 5-hydroxytryptamine1A receptor-dependent mechanism.” *Stroke* 36 (5): 1077–1082. doi:10.1161/01.STR.0000163083.59201.34.
- Mitchell, V. A., J. Harley, S. L. Casey, A. C. Vaughan, B. L. Winters, and C. W. Vaughan. 2021. “Oral efficacy of Δ(9)-tetrahydrocannabinol and cannabidiol in a mouse neuropathic pain model.” *Neuropharmacology* 189: 108529. doi:10.1016/j.neuropharm.2021.108529.
- Mlost, J., M. Bryk, and K. Starowicz. 2020. “Cannabidiol for pain treatment: Focus on pharmacology and mechanism of action.” *Int J Mol Sci* 21 (22): 8870. doi:10.3390/ijms21228870.
- Mohammed, N., M. Ceprian, L. Jimenez, M. R. Pazos, and J. Martinez-Orgado. 2017. “Neuroprotective effects of cannabidiol in hypoxic ischemic insult: The therapeutic window in newborn mice.” *CNS Neurol Disord Drug Targets* 16 (1): 102–108. doi:10.2174/1871527315666160927110305.
- Mondello, E., D. Quattrone, L. Cardia, G. Bova, R. Mallamace, A. A. Barbagallo, C. Mondello, C. Mannucci, M. Di Pietro, V. Arcoraci, and G. Calapai. 2018. “Cannabinoids and spinal cord stimulation for the treatment of failed back surgery syndrome refractory pain.” *J Pain Res* 11: 1761–1767. doi:10.2147/JPR.S166617.
- Mongeau-Pérusse, V., S. Brissette, J. Bruneau, P. Conrod, S. Dubreucq, G. Gazil, E. Stip, and D. Jutras-Aswad. 2021. “Cannabidiol as a treatment for craving and relapse in individuals with cocaine use disorder: A randomized placebo-controlled trial.” *Addiction*. 116 (9): 2431–2442. doi:10.1111/add.15417.
- Montgomery, K. C. 1955. “The relation between fear induced by novel stimulation and exploratory behavior.” *J Comp Physiol Psychol* 48 (4): 254–260. doi:10.1037/h0043788.
- Monti, J. M. 1977. “Hypnoticlike effects of cannabidiol in the rat.” *Psychopharmacology (Berl)* 55 (3): 263–265. doi:10.1007/bf00497858.
- Montoya, Z. T., A. L. Uhernik, and J. P. Smith. 2020. “Comparison of cannabidiol to citalopram in targeting fear memory in female mice.” *J Cannabis Res* 2 (1): 48. doi:10.1186/s42238-020-00055-9.
- Moreira, F. A., and F. S. Guimaraes. 2005. “Cannabidiol inhibits the hyperlocomotion induced by psychotomimetic drugs in mice.” *Eur J Pharmacol* 512 (2–3): 199–205. doi:10.1016/j.ejphar.2005.02.040.
- Morgan, C. J., and H. V. Curran. 2008. “Effects of cannabidiol on schizophrenia-like symptoms in people who use cannabis.” *Br J Psychiatry* 192 (4): 306–307. doi:10.1192/bjp.bp.107.046649.
- Morgan, C. J., R. K. Das, A. Joye, H. V. Curran, and S. K. Kamboj. 2013. “Cannabidiol reduces cigarette consumption in tobacco smokers: Preliminary findings.” *Addict Behav* 38 (9): 2433–2436. doi:10.1016/j.addbeh.2013.03.011.
- Morgan, C. J. A., T. P. Freeman, C. Hindocha, G. Schafer, C. Gardner, and H. V. Curran. 2018. “Individual and combined effects of acute delta-9-tetrahydrocannabinol and cannabidiol on psychotomimetic symptoms and memory function.” *Transl Psychiatry* 8 (1): 181. doi:10.1038/s41398-018-0191-x.
- Morgan, C. J., T. P. Freeman, G. L. Schafer, and H. V. Curran. 2010. “Cannabidiol attenuates the appetitive effects of delta 9-tetrahydrocannabinol in humans smoking their chosen cannabis.” *Neuropsychopharmacology* 35 (9): 1879–1885. doi:10.1038/npp.2010.58.
- Morgan, C. J., C. Gardener, G. Schafer, S. Swan, C. Demarchi, T. P. Freeman, P. Warrington, I. Rupasinghe, A. Ramoutar, N. Tan, G. Wingham, S. Lewis, and H. V. Curran. 2012. “Sub-chronic impact of cannabinoids in street cannabis on cognition, psychotic-like symptoms and psychological well-being.” *Psychol Med* 42 (2): 391–400. doi:10.1017/S0033291711001322.
- Morgan, C. J., G. Schafer, T. P. Freeman, and H. V. Curran. 2010. “Impact of cannabidiol on the acute memory and psychotomimetic effects of smoked cannabis: Naturalistic study: naturalistic study [corrected].” *Br J Psychiatry* 197 (4): 285–290. doi:10.1192/bjp.bp.110.077503.
- Morissette, F., V. Mongeau-Perusse, E. Rizkallah, R. Thebault, S. Lepage, S. Brissette, J. Bruneau, S. Dubreucq, E. Stip, J.F. Cailhier, D. Jutras-Aswad. 2021. “Exploring cannabidiol effects on inflammatory marker in individuals with cocaine use disorder: a randomized controlled trial.” *Neuropsychopharmacology* 46 (12):

- 2101–2111. doi:10.1038/s41386-021-01098-z
- Moulin, D. E., A. J. Clark, I. Gilron, M. A. Ware, C. P. Watson, B. J. Sessle, T.Coderre, P. K. Morley-Forster, J. Stinson, A. Boulanger, P. Peng, G. A. Finley, P. Taenzer, P. Squire, D. Dion, A. Cholkan, A. Gilani, A. Gordon, J. Henry, R. Jovey, M. Lynch, A. Mailis-Gagnon, A. Panju, G. B. Rollman, and A. Velly. 2007. "Pharmacological management of chronic neuropathic pain—consensus statement and guidelines from the Canadian Pain Society." *Pain Res Manag* 12 (1): 13–21. doi:10.1155/2007/730785.
- Mukhopadhyay, P., M. Rajesh, B. Horvath, S. Batkai, O. Park, G. Tanchian, R. Y. Gao, V. Patel, D. A. Wink, L. Liaudet, G. Hasko, R. Mechoulam, and P. Pacher. 2011. "Cannabidiol protects against hepatic ischemia/reperfusion injury by attenuating inflammatory signaling and response, oxidative/nitrative stress, and cell death." *Free Radic Biol Med* 50 (10): 1368–1381. doi:10.1016/j.freeradbiomed.2011.02.021.
- Murillo-Rodriguez, E., G. Arankowsky-Sandoval, N. B. Rocha, R. Peniche-Amante, A. B. Veras, S. Machado, and H. Budde. 2018. "Systemic injections of cannabidiol enhance acetylcholine levels from basal forebrain in rats." *Neurochem Res* 43 (8): 1511–1518. doi:10.1007/s11064-018-2565-0.
- Murillo-Rodriguez, E., G. Arankowsky-Sandoval, R. G. Pertwee, L. Parker, and R. Mechoulam. 2020. "Sleep and neurochemical modulation by cannabidiolic acid methyl ester in rats." *Brain Res Bull* 155: 166–173. doi:10.1016/j.brainresbull.2019.12.006.
- Murillo-Rodriguez, E., D. Millán-Aldaco, D. Cicconcelli, V. Giorgetti, G. Arankowsky-Sandoval, J. Alcaraz-Silva, C. Imperatori, S. Machado, H. Budde, and P. Torterolo. 2021. "Sleep-wake cycle disturbances and NeuN-altered expression in adult rats after cannabidiol treatments during adolescence." *Psychopharmacology (Berl)*. 238 (6): 1437–1447. doi:10.1007/s00213-021-05769-z.
- Murillo-Rodriguez, E., D. Millan-Aldaco, M. Palomero-Rivero, R. Mechoulam, and R. Drucker-Colin. 2006. "Cannabidiol, a constituent of Cannabis sativa, modulates sleep in rats." *FEBS Lett* 580 (18): 4337–4435. doi:10.1016/j.febslet .2006.04.102.
- Murillo-Rodriguez, E., D. Millan-Aldaco, M. Palomero-Rivero, R. Mec houlam, and R. Drucker-Colin. 2008. "The nonpsychoactive cannabis constituent cannabidiol is a wake-inducing agent." *Behav Neurosci* 122 (6): 1378–1382. doi:10.1037/a0013278.
- Murillo-Rodriguez, E., D. Millan-Aldaco, M. Palomero-Rivero, D. Morales-Lara, R. Mechoulam, and R. Drucker-Colin. 2019. "Cannabidiol partially blocks the excessive sleepiness in hypocretindeficient rats: Preliminary data." *CNS Neurol Disord Drug Targets* 18 (9): 705–712. doi:10.2174/187152731866191021143300.
- Murillo-Rodriguez, E., M. Palomero-Rivero, D. Millan-Aldaco, R. Mechoulam, and R. Drucker-Colin. 2011. "Effects on sleep and dopamine levels of microdialysis perfusion of cannabidiol into the lateral hypothalamus of rats." *Life Sci* 88 (11–12): 504–511. doi:10.1016/j.lfs.2011.01.013.
- Murillo-Rodriguez, E., A. Sarro-Ramirez, D. Sanchez, S. Mijangos-Moreno, A. Tejeda-Padron, A. Poot-Ake, K. Guzman, E. Pacheco-Pantoja, and O. Arias-Carrion. 2014. "Potential effects of cannabidiol as a wake-promoting agent." *Curr Neuropharmacol* 12 (3): 269–272. doi:10.2174/1570159X11666131204235805.
- Murkar, A., P. Kent, C. Cayer, J. James, T. Durst, and Z. Merali. 2019. "Cannabidiol and the remainder of the plant extract modulate the effects of delta9-tetrahydrocannabinol on fear memory reconsolidation." *Front Behav Neurosci* 13: 174. doi:10.3389/fnbeh.2019.00174.
- Murphy, M., S. Mills, J. Winstone, E. Leishman, J. Wager-Miller, H. Bradshaw, and K. Mackie. 2017. "Chronic adolescent delta(9)-tetrahydrocannabinol treatment of male mice leads to long-term cognitive and behavioral dysfunction, which are prevented by concurrent cannabidiol treatment." *Cannabis Cannabinoid Res* 2 (1): 235–246. doi:10.1089/can.2017.0034.
- Nadulski, T., F. Pragst, G. Weinberg, P. Roser, M. Schnelle, E. M. Fronk, and A. M. Stadelmann. 2005. "Randomized, double-blind, placebo-controlled study about the effects of cannabidiol (CBD) on the pharmacokinetics of delta9-tetrahydrocannabinol (THC) after oral application of THC verses standardized

- cannabis extract.” *Ther Drug Monit* 27 (6): 799–810. doi:10.1097/01.ftd.0000177223.19294.5c.
- Naftali, T. 2020. “An overview of cannabis-based treatment in Crohn’s disease.” *Expert Rev Gastroenterol Hepatol* 14 (4): 253–257. doi:10.1080/17474124.2020.1740590.
- Naftali, T., L. Bar-Lev Schleider, I. Dotan, E. P. Lansky, F. Skleroversusky Benjaminov, and F. M. Konikoff. 2013. “Cannabis induces a clinical response in patients with Crohn’s disease: A prospective placebo-controlled study.” *Clin Gastroenterol Hepatol* 11 (10): 1276–1280 e1. doi:10.1016/j.cgh.2013.04.034.
- Naftali, T., L. Bar-Lev Schleider, S. Almog, D. Meiri, and F. M. Konikoff. 2021. “Oral CBD-rich cannabis induces clinical but not endoscopic response in patients with Crohn’s disease, a randomised controlled trial.” *Journal of Crohn’s and Colitis* 15 (11): 1799–1806. doi:10.1093/ecco-jcc/jjab069.
- Naftali, T., R. Mechulam, A. Marii, G. Gabay, A. Stein, M. Bronshain, I. Laish, F. Benjaminov, and F. M. Konikoff. 2017. “Low-dose cannabidiol is safe but not effective in the treatment for Crohn’s disease, a randomized controlled trial.” *Dig Dis Sci* 62 (6): 1615–1620. doi:10.1007/s10620-017-4540-z.
- Nahler, G., F. Grotenhermen, A. W. Zuardi, and J. A. S. Crippa. 2017. “A conversion of oral cannabidiol to delta9-tetrahydrocannabinol seems not to occur in humans.” *Cannabis Cannabinoid Res* 2 (1): 81–86. doi:10.1089/can.2017.0009.
- National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Board on Population Health and Public Health Practice; Committee on the Health Effects of Marijuana. 2017. *The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research*. Washington, DC: National Academies Press.
- Navari, R. M., and M. Aapro. 2016. “Antiemetic prophylaxis for chemotherapy-induced nausea and vomiting.” *N Engl J Med* 374 (14): 1356–1367. doi:10.1056/NEJMra1515442.
- Neelakantan, H., R. J. Tallarida, Z. W. Reichenbach, R. F. Tuma, S. J. Ward, and E. A. Walker. 2015. “Distinct interactions of cannabidiol and morphine in three nociceptive behavioral models in mice.” *Behav Pharmacol* 26 (3): 304–314. doi:10.1097/FBP.0000000000000119.
- Nestler, E. J., and S. E. Hyman. 2010. “Animal models of neuropsychiatric disorders.” *Nat Neurosci* 13 (10): 1161–1169. doi:10.1038/nn.2647.
- Newmeyer, M. N., M. J. Swortwood, A. J. Barnes, O. A. Abulseoud, K. B. Scheidweiler, and M. A. Huestis. 2016. “Free and glucuronide whole blood cannabinoids’ pharmacokinetics after controlled smoked, vaporized, and oral cannabis administration in frequent and occasional cannabis users: Identification of recent cannabis intake.” *Clin Chem* 62 (12): 1579–1592. doi:10.1373/clinchem.2016.263475.
- Nguyen, L. C., D. Yang, V. Nicolaescu, T. J. Best, H. Gula, D. Saxena, J. D. Gabbard, S.-N. Chen, T. Ohtsuki, J. B. Friesen, N. Drayman, A. Mohamed, C. Dann, D. Silva, L. Robinson-Mailman, A. Valdespino, L. Stock, E. Suarez, K. A. Jones, S.-A. Azizi, J. K. Demarco, W. E. Severson, C. D. Anderson, J. M. Millis, B. C. Dickinson, S. Tay, S. A. Oakes, G. F. Pauli, K. E. Palmer, The National COVID Cohort Collaborative Consortium, D. O. Meltzer, G. Randall, and M. R. Rosner. 2022. “Cannabidiol inhibits SARS-CoV-2 replication through induction of the host ER stress and innate immune responses.” *Science Advances*: eabi6110. doi:10.1126/sciadv.abi6110.
- Nichols, J. M., and B. L. F. Kaplan. 2020. “Immune responses regulated by cannabidiol.” *Cannabis Cannabinoid Res* 5: 12–31. doi:10.1089/can.2018.0073.
- Nicholson, A. N., C. Turner, B. M. Stone, and P. J. Robson. 2004. “Effect of delta-9-tetrahydrocannabinol and cannabidiol on nocturnal sleep and early-morning behavior in young adults.” *J Clin Psychopharmacol* 24 (3): 305–313. doi:10.1097/01.jcp.0000125688.05091.8f.
- Nickles, M. A., and P. A. Lio. 2020. “Cannabinoids in dermatology: Hope or hype?” *Cannabis and Cannabinoid Research* 5 (4): 279–282. doi:10.1089/can.2019.0097.
- Nitecka-Buchta, A., A. Nowak-Wachol, K. Wachol, K. Walczynska-Dragon, P. Olczyk, O. Batoryna, W. Kempa,

- and S. Baron. 2019. "Myorelaxant effect of transdermal cannabidiol application in patients with TMD: A randomized, double-blind trial." *J Clin Med* 8 (11): 1886. doi:10.3390/jcm8111886.
- Nona, C. N., C. S. Hendershot, and B. Le Foll. 2019. "Effects of cannabidiol on alcohol-related outcomes: A review of preclinical and human research." *Exp Clin Psychopharmacol* 27 (4): 359–369. doi:10.1037/ph0000272.
- Norrbrink Budh, C., I. Lund, P. Ertzgaard, A. Holtz, C. Hultling, R. Levi, L. Werhagen, and T. Lundeberg. 2003. "Pain in a Swedish spinal cord injury population." *Clin Rehabil* 17 (6): 685–690. doi:10.1191/0269215503cr664oa.
- Norris, C., M. Loureiro, C. Kramar, J. Zunder, J. Renard, W. Rushlow, and S. R. Laviolette. 2016. "Cannabidiol modulates fear memory formation through interactions with serotonergic transmission in the mesolimbic system." *NeuroPsychopharmacology* 41 (12): 2839–2850. doi:10.1038/npp.2016.93.
- Notcutt, W., R. Langford, P. Davies, S. Ratcliffe, and R. Potts. 2012. "A placebo-controlled, parallel-group, randomized withdrawal study of subjects with symptoms of spasticity due to multiple sclerosis who are receiving long-term Sativex (nabiximols)." *Mult Scler* 18 (2): 219–228. doi:10.1177/1352458511419700.
- Novotna, A., J. Mares, S. Ratcliffe, I. Novakova, M. Vachova, O. Zapletalova, C. Gasperini, C. Pozzilli, L. Cefaro, G. Comi, P. Rossi, Z. Ambler, Z. Stelmasiak, A. Erdmann, X. Montalban, A. Klimek, P. Davies, and Group Sativex Spasticity Study. 2011. "A randomized, double-blind, placebo-controlled, parallel-group, enriched-design study of nabiximols (Sativex), as add-on therapy, in subjects with refractory spasticity caused by multiple sclerosis." *Eur J Neurol* 18 (9): 1122–1131. doi:10.1111/j.1468–1331.2010.03328.x.
- Nurmikko, T. J., M. G. Serpell, B. Hoggart, P. J. Toomey, B. J. Morlion, and D. Haines. 2007. "Sativex successfully treats neuropathic pain characterised by allodynia: A randomised, double-blind, placebo-controlled clinical trial." *Pain* 133 (1–3): 210–220. doi:10.1016/j.pain.2007.08.028.
- O'Brien, L. D., C. L. Limebeer, E. M. Rock, G. Bottegoni, D. Piomelli, and L. A. Parker. 2013. "Anandamide transport inhibition by ARN272 attenuates nausea-induced behaviour in rats, and vomiting in shrews (*Suncus murinus*)."
Br J Pharmacol 170 (5): 1130–1136. doi:10.1111/bph.12360.
- O'Brien, L. D., K. L. Wills, B. Segsworth, B. Dashney, E. M. Rock, C. L. Limebeer, and L. A. Parker. 2013. "Effect of chronic exposure to rimonabant and phytocannabinoids on anxiety-like behavior and saccharin palatability." *Pharmacol Biochem Behav* 103 (3): 597–602. doi:10.1016/j.pbb.2012.10.008.
- O'Connell, M., M. Sandgren, L. Frantzen, E. Bower, and B. Erickson. 2019. "Medical cannabis: Effects on opioid and benzodiazepine requirements for pain control." *Ann Pharmacother* 53 (11): 1081–1086. doi:10.1177/1060028019854221.
- O'Neill, A., R. Wilson, G. Blest-Hopley, L. Annibale, M. Colizzi, M. Brammer, V. Giampietro, and S. Bhattacharyya. 2020. "Normalization of mediotemporal and prefrontal activity, and mediotemporal-striatal connectivity, may underlie antipsychotic effects of cannabidiol in psychosis." *Psychol Med* 51 (4): 596–606. doi:10.1017/S0033291719003519.
- O'Shaughnessy, W. B. 1839. "On the preparations of Indian hemp, or gunja (*Cannabis indica*); Their effects on the animal system in health, and their utility in the treatment of tentanus and other convulsive diseases." *Br Foreign Med Rev*. 10 (19): 225–228.
- Ohlsson, A., J. E. Lindgren, S. Andersson, S. Agurell, H. Gillespie, and L. E. Hollister. 1986. "Single-dose kinetics of deuterium-labelled cannabidiol in man after smoking and intravenous administration." *Biomed Environ Mass Spectrom* 13 (2): 77–83. doi:10.1002/bms.1200130206.
- Olah, A., B. I. Toth, I. Borbiro, K. Sugawara, A. G. Szollosi, G. Czifra, B. Pal, L. Ambrus, J. Kloepfer, E. Camera, M. Ludovici, M. Picardo, T. Voets, C. C. Zouboulis, R. Paus, and T. Biro. 2014. "Cannabidiol exerts sebostatic and antiinflammatory effects on human sebocytes." *J Clin Invest* 124 (9): 3713–3724. doi:10.1172/JCI64628.

- Onaivi, E. S., M. R. Green, and B. R. Martin. 1990. "Pharmacological characterization of cannabinoids in the elevated plus maze." *Journal of Pharmacology and Experimental Therapeutics* 253 (3): 1002–1009.
- Orzalli, M. H., and J. C. Kagan. 2017. "Apoptosis and necroptosis as host defense strategies to prevent viral infection." *Trends Cell Biol* 27 (11): 800–809. doi:10.1016/j.tcb.2017.05.007.
- Osborne, A. L., N. Solowij, and K. Weston-Green. 2017. "A systematic review of the effect of cannabidiol on cognitive function: Relevance to schizophrenia." *Neurosci Biobehav Rev* 72: 310–324. doi:10.1016/j.neubiorev.2016.11.012.
- Oviedo, A., J. Glowa, and M. Herkenham. 1993. "Chronic cannabinoid administration alters cannabinoid receptor binding in rat brain: A quantitative autoradiographic study." *Brain Res* 616 (1–2): 293–302. doi:10.1016/0006-8993(93)90220-h.
- Owen, M. J., M. C. O'Donovan, A. Thapar, and N. Craddock. 2011. "Neurodevelopmental hypothesis of schizophrenia." *Br J Psychiatry* 198 (3): 173–175. doi:10.1192/bj.psy.2010.4384.
- Pacher, P., N. M. Kogan, and R. Mechoulam. 2020. "Beyond THC and endocannabinoids." *Annu Rev Pharmacol Toxicol* 60: 637–659. doi:10.1146/annurev-pharmtox-010818-021441.
- Palmieri, B., C. Laurino, and M. Vadala. 2017. "Short-term efficacy of CBD-enriched hemp oil in girls with dysautonomic syndrome after human papillomavirus vaccination." *Isr Med Assoc J* 19 (2): 79–84.
- Pan, H., P. Mukhopadhyay, M. Rajesh, V. Patel, B. Mukhopadhyay, B. Gao, G. Hasko, and P. Pacher. 2009. "Cannabidiol attenuates cisplatin-induced nephrotoxicity by decreasing oxidative/nitrosative stress, inflammation, and cell death." *J Pharmacol Exp Ther* 328 (3): 708–714. doi:10.1124/jpet.108.147181.
- Panzullo, S., B. L. A. Collins, J. Weil, J. Whyte, M. Barton, M. Coperchini, M. Rametta, and J. Philip. 2020. "Who is asking about medicinal cannabis in palliative care?" *Internal Medicine Journal* 50 (2): 243–246. doi:10.1111/imj.14732.
- Paolicelli, D., V. Direnzo, A. Manni, M. D'Onghia, C. Tortorella, S. Zoccolella, V. Di Lecce, A. Iaffaldano, and M. Trojano. 2016. "Long-term data of efficacy, safety, and tolerability in a real-life setting of THC/CBD oromucosal spray-treated multiple sclerosis patients." *J Clin Pharmacol* 56 (7): 845–851. doi:10.1002/jcph.670.
- Paria, B. C., S. K. Das, and S. K. Dey. 1995. "The preimplantation mouse embryo is a target for cannabinoid ligand-receptor signaling." *Proc Natl Acad Sci USA* 92 (21): 9460–9464. doi:10.1073/pnas.92.21.9460.
- Parker, L. A. 2014. "Conditioned flavor avoidance and conditioned gaping: rat models of conditioned nausea." *Eur J Pharmacol* 722: 122–133. doi:10.1016/j.ejphar.2013.09.070.
- Parker, L. A., P. Burton, R. E. Sorge, C. Yakiwchuk, and R. Mechoulam. 2004. "Effect of low doses of delta9-tetrahydrocannabinol and cannabidiol on the extinction of cocaine-induced and amphetamine-induced conditioned place preference learning in rats." *Psychopharmacology (Berl)* 175 (3): 360–366. doi:10.1007/s00213-004-1825-7.
- Parker, L. A., M. Kwiatkowska, P. Burton, and R. Mechoulam. 2004. "Effect of cannabinoids on lithium-induced vomiting in the *Suncus murinus* (house musk shrew)." *Psychopharmacology (Berl)* 171 (2): 156–161. doi:10.1007/s00213-003-1571-2.
- Parker, L. A., and R. Mechoulam. 2003. "Cannabinoid agonists and antagonists modulate lithium-induced conditioned gaping in rats." *Integr Physiol Behav Sci.* 38 (2): 133–145.
- Parker, L. A., R. Mechoulam, and C. Schlievert. 2002. "Cannabidiol, a non-psychoactive component of cannabis and its synthetic dimethylheptyl homolog suppress nausea in an experimental model with rats." *Neuroreport* 13 (5): 567–570. doi:10.1097/00001756-200204160-00006.
- Patrician, A., M. Versic-Bratincevic, T. Mijacika, I. Banic, M. Marendic, D. Sutlovic, Z. Dujic, and P. N. Ainslie. 2019. "Examination of a new delivery approach for oral cannabidiol in healthy subjects: A randomized, double-blinded, placebo-controlled pharmacokinetics study." *Adv Ther* 36 (11): 3196–3210. doi:10.1007/

s12325-019-01074-6.

- Patti, F., S. Messina, C. Solaro, M. P. Amato, R. Bergamaschi, S. Bonavita, R. Bruno Bossio, V. Brescia Morra, G. F. Costantino, P. Cavalla, D. Centonze, G. Comi, S. Cottone, M. Danni, A. Francia, A. Gajofatto, C. Gasperini, A. Ghezzi, A. Iudice, G. Lus, G. T. Maniscalco, M. G. Marrosu, M. Matta, M. Mirabella, E. Montanari, C. Pozzilli, M. Rovaris, E. Sessa, D. Spitaleri, M. Trojano, P. Valentino, M. Zappia, and Sa Fe Study Group. 2016. "Efficacy and safety of cannabinoid oromucosal spray for multiple sclerosis spasticity." *J Neurol Neurosurg Psychiatry* 87 (9): 944–951. doi:10.1136/jnnp-2015-312591.
- Paudel, K. S., D. C. Hammell, R. U. Agu, S. Valiveti, and A. L. Stinchcomb. 2010. "Cannabidiol bioavailability after nasal and transdermal application: Effect of permeation enhancers." *Drug Dev Ind Pharm* 36 (9): 1088–1097. doi:10.3109/03639041003657295.
- Pazos, M. R., V. Cinquina, A. Gomez, R. Layunta, M. Santos, J. Fernandez-Ruiz, and J. Martinez-Orgado. 2012. "Cannabidiol administration after hypoxia-ischemia to newborn rats reduces long-term brain injury and restores neurobehavioral function." *Neuropharmacology* 63 (5): 776–783. doi:10.1016/j.neuropharm.2012.05.034.
- Pazos, M. R., N. Mohammed, H. Lafuente, M. Santos, E. Martinez-Pinilla, E. Moreno, E. Valdizan, J. Romero, A. Pazos, R. Franco, C. J. Hillard, F. J. Alvarez, and J. Martinez-Orgado. 2013. "Mechanisms of cannabidiol neuroprotection in hypoxic-ischemic newborn pigs: Role of 5HT(1A) and CB2 receptors." *Neuropharmacology* 71: 282–291. doi:10.1016/j.neuropharm.2013.03.027.
- Pedrazzi, J. F., A. C. Issy, F. V. Gomes, F. S. Guimaraes, and E. A. Del-Bel. 2015. "Cannabidiol effects in the prepulse inhibition disruption induced by amphetamine." *Psychopharmacology (Berl)* 232 (16): 3057–3065. doi:10.1007/s00213-015-3945-7.
- Pellow, S., P. Chopin, S. E. File, and M. Briley. 1985. "Validation of open:closed arm entries in an elevated plus-maze as a measure of anxiety in the rat." *J Neurosci Methods* 14 (3): 149–167. doi:10.1016/0165-0270(85)90031-7.
- Peres, F. F., M. C. Diana, R. Levin, M. A. Suiama, V. Almeida, A. M. Vendramini, C. M. Santos, A. W. Zuardi, J. E. C. Hallak, J. A. Crippa, and V. C. Abilio. 2018. "Cannabidiol administered during peri-adolescence prevents behavioral abnormalities in an animal model of schizophrenia." *Front Pharmacol* 9: 901. doi:10.3389/fphar.2018.00901.
- Pertwee, R. G. 2008. "The diverse CB1 and CB2 receptor pharmacology of three plant cannabinoids: delta9-tetrahydrocannabinol, cannabidiol and delta9-tetrahydrocannabivarin." *Br J Pharmacol* 153 (2): 199–215. doi:10.1038/sj.bjp.0707442.
- Pertwee, R. G., E. M. Rock, K. Guenther, C. L. Limebeer, L. A. Stevenson, C. Haj, R. Smoum, L. A. Parker, and R. Mechoulam. 2018. "Cannabidiolic acid methyl ester, a stable synthetic analogue of cannabidiolic acid, can produce 5-HT." *Br J Pharmacol* 175 (1): 100–112. doi:10.1111/bph.14073.
- Petrzilka, T. W., W. Haefliger, c. Sikemeir, G. Ohloff, and A. Eschenmoser. 1967. "Synthese und chiralitat des (−) cannabidiols." *Helv Chim Acta* 50: 719–723.
- Philpott, H. T., M. O'Brien, and J. J. McDougall. 2017. "Attenuation of early phase inflammation by cannabidiol prevents pain and nerve damage in rat osteoarthritis." *Pain* 158 (12): 2442–2451. doi:10.1097/j.pain.0000000000001052.
- Pinto, J. V., G. Saraf, C. Frysch, D. Vigo, K. Keramatian, T. Chakrabarty, R. W. Lam, M. Kauer-Sant'Anna, and L. N. Yatham. 2020. "Cannabidiol as a treatment for mood disorders: A systematic review." *Can J Psychiatry* 65 (4): 213–227. doi:10.1177/0706743719895195.
- Piper, B. J. 2018. "Mother of berries, ACDC, or choclope: Examination of the strains used by medical cannabis patients in New England." *J Psychoactive Drugs* 50 (2): 95–104. doi:10.1080/02791072.2017.1390179.
- Pisanti, S., A. M. Malfitano, E. Ciaglia, A. Lamberti, R. Ranieri, G. Cuomo, M. Abate, G. Faggiana, M. C. Proto,

- D. Fiore, C. Laezza, and M. Bifulco. 2017. "Cannabidiol: State of the art and new challenges for therapeutic applications." *Pharmacol Ther* 175: 133–150. doi:10.1016/j.pharmthera.2017.02.041.
- Poli-Bigelli, S., J. Rodrigues-Pereira, A. D. Carides, G. Julie Ma, K. Eldridge, A. Hipple, J. K. Evans, K. J. Horgan, F. Lawson, and Group Aprepitant Protocol 054 Study. 2003. "Addition of the neurokinin 1 receptor antagonist aprepitant to standard antiemetic therapy improves control of chemotherapy-induced nausea and vomiting. Results from a randomized, double-blind, placebo-controlled trial in Latin America." *Cancer* 97 (12): 3090–3098. doi:10.1002/cncr.11433.
- Porsolt, R. D., G. Anton, N. Blavet, and M. Jalfre. 1978. "Behavioural despair in rats: A new model sensitive to antidepressant treatments." *Eur J Pharmacol* 47 (4): 379–391. doi:10.1016/0014-2999(78)90118-8.
- Porsolt, R. D., M. Le Pichon, and M. Jalfre. 1977. "Depression: A new animal model sensitive to antidepressant treatments." *Nature* 266 (5604): 730–732. doi:10.1038/266730a0.
- Portenoy, R. K., E. D. Ganae-Motan, S. Allende, R. Yanagihara, L. Shaiova, S. Weinstein, R. McQuade, S. Wright, and M. T. Fallon. 2012. "Nabiximols for opioid-treated cancer patients with poorly-controlled chronic pain: A randomized, placebo-controlled, graded-dose trial." *J Pain* 13 (5): 438–449. doi:10.1016/j.jpain.2012.01.003.
- Porter, B. E., and C. Jacobson. 2013. "Report of a parent survey of cannabidiol-enriched cannabis use in pediatric treatment-resistant epilepsy." *Epilepsy Behav* 29 (3): 574–577. doi:10.1016/j.yebeh.2013.08.037.
- Press, C. A., K. G. Knupp, and K. E. Chapman. 2015. "Parental reporting of response to oral cannabis extracts for treatment of refractory epilepsy." *Epilepsy Behav* 45: 49–52. doi:10.1016/j.yebeh.2015.02.043.
- Pryce, G., and D. Baker. 2014. "Cannabis and multiple sclerosis." In *Handbook of Cannabis*, edited by Roger G. Pertwee, 487–501. Oxford: Oxford University Press.
- Pucci, M., C. Rapino, A. Di Francesco, E. Dainese, C. D'Addario, and M. Maccarrone. 2013. "Epigenetic control of skin differentiation genes by phytocannabinoids." *Br J Pharmacol* 170 (3): 581–591. doi:10.1111/bph.12309.
- Qian, Y., T. K. Gilliland, and J. S. Markowitz. 2020. "The influence of carboxylesterase 1 polymorphism and cannabidiol on the hepatic metabolism of heroin." *Chem Biol Interact* 316: 108914. doi:10.1016/j.cbi.2019.108914.
- Raj, V., J. G. Park, K. H. Cho, P. Choi, T. Kim, J. Ham, and J. Lee. 2021. "Assessment of antiviral potencies of cannabinoids against SARS-CoV-2 using computational and in vitro approaches." *Int J Biol Macromol* 168: 474–485. doi:10.1016/j.ijbiomac.2020.12.020.
- Rajesh, M., P. Mukhopadhyay, S. Batkai, V. Patel, K. Saito, S. Matsumoto, Y. Kashiwaya, B. Horvath, B. Mukhopadhyay, L. Becker, G. Hasko, L. Liaudet, D. A. Wink, A. Veves, R. Mechoulam, and P. Pacher. 2010. "Cannabidiol attenuates cardiac dysfunction, oxidative stress, fibrosis, and inflammatory and cell death signaling pathways in diabetic cardiomyopathy." *J Am Coll Cardiol* 56 (25): 2115–2125. doi:10.1016/j.jacc.2010.07.033.
- Ramer, R., and B. Hinz. 2017. "Cannabinoids as anticancer drugs." *Adv Pharmacol* 80: 397–436. doi:10.1016/bs.apha.2017.04.002.
- Raymundi, A. M., T. R. da Silva, A. R. Zampronio, F. S. Guimaraes, L. J. Bertoglio, and C. A. J. Stern. 2020. "A time-dependent contribution of hippocampal CB1, CB2 and PPAR gamma receptors to cannabidiol-induced disruption of fear memory consolidation." *Br J Pharmacol* 177 (4): 945–957. doi:10.1111/bph.14895.
- RECOVERY Collaborative Group. 2021. "Dexamethasone in hospitalized patients with Covid-19." *New England Journal of Medicine* 384 (8): 693–704. doi:10.1056/NEJMoa2021436
- Reilly, D., P. Didcott, W. Swift, and W. Hall. 1998. "Long-term cannabis use: Characteristics of users in an Australian rural area." *Addiction* 93 (6): 837–846. doi:10.1046/j.1360-0443.1998.9368375.x.
- Reiss, C. S. 2010. "Cannabinoids and viral infections." *Pharmaceuticals (Basel)* 3 (6): 1873–1886. doi:10.3390/ph3061873.

- Ren, Y., J. Whittard, A. Higuera-Matas, C. V. Morris, and Y. L. Hurd. 2009. "Cannabidiol, a nonpsychotropic component of cannabis, inhibits cue-induced heroin seeking and normalizes discrete mesolimbic neuronal disturbances." *J Neurosci* 29 (47): 14764–14769. doi:10.1523/JNEUROSCI.4291–09.2009.
- Renard, J., M. Loureiro, L. G. Rosen, J. Zunder, C. de Oliveira, S. Schmid, W. J. Rushlow, and S. R. Laviolette. 2016. "Cannabidiol counteracts amphetamine-induced neuronal and behavioral sensitization of the mesolimbic dopamine pathway through a novel mTOR/p70S6 kinase signaling pathway." *J Neurosci* 36 (18): 5160–5169. doi:10.1523/JNEUROSCI.3387–15.2016.
- Renard, J., C. Norris, W. Rushlow, and S. R. Laviolette. 2017. "Neuronal and molecular effects of cannabidiol on the mesolimbic dopamine system: Implications for novel schizophrenia treatments." *Neurosci Biobehav Rev* 75: 157–165. doi:10.1016/j.neubiorev.2017.02.006.
- Resstel, L. B., S. R. Joca, F. A. Moreira, F. M. Correa, and F. S. Guimaraes. 2006. "Effects of cannabidiol and diazepam on behavioral and cardiovascular responses induced by contextual conditioned fear in rats." *Behav Brain Res* 172 (2): 294–298. doi:10.1016/j.bbr.2006.05.016.
- Resstel, L. B., R. F. Tavares, S. F. Lisboa, S. R. Joca, F. M. Correa, and F. S. Guimaraes. 2009. "5-HT1A receptors are involved in the cannabidiol-induced attenuation of behavioural and cardiovascular responses to acute restraint stress in rats." *Br J Pharmacol* 156 (1): 181–188. doi:10.1111/j.1476–5381.2008.00046.x.
- Reus, G. Z., R. B. Stringari, K. F. Ribeiro, T. Luft, H. M. Abelaira, G. R. Fries, B. W. Aguiar, F. Kapczinski, J. E. Hallak, A. W. Zuardi, J. A. Crippa, and J. Quevedo. 2011. "Administration of cannabidiol and imipramine induces antidepressant-like effects in the forced swimming test and increases brain-derived neurotrophic factor levels in the rat amygdala." *Acta Neuropsychiatr* 23 (5): 241–248. doi:10.1111/j.1601–5215.2011.00579.x.
- Reynolds, J. R. 1868. "Therapeutical uses and toxic effects of *Cannabis indica*." *Lancet* 1:637–638.
- Ribeiro, A., V. I. Almeida, C. Costola-de-Souza, V. Ferraz-de-Paula, M. L. Pinheiro, L. B. Vitoretti, J. Gimenes-Junior, A. T. Akamine, J. A. Crippa, W. Tavares-de-Lima, and J. Palermo-Neto. 2015. "Cannabidiol improves lung function and inflammation in mice submitted to LPS-induced acute lung injury." *Immunopharmacology and Immunotoxicology* 37 (1): 35–41. doi:10.3109/08923973.2014.976794
- Ribeiro, A., V. Ferraz-de-Paula, M. L. Pinheiro, L. B. Vitoretti, D. P. Mariano-Souza, W. M. Quinteiro-Filho, A. T. Akamine, V. I. Almeida, J. Quevedo, F. Dal-Pizzol, J. E. Hallak, A. W. Zuardi, J. A. Crippa, and J. Palermo-Neto. 2012. "Cannabidiol, a non-psychotropic plant-derived cannabinoid, decreases inflammation in a murine model of acute lung injury: Role for the adenosine A(2A) receptor." *Eur J Pharmacol* 678 (1–3): 78–85. doi:10.1016/j.ejphar.2011.12.043.
- Richards, J. R. 2017. "Cannabinoid hyperemesis syndrome: A disorder of the HPA axis and sympathetic nervous system?" *Med Hypotheses* 103: 90–95. doi:10.1016/j.mehy.2017.04.018.
- Riedel, G., P. Fadda, S. McKillop-Smith, R. G. Pertwee, B. Platt, and L. Robinson. 2009. "Synthetic and plant-derived cannabinoid receptor antagonists show hypophagic properties in fasted and non-fasted mice." *Br J Pharmacol* 156 (7): 1154–1166. doi:10.1111/j.1476–5381.2008.00107.x.
- Rock, E. M., D. Bolognini, C. L. Limebeer, M. G. Cascio, S. Anavi-Goffer, P.J. Fletcher, R. Mechoulam, R. G. Pertwee, and L. A. Parker. 2012. "Cannabidiol, a non-psychotropic component of cannabis, attenuates vomiting and nausea-like behaviour via indirect agonism of 5-HT(1A) somatodendritic autoreceptors in the dorsal raphe nucleus." *British Journal of Pharmacology* 165 (8): 2620–2634. doi:10.1111/j.1476–5381.2011.01621.x.
- Rock, E. M., C. Connolly, C. L. Limebeer, and L. A. Parker. 2016. "Effect of combined oral doses of Δ(9)-tetrahydrocannabinol (THC) and cannabidiolic acid (CBDA) on acute and anticipatory nausea in rat models." *Psychopharmacology (Berl)* 233 (18): 3353–3360. doi:10.1007/s00213-016-4378-7.
- Rock, E. M., J. M. Goodwin, C. L. Limebeer, A. Breuer, R. G. Pertwee, R. Mechoulam, and L. A. Parker. 2011.

- “Interaction between non-psychotropic cannabinoids in marihuana: Effect of cannabigerol (CBG) on the anti-nausea or anti-emetic effects of cannabidiol (CBD) in rats and shrews.” *Psychopharmacology (Berl)* 215 (3): 505–512. doi:10.1007/s00213-010-2157-4.
- Rock, E. M., C. L. Limebeer, R. Mechoulam, D. Piomelli, and L. A. Parker. 2008. “The effect of cannabidiol and URB597 on conditioned gaping (a model of nausea) elicited by a lithium-paired context in the rat.” *Psychopharmacology (Berl)* 196 (3): 389–395. doi:10.1007/s00213-007-0970-1.
- Rock, E. M., C. L. Limebeer, R. Navaratnam, M. A. Sticht, N. Bonner, K. Engeland, R. Downey, H. Morris, M. Jackson, and L. A. Parker. 2014. “A comparison of cannabidiolic acid with other treatments for anticipatory nausea using a rat model of contextually elicited conditioned gaping.” *Psychopharmacology (Berl)* 231 (16): 3207–3215. doi:10.1007/s00213-014-3498-1.
- Rock, E. M., C. L. Limebeer, and L. A. Parker. 2015. “Effect of combined doses of Δ(9)-tetrahydrocannabinol (THC) and cannabidiolic acid (CBDA) on acute and anticipatory nausea using rat (Sprague-Dawley) models of conditioned gaping.” *Psychopharmacology (Berl)* 232 (24): 4445–4454. doi:10.1007/s00213-015-4080-1.
- Rock, E. M., C. L. Limebeer, and L. A. Parker. 2018. “Effect of cannabidiolic acid and (9)-tetrahydrocannabinol on carrageenan-induced hyperalgesia and edema in a rodent model of inflammatory pain.” *Psychopharmacology (Berl)* 235 (11): 3259–3271. doi:10.1007/s00213-018-5034-1.
- Rock, E. M., C. L. Limebeer, G. N. Petrie, L. A. Williams, R. Mechoulam, and L. A. Parker. 2017. “Effect of prior foot shock stress and delta(9)-tetrahydrocannabinol, cannabidiolic acid, and cannabidiol on anxiety-like responding in the light-dark emergence test in rats.” *Psychopharmacology (Berl)* 234 (14): 2207–2217. doi:10.1007/s00213-017-4626-5.
- Rock, E. M., and L. A. Parker. 2013. “Effect of low doses of cannabidiolic acid and ondansetron on LiCl-induced conditioned gaping (a model of nausea-induced behaviour) in rats.” *Br J Pharmacol.* 169 (3): 685–692. doi:10.1111/bph.12162.
- Rock, E. M., and L. A. Parker. 2015. “Synergy between cannabidiol, cannabidiolic acid, and delta(9)-tetrahydrocannabinol in the regulation of emesis in the *Suncus murinus* (house musk shrew).” *Behav Neurosci* 129 (3): 368–370. doi:10.1037/bne0000057.
- Rock, E. M., M. T. Sullivan, S. A. Collins, H. Goodman, C. L. Limebeer, R. Mechoulam, and L. A. Parker. 2020. “Evaluation of repeated or acute treatment with cannabidiol (CBD), cannabidiolic acid (CBDA) or CBDA methyl ester (HU-580) on nausea and/or vomiting in rats and shrews.” *Psychopharmacology (Berl)* 237 (9): 2621–2631. doi:10.1007/s00213-020-05559-z.
- Rock, E. M., M. T. Sullivan, S. Pravato, M. Pratt, C. L. Limebeer, and L. A. Parker. 2020. “Effect of combined doses of delta(9)-tetrahydrocannabinol and cannabidiol or tetrahydrocannabinolic acid and cannabidiolic acid on acute nausea in male Sprague-Dawley rats.” *Psychopharmacology (Berl)* 237 (3): 901–914. doi:10.1007/s00213-019-05428-4.
- Rodrigues da Silva, N., F. V. Gomes, A. B. Sonego, and F. S. Guimaraes. 2020. “Cannabidiol attenuates behavioral changes in a rodent model of schizophrenia through 5-HT1A, but not CB1 and CB2 receptors.” *Pharmacol Res* 156: 104749. doi:10.1016/j.phrs.2020.104749.
- Rodriguez-Munoz, M., Y. Onetti, E. Cortes-Montero, J. Garzon, and P. Sanchez-Blazquez. 2018. “Cannabidiol enhances morphine antinociception, diminishes NMDA-mediated seizures and reduces stroke damage via the sigma 1 receptor.” *Mol Brain* 11 (1): 51. doi:10.1186/s13041-018-0395-2.
- Rog, D. J., T. J. Nurmikko, T. Friede, and C. A. Young. 2005. “Randomized, controlled trial of cannabis-based medicine in central pain in multiple sclerosis.” *Neurology* 65 (6): 812–819. doi:10.1212/01.wnl.0000176753.45410.8b.
- Romero, J., F. Berrendero, J. Manzanares, A. Pérez, J. Corchero, J. A. Fuentes, J. J. Fernández-Ruiz, and J. A. Ramos. 1998. “Time-course of the cannabinoid receptor down-regulation in the adult rat brain caused by

- repeated exposure to delta9-tetrahydrocannabinol.” *Synapse* 30 (3): 298–308. doi:10.1002/(sici)1098–2396(199811)30:3<298::aid-syn7>3.0.co;2–6.
- Rosenkrantz, H., R. W. Fleischman, and R. J. Grant. 1981. “Toxicity of short-term administration of cannabinoids to rhesus monkeys.” *Toxicol Appl Pharmacol* 58 (1): 118–131. doi:10.1016/0041–008x(81)90122–8.
- Rosenthal, M. S. 1972. “Clinical effects of marijuana on the young: A call for more systematic clinical inquiry.” *Int J Psychiatry* 10 (2): 75–77.
- Roser, P., J. Gallatin, G. Weinberg, G. Juckel, I. Gorynia, and A. M. Stadelmann. 2009. “Psychomotor performance in relation to acute oral administration of delta9-tetrahydrocannabinol and standardized cannabis extract in healthy human subjects.” *Eur Arch Psychiatry Clin Neurosci* 259 (5): 284–292. doi:10.1007/s00406-009-0868-5.
- Ross, D. A., M. R. Arbuckle, M. J. Travis, J. B. Dwyer, G. I. van Schalkwyk, and K. J. Ressler. 2017. “An integrated neuroscience perspective on formulation and treatment planning for posttraumatic stress disorder: An educational review.” *JAMA Psychiatry* 74 (4): 407–415. doi:10.1001/jamapsychiatry.2016.3325.
- Rossignoli, M. T., C. Lopes-Aguiar, R. N. Ruggiero, R. A. Do Val da Silva, L. S. Bueno-Junior, L. Kandratavicius, J. E. Peixoto-Santos, J. A. Crippa, J. E. Cecilio Hallak, A. W. Zuardi, R. E. Szawka, J. Anselmo-Franci, J. P. Leite, and R. N. Romcy-Pereira. 2017. “Selective post-training time window for memory consolidation interference of cannabidiol into the prefrontal cortex: Reduced dopaminergic modulation and immediate gene expression in limbic circuits.” *Neuroscience* 350: 85–93. doi:10.1016/j.neuroscience.2017.03.019.
- Ruan, Q., K. Yang, W. Wang, L. Jiang, and J. Song. 2020. “Clinical predictors of mortality due to COVID-19 based on an analysis of data of 150 patients from Wuhan, China.” *Intensive Care Medicine* 46 (5): 846–848. doi:10.1007/s00134-020-05991-x.
- Rubino, T., L. Tizzoni, D. Vigan., P. Massi, and D. Parolaro. 1997. “Modulation of rat brain cannabinoid receptors after chronic morphine treatment.” *Neuroreport* 8 (15): 3219–3223. doi:10.1097/00001756-199710200-00007.
- Rudd, J. A., E. Nalivaiko, N. Matsuki, C. Wan, and P. L. R. Andrews. 2015. “The involvement of TRPV1 in emesis and anti-emesis.” *Temperature* 2 (2): 258–276. doi:10.1080/23328940.2015.1043042.
- Runner, R. P., A. N. Luu, N. A. Nassif, T. S. Scudday, J. J. Patel, S. L. Barnett, and R. S. Gorab. 2020. “Use of tetrahydrocannabinol and cannabidiol products in the perioperative period around primary unilateral total hip and knee arthroplasty.” *J Arthroplasty* 35 (6S): S138–S143. doi:10.1016/j.arth.2020.01.077.
- Russo, E. B. 2017. “Cannabidiol claims and misconceptions.” *Trends Pharmacol Sci* 38 (3): 198–201. doi:10.1016/j.tips.2017.03.006.
- Russo, E. B., A. Burnett, B. Hall, and K. K. Parker. 2005. “Agonistic properties of cannabidiol at 5-HT1a receptors.” *Neurochem Res* 30 (8): 1037–1043. doi:10.1007/s11064-005-6978-1.
- Russo, E. B., C. Spooner, L. May, R. Leslie, and V. L. Whiteley. 2021. “Cannabinoid hyperemesis syndrome survey and genomic investigation.” Online ahead of print. *Cannabis Cannabinoid Res* doi:10.1089/can.2021.0046.
- Russo, E. B., G. W. Guy, and P. J. Robson. 2007. “Cannabis, pain, and sleep: Lessons from therapeutic clinical trials of Sativex, a cannabis-based medicine.” *Chem Biodivers* 4 (8): 1729–1743. doi:10.1002/cbdv.200790150.
- Ryberg, E., N. Larsson, S. Sjogren, S. Hjorth, N. O. Hermansson, J. Leonova, T. Elebring, K. Nilsson, T. Drmota, and P. J. Greasley. 2007. “The orphan receptor GPR55 is a novel cannabinoid receptor.” *Br J Pharmacol* 152 (7): 1092–1101. doi:10.1038/sj.bjp.0707460.
- Saft, C., S. M. von Hein, T. Lucke, C. Thiels, M. Peball, A. Djamshidian, B. Heim, and K. Seppi. 2018. “Cannabinoids for treatment of dystonia in Huntington’s disease.” *J Huntington’s Dis* 7 (2): 167–173. doi:10.3233/JHD-170283.

- Sales, A. J., C. C. Crestani, F. S. Guimaraes, and S. R. L. Joca. 2018. "Antidepressant-like effect induced by cannabidiol is dependent on brain serotonin levels." *Prog Neuropsychopharmacol Biol Psychiatry* 86: 255–261. doi:10.1016/j.pnpbp.2018.06.002.
- Sales, A. J., M. V. Fogaca, A. G. Sartim, V. S. Pereira, G. Wegener, F. S. Guimaraes, and S. R. L. Joca. 2019. "Cannabidiol induces rapid and sustained antidepressant-like effects through increased BDNF signaling and synaptogenesis in the prefrontal cortex." *Mol Neurobiol* 56 (2): 1070–1081. doi:10.1007/s12035-018-1143-4.
- Sales, A. J., F. S. Guimarães, and S. R. L. Joca. 2020. "CBD modulates DNA methylation in the prefrontal cortex and hippocampus of mice exposed to forced swim." *Behav Brain Res* 388: 112627. doi:10.1016/j.bbr.2020.112627.
- Samara, E., M. Bialer, and R. Mechoulam. 1988. "Pharmacokinetics of cannabidiol in dogs." *Drug Metab Dispos* 16 (3): 469–472.
- Sanmartin, P. E., and K. Detyniecki. 2018. "Cannabidiol for epilepsy: New hope on the horizon?" *Clin Ther* 40 (9): 1438–1441. doi:10.1016/j.clinthera.2018.07.020.
- Santavy, F. 1964. "Notes on the structures of cannabidiol compounds." *Acta Univ Palackianae Olomuc* 35:5–6.
- Scarante, F. F., M. A. Ribeiro, A. F. Almeida-Santos, F. S. Guimaraes, and A. C. Campos. 2020. "Glial cells and their contribution to the mechanisms of action of cannabidiol in neuropsychiatric disorders." *Front Pharmacol* 11:618065. doi:10.3389/fphar.2020.618065.
- Scherma, M., L. V. Panlilio, P. Fadda, L. Fattore, I. Gamaleddin, B. Le Foll, Z. Justinová, E. Mikics, J. Haller, J. Medalie, J. Stroik, C. Barnes, S. Yasar, G. Tanda, D. Piomelli, W. Fratta, and S. R. Goldberg. 2008. "Inhibition of anandamide hydrolysis by cyclohexyl carbamic acid 3'-carbamoyl-3-yl ester (URB597) reverses abuse-related behavioral and neurochemical effects of nicotine in rats." *J Pharmacol Exp Ther* 327: 482–490. doi:10.1124/jpet.108.142224.
- Schiavon, A. P., J. M. Bonato, H. Milani, F. S. Guimaraes, and R. M. Weffort de Oliveira. 2016. "Influence of single and repeated cannabidiol administration on emotional behavior and markers of cell proliferation and neurogenesis in non-stressed mice." *Prog Neuropsychopharmacol Biol Psychiatry* 64: 27–34. doi:10.1016/j.pnpbp.2015.06.017.
- Schicho, R., and M. Storr. 2012. "Topical and systemic cannabidiol improves trinitrobenzene sulfonic acid colitis in mice." *Pharmacology* 89 (3–4): 149–155. doi:10.1159/000336871.
- Schilling, J. M., C. G. Hughes, M. S. Wallace, M. Sexton, M. Backonja, and T. Moeller-Bertram. 2021. "Cannabidiol as a treatment for chronic pain: A survey of patients' perspectives and attitudes." *J Pain Res* 14: 1241–1250. doi:10.2147/jpr.s278718.
- Schleicher, E. M., F. W. Ott, M. Muller, B. Silcher, M. E. Sichler, M. J. Low, J. M. Wagner, and Y. Bouter. 2019. "Prolonged cannabidiol treatment lacks on detrimental effects on memory, motor performance and anxiety in C57BL/6J mice." *Front Behav Neurosci* 13: 94. doi:10.3389/fnbeh.2019.00094.
- Schneider, T., L. Zurbriggen, M. Dieterle, E. Mauermann, P. Frei, K. Mercer-Chalmers-Bender, and W. Ruppen. 2022. "Pain response to cannabidiol in induced acute nociceptive pain, allodynia, and hyperalgesia by using a model mimicking acute pain in healthy adults in a randomized trial (CANAB I)." *Pain* 163 (1): e62–e71. doi:10.1097/j.pain.0000000000002310.
- Schoevers, J., J. E. Leweke, and F. M. Leweke. 2020. "Cannabidiol as a treatment option for schizophrenia: Recent evidence and current studies." *Curr Opin Psychiatry* 33 (3): 185–191. doi:10.1097/YCO.0000000000000596.
- Schofield, D., C. Tennant, L. Nash, L. Degenhardt, A. Cornish, C. Hobbs, and G. Brennan. 2006. "Reasons for cannabis use in psychosis." *Aust NZ J Psychiatry* 40 (6–7): 570–574. doi:10.1080/j.1440-1614.2006.01840.x.
- Schubart, C. D., I. E. Sommer, W. A. van Gastel, R. L. Goetgebuer, R. S. Kahn, and M. P. Boks. 2011. "Cannabis with high cannabidiol content is associated with fewer psychotic experiences." *Schizophr Res* 130 (1–3): 216–221. doi:10.1016/j.schres.2011.04.017.

- Scopinho, A. A., F. S. Guimaraes, F. M. Correa, and L. B. Resstel. 2011. "Cannabidiol inhibits the hyperphagia induced by cannabinoid-1 or serotonin-1A receptor agonists." *Pharmacol Biochem Behav* 98 (2): 268–272. doi:10.1016/j.pbb.2011.01.007.
- Serpell, M. G., W. Notcutt, and C. Collin. 2013. "Sativex long-term use: An open-label trial in patients with spasticity due to multiple sclerosis." *J Neurol* 260 (1): 285–295. doi:10.1007/s00415-012-6634-z.
- Serpell, M., S. Ratcliffe, J. Hovorka, M. Schofield, L. Taylor, H. Lauder, and E. Ehler. 2014. "A double-blind, randomized, placebo-controlled, parallel group study of THC/CBD spray in peripheral neuropathic pain treatment." *Eur J Pain* 18 (7): 999–1012. doi:10.1002/ejp.1532–2149.2013.00445.x.
- Shallcross, J., P. Hamor, A. R. Bechard, M. Romano, L. Knackstedt, and M. Schwendt. 2019. "The divergent effects of CDPPB and cannabidiol on fear extinction and anxiety in a predator scent stress model of PTSD in rats." *Front Behav Neurosci* 13: 91. doi:10.3389/fnbeh.2019.00091.
- Shani, A., and R. Mechoulam. 1971. "Photochemical reactions of cannabidiol. Cyclization to 1-THC and other transformations." *Tetrahedron* 27: 601–606.
- Shannon, S., N. Lewis, H. Lee, and S. Hughes. 2019. "Cannabidiol in anxiety and sleep: A large case series." *Perm J* 23: 18–41. doi:10.7812/TPP/18–041.
- Shannon, S., and J. Opila-Lehman. 2015. "Cannabidiol oil for decreasing addictive use of marijuana: A case report." *Integr Med (Encinitas)* 14 (6): 31–35.
- Shannon, S., and J. Opila-Lehman. 2016. "Effectiveness of cannabidiol oil for pediatric anxiety and insomnia as part of posttraumatic stress disorder: A case report." *Perm J* 20 (4): 16-005. doi:10.7812/TPP/16-005.
- Shapiro, L., D. Hen-Shoval, N. Hazut, K. Rapps, S. Dar, G. Zalsman, R. Mechoulam, A. Weller, and G. Shoval. 2019. "Effects of cannabidiol in males and females in two different rat models of depression." *Physiol Behav* 201: 59–63. doi:10.1016/j.physbeh.2018.12.019.
- Sholler, D. J., L. Schoene, and T. R. Spindle. 2020. "Therapeutic efficacy of cannabidiol (CBD): A review of the evidence from clinical trials and human laboratory studies." *Curr Addict Rep* 7 (3): 405–412. doi:10.1007/s40429-020-00326-8.
- Shoval, G., L. Shapiro, L. Hershkovitz, N. Hazut, G. Zalsman, R. Mechoulam, and A. Weller. 2016. "Prohedonic effect of cannabidiol in a rat model of depression." *Neuropsychobiology* 73 (2): 123–129. doi:10.1159/000443890.
- Shover, C. L., and K. Humphreys. 2020. "Debunking cannabidiol as a treatment for COVID-19: Time for the FDA to adopt a focused deterrence model?" *Cureus* 12 (6): e8671. doi:10.7759/cureus.8671.
- Sihota, A., B. K. Smith, S. A. Ahmed, A. Bell, A. Blain, H. Clarke, Z. D. Cooper, C. Cyr, P. Daeninck, A. Deshpande, K. Ethans, D. Flusk, B. Le Foll, M. J. Milroy, D. E. Moulin, V. Naidoo, M. Ong, J. Perez, K. Rod, R. Sealey, D. Sulak, Z. Walsh, and C. O'Connell. 2020. "Consensus-based recommendations for titrating cannabinoids and tapering opioids for chronic pain control." *Int J Clin Pract* 75 (8): e13871. doi:10.1111/ijcp.13871.
- Silva, N. R., F. V. Gomes, M. D. Fonseca, R. Mechoulam, A. Breuer, T. M. Cunha, and F. S. Guimaraes. 2017. "Antinociceptive effects of HUF-101, a fluorinated cannabidiol derivative." *Prog Neuropsychopharmacol Biol Psychiatry* 79 (Pt. B): 369–377. doi:10.1016/j.pnpbp.2017.07.012.
- Silva, R. L., G. T. Silveira, C. W. Wanderlei, N. T. Cecilio, A. G. M. Maganin, M. Franchin, L. M. M. Marques, N. P. Lopes, J. A. Crippa, F. S. Guimaraes, J. C. F. Alves-Filho, F. Q. Cunha, and T. M. Cunha. 2019. "DMH-CBD, a cannabidiol analog with reduced cytotoxicity, inhibits TNF production by targeting NF- κ B activity dependent on A2A receptor." *Toxicol Appl Pharmacol* 368: 63–71. doi:10.1016/j.taap.2019.02.011.
- Sim-Selley, L. J. 2003. "Regulation of cannabinoid CB1 receptors in the central nervous system by chronic cannabinoids." *Crit Rev Neurobiol* 15 (2): 91–119. doi:10.1615/critrevneurobiol.v15.i2.10.
- Simmerman, E., X. Qin, J. C. Yu, and B. Baban. 2019. "Cannabinoids as a potential new and novel treatment for

- melanoma: A pilot study in a murine model.” *J Surg Res* 235: 210–215. doi:10.1016/j.jss.2018.08.055.
- Singer, E., J. Judkins, N. Salomonis, L. Matlaf, P. Soteropoulos, S. McAllister, and L. Soroceanu. 2015. “Reactive oxygen species-mediated therapeutic response and resistance in glioblastoma.” *Cell Death Dis* 6 (1): e1601. doi:10.1038/cddis.2014.566.
- Sledzinski, P., J. Zeyland, R. Slomski, and A. Nowak. 2018. “The current state and future perspectives of cannabinoids in cancer biology.” *Cancer Med* 7 (3): 765–775. doi:10.1002/cam4.1312.
- Smith, P. B., S. P. Welch, and B. R. Martin. 1994. “Interactions between delta 9-tetrahydrocannabinol and kappa opioids in mice.” *J Pharmacol Exp Ther* 268 (3): 1381–1387.
- Sofia, R. D., and L. C. Knobloch. 1976. “Comparative effects of various naturally occurring cannabinoids on food, sucrose and water consumption by rats.” *Pharmacol Biochem Behav* 4 (5): 591–599. doi:10.1016/0091-3057(76)90202-1.
- Sofia, R. D., H. B. Vassar, and L. C. Knobloch. 1975. “Comparative analgesic activity of various naturally occurring cannabinoids in mice and rats.” *Psychopharmacologia* 40 (4): 285–295. doi:10.1007/bf00421466.
- Solinas, M., P. Massi, V. Cinquina, M. Valenti, D. Bolognini, M. Gariboldi, E. Monti, T. Rubino, and D. Parolario. 2013. “Cannabidiol, a non-psychoactive cannabinoid compound, inhibits proliferation and invasion in U87-MG and T98G glioma cells through a multitarget effect.” *PLoS One* 8 (10): e76918. doi:10.1371/journal.pone.0076918.
- Solowij, N., S. J. Broyd, C. Beale, J. A. Prick, L. M. Greenwood, H. van Hell, C. Suo, P. Galettis, N. Pai, S. Fu, R. J. Croft, J. H. Martin, and M. Yucel. 2018. “Therapeutic effects of prolonged cannabidiol treatment on psychological symptoms and cognitive function in regular cannabis users: A pragmatic open-label clinical trial.” *Cannabis Cannabinoid Res* 3 (1): 21–34. doi:10.1089/can.2017.0043.
- Solowij, N., S. Broyd, L. M. Greenwood, H. van Hell, D. Martelozzo, K. Rueb, J. Todd, Z. Liu, P. Galettis, J. Martin, R. Murray, A. Jones, P. T. Michie, and R. Croft. 2019. “A randomised controlled trial of vaporised delta(9)-tetrahydrocannabinol and cannabidiol alone and in combination in frequent and infrequent cannabis users: Acute intoxication effects.” *Eur Arch Psychiatry Clin Neurosci* 269 (1): 17–35. doi:10.1007/s00406-019-00978-2.
- Sonego, A. B., F. V. Gomes, E. A. Del Bel, and F. S. Guimaraes. 2016. “Cannabidiol attenuates haloperidol-induced catalepsy and c-fos protein expression in the dorsolateral striatum via 5-HT1A receptors in mice.” *Behav Brain Res* 309: 22–28. doi:10.1016/j.bbr.2016.04.042.
- Song, C., C. W. Stevenson, F. S. Guimaraes, and J. L. Lee. 2016. “Bidirectional effects of cannabidiol on contextual fear memory extinction.” *Front Pharmacol* 7: 493. doi:10.3389/fphar.2016.00493.
- Spindle, T. R., E. J. Cone, D. Kuntz, J. M. Mitchell, G. E. Bigelow, R. Flegel, and R. Vandrey. 2020. “Urinary pharmacokinetic profile of cannabinoids following administration of vaporized and oral cannabidiol and vaporized CBD-dominant cannabis.” *J Anal Toxicol.* 44 (2): 109–125. doi:10.1093/jat/bkz080.
- Spindle, T. R., M. O. Bonn-Miller, and R. Vandrey. 2019. “Changing landscape of cannabis: Novel products, formulations and methods of administration.” *Curr Opin Psychology* 30: 98–102. doi:10.1016/j.copsyc.2019.04.002.
- Spinella, T. C., S. H. Stewart, J. Naugler, I. Yakovenko, and S. P. Barrett. 2021. “Evaluating cannabidiol (CBD) expectancy effects on acute stress and anxiety in healthy adults: A randomized crossover study.” *Psychopharmacology (Berl)*. 238 (7): 1965–1977. doi:10.1007/s00213-021-05823-w.
- Srebnik, M., N. Lander, A. Breuer, and R. Mechoulam. 1984. “Base catalyzed double bond isomerizations of cannabinoids: Structural and stereochemical aspects.” *J Chem Soc., Perkin Trans* 1: 2881–2886.
- Stark, T., J. Ruda-Kucerova, F. A. Iannotti, C. D’Addario, R. Di Marco, V. Pekarik, E. Drazenova, F. Piscitelli, M. Bari, Z. Babinska, G. Giordanella, M. Di Bartolomeo, S. Salomone, A. Sulcova, M. Maccarrone, C. T. Wotjak, Z. Starcuk, Jr., F. Drago, R. Mechoulam, V. Di Marzo, and V. Micale. 2019. “Peripubertal cannabidiol

- treatment rescues behavioral and neurochemical abnormalities in the MAM model of schizophrenia.” *Neuropharmacology* 146: 212–221. doi:10.1016/j.neuropharm.2018.11.035.
- Stern, C. A. J., T. R. da Silva, A. M. Raymundi, C. P. de Souza, V. A. Hiroaki-Sato, L. Kato, F. S. Guimaraes, R. Andreatini, R. N. Takahashi, and L. J. Bertoglio. 2017. “Cannabidiol disrupts the consolidation of specific and generalized fear memories via dorsal hippocampus CB1 and CB2 receptors.” *Neuropharmacology* 125: 220–230. doi:10.1016/j.neuropharm.2017.07.024.
- Stern, C. A., L. Gazarini, R. N. Takahashi, F. S. Guimaraes, and L. J. Bertoglio. 2012. “On disruption of fear memory by reconsolidation blockade: Evidence from cannabidiol treatment.” *Neuropsychopharmacology* 37 (9): 2132–2142. doi:10.1038/npp.2012.63.
- Stern, C. A., L. Gazarini, A. C. Vanvossen, A. W. Zuardi, I. Galve-Roperh, F. S. Guimaraes, R. N. Takahashi, and L. J. Bertoglio. 2015. “Delta9-tetrahydrocannabinol alone and combined with cannabidiol mitigate fear memory through reconsolidation disruption.” *Eur Neuropsychopharmacol* 25 (6): 958–965. doi:10.1016/j.euroneuro.2015.02.001.
- Steru, L., R. Chermat, B. Thierry, and P. Simon. 1985. “The tail suspension test: A new method for screening antidepressants in mice.” *Psychopharmacology (Berl)* 85 (3): 367–370. doi:10.1007/bf00428203.
- Strumberg, D., S. Brugge, M. W. Korn, S. Koeppen, J. Ranft, G. Scheiber, C. Reiners, C. Mockel, S. Seeber, and M. E. Scheulen. 2002. “Evaluation of long-term toxicity in patients after cisplatin-based chemotherapy for non-seminomatous testicular cancer.” *Ann Oncol* 13 (2): 229–236. doi:10.1093/annonc/mdf058.
- Sultan, S. R., S. A. Millar, T. J. England, and S. E. O’Sullivan. 2017. “A systematic review and meta-analysis of the haemodynamic effects of cannabidiol.” *Front Pharmacol* 8: 81. doi:10.3389/fphar.2017.00081.
- Szabó, I. L., E. Lisztes, G. Béke, K. F. Tóth, R. Paus, A. Oláh, and T. Bíró. 2020. “The phytocannabinoid (–)-cannabidiol operates as a complex, differential modulator of human hair growth: Anti-inflammatory submicromolar versus hair growth inhibitory micromolar effects.” *Journal of Investigative Dermatology* 140 (2): 484–488. e5. doi:10.1016/j.jid.2019.07.690.
- Szaflarski, J. P., E. M. Bebin, A. M. Comi, A. D. Patel, C. Joshi, D. Checketts, J. C. Beal, L. C. Laux, L. M. De Boer, M. H. Wong, M. Lopez, O. Devinsky, P. D. Lyons, P. P. Zentil, and R. Wechsler. 2018. “Long-term safety and treatment effects of cannabidiol in children and adults with treatment-resistant epilepsies: Expanded access program results.” *Epilepsia* 59 (8): 1540–1548. doi:10.1111/epi.14477.
- Sznitman, S. R., S. Vulfsons, D. Meiri, and G. Weinstein. 2020. “Medical cannabis and insomnia in older adults with chronic pain: A cross-sectional study.” *BMJ Support Palliat Care* 10 (4): 415–420. doi:10.1136/bmjspcare-2019-001938.
- Tagne, A. M., B. Pacchetti, M. Sodergren, M. Cosentino, and F. Marino. 2020. “Cannabidiol for viral diseases: Hype or hope.” *Cannabis and Cannabinoid Research*. 5 (2): 121–131. doi:10.1089/cann.2019.0060.
- Tahamtan, A., M. Tavakoli-Yaraki, T. P. Rygiel, T. Mokhtari-Azad, and V. Salimi. 2016. “Effects of cannabinoids and their receptors on viral infections.” *J Med Virol* 88 (1): 1–12. doi:10.1002/jmv.24292.
- Tamir, I., R. Mechoulam, and A. Y. Meyer. 1980. “Cannabidiol and phenytoin: A structural comparison.” *J Med Chem* 23 (2): 220–223. doi:10.1021/jm00176a022.
- Taylor, L., J. Crockett, B. Tayo, and G. Morrison. 2019. “A phase 1, open-label, parallel-group, single-dose trial of the pharmacokinetics and safety of cannabidiol (CBD) in subjects with mild to severe hepatic impairment.” *J Clin Pharmacol* 59 (8): 1110–1119. doi:10.1002/jcpb.1412.
- Taylor, L., B. Gidal, G. Blakey, B. Tayo, and G. Morrison. 2018. “A phase I, randomized, double-blind, placebo-controlled, single ascending dose, multiple dose, and food effect trial of the safety, tolerability and pharmacokinetics of highly purified cannabidiol in healthy subjects.” *CNS Drugs* 32 (11): 1053–1067. doi:10.1007/s40263-018-0578-5.
- Tham, M., O. Yilmaz, M. Alaverdashvili, M. E. M. Kelly, E. M. Denovan-Wright, and R. B. Laprairie. 2019.

- “Allosteric and orthosteric pharmacology of cannabidiol and cannabidiol-dimethylheptyl at the type 1 and type 2 cannabinoid receptors.” *Br J Pharmacol* 176 (10): 1455–1469. doi:10.1111/bph.14440.
- Thiele, E. A., E. D. Marsh, J. A. French, M. Mazurkiewicz-Beldzinska, S. R. Benbadis, C. Joshi, P. D. Lyons, A. Taylor, C. Roberts, K. Sommerville, and Gwpcare Study Group. 2018. “Cannabidiol in patients with seizures associated with Lennox-Gastaut syndrome (GWPCARE4): A randomised, double-blind, placebo-controlled phase 3 trial.” *Lancet* 391 (10125): 1085–1096. doi:10.1016/S0140-6736(18)30136-3.
- Thomas, H. 1993. “Psychiatric symptoms in cannabis users.” *Br J Psychiatry* 163:141–149. doi:10.1192/bjp.163.2.141.
- Todd, S. M., and J. C. Arnold. 2016. “Neural correlates of interactions between cannabidiol and delta(9)-tetrahydrocannabinol in mice: Implications for medical cannabis.” *Br J Pharmacol* 173 (1): 53–65. doi:10.1111/bph.13333.
- Torres, S., M. Lorente, F. Rodriguez-Fornes, S. Hernandez-Tiedra, M. Salazar, E. Garcia-Taboada, J. Barcia, M. Guzman, and G. Velasco. 2011. “A combined preclinical therapy of cannabinoids and temozolomide against glioma.” *Mol Cancer Ther* 10 (1): 90–103. doi:10.1158/1535-7163.MCT-10-0688.
- Toth, C. C., N. M. Jedrzejewski, C. L. Ellis, and W. H. Frey, 2nd. 2010. “Cannabinoid-mediated modulation of neuropathic pain and microglial accumulation in a model of murine type I diabetic peripheral neuropathic pain.” *Mol Pain* 6: 16. doi:10.1186/1744-8069-6-16.
- Touitou, E., N. Dayan, L. Bergelson, B. Godin, and M. Eliaz. 2000. “Ethosomes—novel vesicular carriers for enhanced delivery: Characterization and skin penetration properties.” *J Control Release* 65 (3): 403–418. doi:10.1016/s0168-3659(99)00222-9.
- Tramer, M. R., D. Carroll, F. A. Campbell, D. J. Reynolds, R. A. Moore, and H. J. McQuay. 2001. “Cannabinoids for control of chemotherapy induced nausea and vomiting: Quantitative systematic review.” *BMJ (Clinical Research Ed.)* 323 (7303): 16–21. doi:10.1136/bmj.323.7303.16.
- Tran, T., and R. Kavuluru. 2020. “Social media surveillance for perceived therapeutic effects of cannabidiol (CBD) products.” *Int J Drug Policy* 77: 102688. doi:10.1016/j.drugpo.2020.102688.
- Trigo, J. M., D. Lagzdins, J. Rehm, P. Selby, I. Gamaleddin, B. Fischer, A. J. Barnes, M. A. Huestis, and B. Le Foll. 2016. “Effects of fixed or self-titrated dosages of Sativex on cannabis withdrawal and cravings.” *Drug Alcohol Depend* 161: 298–306. doi:10.1016/j.drugaldep.2016.02.020.
- Trigo, J. M., A. Soliman, L. C. Quilty, B. Fischer, J. Rehm, P. Selby, A. J. Barnes, M. A. Huestis, T. P. George, D. L. Streiner, G. Staios, and B. Le Foll. 2018. “Nabiximols combined with motivational enhancement/cognitive behavioral therapy for the treatment of cannabis dependence: A pilot randomized clinical trial.” *PLoS One* 13 (1): e0190768. doi:10.1371/journal.pone.0190768.
- Trojano, M., and C. Vila. 2015. “Effectiveness and tolerability of THC/CBD oromucosal spray for multiple sclerosis spasticity in Italy: First data from a large observational study.” *Eur Neurol* 74 (3–4): 178–185. doi:10.1159/000441619.
- Turcott, J. G., M. Del Rocío Guillen Núñez, D. Flores-Estrada, L. F. Oñate-Ocaña, Z. L. Zatarain-Barrón, F. Barrón, and O. Arrieta. 2018. “The effect of nabilone on appetite, nutritional status, and quality of life in lung cancer patients: A randomized, double-blind clinical trial.” *Support Care Cancer* 26 (9): 3029–3038. doi:10.1007/s00520-018-4154-9.
- Turkanis, S. A., K. A. Smiley, H. K. Borys, D. M. Olsen, and R. Karler. 1979. “An electrophysiological analysis of the anticonvulsant action of cannabidiol on limbic seizures in conscious rats.” *Epilepsia* 20 (4): 351–363. doi:10.1111/j.1528-1179.1979.tb04815.x.
- Turri, M., F. Teatini, F. Donato, G. Zanette, V. Tognoli, L. Deotto, B. Bonetti, and G. Squintani. 2018. “Pain modulation after oromucosal cannabinoid spray (Sativex in patients with multiple sclerosis: A study with quantitative sensory testing and laser-evoked potentials.” *Medicines (Basel)* 5 (3): 59. doi:10.3390/

- medicines5030059.
- Twomey, C. D. 2017. "Association of cannabis use with the development of elevated anxiety symptoms in the general population: A meta-analysis." *J Epidemiol Community Health* 71 (8): 811–816. doi:10.1136/jech-2016-208145.
- Ueberall, M. A., U. Essner, and G. H. Mueller-Schwefe. 2019. "Effectiveness and tolerability of THC:CBD oromucosal spray as add-on measure in patients with severe chronic pain: Analysis of 12-week open-label real-world data provided by the German Pain e-Registry." *J Pain Res* 12: 1577–1604. doi:10.2147/JPR.S192174.
- van Breemen, R. D., R. Muchiri, T. A. Bates, J. B. Weinstein, H. C. Leier, S. Farley, and F. G. Tafesse. 2022. "Cannabinoids block cellular entry of SARSCoV-2 and the emerging variants." *J Natural Products*. Online ahead of print. doi:10.1021/acs.jnatprod.1c00946.
- van de Donk, T., M. Niesters, M. A. Kowal, E. Olofsen, A. Dahan, and M. van Velzen. 2019. "An experimental randomized study on the analgesic effects of pharmaceutical-grade cannabis in chronic pain patients with fibromyalgia." *Pain* 160 (4): 860–869. doi:10.1097/j.pain.0000000000001464.
- van Orten-Luiten, A. B., N. M. de Roos, S. Majait, B. J. M. Witteman, and R. F. Witkamp. 2021. "Effects of cannabidiol chewing gum on perceived pain and well-being of irritable bowel syndrome patients: A placebo-controlled crossover exploratory intervention study with symptom-driven dosing." Online ahead of print. *Cannabis Cannabinoid Res*. doi:10.1089/can.2020.0087.
- Vann, R. E., T. F. Gamage, J. A. Warner, E. M. Marshall, N. L. Taylor, B. R. Martin, and J. L. Wiley. 2008. "Divergent effects of cannabidiol on the discriminative stimulus and place conditioning effects of Delta(9)-tetrahydrocannabinol." *Drug Alcohol Depend* 94 (1–3): 191–198. doi:10.1016/j.drugalcdep.2007.11.017.
- Varvel, S. A., J. L. Wiley, R. Yang, D. T. Bridgen, K. Long, A. H. Lichtman, and B. R. Martin. 2006. "Interactions between THC and cannabidiol in mouse models of cannabinoid activity." *Psychopharmacology (Berl)* 186 (2): 226–234. doi:10.1007/s00213-006-0356-9.
- Vaughn, D., J. Kulpa, and L. Paulonis. 2020. "Preliminary investigation of the safety of escalating cannabinoid doses in healthy dogs." *Frontiers in Veterinary Science* 7: 51. doi:10.3389/fvets.2020.00051.
- Vaughn, D. M., L. J. Paulonis, and J. E. Kulpa. 2021. "Randomized, placebo-controlled, 28-day safety and pharmacokinetics evaluation of repeated oral cannabidiol administration in healthy dogs." *American Journal of Veterinary Research*. 82 (5): 405–416. doi:10.2460/ajvr.82.5.405.
- Vecchio, D., C. Varrasi, E. Virgilio, A. Spagarino, P. Naldi, and R. Cantello. 2020. "Cannabinoids in multiple sclerosis: A neurophysiological analysis." *Acta Neurol Scand* 142 (4): 333–338. doi:10.1111/ane.13313.
- Vela, J., L. Dreyer, K. K. Petersen, A. N. Lars, K. S. Duch, and S. Kristensen. 2021. "Cannabidiol treatment in hand osteoarthritis and psoriatic arthritis: A randomized, double-blind placebo-controlled trial." Online. *Pain*. doi:10.1097/j.pain.0000000000002466.
- Vermersch, P., and M. Trojano. 2016. "Tetrahydrocannabinol:cannabidiol oromucosal spray for multiple sclerosis-related resistant spasticity in daily practice." *Eur Neurol* 76 (5–6): 216–226. doi:10.1159/000449413.
- Vigil, J. M., S. S. Stith, I. M. Adams, and A. P. Reeve. 2017. "Associations between medical cannabis and prescription opioid use in chronic pain patients: A preliminary cohort study." *PLoS One* 12 (11): e0187795. doi:10.1371/journal.pone.0187795.
- Villares, J. 2007. "Chronic use of marijuana decreases cannabinoid receptor binding and mRNA expression in the human brain." *Neuroscience* 145 (1): 323–334. doi:10.1016/j.neuroscience.2006.11.012.
- Viudez-Martinez, A., M. S. Garcia-Gutierrez, A. I. Fraguas-Sanchez, A. I. Torres-Suarez, and J. Manzanares. 2018. "Effects of cannabidiol plus naltrexone on motivation and ethanol consumption." *Br J Pharmacol* 175 (16): 3369–3378. doi:10.1111/bph.14380.
- Viudez-Martinez, A., M. S. Garcia-Gutierrez, C. M. Navarron, M. I. Morales-Calero, F. Navarrete, A. I. Torres-

- Suarez, and J. Manzanares. 2018. "Cannabidiol reduces ethanol consumption, motivation and relapse in mice." *Addict Biol* 23 (1): 154–164. doi:10.1111/adb.12495.
- Volicer, L., M. Stelly, J. Morris, J. McLaughlin, and B. J. Volicer. 1997. "Effects of dronabinol on anorexia and disturbed behavior in patients with Alzheimer's disease." *Int J Geriatr Psychiatry* 12 (9): 913–919.
- Vuolo, F., F. Petronilho, B. Sonai, C. Ritter, J. E. Hallak, A. W. Zuardi, J. A. Crippa, and F. Dal-Pizzol. 2015. "Evaluation of serum cytokines levels and the role of cannabidiol treatment in animal model of asthma." *Mediators Inflamm* 2015: 538670. doi:10.1155/2015/538670.
- Wade, D. T., P. Makela, P. Robson, H. House, and C. Bateman. 2004. "Do cannabis-based medicinal extracts have general or specific effects on symptoms in multiple sclerosis? A double-blind, randomized, placebo-controlled study on 160 patients." *Mult Scler* 10 (4): 434–441. doi:10.1191/1352458504ms1082oa.
- Wade, D. T., P. Robson, H. House, P. Makela, and J. Aram. 2003. "A preliminary controlled study to determine whether whole-plant cannabis extracts can improve intractable neurogenic symptoms." *Clin Rehabil* 17 (1): 21–29. doi:10.1191/0269215503cr581oa.
- Wallace, D., A. L. Martin, and B. Park. 2007. "Cannabinoid hyperemesis: Marijuana puts patients in hot water." *Australasian Psychiatry* 15 (2): 156–158. doi:10.1080/10398560701196778.
- Walsh, Z., R. Callaway, L. Belle-Isle, R. Capler, R. Kay, P. Lucas, and S. Holtzman. 2013. "Cannabis for therapeutic purposes: Patient characteristics, access, and reasons for use." *Int J Drug Policy* 24 (6): 511–516. doi:10.1016/j.drugpo.2013.08.010.
- Wang, B., A. Kovalchuk, D. Li, R. Rodriguez-Juarez, Y. Ilnytskyy, I. Kovalchuk, and O. Kovalchuk. 2020. "In search of preventive strategies: novel high-CBD *Cannabis sativa* extracts modulate ACE2 expression in COVID-19 gateway tissues." *Aging (Albany NY)* 12 (22): 22425–22444. doi:10.18632/aging.202225.
- Wang, Y., P. Mukhopadhyay, Z. Cao, H. Wang, D. Feng, G. Hasko, R. Mechoulam, B. Gao, and P. Pacher. 2017. "Cannabidiol attenuates alcohol-induced liver steatosis, metabolic dysregulation, inflammation and neutrophil-mediated injury." *Sci Rep* 7 (1): 12064. doi:10.1038/s41598-017-10924-8.
- Wanner, N. M., M. Colwell, C. Drown, and C. Faulk. 2021. "Developmental cannabidiol exposure increases anxiety and modifies genome-wide brain DNA methylation in adult female mice." *Clinical Epigenetics* 13 (1): 4. doi:10.1186/s13148-020-00993-4.
- Ward, S. J., S. D. McAllister, R. Kawamura, R. Murase, H. Neelakantan, and E. A. Walker. 2014. "Cannabidiol inhibits paclitaxel-induced neuropathic pain through 5-HT(1A) receptors without diminishing nervous system function or chemotherapy efficacy." *Br J Pharmacol* 171 (3): 636–645. doi:10.1111/bph.12439.
- Ward, S. J., M. D. Ramirez, H. Neelakantan, and E. A. Walker. 2011. "Cannabidiol prevents the development of cold and mechanical allodynia in paclitaxel-treated female C57Bl/6 mice." *Anesth Analg* 113 (4): 947–950. doi:10.1213/ANE.0b013e3182283486.
- Watt, G., and T. Karl. 2017. "In vivo evidence for therapeutic properties of cannabidiol (CBD) for Alzheimer's disease." *Front Pharmacol* 8: 20. doi:10.3389/fphar.2017.00020.
- Wei, D., H. Wang, J. Yang, Z. Dai, R. Yang, S. Meng, Y. Li, and X. Lin. 2020. "Effects of O-1602 and CBD on TNBS-induced colonic disturbances." *Neurogastroenterol Motil* 32 (3): e13756. doi:10.1111/nmo.13756.
- Weiss, L., M. Zeira, S. Reich, M. Har-Noy, R. Mechoulam, S. Slavin, and R. Gallily. 2006. "Cannabidiol lowers incidence of diabetes in non-obese diabetic mice." *Autoimmunity* 39 (2): 143–151. doi:10.1080/08916930500356674.
- Weiss, L., M. Zeira, S. Reich, S. Slavin, I. Raz, R. Mechoulam, and R. Gallily. 2008. "Cannabidiol arrests onset of autoimmune diabetes in NOD mice." *Neuropharmacology* 54 (1): 244–249. doi:10.1016/j.neuropharm.2007.06.029.
- Welburn, P. J., G. A. Starmer, G. B. Chesher, and D. M. Jackson. 1976. "Effect of cannabinoids on the abdominal constriction response in mice: Within cannabinoid interactions." *Psychopharmacologia* 46 (1): 83–85.

- doi:10.1007/bf00421553.
- Welch, S. P. 1997. "Characterization of anandamide-induced tolerance: comparison to delta 9-THC-induced interactions with dynorphinergic systems." *Drug Alcohol Depend* 45 (1–2): 39–45. doi:10.1016/s0376-8716(97)01342-2.
- Wheeler, M., J. W. Merten, B. T. Gordon, and H. Hamadi. 2020. "CBD (cannabidiol) product attitudes, knowledge, and use among young adults." *Subst Use Misuse* 55 (7): 1138–1145. doi:10.1080/10826084.2020.1729201.
- Whiting, P. F., R. F. Wolff, S. Deshpande, M. Di Nisio, S. Duffy, A. V. Hernandez, J. C. Keurentjes, S. Lang, K. Misso, S. Ryder, S. Schmidtkofer, M. Westwood, and J. Kleijnen. 2015. "Cannabinoids for medical use: A systematic review and meta-analysis." *JAMA* 313 (24): 2456–2473. doi:10.1001/jama.2015.6358.
- Wiley, J. L., J. J. Burston, D. C. Leggett, O. O. Alekseeva, R. K. Razdan, A. Mahadevan, and B. R. Martin. 2005. "CB1 cannabinoid receptor-mediated modulation of food intake in mice." *Br J Pharmacol* 145 (3): 293–300. doi:10.1038/sj.bjp.0706157.
- Wilkie, G., B. Sakr, and T. Rizack. 2016. "Medical marijuana use in oncology: A review." *JAMA Oncol* 2 (5): 670–675. doi:10.1001/jamaoncol.2016.0155.
- Wilkinson, J. D., B. J. Whalley, D. Baker, G. Pryce, A. Constanti, S. Gibbons, and E. M. Williamson. 2003. "Medicinal cannabis: Is delta9-tetrahydrocannabinol necessary for all its effects?" *J Pharm Pharmacol* 55 (12): 1687–1694. doi:10.1211/0022357022304.
- Wilkinson, J. D., and E. M. Williamson. 2007. "Cannabinoids inhibit human keratinocyte proliferation through a non-CB1/CB2 mechanism and have a potential therapeutic value in the treatment of psoriasis." *J Dermatol Sci* 45 (2): 87–92. doi:10.1016/j.jdermsci.2006.10.009.
- Williams, C. M., N. A. Jones, and B. J. Whalley. 2014. "Cannabis and epilepsy." In *Handbook of Cannabis*, edited by Roger G. Pertwee, 547–564. Oxford: Oxford University Press.
- Wilson, M. M., C. Philpot, and J. E. Morley. 2007. "Anorexia of aging in long term care: Is dronabinol an effective appetite stimulant? A pilot study." *J Nutr Health Aging* 11 (2): 195–198.
- Withey, S. L., B. D. Kangas, S. Charles, A. B. Gumbert, J. E. Eisold, S. R. George, J. Bergman, and B. K. Madras. 2021. "Effects of daily delta(9)-tetrahydrocannabinol (THC) alone or combined with cannabidiol (CBD) on cognition-based behavior and activity in adolescent nonhuman primates." *Drug Alcohol Depend* 221: 108629. doi:10.1016/j.drugalcdep.2021.108629.
- Wray, L., C. Stott, N. Jones, and S. Wright. 2017. "Cannabidiol does not convert to delta(9)-tetrahydrocannabinol in an *in vivo* animal model." *Cannabis Cannabinoid Res* 2 (1): 282–287. doi:10.1089/can.2017.0032.
- Wright, M. J., Jr., S. A. Vandewater, and M. A. Taffe. 2013. "Cannabidiol attenuates deficits of visuospatial associative memory induced by delta(9) tetrahydrocannabinol." *Br J Pharmacol* 170 (7): 1365–1373. doi:10.1111/bph.12199.
- Xu, D. H., B. D. Cullen, M. Tang, and Y. Fang. 2020. "The effectiveness of topical cannabidiol oil in symptomatic relief of peripheral neuropathy of the lower extremities." *Curr Pharm Biotechnol* 21 (5): 390–402. doi:10.2174/13892010206619120211534.
- Xu, X., M. Han, T. Li, W. Sun, D. Wang, B. Fu, Y. Zhou, X. Zheng, Y. Yang, X. Li, X. Zhang, A. Pan, and H. Wei. 2020. "Effective treatment of severe COVID-19 patients with tocilizumab." *Proceedings of the National Academy of Sciences* 117 (20): 10970–10975. doi:10.1073/pnas.2005615117.
- Yang, K. H., S. Galadari, D. Isaev, G. Petroianu, T. S. Shippenberg, and M. Oz. 2010. "The nonpsychoactive cannabinoid cannabidiol inhibits 5-hydroxytryptamine3A receptor-mediated currents in *Xenopus laevis* oocytes." *J Pharmacol Exp Ther* 333 (2): 547–554. doi:10.1124/jpet.109.162594.
- Yang, L., R. Rozenfeld, D. Wu, L. A. Devi, Z. Zhang, and A. Cederbaum. 2014. "Cannabidiol protects liver from binge alcohol-induced steatosis by mechanisms including inhibition of oxidative stress and increase in autophagy." *Free Radic Biol Med* 68: 260–267. doi:10.1016/j.freeradbiomed.2013.12.026.

- Yeshurun, M., O. Shpilberg, C. Herscovici, L. Shargian, J. Dreyer, A. Peck, M. Israeli, M. Levy-Assraf, T. Gruenewald, R. Mechoulam, P. Raanani, and R. Ram. 2015. "Cannabidiol for the prevention of graft-versus-host-disease after allogeneic hematopoietic cell transplantation: Results of a phase II study." *Biol Blood Marrow Transplant* 21 (10): 1770–1775. doi:10.1016/j.bbmt.2015.05.018.
- Yimam, M., A. O'Neal, T. Horm, P. Jiao, M. Hong, S. Rossiter, L. Brownell, and Q. Jia. 2021. "Antinociceptive and anti-inflammatory properties of cannabidiol alone and in combination with standardized bioflavonoid composition." *J Med Food* 24 (9): 960–967. doi:10.1089/jmf.2020.0178.
- Yucel, M., V. Lorenzetti, C. Suo, A. Zalesky, A. Fornito, M. J. Takagi, D. I. Lubman, and N. Solowij. 2016. "Hippocampal harms, protection and recovery following regular cannabis use." *Transl Psychiatry* 6: e710. doi:10.1038/tp.2015.201.
- Zajicek, J., P. Fox, H. Sanders, D. Wright, J. Vickery, A. Nunn, and A. Thompson. 2003. "Cannabinoids for treatment of spasticity and other symptoms related to multiple sclerosis (CAMS study): Multicentre randomised placebo-controlled trial." *Lancet* 362 (9395): 1517–1526. doi:10.1016/s0140-6736(03)14738-1.
- Zanelati, T. V., C. Biojone, F. A. Moreira, F. S. Guimaraes, and S. R. Joca. 2010. "Antidepressant-like effects of cannabidiol in mice: Possible involvement of 5-HT1A receptors." *Br J Pharmacol* 159 (1): 122–128. doi:10.1111/j.1476-5381.2009.00521.x.
- Zhu, Y. F., K. Linher-Melville, M. J. Niazmand, M. Sharma, A. Shahid, K. L. Zhu, N. Parzei, J. Sidhu, C. Haj, R. Mechoulam, and G. Singh. 2020. "An evaluation of the anti-hyperalgesic effects of cannabidiolic acid-methyl ester in a preclinical model of peripheral neuropathic pain." *Br J Pharmacol*. 177 (12): 2712–2725. doi:10.1111/bph.14997.
- Zuardi, A. W., R. A. Cosme, F. G. Graeff, and F. S. Guimaraes. 1993. "Effects of ipsapirone and cannabidiol on human experimental anxiety." *J Psychopharmacol* 7 (1 Suppl.): 82–88. doi:10.1177/026988119300700112.
- Zuardi, A., J. Crippa, S. Dursun, S. Morais, J. Vilela, R. Sanches, and J. Hallak. 2010. "Cannabidiol was ineffective for manic episode of bipolar affective disorder." *J Psychopharmacol* 24 (1): 135–137. doi:10.1177/0269881108096521.
- Zuardi, A. W., J. A. Crippa, J. E. Hallak, F. A. Moreira, and F. S. Guimaraes. 2006. "Cannabidiol, a Cannabis sativa constituent, as an antipsychotic drug." *Braz J Med Biol Res* 39 (4): 421–429. doi:10.1590/s0100-879x2006000400001.
- Zuardi, A. W., J. E. Hallak, and J. A. Crippa. 2012. "Interaction between cannabidiol (CBD) and (9)-tetrahydrocannabinol (THC): influence of administration interval and dose ratio between the cannabinoids." *Psychopharmacology (Berl)* 219 (1): 247–249. doi:10.1007/s00213-011-2495-x.
- Zuardi, A. W., S. L. Morais, F. S. Guimaraes, and R. Mechoulam. 1995. "Antipsychotic effect of cannabidiol." *J Clin Psychiatry* 56 (10): 485–486.
- Zuardi, A. W., J. A. Rodrigues, and J. M. Cunha. 1991. "Effects of cannabidiol in animal models predictive of antipsychotic activity." *Psychopharmacology (Berl)* 104 (2): 260–264. doi:10.1007/bf02244189.
- Zuardi, A. W., N. P. Rodrigues, A. L. Silva, S. A. Bernardo, J. E. C. Hallak, F. S. Guimaraes, and J. A. S. Crippa. 2017. "Inverted U-shaped dose-response curve of the anxiolytic effect of cannabidiol during public speaking in real life." *Front Pharmacol* 8: 259. doi:10.3389/fphar.2017.00259.
- Zuardi, A. W., I. Shirakawa, E. Finkelfarb, and I. G. Karniol. 1982. "Action of cannabidiol on the anxiety and other effects produced by delta 9-THC in normal subjects." *Psychopharmacology (Berl)* 76 (3): 245–250. doi:10.1007/BF00432554.

解説　日本における大麻取締法の改正を巡る動き

- 1) 大麻博物館 . 2021. 日本人のための大麻の教科書：「古くて新しい農作物」の再発見 . イースト・プレス .
- 2) 山本奈生 . 2021. 大麻の社会学 . 青弓社 .
- 3) 農林省特産課特産会二十五年記念事業協賛会 . 1963. 特産課特産会二十五年誌 . 農林省特産課特産会二十五年記念事業協賛会 .
- 4) 1948 年制定 大麻取締法（全文） . <https://elaws.e-gov.go.jp/document?lawid=323AC0000000124>
- 5) Miyaji, T. Nagasawa, M. Yamaguchi, T. Tsutani, K. 2016. Tackling the Pharmaceutical Frontier: Regulation of Cannabinoid-Based Medicines in Postwar Japan. *Cannabis Cannabinoid Res.* 1(1): 31-37. doi.org/10.1089/can.2015.0011
- 6) Ahn, B. Kang, S. Lee, K. H. Kim, S. Park, J. S. Seo, H. 2020. A Literature Analysis on Medicinal Use and Research of Cannabis in the Meiji Era of Japan. *J Pharmacopuncture*. 23(3): 142–157. doi.org/10.3831%2FKPI.2020.23.3.142
- 7) 小清水敏昌 . 2020. 明治初期に市販された「喘息煙草」を巡る史的考察 . 薬史学雑誌 55(2): 194-202
- 8) 厚生労働省科学研究成果データベース：危険ドラッグ等の乱用防止のより効果的な普及啓発に関する特別研究（2017 年 3 月）
- 9) 厚生労働省科学研究成果データベース：危険ドラッグ等の濫用防止のより効果的な普及啓発に関する特別研究（2018 年 3 月）
- 10) 厚生労働省科学研究成果データベース：危険ドラッグ等の濫用防止のより効果的な普及啓発に関する研究（2019 年 3 月）
- 11) 厚生労働省科学研究成果データベース：危険ドラッグ等の濫用防止のより効果的な普及啓発に関する研究（2020 年 3 月）
- 12) 「危険ドラッグ等の濫用防止のより効果的な普及啓発に関する研究」研究班（企画・編集） . 2020. 大麻問題の現状 . 真興交易医書出版部 .
- 13) 厚生省薬務局 . 1976. 大麻 . 厚生省薬務局麻薬課 .
- 14) 佐藤均（監修） . 日本臨床カンナビノイド学会（編） . 2015. カンナビノイドの科学：大麻の医療・福祉・産業への利用 . 築地書館 .
- 15) 正高佑志 . 2021. お医者さんがする大麻と CBD の話 . 彩図社 .
- 16) エピディオレックス（Epidiolex）Jazz Pharmaceuticals, Inc. <https://www.epidiolex.com/>
- 17) 第 198 回国会 参議院 沖縄及び北方問題に関する特別委員会 第 3 号 平成 31 年 3 月 19 日 . <https://kokkai.ndl.go.jp/#/detail?minId=119813895X00320190319>
- 18) 第 198 回国会 参議院 沖縄及び北方問題に関する特別委員会 第 4 号 令和元年 5 月 15 日 . <https://kokkai.ndl.go.jp/#/detail?minId=119813895X00420190515>
- 19) IDPC レポート：世界各国の医療用大麻の政策と実践 . 2018 年 5 月 22 日 . 日本臨床カンナビノイド学会 . http://cannabis.kenkyukai.jp/information/information_detail.asp?id=79450
- 20) 薬に大麻成分 国内初の治験見通し 難治てんかん治療で沖縄赤十字病院 . 2019 年 12 月 28 日 . 沖縄タイムスプラス . <https://www.okinawatimes.co.jp/articles/-/515944>
- 21) 厚生労働科学特別研究「難治性てんかんにおけるカンナビノイド（大麻抽出成分）由来医薬品の治療に向けた課題把握および今後の方策に向けた研究」報告書 . 2021. <https://mhlw-grants.niph.go.jp/project/145770>
- 22) 千九百六十一年の麻薬に関する單一条約 . https://www.mhlw.go.jp/web/t_doc?dataId=97128000&dataType=0&pageNo=1
- 23) Azerbaijan, Japan. Exploration of all aspects related to the use of cannabis seeds for illicit purposes: revised draft resolution / Azerbaijan and Japan (不正目的のための大麻種子の使用に関するあらゆる側面の探求：改訂草案／アゼルバイジャンと日本) . 2009. <https://digitallibrary.un.org/record/655565?ln=en>

- 24) 国連は大麻及び大麻樹脂を附表IVから削除を決定。「最も危険で医療価値なし」という分類を変更し、医療価値を認める。2020年12月3日。日本臨床カンナビノイド学会。http://cannabis.kenkyuukai.jp/information/information_detail.asp?id=108328
- 25) WHOによる薬用大麻の初の科学的評価：世界的な悪戦苦闘から患者への影響まで。2022年8月26日。日本臨床カンナビノイド学会。http://cannabis.kenkyuukai.jp/information/information_detail.asp?id=128683
- 26) 大麻及び大麻関連物質のWHO勧告と日本国政府の立場。2020年5月6日。日本臨床カンナビノイド学会。http://cannabis.kenkyuukai.jp/information/information_detail.asp?id=103194
- 27) WHOの大麻レビューと勧告に日本の活動家の果たした役割。2020年2月7日。*終了 REVISION 大麻取締法改正請願署名。<https://note.com/japancannabis/n/n8c19ddb5f765>
- 28) カンナビジオール（CBD）におけるWHO/ECDD報告書とWHO勧告について。2022年8月24日。日本臨床カンナビノイド学会。http://cannabis.kenkyuukai.jp/information/information_detail.asp?id=128623
- 29) 厚生労働省。大麻等の薬物対策のあり方検討会。https://www.mhlw.go.jp/stf/shingi/other-syokuhin_436610_00005.html
- 30) 「大麻使用罪」創設の議論受け、依存症家族に聞いた。逮捕などは解決策になった? 8割弱が否定【アンケート】ハフポスト。2021年3月30日。https://www.huffingtonpost.jp/entry/story_jp_60617291c5b6531eed0661ee
- 31) 「大麻『使用罪』に反対」「大麻の柔軟な医療利用を」弁護士有志、大麻使用罪創設反対署名を厚労省に提出。2021年5月24日。BuzzFeedNews。<https://www.buzzfeed.com/jp/naokoianaga/cannabis-kyokuchou>
- 32) 大麻使用罪創設に反対する依存症関連団体・支援者ネットワーク。声明：私たちは大麻使用罪の創設に反対します!。2021年6月2日。<https://izonsho-shien.net/conference/>
- 33) 有馬知子。2021.どうなる?ギリギリの攻防 「大麻使用罪」に相次ぐ反対の声。季刊ビィ144:40-46.
- 34) 石塚伸一・加藤武士・長吉秀夫・正高佑志・松本俊彦（編著）。2022. 大麻使用は犯罪か?:大麻政策とダイバーシティ。現代人文社。
- 35) 「大麻を使うことの一番の害は、逮捕されること」 松本俊彦さんが戒める「支援者の傲慢」とは?. 2022年8月24日。BuzzFeedJapan.<https://www.buzzfeed.com/jp/naokoianaga/cannabis-matsumoto-1?bfsource=relatedmanual>
- 36) 渡辺豪。2021. 時代を読む日本の懲罰主義に人権侵害の指摘 大麻「使用罪」は世界の潮流に逆行。AERA 34(32): 32-34.
- 37) 丸山泰弘。2022.〈論説〉大麻使用罪創設の何が問題か。治療的司法ジャーナル 5: 10-15.
- 38) 矢部武。ハイデン大統領の「大麻恩赦」は米国と日本に何をもたらすか。2022年10月12日。集英社新書プラス。<https://shinsho-plus.shueisha.co.jp/news/21413>
- 39) 解説：(株)伊勢麻 松本代表・新田均 皇學館大学教授らが県の不許可決定に不服申し立て。2020年12月18日。Hemp TODAY JAPAN.<https://hemptoday-japan.net/10002>
- 40) 新田均。2021. 濡れ衣だった日本大麻有害説。Will 201: 302-307.
- 41) 「麻酔い」はない 厚労省が『大麻栽培でまちおこし!』ホームページを削除 栽培農家の反発受け。2021年6月17日。東京新聞。<https://www.tokyo-np.co.jp/article/111091>
- 42) 【ビッグニュース】産業用大麻のファーストランナーへ、三重県知事「規制から活用へ、国に先んじて先手先手で対応していきたい」。2023年3月2日。Hemp TODAY JAPAN.<https://hemptoday-japan.net/13798>
- 43) 〈まる見えリポート〉明和町・天津菅麻プロジェクト 「麻の聖地」で栽培復活 産学官8団体、産業振興へ。2023年4月24日。伊勢新聞。<https://www.isenp.co.jp/2023/04/24/91930/>
- 44) 「現状では国産大麻で神事すらできない」三重大学で立ち上がった「大麻の学術研究組織」の挑戦。2023年5月18日。FINDERS.<https://finders.me/articles.php?id=3728>
- 45) 自民党大麻撲滅プロジェクトチーム提言を法務省へ提出。令和3年7月9日。https://www.moj.go.jp/hishokouhou/hisho06_00323.html

- 46) 厚労省地方厚生局麻薬取締部「CBD（カンナビジオール）を含有する製品について」<https://www.mhlw.go.jp/cbd.html>
- 47) CBD普及へ「突破口を開きたい」 超党派議連の事務局長 松原仁議員が語る . 2022年4月6日 . Wellness Daily News. <https://bit.ly/37C2C43>
- 48) 厚労省に提出された、大麻取締法改正へのCBD議連「とりまとめ案」とは? . 2022年5月25日 . Forbes Japan. <https://forbesjapan.com/articles/detail/47646>
- 49) 安倍晋三氏、勉強会で大麻に対する偏見と新たな活用を語る「政治の場で考えていく必要がある」 . 2022年4月28日 . 日刊スポーツ . <https://www.nikkansports.com/general/nikkan/news/202204270000618.html>
- 50) 経済財政運営と改革の基本方針 2022. 2022年6月7日 . https://www5.cao.go.jp/keizai-shimon/kaigi-minutes/2022/0607/shiryo_04-1.pdf
- 51) 厚生労働省「大麻規制検討小委員会」報告書 2022年10月19日 https://www.mhlw.go.jp/stf/newpage_25666.html
- 52) 播種用のアサ種子の安定供給を目指して . 北海道ヘンプ協会 . <https://www.hokkaido-hemp.net/hempseed.html>
- 53) 厚生労働省 厚生科学審議会（医薬品医療機器制度部会）「(2) 大麻規制検討小委員会とりまとめについて」 2023年1月12日 . https://www.mhlw.go.jp/stf/shingi/shingi-kousei_430263.html
- 54) 加藤祐子（構成・まとめ）. 2017. 産業用ヘンプの世界の最新動向 . 農業経営者 25(10): 13-27.
- 55) Hudson, R., Renard, J., Norris, C., Rushlow, W. J., Laviolette, S. R. 2019. Cannabidiol Counteracts the Psychotropic Side-Effects of Δ -9-Tetrahydrocannabinol in the Ventral Hippocampus through Bidirectional Control of ERK1–2 Phosphorylation, Journal of Neuroscience, 39 (44): 8762-8777. doi: 10.1523/JNEUROSCI.0708-19.2019
- 56) 杉江謙一・阿久津守 . 2020. 繊維型大麻草およびその濃縮物中のカンナビノイド含有量の調査 . 日本法科学技術学会誌 25 (1): 115-121.
- 57) 正高佑志・杉山岳史・赤星栄志・新垣実 . 2022. 日本におけるカンナビジオール製品の使用実態に関する横断調査 . 日本統合医療学会誌 15 (2), 92-101.
- 58) Charlotte's web. <https://www.charlottesweb.com/>
- 59) Hazekamp, A. 20018. The Trouble with CBD Oil. Medical Cannabis and Cannabinoids 1(1): 65–72. doi: 10.1159/0004489287
- 60) Novel foods (including CBD and hemp). <https://www.businesscompanion.info/en/quick-guides/food-and-drink/novel-foods-including-cbd-and-hemp>
- 61) Joy, J.E., Watson, S. J. Jr., Benson, J. A. Jr. 1999. 5 Development of Cannabinoid Drugs, Marijuana and Medicine: Assessing the Science Base. National Academies Press.
- 62) SYNDROS. <https://syndros.com/>.
- 63) Valeant returns synthetic cannabinoid to USA. 17th May 2006. http://www.pharmatimes.com/news/valeant_returns_synthetic_cannabinoid_to_usa_996830.
- 64) Bostwick, J. M. 2012. Blurred Boundaries: the Therapeutics and Politics of medical marijuana. Mayo Clinic Proceeding. 87(2): 172–186. doi: 10.1016/j.mayocp.2011.10.003
- 65) 編引智成 . 2016. カンナビノイド系を標的とした医薬品開発状況 . ファルマシア 52(9): 850-854. doi: 10.14894/faruawpsj.52.9_850
- 66) Datapharm. Sativex Oromucosal Spray. 2020. <https://www.medicines.org.uk/emc/product/602>
- 67) Datapharm. Epidyolex 100mg/ml oral solution. 2021. <https://www.medicines.org.uk/emc/product/10781>
- 68) Jazz Pharmaceuticals, Press release, February 3, 2021. <https://investor.jazzpharma.com/news-releases/news-release-details/jazz-pharmaceuticals-acquire-gw-pharmaceuticals-plc-creating/>
- 69) Canadian Chamber of Commerce National Cannabis Business Coalition, Analysis and Forecast of Global Medical Cannabis Markets, June 2022. <https://chamber.ca/wp-content/uploads/2022/11/Medical-Cannabis->

Research_FINAL-June-27-2022-2.pdf

- 70) 医療用大麻のハーブ製剤：処方医のための便覧 . 2021 年 5 月 14 日 . 日本臨床カンナビノイド学会 . http://cannabis.kenkyuukai.jp/information/information_detail.asp?id=113016
- 71) 欧州医薬品庁「大麻由来医薬品の用語と定義の整理」 . 2022 年 6 月 24 日 . 日本臨床カンナビノイド学会 . http://cannabis.kenkyuukai.jp/information/information_detail.asp?id=126877
- 72) Rick Simpson Oil (RSO). <https://weedmaps.com/learn/dictionary/rick-simpson-oil-rso/>
- 73) Washington State Liquor and Cannabis Board. <https://dor.wa.gov/taxonomy/term/1525>
- 74) The Office of Medicinal Cannabis (OMC). <https://english.cannabisbureau.nl/>
- 75) United States Pharmacopoeia (USP). Supporting the quality of cannabis for medical use. <https://www.usp.org/dietary-supplements-herbal-medicines/cannabis>
- 76) ECA Academy. Ph. Eur. Cannabis Monograph Proposed for Comment. <https://www.gmp-compliance.org/gmp-news/ph-eur-cannabis-monograph-proposed-for-comment>
- 77) 医療目的の大麻花序：品質属性に関する米国薬局方（USP）の考慮事項 . 2022 年 11 月 24 日 . 日本臨床カンナビノイド学会 . http://cannabis.kenkyuukai.jp/information/information_detail.asp?id=131621

監訳者後書き

- 1) 日本臨床カンナビノイド学会 . 過去の学術大会開催履歴 . <http://cannabis.kenkyuukai.jp/event/index.asp>
- 2) The Scientist (日本語字幕付き、 62 分) . <https://www.youtube.com/watch?v=AWNhZnnISDM>
- 3) 予告編：WEED THE PEOPLE – 大麻が救う命の物語 – (日本語字幕付き、 94 分) . <https://www.youtube.com/watch?v=A1KdOSQIdAs>
- 4) CBD Nation 予告編 (日本語字幕付き、 84 分) . https://www.youtube.com/watch?v=hX_qyxbQ8cI
- 5) 医療従事者向けカンナビノイド医療講座提供 . <https://medicalmarijuana411.jp/?v=24d22e03afb2>
- 6) 厚生労働科学特別研究事業「難治性てんかんにおけるカンナビノイド（大麻抽出成分）由来医薬品の治験に向けた課題把握および今後の方策に向けた研究」令和 2 年度 総括・分担研究報告書、 2021 年 . <https://mhlw-grants.niph.go.jp/project/145770>