

DAFTAR PUSTAKA

- Abdullah, Nurvita, N. I. Ischak, L. Alio, Y. K. Salimi, and L. O. Aman. (2025). Inhibisi Enzim α -Glukosidase dan α -Amilase Dari Ekstrak Metanol Daun Buhu (*Garuga floribunda* Decne) Sebagai Antidiabetes. *Algoritma : Jurnal Matematika, Ilmu pengetahuan Alam, Kebumihan dan Angkasa* 3(1).
- Ahmed AR, Juwita J, Ratulangi SAD dan Malik A. (2016). Penetapan Kadar Fenolik Dan Flavonoid Total Ekstrak Metanol Buah Dan Daun Patikala (*Etlingera Elatior* (Jack) Rm Sm) Menggunakan Spektrofotometri Uv- Vis. *Pharmaceutical Sciences And Research* ;2(1):1-10.
- Ahmed, S., Ali, M. C., Ruma, R. A., Mahmud, S., Paul, G. K., Saleh, M. A., Alshahrani, M. M., Obaidullah, A. J., Biswas, S. K., Rahman, M. M., & Islam, M. R. (2022). Molecular Docking and Dynamics Simulation of Natural Compounds from Betel Leaves (*Piper betle* L.) for Investigating the Potential Inhibition of Alpha-Amylase and Alpha-Glucosidase of Type 2 Diabetes. *Molecules*, 27(4526), 1–19. <https://doi.org/10.3390/molecules27144526>
- Alias N, Leow TC, Ali MS, Tajudin AA, Salleh AB, Abd Rahman RNZ. (2017). Anti-obesity potential of selected tropical plants via pancreatic lipase inhibition. *Adv Obesity, Weight Manag Control*, 6(4):122-31. <https://doi.org/10.15406/aowmc.2017.06.00163>
- Aryanti, A. R., M. H. Susanti, A. H. Saputro, Herayati, I. P. Sari, and I. S. Saputra. (2025). Perbandingan Metode Ekstraksi Maserasi, Sokletasi, Dan Sonikasi Terhadap Nilai Rendemen Ekstrak. *Journal of Chemistry Sciences & Education* 2(1): 1–9. doi:10.69606/jcse.v2i01.237.
- Asmita J. Gavhane, P. Padmanabhan, Suresh P. Kamble and Suresh N. Jangle. (2012). Synthesis of Silver Nanoparticles Using Extract of Neem Leaf and Triphala and Evaluation of Their Antimicrobial Activities. *Int. J. Pharm. Bio. Sci.*, vol. 3 (3), pp. 88-100.
- Balu, S. K., Andra, S., Damiri, F., Sivaramalingam, A., Sudandaradoss, V., Kumarasamy, K., Bhakthavachalam, K., Ali, F., Kundu, M. K., Rahman, H., Berrada, M., & Cavalu, S. (2022). Size-Dependent Antibacterial, Antidiabetic, and Toxicity of Silver Nanoparticles Synthesized Using Solvent Extraction of *Rosa indica* L. Petals. *Pharmaceuticals* 15 (689), 1-14. <https://doi.org/10.3390/ph15060689>.
- Basnet, S., Ghimire, M. P., Lamichhane, T. R., Adhikari, R., and Adhikari, A. (2023). Identification of potential human pancreatic α -amylase inhibitors from natural products by molecular docking, MM/GBSA calculations, MD simulations, and ADMET analysis. *PLoS ONE*, 18(3), 1–13. <https://doi.org/10.1371/journal.pone.0275765>

- Cai, G., Wang, O., Huang, C., Wang, Z., and Chen, J. (2020). A Review on Applications of Computational Methods in Drug Screening and Design. *Current Pharmaceutical Design*, 26(18), 2151–2163.
- Chaudhary, K. Kumar, and N. Mishra. (2016). A Review on Molecular Docking: Novel Tool for Drug Discovery. *JSM Chemistry* 4(3): 1–4.
- Citriniti, E. L., Rocca, R., Sciacca, C., Cardullo, N., Muccilli, V., Ortuso, F., and Alcaro, S. (2025). Leveraging Natural Compounds for Pancreatic Lipase Inhibition via Virtual Screening. 1–15.
- Danciu, C., Vlaia, L., Fetea, F., Hancianu, M., Coricovac, D.E., Ciurlea, S.A., Șoica, C.M., Marincu, I., Vlaia, V., Dehelean, C.A., and Trandafirescu, C. (2015). Evaluation of Phenolic Profile, Antioxidant and Anticancer Potential of Two Main Representatives of Zingiberaceae Family Against B164A5 Murine Melanoma Cells. *Biological Research*, 48, 1–9.
- Dwi Apriliani, N., and Amelia Saputri, F. (2018). Potensi Penghambatan Enzim alpha-Glukosidase Pada Tanaman Obat Tradisional Indonesia. *Farmaka*, 16(1), 169–177.
- Essa, Ahmed F, Mohamed Teleb, Dina M El-Kersh, Abd El-nasser G El Gendy, I Abdelsamed Elshamy, and Mohamed A Farag. (2023). 22 Phytochemistry Reviews Natural Acylated Flavonoids : Their Chemistry and Biological Merits in Context to Molecular Docking Studies. *Springer Netherlands*. doi:10.1007/s11101-022-09840-1.
- Filimonov, D. A., Lagunin, A. A., Glorizova, T. A., Rudik, A. V., Druzhilovskii, D., & S., Pogodin, P. V., and Poroikov, V. V. (2014). Prediction of the biological activity spectra of organic compounds using the PASS Online web resource, *Chemistry of Heterocyclic Compounds*, 50(3), 444–457.
- Gangal, A., Bachhar, V., Joshi, V., Akhtar, N., Duseja, M., Sethiya, N. K., and Shukla, R. K. (2024). Green synthesis of silver nanoparticles from the essential oil of *Curcuma amada* and their antihyperglycemic effect in STZ induced diabetic rats. *Inorganic Chemistry Communications*, 168, 112873. <https://doi.org/10.1016/j.inoche.2024.112873>
- Gaspersz, Nelson, E. G. Fransina, and A. R. Ngarbingan. (2022). A-Amylase And Glucoamylase Enzyme Inhibitory Activity Test Of Ethanol Extract Of Kirinyuh Leaves (*Chromolaena odorata* L). *Jurnal Kimia Mulawarman* 19: 51–57.
- GBD 2021 Diabetes Collaborators (2023). Global, regional, and national burden of diabetes from 1990 to 2021, with projections of prevalence to 2050: a systematic analysis for the Global Burden of Disease Study 2021. *Lancet* 402, 203–234. [https://doi.org/10.1016/S0140-6736\(23\)01301-6](https://doi.org/10.1016/S0140-6736(23)01301-6).
- González-Montoya, M., Hernández-Ledesma, B., Mora-Escobedo, R., and Martínez-Villaluenga, C. (2018). Bioactive Peptides from Germinated Soybean with

- Antidiabetic Potential by Inhibition of Dipeptidyl Peptidase-IV, α -Amylase, and α -Glucosidase Enzymes. *International Journal of Molecular Sciences*, 19(10), 2883. <https://doi.org/10.3390/ijms19102883>.
- Hasan, T., Siddiqui, A. A., Zafar, M., Al-Ghamdi, N. A., Al-Abbasi, F. A., Al-Mutairi, A. S., Al-Otaibi, W. F., Ahmad, M. Z., Alomair, J. A., and Badr, A. M. (2023). Phytochemicals from *Zingiber capitatum* rhizome as potential alpha glucosidase, alpha amylase, and glycogen phosphorylase inhibitors for the management of Type-II diabetes mellitus: Inferences from in vitro, in vivo and in-silico investigations. *Arabian Journal of Chemistry*, 16(10), Article 105128. <https://doi.org/10.1016/j.arabjc.2023.105128>.
- Hawash, M., Jaradat, N., Shekfeh, S., Abualhasan, M., Eid, A. M., and Issa, L. (2021). Molecular docking , chemo - informatic properties , alpha - amylase , and lipase inhibition studies of benzodioxol derivatives. *BMC Chemistry*, 1–10. <https://doi.org/10.1186/s13065-021-00766-x>.
- Hettiarachchi, Sandhuli S, Shashiprabha P Dunuweera, Asiri N Dunuweera, and R M Gamini Rajapakse. (2021). Synthesis of Curcumin Nanoparticles from Raw Turmeric Rhizome. *ACS Omega* 6: 8246–52. doi:10.1021/acsomega.0c06314
- Huang, Y., Richardson, S. J., Brennan, C. S., and Kasapis, S. (2024). Mechanistic insights into α -amylase inhibition, binding affinity and structural changes upon interaction with gallic acid. *Food Hydrocolloids*, 148, 109467. <https://doi.org/10.1016/j.foodhyd.2023.109467>
- Ina, F. R., & Saragih, H. (2025). Jurnal Biologi Tropis Nanoemulsion of Cardamom Fruit Extract (*Amomum compactum*) and its Characterization. *Jurnal Biologi Tropis*, 2(25), 1490–1501. <https://doi.org/10.29303/jbt.v25i2.8902>
- Jini, D, S Sharmila, A Anitha, Mahalakshmi Pandian, and R.M.H Rajapaksha. (2022). In Vitro and in Silico Studies of Silver Nanoparticles (AgNPs) from *Allium Sativum* against Diabetes. *Scientific Reports* 12(22109): 1–13. doi:10.1038/s41598-022-24818-x.
- Julianto, T. S. (2019). Fitokimia: Tinjauan metabolit sekunder dan skrining fitokimia. Yogyakarta: Universitas Islam Indonesia.
- Juliantoni, Y., Hajrin, W., and Subaidah, W. A. (2020). Jurnal Biologi Tropis Nanoparticle Formula Optimization of Juwet Seeds Extract (*Syzygium cumini*) using Simplex Lattice Design Method. *Jurnal Biologi Tropis*, 20(3), 416–422. <https://doi.org/10.29303/jbt.v20i3.2124>
- Kamila, N. C, S. Amin, A. Sriwahyuni, and A. Januar. (2025). Prediksi Aktivitas Antikanker Babandotan Dengan Pendekatan Kimia Medisinal Dan Komputasi In Silico. *Journal Riset Rumpun Ilmu Kesehatan* 4: 345–51.
- Kashtoh, Hamdy, and Kwang-Hyun Baek. (2022). Recent Updates on Phytoconstituent Alpha-Glucosidase Inhibitors: An Approach towards the Treatment of Type Two Diabetes. *Plant* 11(2722): 1–25. doi:10.3390.

- Khairina, A., and Leny, Y. (2015). Pengaruh Variasi Lama Penyimpanan Umbi Bengkuang (*Pachirhizus erosus*) terhadap Kadar Glukosa Darah *Rattus novergicus*. Unesa, *Journal of Chemistry*, 4(1), 31–36.
- Khan, H. A., Ghufuran, M., Shams, S., Jamal, A., Khan, A., Abdullah, Awan, A. Z., and Khan, M. I. (2023). Green synthesis of silver nanoparticles from plant *Fagonia cretica* and evaluating its anti-diabetic activity through indepth in-vitro and in-vivo analysis. *Front. Pharmacol*, 14(1194809), 1–16. <https://doi.org/10.3389/fphar.2023.1194809>
- Kotowska, Dorota, M. Neuhaus, L. Heyman-Linden, B. Moren, S. Lli, D. Kryvokhyzha, K. Berger, and K. G. Stenkula. (2022). Short-Term Lingonberry Feeding Is Associated with Decreased Insulin Levels and Altered Adipose Tissue Function in High-Fat Diet Fed C57BL / 6J Mice. *Journal of Functional Foods* 94: 1–8. doi:10.1016/j.jff.2022.105125
- Kumar, A., and Chauhan, S. (2021). Pancreatic lipase inhibitors: The road voyaged and successes. *Life Sciences*, 271, 119115. <https://doi.org/10.1016/j.lfs.2021.119115>.
- Kusumawati, N., Haryoto, and Indrayudha, P. (2021). Penghambatan Enzim Alpha-Glukosidase oleh Daun Mimba (*Azadirachta indica*) dan Rimpang Temu Mangga (*Curcuma mangga*). *JURNAL Kefarmasian Indonesia*, 11(1), 56–64.
- Laoufi, H., Benariba, N., Adjdir, S., and Djaziri, R., (2017). In vitro α -amylase and α -glucosidase Inhibitory Activity of *Ononis Angustissima* Extracts. *Journal of Applied Pharmaceutical Science*, 7(2), 191–198. <https://doi.org/10.7324/JAPS.2017.70227>.
- Le, T. H., Lu, D. N. T., Nguyen, H. X., Dang, P. H., Do, T. N. Van, Le, N. T. H., Truong, T. Q., Nguyen, M. H., and Nguyen, M. T. T. (2025). RSC Advances Isolation , structural elucidation , and integrated biological and computational evaluation of antidiabetic labdane diterpenes from *Curcuma zedoaria* rhizomes †. *RSC Advances*, 15(21879), 21879–21889. <https://doi.org/10.1039/D5RA03418C>
- Maryam, St., A. Suhaenah, and N. F. Amrullah. (2020). Uji Aktivitas Penghambatan Enzim A -Glukosidase Ekstrak Etanol Biji Buah Alpukat Sangrai (*Persea americana* Mill.) Secara In Vitro. *As-Syifaa Jurnal Farmasi* 12(1): 51–56.
- Marzouk, M. A., Mahmoud, E. M., Shehab, W. S., Fawzy, S. M., Mohammed, S. M., Abdel-razek, M. A., Khedr, G. E., and Elsayed, D. A. (2025). Dual α -amylase and α -glucosidase inhibition by 1,2,4-triazole derivatives for diabetes treatment. *Scientific Reports*, 15(27172), 1–20. <https://doi.org/10.1038/s41598-025-11214-42>
- Melinda, N. A., Kusumo, D. W., and Sari, D. I. K. (2023). Aktivitas antidiabetes beberapa fraksi daun mimba (*Azadirachta indica*) secara in vitro berdasarkan penghambatan enzim α - Amilase. *Majalah Farmasi dan Farmakologi*, 27(3), 82–87.

- Nada, A. A., Metwally, A. M., Asaad, A. M., Celik, I., Ibrahim, R. S., and Eldin, S. M. S. (2024). Synergistic effect of potential alpha-amylase inhibitors from Egyptian propolis with acarbose using in silico and in vitro combination analysis. *BMC Complementary Medicine and Therapies*, 1–19. <https://doi.org/10.1186/s12906-024-04348-x>
- Nawawi, J. A. (2021). Efek Pemberian Ekstrak Etanol Rimpang Kunyit Liar Endemik Sumatera (*Curcuma sumatrana*, Zingiberaceae) Terhadap Tingkat Kecerdasan, Struktur Histologi Otak Dan Konsentrasi Malondialdehid Mencit Yang Diinduksi Monosodium Glutamat. *Diploma thesis*. Universitas Andalas.
- Nawaz, M., Taha, M., Qureshi, F., Ullah, N., Selvaraj, M., Shahzad, S., Chigurupati, S., Waheed, A., and Almutairi, F. A. (2020). Structural elucidation , molecular docking , α - amylase and α - glucosidase inhibition studies of 5 - amino - nicotinic acid derivatives. *BMC Chemistry*, 1–11. <https://doi.org/10.1186/s13065-020-00695-1>
- Ndarawit, W., Ochieng, C. O., Angwenyi, D., Cruz, J. N., Santos, C. B. R., & Kimani, N. M. (2024). Discovery of α -amylase and α -glucosidase dual inhibitors from NPASS database for management of Type 2 Diabetes Mellitus : A chemoinformatic approach. *PLoS ONE*, 19(11), 1–24. <https://doi.org/10.1371/journal.pone.0313758>
- Ndebele, L. J., Nkeh-Chungag, B. N., and Olatunde, O. (2022). Review on the use of Molecular Docking as the First Line Tool in Drug Discovery and Development. *Journal of Smart Cities: International Interdisciplinary Review*, 4(2), 26–36.
- Neculai-văleanu, Sabina, A. Arition, A C Matei, M. Davidescu, I. Poroşnicu, and Şt Creangă. (2020). Green Synthesis Of Silver Nanoparticles Using Curcuma longa Plant Extract And Their Possible Applications. *Scientific Papers-Animal Science Series: Lucrări Ştiinţifice - Seria Zootehnie* 75: 21–26.
- Nelvi, D. A. (2025). Pengaruh Ekstrak Etanol Rimpang Kunyit Sumatra (*Curcuma sumatrana* Miq.) terhadap Pencegahan Neuropati Diabetik Pada Mencit Putih Yang Diinduksi Aloksan (*Doctoral Dissertation*, Universitas Andalas).
- Nguyen, P. T. V., Huynh, H. A., Truong, D. Van, Tran, T.-D., and Vo, C.-V. T. (2020). Exploring Aurone Derivatives as Potential Human Pancreatic Lipase Inhibitors through Molecular. *Molecules*, 25(4657), 1–15.
- Okechukwu, A. M., Okeke, E. S., Eze, K. N., Ezeorba, W. F. C., and Ezeorba, T. P. C. (2023). Insight into the Alpha-Glucosidase Inhibitory Potentials of Curcuma longa Methanolic Extracts and Phytochemicals : An In Vitro and In Silico Study. *Biol Life Sci Forum*, 26(92), 1–10.
- Owoloye, A. J., Ligali, F. C., Enejoh, O. A., Musa, A. Z., Aina, O., Idowu, E. T., and Oyebola, K. M. (2022). Molecular docking, simulation and binding free energy analysis of small molecules as PfHT1 inhibitors. *PLOS ONE*, 17(8), e0268269.

- Oyedemi, S. O., Oyedemi, B. O., Ijeh, I. I., Ohanyerem, P. E., Cooposamy, R. M., and Aiyegoro, O. A., (2017). Alpha-Amylase Inhibition and Antioxidative Capacity of Some Antidiabetic Plants Used by the Traditional Healers in Southeastern Nigeria. *The Scientific World Journal*, 2017, 1–11. <https://doi.org/10.1155/2017/3592491>.
- Pantsar, Tatu, and Antti Poso. (2018). Binding Affinity via Docking: Fact and Fiction. *Molecules* 23(1899): 1–11. doi:10.3390/molecules23081899.
- Petrovsky, I, P. Santoso, and M. S. Fadil. (2026). In Silico Insights Into Bioactive Compounds Of Wild Sumatran Turmeric (*Curcuma sumatrana*, Zingiberaceae) As Potent Antioxidant Candidates. *AL-Kauniyah: Jurnal Biologi* 19(1): 163–76.
- Pohanka M. (2019). Biosensors and bioassays based on lipases, principles and applications, a review. *Molecules*. 24(3): 616.
- Poroikov, V. V., Filimonov, D. A., Gloriozova, T. A., Lagunin, A. A., Druzhilovskiy, D. S., Rudik, A. V., Stolbov, L. A., Dmitriev, A. V., Tarasova, O. A., Ivanov, S. M., and Pogodin, P. V. (2019). Computer-aided prediction of biological activity spectra for organic compounds: The possibilities and limitations. *Russian Chemical Bulletin*, 68(12), 2143–2154. <https://doi.org/10.1007/s11172-019-2683-0>
- Pradhan, A. Kumar, S. R. Sahoo, S. Satapathy, S. Pradhan, J. S. Prusty, and S. Preetam. (2022). Green Synthesis of Silver Nanoparticles from Various Plant Extracts and Its Applications: A Mini Review. *World Journal of Biology Pharmacy and Health Sciences* 11(01): 050–061. doi:10.30574/wjbpshs.2022.11.1.0100.
- Pramely, R., and Raj, T. L. S. (2012). Prediction of biological activity spectra of a few phytoconstituents of *Azadirachta indica* A. Juss. *Neem Constituents*. 3, 375–379.
- Rahman, A. T., Rafia, Jethro, A., Santoso, P., Kharisma, V. D., Murtadlo, A. A. A., Purnamasari, D., Soekamto, N. H., Ansori, A. N. M., Kuswati, Mandeli, R. S., Aledresi, K. A. M. S., Yusof, N. F. M., Jakhmola, V., Rebezov, M., Zainul, R., Dobhal, K., Parashar, T., Ghifari, M. A., and Sari, D. A. P. (2022). In silico Study of the Potential of Endemic Sumatra Wild Turmeric Rhizomes (*Curcuma Sumatrana*: Zingiberaceae) As Anti-Cancer. *Pharmacognosy Journal*, 14(6), 806–812. <https://doi.org/10.5530/pj.2022.14.171>.
- Rahman, N., Muhammad, I., Khan, H., and Aschner, M. (2019). Molecular Docking of Isolated Alkaloids for Possible α -Glucosidase Inhibition. *Biomolecules*, 9(544), 1–17.
- Rahminiwati, M., Iswantini, D., Novalia, R., Sianipar, R., Sukma, R. M., Indariani, S., and Murni, A. (2025). The Strong Inhibition of Pancreatic Lipase by Selected Indonesian Medicinal Plants as Anti-Obesity Agents.

- Rawle, A. (2010). Basic Principles of Particle Size Analysis—Technical Paper of Malvern Instruments. *Worcestershire*. The United Kingdom, 1012–1017
- Raza, M. A., Farwa, U., Mumtaz, M. W., Kainat, J., Sabir, A., and Al-schemi, A. G. (2023). Green Chemistry Letters and Reviews Green synthesis of gold and silver nanoparticles as antidiabetic and anticancerous agents. *Green Chemistry Letters and Reviews*, 16, 1–24. <https://doi.org/10.1080/17518253.2023.2275666>
- Riches, Sapam, S. J. Akshatha, M. B. Abbigeri, A. Choudhari, S. Mallikarjun, S. Rao, B. Thokchom. (2025). Next Nanotechnology Eco-Synthesized Silver Nanoparticles from Curcuma Longa Leaves: Phytochemical and Biomedical Applications. *Next Nanotechnology* 8: 100249. doi:10.1016/j.nxnano.2025.100249.
- Riyaphan, J., Pham, D., Leong, M. K., and Weng, C.-F. (2021). In Silico Approaches to Identify Polyphenol Compounds as α -Glucosidase and α -Amylase Inhibitors against Type-II Diabetes. *Biomolecules*, 11(1877), 1–31.
- Rosyadi, G. Z., S. P. Fitrianiingsih, and F. Lestari. (2021). Studi Literatur Aktivitas Sitotoksik Ekstrak Rimpang Genus Curcuma dengan Metode *Brine Shrimp Lethality Test* (BSLT). *Prosiding Farmasi Seminar Penelitian Sivitas Akademika UNISBA*, 2(7), 468–474. <http://dx.doi.org/10.29313/v0i0.29557>.
- Salmaso, Veronica, and Stefano Moro. (2018). Bridging Molecular Docking to Molecular Dynamics in Exploring Ligand-Protein Recognition Process : An Overview. *Front. Pharmacol* 9(923): 1–16. doi:10.3389/fphar.2018.00923
- Santoso, P., N. Annisa, K. Ilham, M. S. Fadil, and J. A. Nawawi. (2025). Therapeutic Effect of Wild Sumatran Turmeric (*Curcuma sumatrana*) Extract against Non-Alcoholic Fatty Liver Disease in Mice. *Journal of Research in Pharmacy* 29(6): 2206–17. doi:10.12991.
- Sebaugh, J L Æ. (2011). Guidelines for Accurate EC50 / IC50 Estimation. *Pharmaceutical Statistic* 10: 128–34. doi:10.1002/pst.426.
- Shahu, R. R., Mhatre, S., Rathod, P., Kulkarni, C., and Ydav, R. P. (2017). Pancreatic Lipase Inhibitors from Plant Sources for Possible use as Antiobesity Drugs. *MGM Journal of Medical Sciences*, 4(4), 177–184. <https://doi.org/10.5005/jp-journals-10036-1166>
- Sharma, N. K., Vishwakarma, J., Rai, S., Alomar, T. S., Almasoud, N., and Bhattarai, A. (2022). Green Route Synthesis and Characterization Techniques of Silver Nanoparticles and Their Biological Adeptness. *ACS Omega*, 7(31), 27004–27020. <https://doi.org/10.1021/acsomega.2c01400>.
- Sharma, R., Maheshwari, S., Mishra, A., Mehta, N. R., & Patani, P. (2025). Targeting fatty acid metabolism in obesity: Role of fatty-acyl-CoA synthase as a therapeutic target. *Journal of Population Therapeutics and Clinical Pharmacology*, 32(8), 1348–1354. <https://doi.org/10.53555/pq48qt39>

- Silva, D. B. S., Ferreira, S. F., and Lima, A. M. (2022). Screening for pancreatic lipase inhibitors: evaluating assay conditions using p-nitrophenyl palmitate as substrate. *Analytical and Bioanalytical Chemistry*, 414(1), 221–231.
- Singh, R., Sindhu, J., Singh, D., and Kumar, P. (2025). Key molecular scaffolds in the development of clinically viable α -amylase inhibitors. *Future Medicinal Chemistry*, 17(3), 347–362. <https://doi.org/10.1080/17568919.2025.2453421>.
- Sinulingga, S., Subandrate, S., and Safyudin, S. (2020). Uji fitokimia dan potensi antidiabetes fraksi etanol air benalu kersen (*Dendrophloe petandra* (L.) Miq). *Jurnal Kedokteran dan Kesehatan*, 16(1), 76–83.
- Sri, W. (2017). *Biokimia enzim dan karbohidrat*. Unimal Press
- Sugiwati, S., Setiasih, S., and Afifah, E. (2009). Antihyperglycemic Activity of the Mahkota Dewa Leaf Extracts as an Alpha-Glucosidase Inhibitor. *Makara Journal of Health Research*, 13(2), 74–78.
- Suharsanti, R., Wahyuono, S., Yuniarti, N., and Astuti, P. (2024). Molecular Docking of Lipase Inhibitory Activities, Pharmacokinetics and Toxicity Prediction of Chemical Constituents from *Curcuma aeruginosa* Roxb Rhizome. *IJPRA Journal*, 9(2), 162–174. <https://doi.org/10.35629/7781-0902162174>.
- Tan, L. S., Lau, H. H., Abdelalim, E. M., Khoo, C. M., O'Brien, R. M., Tai, E. S., and Teo, A. K. K. (2025). The role of glucose-6-phosphatase activity in glucose homeostasis and its potential for diabetes therapy. *Trends in Molecular Medicine*, 31(2), 152–164. <https://doi.org/10.1016/j.molmed.2024.09.005>
- Tran, The-huan, Thanh-tan Mai, Thi-thu-trang Ho, Thi-ngoc-dung Le, Thi-cam-nhung Cao, Khac-minh Thai, and Thai-son Tran. (2024). Inhibition of Pancreatic Lipase by Flavonoid Derivatives: In Vitro and In Silico Investigations. *Hindawi* 1(3152): 1–10. doi:10.1155/2024/6655996.
- Velgosova, Oksana, Livia Mačák, Maksym Lisnichuk, and Peter Varga. (2025). Influence of PH and Temperature on the Synthesis and Stability of Biologically Synthesized AgNPs. *Applied nano* 6(22): 1–15. doi:10.3390/applnano6040022.
- Venkatadri, B, E Shanparvish, M R Rameshkumar, Mariadhas Valan, Naif Abdullah Al-dhabi, Vinoth Kumar, and P Agastian. (2020). Green Synthesis of Silver Nanoparticles Using Aqueous Rhizome Extract of *Zingiber Officinale* and *Curcuma longa*: In-Vitro Anti-Cancer Potential on Human Colon Carcinoma HT-29 Cells. *Saudi Journal of Biological Sciences* 27(11): 2980–86. doi:10.1016/j.sjbs.2020.09.021.
- Vo, Cam-van T, Nhan V H Luu, Thoai T H Nguyen, Truc T Nguyen, Q Bach, Thuong H Nguyen, Thanh-dao Tran, and Quoc-thai Nguyen. (2022). Screening for Pancreatic Lipase Inhibitors: Evaluating Assay Conditions Using p - Nitrophenyl Palmitate as Substrate. *All Life* 15(1): 13–22. doi:10.1080/26895293.2021.2019131

- Williams, L. K., Zhang, X., Caner, S., Tysoe, C., Nguyen, N. T., Wicki, J., Williams, D. E., Coleman, J., McNeill, J. H., Yuen, V., Andersen, R. J., Withers, S. G., and Brayer, G. D. (2015). glycosidase inhibition motif. *Nature Chemical Biology*, july. <https://doi.org/10.1038/nchembio.1865>
- Wulansari, S. A., Sumiyani, R., and Aryani, N. L. D. (2019). Pengaruh Konsentrasi Surfaktan Terhadap Karakteristik Fisik Nanoemulsi Dan Nanoemulsi Gel Koenzim Q10. *Jurnal Kimia Riset*, 4(2), 143–151.
- Wulansari, D, Ersaliany N.P.Q, Dharma. B, Kamal A.S, Hafid. L, Marlina. L dan Praptiwi. (2020). Aktivitas Antibakteri Ekstrak Kultur Jamur Endofit *Fusarium* sp. CSP-4 Yang Diisolasi Dari *Curcuma sumatrana* Miq. *Berita Biologi* 19(1),71-76.
- Yandri, Nadila, N., Suhartati, T., Satria, H., and Hadi, S. (2020). Peningkatan kestabilan enzim α -amilase dengan penambahan gliserol. *Analytical and Environmental Chemistry*, 5(2), 143-154.
- Yoshioka, Y., Yoshimura, N., Matsumura, S., Wada, H., Hoshino, M., Makino, S., and Morimoto, M. (2019). α -Glucosidase and Pancreatic Lipase Inhibitory Activities of Diterpenes from Indian Mango Ginger (*Curcuma amada* Roxb.) and Its Derivatives. *Molecules*, 24(4071), 1–12.
- Zahra, R. (2024). Pengaruh Ekstrak Etanol Rimpang Kunyit (*Curcuma sumatrana*) terhadap Gula Darah dan Histopatologi Pankreas Pada Mencit Putih Yang Diinduksi Alloxan (*Doctoral Dissertation*, Universitas Andalas).
- Zhang, J., Zhang, Z., Yao, D., and Yang, B. (2020). Recent Advances in Molecular Docking for the Research and Discovery of Potential Marine Drugs. *Marine Drugs*, 18(11), 545.
- Zhang, Zixuan, Jinhua Long, Tingting Li, Nan Xu, Zhili Xu, Yuedan Wang, Ming Chu, and Mingbo Zhang. (2026). Identification of Potential Pancreatic Lipase Inhibitors from Traditional Chinese Medicines via Molecular Docking , Molecular Dynamics Simulation and In Vitro Validation. *Curr. Issue Mol. Biol* 48(404): 1–19. doi:10.3390/cimb48040404.