

REFERENCES

- Aliferis, K.A., Bernard-Perron, D., 2020. Cannabinomics: application of metabolomics in annabis (*Cannabis sativa L.*) research and development. *Front. Plant Sci.* <https://doi.org/10.3389/fpls.2020.00554>.
- Ashton, C.H., 2001. Pharmacology and effects of cannabis: A brief review. *Br. J. Psychiatry* 178, 101–106. <https://doi.org/10.1192/bjp.178.2.101>.
- Bernaerts, T.M.M., Gheysen, L., Foubert, I., Hendrickx, M.E., Van Loey, A.M., 2019. Evaluating microalgal cell disruption upon ultra-high pressure homogenization. *Algal Res.* 42. <https://doi.org/10.1016/j.algal.2019.101616>.
- Black, N., Stockings, E., Campbell, G., Tran, L.T., Zagic, D., Hall, W.D., Farrell, M., Degenhardt, L., 2019. Cannabinoids for the treatment of mental disorders and symptoms of mental disorders: a systematic review and meta-analysis. *The Lancet Psychiatry* 6. [https://doi.org/10.1016/S2215-0366\(19\)30401-8](https://doi.org/10.1016/S2215-0366(19)30401-8).
- Boyle, J., 2005. Lehninger principles of biochemistry (4th ed.): Nelson, D., and Cox, M. *Biochem. Mol. Biol. Educ.* 33. <https://doi.org/10.1002/bmb.2005.494033010419>.
- Brandley, B.K., Schnaar, R.L., 1986. Cell-surface carbohydrates in cell recognition and response. *J. Leukoc. Biol.* <https://doi.org/10.1002/jlb.40.1.97>.
- Bungaruang, L., Gutmann, A., Nidetzky, B., 2013. Leloir glycosyltransferases and natural product glycosylation: Biocatalytic synthesis of the C-glucoside nothofagin, a major antioxidant of redbush herbal tea. *Adv. Synth. Catal.* 355, 2757–2763. <https://doi.org/10.1002/adsc.201300251>.
- Calapai, F., Cardia, L., Sorbara, E.E., Navarra, M., Gangemi, S., Calapai, G., Mannucci, C., 2020. Cannabinoids, blood–brain barrier, and brain disposition. *Pharmaceutics*. <https://doi.org/10.3390/pharmaceutics12030265>.
- Cerino, P., Buonerba, C., Cannazza, G., D'Auria, J., Ottoni, E., Fulgione, A., Di Stasio, A., Pierri, B., Gallo, A., 2021. A review of hemp as food and nutritional supplement. *Cannabis Cannabinoid Res.* <https://doi.org/10.1089/can.2020.0001>.
- Chen, F., Huang, G., 2019. Application of glycosylation in targeted drug delivery. *Eur. J. Med. Chem.* <https://doi.org/10.1016/j.ejmech.2019.111612>.

- Chen, Fang, Huang, G., Huang, H., 2020. Sugar ligand-mediated drug delivery. Future Med. Chem. <https://doi.org/10.4155/fmc-2019-0114>.
- Chen, L., Cai, R., Weng, J., Li, Y., Jia, H., Chen, K., Yan, M., Ouyang, P., 2020. Production of rebaudioside D from stevioside using a UGTS12 Asn358Phe mutant in a multi-enzyme system. Microb. Biotechnol. 13, 974–983. <https://doi.org/10.1111/1751-7915.13539>.
- Chen, L., Sun, P., Li, Y., Yan, M., Xu, L., Chen, K., Ouyang, P., 2017. A fusion protein strategy for soluble expression of Stevia glycosyltransferase UGT76G1 in *Escherichia coli*. 3 Biotech 7. <https://doi.org/10.1007/s13205-017-0943-y>.
- Chu, J., Yue, J., Qin, S., Li, Y., Wu, B., He, B., 2021. Biocatalysis for rare ginsenoside rh2 production in high level with co-immobilized UDP-glycosyltransferase bs-yjic mutant and sucrose synthase atsusy. Catalysts 11. <https://doi.org/10.3390/catal11010132>.
- Corroon, J., MacKay, D., Dolphin, W., 2020. Labeling of cannabidiol products: A public health perspective. Cannabis Cannabinoid Res. <https://doi.org/10.1089/can.2019.0101>.
- Cristino, L., Bisogno, T., Di Marzo, V., 2020. Cannabinoids and the expanded endocannabinoid system in neurological disorders. Nat. Rev. Neurol. <https://doi.org/10.1038/s41582-019-0284-z>.
- Dai, L., Liu, C., Li, J., Dong, C., Yang, J., Dai, Z., Zhang, X., Sun, Y., 2018. One-pot synthesis of ginsenoside Rh2 and bioactive unnatural ginsenoside by coupling promiscuous glycosyltransferase from *Bacillus subtilis* 168 to sucrose synthase. J. Agric. Food Chem. 66. <https://doi.org/10.1021/acs.jafc.8b00597>.
- De Graaf, M., Pinedo, H.M., Quadir, R., Haisma, H.J., Boven, E., 2003. Cytosolic β -glycosidases for activation of glycoside prodrugs of daunorubicin. Biochem. Pharmacol. 65. [https://doi.org/10.1016/S0006-2952\(03\)00183-7](https://doi.org/10.1016/S0006-2952(03)00183-7).
- De Winter, K., Dewitte, G., Dirks-Hofmeister, M.E., De Laet, S., Pelantová, H., Křen, V., Desmet, T., 2015. Enzymatic glycosylation of phenolic antioxidants: Phosphorylase-mediated synthesis and characterization. J. Agric. Food Chem. 63. <https://doi.org/10.1021/acs.jafc.5b04380>.
- Dewitte, G., Walmagh, M., Diricks, M., Lepak, A., Gutmann, A., Nidetzky, B., Desmet, T., 2016. Screening of recombinant glycosyltransferases reveals the broad

- acceptor specificity of stevia UGT-76G1. *J. Biotechnol.* 233. <https://doi.org/10.1016/j.biotech.2016.06.034>.
- Duman-Özdamar, Z.E., Ünlü, A., Ünal, H., Woodley, J.M., Binay, B., 2021. High-yield production of active recombinant *S. simulans* lysostaphin expressed in *E. coli* in a laboratory bioreactor. *Protein Expr. Purif.* 177. <https://doi.org/10.1016/j.pep.2020.105753>.
- Elferink, H., Titulaer, W.H.C., Derkx, M.G.N., Veeneman, G.H., Rutjes, F.P.J.T., Boltje, T.J., 2022. Chloromethyl glycosides as versatile synthons to prepare glycosyloxymethyl-prodrugs. *Chem. - A Eur. J.* 28. <https://doi.org/10.1002/chem.202103910>.
- Ferrazzano, G.F., Cantile, T., Alcidi, B., Coda, M., Ingenito, A., Zarrelli, A., Di Fabio, G., Pollio, A., 2016. Is *Stevia rebaudiana bertoni* a non cariogenic sweetener? A review. *Molecules*. <https://doi.org/10.3390/molecules21010038>.
- Fraw-doktor, 2016. *Glycine max* [WWW Document]. URL <https://plantsam.com/glycine-max/>.
- Fride, E., 2005. Endocannabinoids in the central nervous system: From neuronal networks to behavior. *Curr. Drug Targets CNS Neurol. Disord.* <https://doi.org/10.2174/156800705774933069>.
- Gan, S., Rozhon, W., Varga, E., Halder, J., Berthiller, F., Poppenberger, B., 2021. The acyltransferase PMAT1 malonylates brassinolide glucoside. *J. Biol. Chem.* 296. <https://doi.org/10.1016/j.jbc.2021.100424>.
- Geogre Mouratidis, 2020. Cannabis plant anatomy: A beginner's guide [WWW Document]. URL <https://cannigma.com/plant/cannabis-plant-anatomy>.
- Ghosh, A.K., Khan, S., Marini, F., Nelson, J.A., Farquhar, D., 2000. A daunorubicin β -galactoside prodrug for use in conjunction with gene- directed enzyme prodrug therapy. *Tetrahedron Lett.* 41. [https://doi.org/10.1016/S0040-4039\(00\)00742-5](https://doi.org/10.1016/S0040-4039(00)00742-5).
- Goyal, D., Sahni, G., Sahoo, D.K., 2009. Enhanced production of recombinant streptokinase in *Escherichia coli* using fed-batch culture. *Bioresour. Technol.* 100, 4468–4474. <https://doi.org/10.1016/j.biortech.2009.04.008>.
- Haberl Meglič, S., Janež, N., Peterka, M., Flisar, K., Kotnik, T., Miklavčič, D., 2020. Evaluation and optimization of protein extraction from *E. coli* by

- electroporation. *Front. Bioeng. Biotechnol.* 8, 543187. <https://doi.org/10.3389/fbioe.2020.543187>.
- Hamada, Hiroki, Nakayama, T., Shimoda, K., Matsuura, N., Hamada, Hatsuyuki, Iwaki, T., Kiriake, Y., Saikawa, T., 2020. Curcumin oligosaccharides (gluco-oligosaccharides) penetrate the blood-brain barrier in mouse brain: glycoside (polysaccharide) modification approach for brain drug delivery across the blood-brain barrier and tumor drug delivery. *Nat. Prod. Commun.* 15. <https://doi.org/10.1177/1934578X20953653>.
- Hardman, J.M., Brooke, R.T., Zipp, B.J., 2017. Cannabinoid glycosides: In vitro production of a new class of cannabinoids with improved physicochemical properties. *bioRxiv*. <https://doi.org/10.1101/104349>.
- Hu, Y., Min, J., Qu, Y., Zhang, X., Zhang, J., Yu, X., Dai, L., 2020. Biocatalytic synthesis of calycosin-7-o- β -D-glucoside with uridine diphosphate–glucose regeneration system. *Catalysts* 10 (2), 258. <https://doi.org/10.3390/catal10020258>.
- Hua, T., Li, X., Wu, L., Iliopoulos-Tsoutsouvas, C., Wang, Y., Wu, M., Shen, L., Brust, C.A., Nikas, S.P., Song, F., Song, X., Yuan, S., Sun, Q., Wu, Y., Jiang, S., Grim, T.W., Benchama, O., Stahl, E.L., Zvonok, N., Zhao, S., Bohn, L.M., Makriyannis, A., Liu, Z.J., 2020. Activation and signaling mechanism revealed by cannabinoid receptor-Gi complex structures. *Cell* 180. <https://doi.org/10.1016/j.cell.2020.01.008>.
- Humphrey, T. V., Richman, A.S., Menassa, R., Brandle, J.E., 2006. Spatial organisation of four enzymes from *Stevia rebaudiana* that are involved in steviol glycoside synthesis. *Plant Mol. Biol.* 61. <https://doi.org/10.1007/s11103-005-5966-9>.
- Lan Parkes, 2020. The solubility and stability profiles of cannabidiol. *CBD world news*.
- Idrees, H., Zaidi, S.Z.J., Sabir, A., Khan, R.U., Zhang, X., Hassan, S.U., 2020. A review of biodegradable natural polymer-based nanoparticles for drug delivery applications. *Nanomaterials*. <https://doi.org/10.3390/nano10101970>.
- Jansson, D., Dieriks, V.B., Rustenhoven, J., Smyth, L.C.D., Scotter, E., Aalderink, M., Feng, S., Johnson, R., Schweder, P., Mee, E., Heppner, P., Turner, C., Curtis, M., Faull, R., Dragunow, M., 2021. Cardiac glycosides target barrier inflammation of the vasculature, meninges and choroid plexus. *Commun. Biol.* 4. <https://doi.org/10.1038/s42003-021-01787-x>.

- Kienzl, M., Kargl, J., Schicho, R., 2020. The immune endocannabinoid system of the tumor microenvironment. *Int. J. Mol. Sci.* <https://doi.org/10.3390/ijms21238929>.
- Kim, M., Park, M.H., Nam, G., Lee, M., Kang, J., Song, I.S., Choi, M.K., Jin, H.K., Bae, J.S., Lim, M.H., 2021. A Glycosylated prodrug to attenuate neuroinflammation and improve cognitive deficits in Alzheimer's Disease transgenic mice. *Mol. Pharm.* 18. <https://doi.org/10.1021/acs.molpharmaceut.0c00677>.
- Kim, M.J., Zheng, J., Liao, M.H., Jang, I.C., 2019. Overexpression of SrUGT76G1 in Stevia alters major steviol glycosides composition towards improved quality. *Plant Biotechnol. J.* 17. <https://doi.org/10.1111/pbi.13035>.
- Kleinig, A.R., Mansell, C.J., Nguyen, Q.D., Badalyan, A., Middelberg, A.P.J., 1995. Influence of broth dilution on the disruption of *Escherichia coli*. *Biotechnol. Tech.* 9, 759–762. <https://doi.org/10.1007/BF00159244>.
- Koley, D., Bard, A.J., 2010. Triton X-100 concentration effects on membrane permeability of a single HeLa cell by scanning electrochemical microscopy (SECM). *Proc. Natl. Acad. Sci. U. S. A.* 107, 16783–16787. <https://doi.org/10.1073/pnas.1011614107>.
- Kulmer, S.T., Gutmann, A., Lemmerer, M., Nidetzky, B., 2017. Biocatalytic cascade of polyphosphate kinase and sucrose synthase for synthesis of nucleotide-activated derivatives of glucose. *Adv. Synth. Catal.* 359, 292–301. <https://doi.org/10.1002/adsc.201601078>.
- Kurze, E., Ruß, V., Syam, N., Effenberger, I., Jonczyk, R., Liao, J., Song, C., Hoffmann, T., Schwab, W., 2021. Glucosylation of (\pm)-menthol by uridine-diphosphate-sugar dependent glucosyltransferases from plants. *Molecules* 26. <https://doi.org/10.3390/molecules26185511>.
- Kweon, D.H., Han, N.S., Park, K.M., Seo, J.H., 2001. Overproduction of *Phytolacca insularis* protein in batch and fed-batch culture of recombinant *Escherichia coli*. *Process Biochem.* 36, 537–542. [https://doi.org/10.1016/S0032-9592\(00\)00237-5](https://doi.org/10.1016/S0032-9592(00)00237-5).
- Lairson, L.L., Henrissat, B., Davies, G.J., Withers, S.G., 2008. Glycosyl transferases: Structures, functions, and mechanisms. *Annu. Rev. Biochem.* <https://doi.org/10.1146/annurev.biochem.76.061005.092322>.

- Lu, H.C., MacKie, K., 2016. An introduction to the endogenous cannabinoid system. *Biol. Psychiatry.* <https://doi.org/10.1016/j.biopsych.2015.07.028>.
- Madan, S., Ahmad, S., Singh, G.N., Kohli, K., Kumar, Y., Singh, R., Garg, M., 2010. *Stevia rebaudiana (Bert.) Bertoni* - A Review. *Indian J. Nat. Prod. Resour.*
- Madhav, H., Bhasker, S., Chinnamma, M., 2013. Functional and structural variation of uridine diphosphate glycosyltransferase (UGT) gene of *Stevia rebaudiana*-UGTSr involved in the synthesis of rebaudioside A. *Plant Physiol. Biochem.* 63. <https://doi.org/10.1016/j.plaphy.2012.11.029>.
- Mao, Y., Zhang, Y., Luo, Z., Zhan, R., Xu, H., Chen, W., Huang, H., 2018. Synthesis, biological evaluation and low-toxic formulation development of glycosylated paclitaxel prodrugs. *Molecules* 23. <https://doi.org/10.3390/molecules23123211>.
- Martin, H., Lázaro, L.R., Gunnlaugsson, T., Scanlan, E.M., 2022. Glycosidase activated prodrugs for targeted cancer therapy. *Chem. Soc. Rev.* 9694–9716. <https://doi.org/10.1039/d2cs00379a>.
- Mawson, R., Gamage, M., Terefe, N.S., Knoerzer, K., 2011. Ultrasound in enzyme activation and inactivation, in: Food Engineering Series. pp. 369–404. https://doi.org/10.1007/978-1-4419-7472-3_14.
- McGilveray, I.J., 2005. Pharmacokinetics of cannabinoids. *Pain Res. Manag.* <https://doi.org/10.1155/2005/242516>.
- Menzella, H.G., Ceccarelli, E.A., Gramajo, H.C., 2003. Novel *Escherichia coli* strain allows efficient recombinant protein production using lactose as inducer. *Biotechnol. Bioeng.* 82, 809–817. <https://doi.org/10.1002/bit.10630>.
- Mestrom, L., Przypis, M., Kowalczykiewicz, D., Pollender, A., Kumpf, A., Marsden, S.R., Bento, I., Jarzębski, A.B., Szymańska, K., Chruściel, A., Tischler, D., Schoevaart, R., Hanefeld, U., Hagedoorn, P.L., 2019. Leloir glycosyltransferases in applied biocatalysis: A multidisciplinary approach. *Int. J. Mol. Sci.* <https://doi.org/10.3390/ijms20215263>.
- Middleberg, A.P.J., 2000. 2 Microbial cell disruption by high-pressure homogenization. pp. 11–21. https://doi.org/10.1007/978-1-59259-027-8_2.
- Millar, S.A., Maguire, R.F., Yates, A.S., O'sullivan, S.E., 2020. Towards better delivery of cannabidiol (Cbd). *Pharmaceuticals* 13, 1–15. <https://doi.org/10.3390/ph13090219>.

- Millar, S.A., Stone, N.L., Yates, A.S., O'Sullivan, S.E., 2018. A systematic review on the pharmacokinetics of cannabidiol in humans. *Front. Pharmacol.* <https://doi.org/10.3389/fphar.2018.01365>.
- Mistry, S., 2021. Glycosides [WWW Document]. URL <https://solutionpharmacy.in/classification-of-glycosides>.
- Monshouwer, K., Van Laar, M., Vollebergh, W.A., 2011. Buying cannabis in “coffee shops.” *Drug Alcohol Rev.* 30. <https://doi.org/10.1111/j.1465-3362.2010.00268.x>.
- Murota, K., Matsuda, N., Kashino, Y., Fujikura, Y., Nakamura, T., Kato, Y., Shimizu, R., Okuyama, S., Tanaka, H., Koda, T., Sekido, K., Terao, J., 2010. α -Oligoglucosylation of a sugar moiety enhances the bioavailability of quercetin glucosides in humans. *Arch. Biochem. Biophys.* 501. <https://doi.org/10.1016/j.abb.2010.06.036>.
- Navarro, P.P., Vettiger, A., Ananda, V.Y., Llopis, P.M., Allolio, C., Bernhardt, T.G., Chao, L.H., 2022. Cell wall synthesis and remodelling dynamics determine division site architecture and cell shape in *Escherichia coli*. *Nat. Microbiol.* 7, 1621–1634. <https://doi.org/10.1038/s41564-022-01210-z>.
- Nawaz, N., Wen, S., Wang, F., Nawaz, S., Raza, J., Iftikhar, M., Usman, M., 2022. Lysozyme and its application as antibacterial agent in food industry. *Molecules*. <https://doi.org/10.3390/molecules27196305>.
- Nidetzky, B., Gutmann, A., Zhong, C., 2018. Leloir glycosyltransferases as biocatalysts for chemical production. *ACS Catal.* 8, 6283–6300. <https://doi.org/10.1021/acscatal.8b00710>.
- Oberbarnscheidt, T., Miller, N.S., 2020. The impact of cannabidiol on psychiatric and medical conditions. *J. Clin. Med. Res.* 12. <https://doi.org/10.14740/jocmr4159>.
- Pamplona, F.A., Da Silva, L.R., Coan, A.C., 2018. Potential clinical benefits of CBD-Rich cannabis extracts over purified CBD in treatment-resistant epilepsy: Observational data meta-analysis. *Front. Neurol.* <https://doi.org/10.3389/fneur.2018.00759>.
- Pan, H., Xie, Z., Bao, W., Zhang, J., 2008. Optimization of culture conditions to enhance cis-epoxysuccinate hydrolase production in *Escherichia coli* by response surface methodology. *Biochem. Eng. J.* 42, 133–138. <https://doi.org/10.1016/j.bej.2008.06.007>.

- Pei, J., Chen, A., Zhao, L., Cao, F., Ding, G., Xiao, W., 2017. One-pot synthesis of hyperoside by a three-enzyme cascade using a UDP-Galactose regeneration system. *J. Agric. Food Chem.* 65. <https://doi.org/10.1021/acs.jafc.7b02320>.
- Ponton, J.A., Smyth, K., Soumbasis, E., Llanos, S.A., Lewis, M., Meerholz, W.A., Tanguay, R.L., 2020. A pediatric patient with autism spectrum disorder and epilepsy using cannabinoid extracts as complementary therapy: A case report. *J. Med. Case Rep.* 14. <https://doi.org/10.1186/s13256-020-02478-7>.
- Rezaei, L., Shojaosadati, S.A., Farahmand, L., Moradi-Kalbolandi, S., 2020. Enhancement of extracellular bispecific anti-MUC1 nanobody expression in *E. coli* BL21 (DE3) by optimization of temperature and carbon sources through an auto-induction condition. *Eng. Life Sci.* 20, 338–349. <https://doi.org/10.1002/elsc.201900158>.
- Richman, A., Swanson, A., Humphrey, T., Chapman, R., McGarvey, B., Pocs, R., Brandle, J., 2005. Functional genomics uncovers three glucosyltransferases involved in the synthesis of the major sweet glucosides of *Stevia rebaudiana*. *Plant J.* 41. <https://doi.org/10.1111/j.1365-313X.2004.02275.x>.
- Rimmington, F., 2020. Pharmacokinetics and pharmacodynamics. *South. African J. Anaesth. Analg.* 26. <https://doi.org/10.36303/SAJAA.2020.26.6.S3.2562>.
- Rosano, G.L., Ceccarelli, E.A., 2014. Recombinant protein expression in *Escherichia coli*: Advances and challenges. *Front. Microbiol.* 5. <https://doi.org/10.3389/fmicb.2014.00172>.
- Sacco, P., Cok, M., Scognamiglio, F., Pizzolitto, C., Vecchies, F., Marfoglia, A., Marsich, E., Donati, I., 2020. Glycosylated-chitosan derivatives: A systematic review. *Molecules*. <https://doi.org/10.3390/molecules25071534>.
- Sarkandy, S.Y., Khalilzadeh, R., Shojaosadati, S.A., Sadeghizadeh, M., Farnoud, A.M., Babaeipour, V., Maghsoudi, A., 2010. A novel amino acid supplementation strategy based on a stoichiometric model to enhance human IL-2 (interleukin-2) expression in high-cell-density *Escherichia coli* cultures. *Biotechnol. Appl. Biochem.* 57, 151–156. <https://doi.org/10.1042/ba20100320>.
- Schmöller, K., Gutmann, A., Diricks, M., Desmet, T., Nidetzky, B., 2016. Sucrose synthase: A unique glycosyltransferase for biocatalytic glycosylation process development. *Biotechnol. Adv.* <https://doi.org/10.1016/j.biotechadv.2015.11.003>.

- Shchegrevina, E.S., Sachkova, A.A., Usova, S.D., Nyuchev, A. V., Gracheva, Y.A., Fedorov, A.Y., 2021. Carbohydrate systems in targeted drug delivery: Expectation and reality. Russ. J. Bioorganic Chem. <https://doi.org/10.1134/S1068162021010222>.
- Shimizu, R., Shimabayashi, H., Moriwaki, M., 2006. Enzymatic production of highly soluble myricitrin glycosides using β -galactosidase. Biosci. Biotechnol. Biochem. 70. <https://doi.org/10.1271/bbb.70.940>.
- Shu, W., Zheng, H., Fu, X., Zhen, J., Tan, M., Xu, J., Zhao, X., Yang, S., Song, H., Ma, Y., 2020. Enhanced heterologous production of glycosyltransferase ugt76g1 by co-expression of endogenous prpd and malk in *Escherichia coli* and its transglycosylation application in production of rebaudioside. Int. J. Mol. Sci. 21, 1–12. <https://doi.org/10.3390/ijms21165752>.
- Sivashanmugam, A., Murray, V., Cui, C., Zhang, Y., Wang, J., Li, Q., 2009. Practical protocols for production of very high yields of recombinant proteins using *Escherichia coli*. Protein Sci. 18, 936–948. <https://doi.org/10.1002/pro.102>.
- Spleman, L., Sinclair, R., Freeman, M., Davis, M., Gebauer, K., 2018. 1061 The safety of topical cannabidiol (CBD) for the treatment of acne. J. Invest. Dermatol. 138. <https://doi.org/10.1016/j.jid.2018.03.1074>.
- Stein, O., Granot, D., 2019. An overview of sucrose synthases in plants. Front. Plant Sci. 10. <https://doi.org/10.3389/fpls.2019.00095>.
- Stinchcomb, A.L., Lexington, K.Y., Lee, S., 2010. Formulations of cannabidiol and prodrugs of cannabidiol and methods of using the same. Us 2010/0273895 a1 61.
- Takemori, S., Furuya, E., Suzuki, H., Katagiri, M., 1967. Stabilization of enzyme activity by an organic solvent [37]. Nature. <https://doi.org/10.1038/215417a0>.
- Tan, S.C., Yiap, B.C., 2009. DNA, RNA, and protein extraction: The past and the present. J. Biomed. Biotechnol. <https://doi.org/10.1155/2009/574398>.
- Tanasescu, R., Constantinescu, C.S., 2010. Cannabinoids and the immune system: An overview. Immunobiology 215. <https://doi.org/10.1016/j.imbio.2009.12.005>.
- Trad-Paulo Gómzer, 2017. How THC gets into your brain – and how to increase it [WWW Document]. URL <http://profoppot.com/thc-blood-brain-barrier/> (accessed 5.21.17)..

- Tripathi, N.K., 2016. Production and purification of recombinant proteins from *Escherichia coli*. *ChemBioEng Rev.* 3, 116–133. <https://doi.org/10.1002/cben.201600002>.
- Tzadok, M., Uliel-Siboni, S., Linder, I., Kramer, U., Epstein, O., Menascu, S., Nissenkorn, A., Yosef, O.B., Hyman, E., Granot, D., Dor, M., Lerman-Sagie, T., Ben-Zeev, B., 2016. CBD-enriched medical cannabis for intractable pediatric epilepsy: The current Israeli experience. *Seizure* 35. <https://doi.org/10.1016/j.seizure.2016.01.004>.
- Voeks, R., 2014. Cannabis: evolution and ethnobotany. *AAG Rev. Books* 2. <https://doi.org/10.1080/2325548x.2014.901859>.
- Wakshlag, J.J., Schwark, W.S., Deabold, K.A., Talsma, B.N., Cital, S., Lyubimov, A., Iqbal, A., Zakharov, A., 2020. Pharmacokinetics of cannabidiol, cannabidiolic Acid, Δ9-tetrahydrocannabinol, tetrahydrocannabinolic acid and related metabolites in canine serum after dosing with three oral forms of hemp extract. *Front. Vet. Sci.* 7. <https://doi.org/10.3389/fvets.2020.00505>.
- Wang, H., Yang, R., Hua, X., Zhang, Z., Zhao, W., Zhang, W., 2011. Expression, enzymatic characterization, and high-level production of glucose isomerase from *Actinoplanes missouriensis* CICIM B0118(A) in *Escherichia coli*. *Zeitschrift fur Naturforsch.-Sect. C J. Biosci.* 66. <https://doi.org/10.1515/znc-2011-11-1210>.
- Wang, X., 2009. Structure, mechanism and engineering of plant natural product glycosyltransferases. *FEBS Lett.* <https://doi.org/10.1016/j.febslet.2009.09.042>.
- Wang, Y., Chen, L., Li, Yan, Li, Yangyang, Yan, M., Chen, K., Hao, N., Xu, L., 2016. Efficient enzymatic production of rebaudioside A from stevioside. *Biosci. Biotechnol. Biochem.* 80. <https://doi.org/10.1080/09168451.2015.1072457>.
- Wouters, M., Benschop, A., van Laar, M., Korf, D.J., 2012. Cannabis use and proximity to coffee shops in the Netherlands. *Eur. J. Criminol.* 9. <https://doi.org/10.1177/1477370812448033>.
- Wu, J.Y., Ding, H.Y., Wang, T.Y., Tsai, Y.L., Ting, H.J., Chang, T.S., 2021. Improving aqueous solubility of natural antioxidant mangiferin through glycosylation by maltogenic amylase from *parageobacillus galactosidasius* DSM 18751. *Antioxidants* 10. <https://doi.org/10.3390/antiox10111817>.

- Xu, W., Ling, P., Zhang, T., 2013. Polymeric micelles, a promising drug delivery system to enhance bioavailability of poorly water-soluble drugs. *J. Drug Deliv.* 2013. <https://doi.org/10.1155/2013/340315>.
- Yasmin-Karim, S., Moreau, M., Mueller, R., Sinha, N., Dabney, R., Herman, A., Ngwa, W., 2018. Enhancing the therapeutic efficacy of cancer treatment with cannabinoids. *Front. Oncol.* 8. <https://doi.org/10.3389/fonc.2018.00114>.
- Yoon, S.K., Kang, W.K., Park, T.H., 1994. Fed-batch operation of recombinant *Escherichia coli* containing trp promoter with controlled specific growth rate. *Biotechnol. Bioeng.* 43, 995–999. <https://doi.org/10.1002/bit.260431013>.
- Yu, J., Tao, Y., Pan, H., Lin, L., Sun, J., Ma, R., Li, Y., Jia, H., 2022. Mutation of Stevia glycosyltransferase UGT76G1 for efficient biotransformation of rebaudioside E into rebaudioside M. *J. Funct. Foods* 92. <https://doi.org/10.1016/j.jff.2022.105033>.
- Yu, N., Liu, T., Zhang, X., Gong, N., Ji, T., Chen, J., Liang, X.J., Kohane, D.S., Guo, S., 2020. Dually enzyme- and acid-triggered self-immolative ketal glycoside nanoparticles for effective cancer prodrug monotherapy. *Nano Lett.* 20. <https://doi.org/10.1021/acs.nanolett.0c01973>.
- Zea, C.J., Camci-Unal, G., Pohl, N.L., 2008. Thermodynamics of binding of divalent magnesium and manganese to uridine phosphates: Implications for diabetes-related hypomagnesaemia and carbohydrate biocatalysis. *Chem. Cent. J.* 2. <https://doi.org/10.1186/1752-153X-2-15>.
- Zhang, S., Liu, Q., Lyu, C., Chen, Jinsong, Xiao, R., Chen, Jingtian, Yang, Y., Zhang, H., Hou, K., Wu, W., 2020. Characterizing glycosyltransferases by a combination of sequencing platforms applied to the leaf tissues of *Stevia rebaudiana*. *BMC Genomics* 21. <https://doi.org/10.1186/s12864-020-07195-5>.
- Zhang, X.Q., Lund, A.A., Sarath, G., Cerny, R.L., Roberts, D.M., Chollet, R., 1999. Soybean nodule sucrose synthase (nodulin-100): Further analysis of its phosphorylation using recombinant and authentic root-nodule enzymes. *Arch. Biochem. Biophys.* 371, 70–82. <https://doi.org/10.1006/abbi.1999.1415>.
- Zipp, B.J., Hardman, J.M., Brooke, R.T., 2017. Cannabinoid glycoside prodrugs and methods of synthesis.

Zou, S., Kumar, U., 2018. Cannabinoid receptors and the endocannabinoid system: Signaling and function in the central nervous system. *Int. J. Mol. Sci.* <https://doi.org/10.3390/ijms19030833>.

