

DAFTAR PUSTAKA

- Adelusi, T. I., Abdul-Hammed, M., Idris, M. O., Oyedele, Q. K., & Adedotun, I. O. (2021). Molecular dynamics , quantum mechanics and docking studies of some Keap1 inhibitors – An insight into the atomistic mechanisms of their antioxidant potential. *Heliyon*, 7(6), e07317. <https://doi.org/10.1016/j.heliyon.2021.e07317>
- Akhigbe, R., & Ajayi, A. (2021). The Impact of Reactive Oxygen Species in The Development of Cardiometabolic Disorders : A Review. *Lipids in Health and Disease*, 7, 1–18. <https://doi.org/10.1186/s12944-021-01435-7>
- Akmal, A., Javaid, A., Hussain, R., Kanwal, A., Zubair, M., & Ashfaq, U. A. (2019). *Screening of phytochemicals against KEAP1- NRF2 interaction to reactivate NRF2 Functioning : Pharmacoinformatics based approach*. 32(6), 2823–2828.
- Al-karmalawy, A. A., Dahab, M. A., Metwaly, A. M., Elhady, S. S., Elkaeed, E. B., Eissa, I. H., & Darwish, K. M. (2021). Molecular Docking and Dynamics Simulation Revealed the Potential Inhibitory Activity of ACEIs Against SARS-CoV-2 Targeting the h ACE2 Receptor. *Frontiers in Chemistry*, 9(May). <https://doi.org/10.3389/fchem.2021.661230>
- Alshehry, G. A. (2023). Retraction Retracted: Medicinal Applications of Banana Peel Flour Used as a Substitute for Computing Dietary Fiber for Wheat Flour in the Biscuit Industry. *Applied Bionics and Biomechanics*, 9. <https://doi.org/10.1155/2023/9754509>
- Alzain, A. A., Mukhtar, R. M., Abdelmoniem, N., Shoaib, T. H., Osman, W., Alsulaimany, M., Aljohani, A. K. B., Almadani, S. A., Alsaadi, B. H., Althubyani, M. M., Mohamed, S. G. A., Mohamed, G. A., & Ibrahim, S. R. M. (2023). Modulation of NRF2 / KEAP1 - Mediated Oxidative Stress for Cancer Treatment by Natural Products Using Pharmacophore - Based Screening , Molecular Docking , and Molecular Dynamics Studies. *Molecules*, 28(16), 6003. <https://doi.org/10.3390/molecules28166003>
- Amadi, A. O., Orisa, C. A., Banigo, F. A., & Longjohn, M. I. (2025). Production

- and Quality Assessment of Infusion Tea from Banana Peels. *IPS Journal of Nutrition and Food Science*, 4(2), 460–466. <https://doi.org/10.54117/ijnfs.v4i2.107>
- Amto, A., Ertikanto, C., & Nyeneng, I. D. P. (2019). Pengaruh Keterampilan Berpikir Kritis melalui Pembelajaran Berbasis Aneka Sumber Belajar terhadap Hasil Belajar Fisika Siswa. *Jurnal Pendidikan Fisika*, 7(1), 28. <https://doi.org/10.24127/jpf.v7i1.1337>
- Argent, G. C. G. (1966). The wild bananas of papua new guinea. *The Royal Botanic Garden Edinburgh*, 35(1). <https://doi.org/10.24823/nrbge.1976.3053>
- Arista, N. (2023). *Uji Aktivitas Antioksidan Ekstrak Kulit Pisang Barangan (Musa Acuminata Linn) dengan Metode DPPH*. digilib.unimed.ac.id. <https://digilib.unimed.ac.id/id/eprint/54263/>
- Asuquoa, E. O., Ukamb, E. E., Edetc, E. E., & Ufala, V. O. (2025). Formulation and evaluation of banana peel-based herbal cream for antibacterial and antifungal applications in cosmetic products. *Journal of Dermatologic Science and Cosmetic Technology*, 2(3), 100106. <https://doi.org/10.1016/j.jdsct.2025.100106>
- Ayunda, R. D., & Malita, S. (2024). Pemanfaatan Senyawa Flavonoid sebagai Antioksidan pada Penderita Hiperkolesterolemia : Studi Literatur. *Jurnal Kedokteran Unram*, 13(3). <https://doi.org/10.29303/jk.v13i3.5388>
- Azizah, N. N., Niam, F., & Prastowo, A. Y. (2022). Pengembangan Media Pembelajaran Booklet Materi Benda di sekitar Kelas 3 untuk Meningkatkan Keaktifan dan Hasil Belajar Siswa SDN Wonorejo 02 Kabupaten Blitar. *Patria Eduacational Journal (PEJ)*, 2(1), 60–69. <https://doi.org/10.28926/pej.v2i1.96>
- Azwanida, N. (2015). A Review on The Extraction Methods Use in Medicinal Plants, Principle, Strength and Limitation. *Medicinal & Aromatic Plants*, 04(03), 3–8. <https://doi.org/10.4172/2167-0412.1000196>
- Badan Standar Kurikulum dan Asesmen Pendidikan. (2025). Keputusan Kepala Badan Standar, Kurikulum, dan Asesmen Pendidikan Nomor 046/H/KR/2025 tentang Capaian Pembelajaran pada Pendidikan Anak Usia Dini, Jenjang

- Pendidikan Dasar, dan Jenjang Pendidikan Menengah. In *kemdikbud.go.id*.
- Baird, L., & Yamamoto, M. (2020). The Molecular Mechanisms Regulating the KEAP1-NRF2 Pathway. *Molecular and Cellular Biology*, 40(13), 1–23. <https://doi.org/10.1128/MCB.00099-20>. Copyright
- Begnini, F., Geschwindner, S., Johansson, P., Wissler, L., Lewis, R. J., Danelius, E., Lutten, A., Matricon, P., Carlsson, J., Lenders, S., Beate, K., Friedel, A., Sj, P., Schiesser, S., & Kihlberg, J. (2022). Importance of Binding Site Hydration and Flexibility Revealed When Optimizing a Macrocyclic Inhibitor of the Keap1 – Nrf2 Protein – Protein Interaction. *Journal of Medicinal Chemistry*, 66(4). <https://doi.org/10.1021/acs.jmedchem.1c01975>
- Benatar, G. V. (2025). *Pelapisan In Silico Senyawa Biopestisida*. Unsil Library Publisher.
- Bissantz, C., Kuhn, B., & Stahl, M. (2010). A Medicinal Chemist ' s Guide to Molecular Interactions. *Journal of Medicinal Chemistry*, 53(14), 5061–5084. <https://doi.org/10.1021/jm100112j>
- Bitew, M., Desalegn, T., Demissie, T. B., Belayneh, A., Endale, M., & Eswaramoorthy, R. (2021). Pharmacokinetics and drug-likeness of antidiabetic flavonoids: Molecular docking and DFT study. *PLoS ONE*, 16(12). <https://doi.org/10.1371/journal.pone.0260853>
- Braune, A., & Blaut, M. (2016). Bacterial species involved in the conversion of dietary flavonoids in the human gut. *Gut Microbes*, 7(3). <https://doi.org/10.1080/19490976.2016.1158395>
- Canning, P., Sorrell, F. J., & Bullock, A. N. (2015). Free Radical Biology and Medicine Structural basis of Keap1 interactions with Nrf2. *Free Radical Biology and Medicine*, 88, 101–107. <https://doi.org/10.1016/j.freeradbiomed.2015.05.034>
- Chen, M., Zhong, X., Lin, H., & Qin, X. (2022). Combined Transcriptome and Metabolome Analysis of Musa nana Laur . Peel Treated With UV-C Reveals the Involvement of Key Metabolic Pathways. *Frontiers in Genetics*, 12(January), 1–17. <https://doi.org/10.3389/fgene.2021.792991>
- Cortese, M., Gigliobianco, M. R., Magnoni, F., Censi, R., & Martino, P. Di. (2020).

Molecules Compensate for or Minimize Matrix Effects? Strategies for Overcoming Matrix Effects in Liquid. *Molecules*, 25, 3047.

Crisman, E., Duarte, P., Dauden, E., Cuadrado, A., Isabel, M., Franco, R., López, M. G., & León, R. (2023). KEAP1 - NRF2 protein – protein interaction inhibitors: Design, pharmacological properties and therapeutic potential. *Medicinal Research Reviews*, June 2022, 237–287. <https://doi.org/10.1002/med.21925>

Cuadrado, A., Rojo, A. I., Wells, G., Hayes, J. D., Cousin, S. P., Rumsey, W. L., Attucks, O. C., Franklin, S., Levonen, A.-L., Kensler, T. W., & Dinkova-Kostova, A. T. (2019). Therapeutic targeting of the NRF2 and KEAP1 partnership in chronic diseases. *Nature Reviews Drug Discovery*, 18(4). <https://doi.org/10.1038/s41573-018-0008-x>

Culletta, G., Buttari, B., Arese, M., Brogi, S., Almerico, A. M., Saso, L., & Tutone, M. (2024). Natural products as non-covalent and covalent modulators of the KEAP1/NRF2 pathway exerting antioxidant effects. *European Journal of Medicinal Chemistry*, 270, 116355. <https://doi.org/https://doi.org/10.1016/j.ejmech.2024.116355>

Daina, A., Michielin, O., & Zoete, V. (2017). SwissADME: a free web tool to evaluate pharmacokinetics, drug-likeness and medicinal chemistry friendliness of small molecules. *Nature Publishing Group*, October 2016, 1–13. <https://doi.org/10.1038/srep42717>

Dmitriev, A. V., Lagunin, A. A., Rudik, A. V., Savosina, P. I., Druzhilovskiy, D. S., Filimonov, D. A., & Poroikov, V. V. (2025). SAR Modeling to Predict Ames Mutagenicity Across Different Salmonella typhimurium Strains. *Pharmaceuticals*, 18(12), 1853. <https://doi.org/10.3390/ph18121853>

Dwivany, F. M., Patty, K. L., & Novianti, C. (2020). Isolation And Characterization Of Pisang Tongkat Langit (Musa troglodytarum L.) Acs1 And Aco1 Gene Expression During Fruit Ripening Process. *Malays. Appl. Biol.*, 49, 81–92.

Dwivany, F. M., Stefani, G., Sutanto, A., Nugrahapraja, H., Wikantika, K., Hiarij, A., Hidayat, T., Rai, I. N., & Sukriandi, N. (2020). Genetic Relationship between Tongka Langit Bananas (Musa troglodytarum l.) from Galunggung

- and Maluku, Indonesia, Based on ITS2. *Hayati Journal of Biosciences*, 27(3), 258–265. <https://doi.org/10.4308/hjb.27.3.258>
- Esazadeh, K., Ezzati, J., Dolatabadi, N., Andishmand, H., Aghdash, H. M., Mahmoudpour, M., Naemi, M., & Yousef, K. (2024). Cytotoxic and genotoxic effects of tert- - butylated hydroxyanisole and propyl gallate as synthetic food antioxidants. *Food Science & Nutrition*, March, 7004–7016. <https://doi.org/10.1002/fsn3.4373>
- Etukudo, E. M., Usman, I. M., Ovioun, A., Ojiakor, V. O., Makena, W., Owembabazi, E., Aja, P. M., Mutume, B., Vivalya, N., Archibong, V. B., & Anyanwu, E. (2025). Exploring the Neuroprotective Potentials of Flavonoid Metabolites in *Syzygium aromaticum*: A Review with in-silico Insight to Therapeutic Potential. *Journal of Experimental Pharmacology*, 17. <https://doi.org/10.2147/JEP.S536765>
- Fauzi, N. I., Hanafiah, A., Rusmana, W. E., Puspitasari, E., Tinggi, S., Indonesia, F., Soekarno, J., No, H., 354, J., & Barat, I. (2023). Aktivitas Insulin-Sensitizer Kulit Buah Pisang Ranggag (*Musa troglodytarum* L.) pada Tikus Wistar Jantan. *Prosiding Seminar Nasional Diseminasi Penelitian*, 3(September), 2964–6154. <https://ejurnal.universitastbh.ac.id/index.php/PSNDPV3/article/view/1151>
- Gonçalves-Filho, D., & Souza, D. De. (2022). Detection of Synthetic Antioxidants : What Factors Affect the Efficiency in the Chromatographic Analysis and in the. *Molecules*. <https://doi.org/10.3390/molecules27207137>
- Gutiérrez-del-Río, I., López-Ibáñez, S., Magadán-Corpas, P., Fernández-Calleja, L., Pérez-Valero, Á., Tuñón-Granda, M., Miguélez, E. M., Villar, C. J., & Lombó, F. (2021). Review: Terpenoids and Polyphenols as Natural Antioxidant Agents in Food Preservation. *Antioxidants*, 10. <https://doi.org/10.3390/antiox10081264>
- Hafizah, G., Mahrudin, M., & Irianti, R. (2022). Validitas Booklet Sebagai Bahan Ajar Konsep Animalia (Bekantan). *Indonesian Journal of Science Education and Applied Science*, 2(1), 13. <https://doi.org/10.20527/i.v2i1.4157>
- Hapsari, L. I. A., Kennedy, J., Lestari, D. A. Y. U., Masrum, A., & Lestarini, W.

- (2017). Ethnobotanical survey of bananas (Musaceae) in six districts of East Java , Indonesia. *Biodiversitas*, 18(1), 160–174. <https://doi.org/10.13057/biodiv/d180123>
- Hasanah, U., & Fitrihidajati, H. (2020). Pengembangan Booklet Berbasis Scientific Literacy Materi Pencemaran Lingkungan untuk Siswa Kelas X SMA. *Berkala Ilmiah Pendidikan Biologi (BioEdu)*, 9(3), 498–505. <https://doi.org/10.26740/bioedu.v9n3.p498-505>
- Hendrawan, A., Suprpto, P. K., & Nuryadin, E. (2024). *Analisis In Silico Senyawa Metabolit Sekunder Pisang Ranggap (Musa triglodytarum) sebagai Inhibitor Diabetes Melitus*. 4(02), 7823–7830.
- Hernawati, D., Rizal Putra, R., Hardian, A., & Yudi Supriatna, A. (2021). Pisang Ranggap: Pengetahuan Lokal Masyarakat Sekitar Gunung Galunggung. *Seminar Nasional Perhimpunan Masyarakat Etnobiologi Indonesia*, 52–54. <https://jte.pmei.or.id/index.php/jte/article/download/122/96/342>
- Hiariej, A., Pesik, A., & Riupassa, P. A. (2021). Nutritional Profile of Fruit and Processed Products of Tongka Langit Banana in Maluku, Indonesia. *Journal of Hunan University (Natural Sciences)* , 48(3).
- Hou, T., Wang, J., Zhang, W., & Xu, X. (2007). ADME Evaluation in Drug Discovery. 7. Prediction of Oral Absorption by Correlation and Classification. *Journal of Chemical Information and Modeling*, 47(1). <https://doi.org/doi.org/10.1021/ci600343x>
- Huang, R., Xia, M., Sakamuru, S., Zhao, J., Shahane, S. A., Attene-ramos, M., Zhao, T., Austin, C. P., & Simeonov, A. (2016). Modelling the Tox21 10 K chemical profiles for in vivo toxicity prediction and mechanism characterization. *Nature Communications*, 7. <https://doi.org/10.1038/ncomms10425>
- Integrated Taxonomic Information System. (2025). *Musa troglodytarum L.* <https://www.gbif.org/species/2762936>
- Javed, A., Alam, B., Naznin, M., Ahmad, R., Lee, C. H., Kim, S., & Lee, S. (2024). RSM- and ANN-Based Multifrequency Ultrasonic Extraction of Polyphenol-Rich Sargassum horneri Extracts Exerting Antioxidative Activity via the

- Regulation of MAPK/Nrf2/HO-1 Machinery. *Antioxidants*, 13(6), 690. <https://doi.org/10.3390/antiox13060690>
- Jayengsari, R., Suryakencana, U., Cianjur, K., & Kunci, K. (2023). Pengolahan keripik kulit pisang sebagai inovasi peningkatan nilai guna pisang. *Journal of Empowerment*, 4(2), 175–182. <https://doi.org/doi.org/10.35194/je.v4i2.3835>
- Jnoff, E., Albrecht, C., Barker, J. J., Barker, O., Beaumont, E., Bromidge, S., Brookfield, F., Brooks, M., Bubert, C., Ceska, T., Corden, V., Dawson, G., Duclos, S., Fryatt, T., Genicot, C., Jigorel, E., Kwong, J., Maghames, R., Mushi, I., Pike, R., Sands, Z. A., Smith, M. A., Stimson, C. C., & Courade, J. (2014). Binding Mode and Structure – Activity Relationships around Direct Inhibitors of the Nrf2 – Keap1 Complex. *Chemmedchem Communications*, 699–705. <https://doi.org/10.1002/cmdc.201300525>
- Jomova, K., Raptova, R., Alomar, S. Y., Alwasel, S. H., Nepovimova, E., & Kuca, K. (2023). Reactive oxygen species , toxicity , oxidative stress , and antioxidants : chronic diseases and aging. In *Archives of Toxicology* (Vol. 97, Nomor 10). Springer Berlin Heidelberg. <https://doi.org/10.1007/s00204-023-03562-9>
- Juan, C. A., Lastra, J. M. P. de la, Plou, F. J., & Pérez-Lebeña, E. (2021). The Chemistry of Reactive Oxygen Species (ROS) Revisited : Outlining Their Role in Biological Macromolecules (DNA , Lipids and Proteins) and Induced Pathologies. *International Journal of Molecular Sciences*, 22(9), 4642. <https://doi.org/10.3390/ijms 22094642>
- Juliastuti, H., Yuslianti, E. R., Rakhmat, I. I., Handayani, D. R., & Prayoga, A. M. (2021). *Sayuran dan buah berwarna merah, antioksidan penangkal radikal bebas* (Euis Reni). Deepublish_CV BUDI UTAMA.
- Juwita, R., & Suharti. (2026). *SDGs Dalam Aksi: Inovasi Lokal Untuk Perubahan Global*. Kramantara JS.
- Kato, R., Zhang, L., Kinatukara, N., Huang, R., Asthana, A., & Weber, C. (2025). Investigating blood – brain barrier penetration and neurotoxicity of natural products for central nervous system drug development. *Scientific Reports*, 1–14. <https://doi.org/10.1038/s41598-025-90888-2>

- Kirchmair, J., Göller, A. H., Lang, D., Kunze, J., Testa, B., Wilson, I. D., Glen, R. C., & Schneider, G. (2015). Predicting drug metabolism: experiment and/or computation? *Nature Publishing Group, April*. <https://doi.org/10.1038/nrd4581>
- Kumari, P., & Tiwari, R. K. (2023). Banana and its by - products : A comprehensive review on its nutritional composition and pharmacological benefits. *eFood*, 4(5). <https://doi.org/10.1002/efd2.110>
- Letelay, O. P., Hiarij, A., & Pesik, A. (2020). Analisis Beta Karoten dan Vitamin pada Kulit dan Daging Buah Pisang Tongka Langit (*Musa Troglodytarum* L.) di Kota Ambon. *Jurnal Agritechno*, 13(1), 24–33. <https://doi.org/10.20956/at.v13i1.243>
- Li, M., Huang, W., Jie, F., Wang, M., Zhong, Y., Chen, Q., & Lu, B. (2020). Discovery of Keap1–Nrf2 small-molecule inhibitors from phytochemicals based on molecular docking. *Food and Chemical Toxicology, January*. <https://doi.org/10.1016/j.fct.2019.110758>
- Liguori, I., Russo, G., Curcio, F., Bulli, G., Aran, L., Della-Morte, D., Gargiulo, G., Testa, G., Cacciatore, F., Bonaduce, D., & Abete, P. (2018). Oxidative Stress, Aging, and Diseases. *Clinical Interventions in Aging*, 13, 757–772. <https://doi.org/10.2147/CIA.S158513>
- Magdalena, I., Fauziyyah, B. S., Afiani, R., & Fushilat, L. A. (2020). Inovasi Teknologi Dalam Pembelajaran Pada Masa Pandemi Covid-19 Di Mi Nurul Yaqin. *Jurnal Pendidikan Dan Ilmu Sosial*, 2(3), 408–419.
- Maharani, A. D., Amin, S., Fauzan, N. N., & Sopiyan, N. (2025). Peran Senyawa Bioaktif Tumbuhan untuk Penyakit Degeneratif : Tinjauan Kimia Medisinal. *Jurnal Ilmiah Kedokteran dan Kesehatan*, 4(April). <https://doi.org/10.55606/klinik.v4i2.3959>
- Makino, T., Shimizu, R., Kanamaru, M., Suzuki, Y., Moriwaki, M., & Mizukamia, H. (2009). Enzymatically Modified Isoquercitrin , a -Oligoglucosyl Quercetin 3- O - Glucoside , Is Absorbed More Easily than Other Quercetin Glycosides or Aglycone after Oral Administration in Rats. *Biol Pharm Bull*, 32(12), 2034–2040. <https://doi.org/10.1248/bpb.32.2034>

- Manach, C., Scalbert, A., Morand, C., Rémésy, C., & Jime, L. (2004). Polyphenols: food sources and bioavailability. *The American Journal of Clinical Nutrition*, 79(5), 727–747. <https://doi.org/10.1093/ajcn/79.5.727>
- Marín, L., Miguélez, E. M., Villar, C. J., & Lombó, F. (2015). Bioavailability of Dietary Polyphenols and Gut Microbiota Metabolism: Antimicrobial Properties. *BioMed Research International*, 2015. <https://doi.org/10.1155/2015/905215>
- Marlina, M., Mardiana, R., Surbakti, M., & Pulungan, L. H. (2024). Evaluation of the Impact of Educational Resource Management on Student Learning Outcomes. *EDUCTUM: Journal Research*, 3(3), 107–113. <https://doi.org/10.56495/ejr.v3i3.572>
- Marselina, K. A., Basori, M., & Zaman, W. I. (2024). Pengembangan Media Pembelajaran Booklet Berbasis Qr-Code Materi Bentuk Dan Fungsi Bagian Tubuh Pada Manusia (Panca Indra) Untuk Siswa Kelas Iv Sdn Dawuhan Lor. *Elementary: Jurnal Inovasi Pendidikan Dasar*, 4(3), 103–119. <https://doi.org/10.51878/elementary.v4i3.3010>
- Mehta, P. A., Nelson, A., Loveless, S., Lane, A., Fukuda, T., Teusink-cross, A., Elder, D., Lagory, D., Miller, E., Cancelas, J. A., Howell, J., Zhao, J., Mizuno, K., Myers, K. C., Lake, K., McIntosh, K., Setchell, K. D. R., Luebbering, N., Edwards, S., Chihanga, T., Wells, S. I., & Davies, S. M. (2025). Phase 1 study of quercetin , a natural antioxidant for children and young adults with Fanconi anemia. *BLOOD ADVANCES*, 9(8), 1927–1939. <https://doi.org/10.1182/bloodadvances.2024015053>
- Melati, R., Widya, M., Fitriani, L., & Sari, P. A. (2020). Pengembangan Booklet Berbasis Kearifan Lokal Pada Materi Tumbuhan (Plantae) Kelas X Mipa Man 1 (Model) Lubuklinggau. *Diklabio: Jurnal Pendidikan dan Pembelajaran Biologi*, 4(2), 153–161. <https://doi.org/10.33369/diklabio.4.2.153-161>
- Mohd, H., Roslan, J., Saallah, S., Munsu, E., Shaeera, N., & Pindi, W. (2022). Banana peels as a bioactive ingredient and its potential application in the food industry. *Journal of Functional Foods*, 92(December 2021), 105054. <https://doi.org/10.1016/j.jff.2022.105054>

- Mushebenge, A. G. A., Ugbaja, S. C., Mbatha, N. A., B. Khan, R., & Kumalo, H. M. (2023). Assessing the Potential Contribution of In Silico Studies in Discovering Drug Candidates That Interact with Various SARS-CoV-2 Receptors. *International Journal of Molecular Sciences*, 24(21). <https://doi.org/10.3390/ijms242115518>
- Mutha, R. E., Tatiya, A. U., & Surana, S. J. (2021). Flavonoids as natural phenolic compounds and their role in therapeutics : an overview. *Future Journal of Pharmaceutical Sciences*, 8. <https://doi.org/10.1186/s43094-020-00161-8>
- Nadia, R., Gurning, S., Puarada, S. H., & Fuadi, M. (2021). Pemanfaatan Limbah Buah Pisang Menjadi Selai Kulit Pisang sebagai Peningkatan Nilai Guna Pisang. *Jurnal Pengabdian kepada Masyarakat*, 12(1), 106–111. <https://doi.org/10.26877/e-dimas.v12i1.6395>
- Narayanan, D., Tran, K. T., Pallesen, J. S., Solbak, S. M. Ø., Qin, Y., Mukminova, E., Luchini, M., Vasilyeva, K. O., Gonz, D., Goutsiou, G., Poulsen, C., Haapanen, N., Popowicz, G. M., Sattler, M., Olganier, D., Gajhede, M., & Bach, A. (2022). Development of Noncovalent Small-Molecule Keap1-Nrf2 Inhibitors by Fragment-Based Drug Discovery. *Journal of Medical Chemistry*, 65, 14481–14526. <https://doi.org/10.1021/acs.jmedchem.2c00830>
- Ningsih, M. A. L., Lianastuti, M., Suciyantri, Q. P., & Yuniarsih, N. (2022). Potensi Tabir Surya pada Berbagai Tanaman Herbal. *Jurnal Health Sains*, 3(6). <https://doi.org/10.46799/jhs.v4i06.511>
- Nugrahaningsih, & Afanin, S. I. (2022). Farmakokinetika Flavonoid Ekstrak Daun Tin pada Plasma Darah Tikus. *Life Science*, 11(2), 192–205. <https://share.google/HeLKAYNkm90wmjhVZ>
- Nugroho, A., & Firsto. (2023). *Gedung Baru LPPT Dongkrak Penelitian dan Inovasi di UGM*. Universitas Gadjah Mada. <https://ugm.ac.id/id/berita/23661-ugm-meresmikan-gedung-baru-lppt-dan-luncurkan-halal-center-ugm/>
- Nurkhasanah, Bachri, M. S., & Yuliani, S. (2023). *Antioksidan dan Stres Oksidatif* (G. A. Sabilla (ed.)). UAD PRESS. https://eprints.uad.ac.id/45455/1/Antioksidan_dan_Stres_Oksidatif_p%5B1%5D.pdf

- Nuur, N., Susanti, Yulastuti, D., Sari, W. Y., & Widyoningsih. (2021). *Kandungan Senyawa Kimia Buah Pisang dan Bioaktivitasnya*. 45–52. <https://doi.org/10.33061>
- Oktavia, F., & Zulyusri. (2024). Analisis Kepraktisan Booklet Menurut Pendidik dan Peserta Didik dalam Proses Pembelajaran. *Jurnal Biology Science & Education*, 13(2), 121–128. <https://doi.org/10.33477/bs.v13i2.7083>
- Ona, S. (2023). *Keap1-Nrf2 Pathway*. BioRender. <https://www.biorender.com/template/keap1-nrf2-pathway>
- Pamungkas, K. D., Raharjo, D., & Tafakresnanto, C. (2025). Optimalisasi Pemanfaatan Limbah Pertanian : Menciptakan Produk Keripik Bernilai Ekonomis dari Kulit Pisang Raja Nangka di Kabupaten Jombang. *Jurnal Pertanian dan Pengabdian Masyarakat*, 5(2), 202–211. <https://doi.org/10.30737/jatimas.v5i2.7088>
- Parvez, G. M., Tonu, J. F., Ara, R., Joarder, M. Y. A., Milon, M. M. M., Sarker, R. K., Naznin, M. A., Hossain, M. S., Sultana, R., Parvin, S., & Kader, M. A. (2023). Phytochemical and Antioxidant Comparison of Different Varieties of Banana. *Journal of Pharmacognosy and Phytochemistry*, 12(1), 194–199. <https://doi.org/10.22271/phyto.2023.v12.i1c.14574>
- Pinzi, L., & Rastelli, G. (2019). Molecular Docking: Shifting Paradigms in Drug Discovery. *International Journal of Molecular Sciences*, 20(18). <https://doi.org/10.3390/ijms20184331>
- Pires, D. E. V, Blundell, T. L., & Ascher, D. B. (2015). pkCSM: Predicting Small-Molecule Pharmacokinetic and Toxicity Properties Using Graph-Based Signatures. *Journal of Medicinal Chemistry*, 58(9), 4066–4072. <https://doi.org/10.1021/acs.jmedchem.5b00104>
- Pizzino, G., Irrera, N., Cucinotta, M., Pallio, G., Mannino, F., Arcoraci, V., Squadrito, F., Altavilla, D., & Bitto, A. (2017). Oxidative Stress: Harms and Benefits for Human Health. *Oxidative Medicine and Cellular Longevity*, 2017. <https://doi.org/10.1155/2017/8416763>
- Ploetz, R. C., Kepler, A. K., Daniells, J., & Nelson, S. C. (2007). Species Profiles for Pacific Island Agroforestry Banana and plantain — an overview with

- emphasis on Pacific island cultivars. *Pacific Island Agroforestry*, February. <https://agroforestry.org/images/pdfs/Banana-plantain-overview.pdf>
- Pradhan, P., Rai, V. K., Kar, D., Prusty, S. K., Rout, S. K., Ghosh, G., & Rath, G. (2025). Neuroprotective potential of quercetin-enriched banana peel extract via GABA and NMDA receptors modulation: in silico and in vitro approaches. *Nutrire*, 50(2), 57. <https://doi.org/10.1186/s41110-025-00363-1>
- Rajendran, P., Ammar, R. Ben, Al-saeedi, F. J., & Mohamed, M. E. (2021). Kaempferol Inhibits Zearalenone-Induced Oxidative Stress and Apoptosis via the PI3K / Akt-Mediated Nrf2 Signaling Pathway : In Vitro and In Vivo Studies. *International Journal of Molecular Sciences*, 22, 217. <https://doi.org/10.3390/ijms22010217>
- Rana, A., Goel, A., Yadav, S., Praveen, S., & Kumar, T. (2023). A Review On Pharmacological Activities Of Banana (Musa Paradisiaca). *Pharmaceutical Research and Applications*, 8(3). <https://doi.org/10.35629/7781-080329012910>
- Rao, M. J., Feng, B., Ahmad, M. H., Tahir, M., Aslam, M. Z., Khalid, M. F., Hussain, S., Zhong, R., Ali, Q., Xu, Q., Ma, C., & Wang, L. (2023). LC-MS / MS-based metabolomics approach identified novel antioxidant flavonoids associated with drought tolerance in citrus species. *Frontiers in Plant Science*, August, 1–15. <https://doi.org/10.3389/fpls.2023.1150854>
- Ren, J., Li, Z., Li, X., Yang, L., Bu, Z., Wu, Y., & Li, Y. (2025). Exploring the Mechanisms of the Antioxidants BHA , BHT , and TBHQ in Hepatotoxicity , Nephrotoxicity , and Neurotoxicity from the Perspective of Network Toxicology. *Foods*, 14. <https://doi.org/10.3390/foods14071095> Copyright:
- Richards, S., & Gibson, M. I. (2021). Toward Glycomaterials with Selectivity as Well as Affinity. *JACS Au*, 1(12). <https://doi.org/10.1021/jacsau.1c00352>
- Roney, M., & Mohd Aluwi, M. F. F. (2024). The Importance of In-Silico Studies in Drug Discovery. *Intelligent Pharmacy*, 2(4), 578–579. <https://doi.org/10.1016/j.ipha.2024.01.010>
- Salla, M., Karaki, N., Kaderi, B. El, Ayoub, A. J., Younes, S., Chahla, M. N. A., Baksh, S., & Khatib, S. El. (2024). Enhancing the Bioavailability of

- Resveratrol : Combine It , Derivatize It , or Encapsulate It ? *pharmaceutics*, 16(569). <https://doi.org/https://doi.org/10.3390/pharmaceutics16040569>
- Samson, E., Semangun, H., & Rondonuwu, F. S. (2013). Analysis of Carotenoid Content of Crude Extract of Tongkat Langit Banana Fruit (*Musa Troglodytarum*) Using Nir Spectroscopy (Near Infrared). *Traditional Medicine Journal*, 18(1), 2013.
- Sarmoko, Suprahman, N. Y., Putri, R. A., Zammi, A., Hakim, A., Cahyadi, D. R., & Saputra, M. Y. (2025). In Silico Analysis of Cucurbitacin IIa and Cucurbitacin IIb as Potential Modulators of Oxidative Stress Regulatory Proteins. *Indonesian Journal of Cancer Chemoprevention*, 15(3), 224–236. <https://doi.org/10.14499/indonesianjcanchemoprev15iss3pp224-236>
- Selma, M. V., Espin, J. C., & Tomas-Barberan, F. A. (2009). Interaction between Phenolics and Gut Microbiota : Role in Human Health. *Journal of Agricultural and Food Chemistry*, 57(15), 6485–6501. <https://doi.org/10.1021/jf902107d>
- simplyindonesia. (2010). *Ranggap, Raja Pisang Dari Galunggung*. Serpihan Kecil Indonesia. <https://simplyindonesia.wordpress.com/2010/12/10/ranggap-raja-pisang-dari-galunggung/>
- Stoia, M., & Oancea, S. (2022). Review: Low-Molecular-Weight Synthetic Antioxidants : Classification , Pharmacological Profile , Effectiveness and Trends. *Antioxidants*, 11, 638. <https://doi.org/10.3390/antiox11040638>
- Sugiyono. (2015). *Metode Penelitian Pendidikan (Pendekatan Kuantitatif, dan Kualitatif, R&D)* (22 ed.). Alfabeta.
- Theodoridis, G., Gika, H., Raftery, D., Goodacre, R., Plumb, R. S., & Wilson, I. D. (2023). Ensuring Fact-Based Metabolite Identification in Liquid Chromatography-Mass Spectrometry-Based Metabolomics. *Analytical Chemistry*, 95(8), 3909–3916. <https://doi.org/10.1021/acs.analchem.2c05192>
- Torres, P. H. M., Sodero, A. C. R., Jofily, P., & Silva-Jr, F. P. (2019). Key Topics in Molecular Docking for Drug Design. *International Journal of Molecular Sciences*, 20(18), 1–29. <https://doi.org/10.3390/ijms20184574>
- Tu, W., Wang, H., Li, S., Liu, Q., & Sha, H. (2019). The Anti-Inflammatory and Anti-Oxidant Mechanisms of the Keap1 / Nrf2 / ARE Signaling Pathway in

- Chronic Diseases. *Aging and Disease*, 10(3), 637–651.
<https://doi.org/10.14336/AD.2018.0513>
- Vaou, N., Stavropoulou, E., Voidarou, C. C., & Tsakris, Z. (2022). Interactions between Medical Plant-Derived Bioactive Compounds: Focus on Antimicrobial Combination Effects. *antibiotics Review*, 11(8).
<https://doi.org/10.3390/antibiotics11081014>
- Wani, K. M., & Dhanya, M. (2025). Unlocking the potential of banana peel bioactives: extraction methods, benefits, and industrial applications. *Discover Food*. <https://doi.org/10.1007/s44187-025-00276-y>
- Warren, G. L., Andrews, C. W., Capelli, A., Clarke, B., Lalonde, J., Lambert, M. H., Lindvall, M., Nevins, N., Semus, S. F., Senger, S., Tedesco, G., Wall, I. D., Woolven, J. M., Peishoff, C. E., & Head, M. S. (2006). A Critical Assessment of Docking Programs and Scoring Functions. *Journal of Medicinal Chemistry*, 49(20), 5912–5931.
<https://doi.org/doi.org/10.1021/jm050362n>
- Wenno, M. F., Siahaya, W. A., & Puturuhu, F. (2022). Karakteristik lahan tanaman pisang Tongka Langit (*Musa troglodytarum* L.) di Pulau Ambon. *Agrologia*, 11(1), 51–58. <https://scispace.com/pdf/determination-of-land-characteristics-for-tongka-langit-1n5oq0hd.pdf>
- Widiasriani, I. A. P., Udayani, N. N. W., Triansyah, G. A. P., Dewi, N. P. E. M. K., Wulandari, N. L. W. E., & Prabandari, A. A. S. S. (2024). Artikel Review: Peran Antioksidan Flavonoid dalam Menghambat Radikal Bebas. *Journal Syifa Sciences and Clinical Research*, 6(2), 188–197.
<https://doi.org/10.37311/jsscr.v6i2.27055>
- World Health Organization. (2025). *Noncommunicable Diseases: Key Facts*. World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>
- Yadav, A. (2021). Banana (*Musa acuminata*): Most popular and common Indian plant with multiple pharmacological potentials. *World Journal of Biology Pharmacy and Health Sciences*.
<https://doi.org/10.30574/wjbphs.2021.7.1.0073>

- Yulis, P. A. R., & Sari, Y. (2020). Aktivitas Antioksidan dari Limbah Kulit Pisang Muli (*Musa acuminata* linn) dan Kulit Pisang Kepok (*Musa paradisiaca formatypica*). *Al-Kimia*.
<https://scholar.archive.org/work/4jdwku4ymnebnewguwiubjs4vu/access/wayback/https://journal.uin-alauddin.ac.id/index.php/al-kimia/article/download/15543/pdf>
- Zhang, Q., Yang, W., Liu, J., Liu, H., Lv, Z., Zhang, C., Chen, D., & Jiao, Z. (2020). Identification of Six Flavonoids as Novel Cellular Antioxidants and Their Structure-Activity Relationship. *Oxidative Medicine and Cellular Longevity*, 2020. <https://doi.org/10.1155/2020/4150897>