

DAFTAR PUSTAKA

- Abdullah, S. S., Putra, P. P., Antasionasti, I., Rundengan, G., Suoth, E. J., Abdullah, R. P. I., & Abdullah, F. (2021). ANALISIS SIFAT FISIKOKIMIA, FARMAKOKINETIK DAN TOKSIKOLOGI PADA PERICARPIUM PALA (*Myristica fragransa*) SECARA ARTIFICIAL INTELLIGENCE. *Chemistry Progress*, 14(2), 81. <https://doi.org/10.35799/cp.14.2.2021.37112>
- Abo-Salem, H. M., El Souda, S. S. M., Shafey, H. I., Zoheir, K. M. A., Ahmed, K. M., Mahmoud, K., Mahrous, K. F., & Fawzy, N. M. (2024). Synthesis, bioactivity assessment, molecular docking and ADMET studies of new chromone congeners exhibiting potent anticancer activity. *Scientific Reports*, 14(1), 1–24. <https://doi.org/10.1038/s41598-024-59606-2>
- Adisakwattana, S. (2017). Cinnamic acid and its derivatives: Mechanisms for prevention and management of diabetes and its complications. *Nutrients*, 9(2). <https://doi.org/10.3390/nu9020163>
- Al Wasidi, A. S., Hassan, A. S., & Naglah, A. M. (2020). In vitro cytotoxicity and druglikeness of pyrazolines and pyridines bearing benzofuran moiety. *Journal of Applied Pharmaceutical Science*, 10(4), 142–148. <https://doi.org/10.7324/JAPS.2020.104018>
- Ambade, S. S., Gupta, V. K., Bhole, R. P., Khedekar, P. B., & Chikhale, R. V. (2023). A Review on Five and Six-Membered Heterocyclic Compounds Targeting the Penicillin-Binding Protein 2 (PBP2A) of Methicillin-Resistant Staphylococcus aureus (MRSA). *Molecules*, 28(20). <https://doi.org/10.3390/molecules28207008>
- American Chemical Society, 2025, CAS Scifinder, <https://scifindern.cas.org/searchDetail substance/67b2dd6d995111347f7e2f0d/substanceDetails>. Diakses pada : tanggal 16 Februari 2025.
- Arifan, F., Winarni, S., Wahyuningsih, W., Pudjihastuti, I., & Broto, R. W. (2019). Total Plate Count (TPC) Analysis of Processed Ginger on Tlogowungu Village. 167(ICoMA 2018), 377–379. <https://doi.org/10.2991/icoma-18.2019.80>
- Avanesyan, A. A., Pashkov, A. N., Simonyan, N. A., Simonyan, A. V., & Myachina, O. V. (2009). Antiradical activity of cinnamic acid derivatives. *Pharmaceutical Chemistry Journal*, 43(5), 249–250. <https://doi.org/10.1007/s11094-009-0285-0>
- Balouiri, M., Sadiki, M. and Ibnsouda, S. K. (2016) ‘Methods for in vitro evaluating activity: A review’, Journal of pharmaceutical analysis. Elsevier, DOI: 10.1016/j.jpha.2015.11.005
-  Navarro, M., Hafian, R., Sánchez-Somolinos, M., Vaquero, J., Öz, P., & Guembe, M. (2022). Effect of Tranexamic Acid against spp. and Cutibacterium acnes Associated with Peri-Implant ts from an In Vitro Study . *Microbiology Spectrum*, 10(1), 1–7. <https://doi.org/10.1128/spectrum.01612-21>

- Bhalani, D. V., Nutan, B., Kumar, A., & Singh Chandel, A. K. (2022). Bioavailability Enhancement Techniques for Poorly Aqueous Soluble Drugs and Therapeutics. *Biomedicines*, 10(9). <https://doi.org/10.3390/biomedicines10092055>
- Bouras, M., Bourdiol, A., Rooze, P., Hourmant, Y., Caillard, A., & Roquilly, A. (2024). Tranexamic acid: a narrative review of its current role in perioperative medicine and acute medical bleeding. *Frontiers in Medicine*, 11(August), 1–11. <https://doi.org/10.3389/fmed.2024.1416998>
- Bułakowska, A., Ślawiński, J., Hałasa, R., Hering, A., Gucwa, M., Ochocka, J. R., & Stefanowicz-Hajduk, J. (2023). An In Vitro Antimicrobial, Anticancer and Antioxidant Activity of N-[(2-Arylmethylthio)phenylsulfonyl]cinnamamide Derivatives. *Molecules*, 28(7). <https://doi.org/10.3390/molecules28073087>
- Butt, S. S., Badshah, Y., Shabbir, M., & Rafiq, M. (2020). Molecular Docking Using Chimera and Autodock Vina Software for Nonbioinformaticians. *JMIR Bioinformatics and Biotechnology*, 1(1), 1–25. <https://doi.org/10.2196/14232>
- Cai, J., Ribkoff, J., Olson, S., Raghunathan, V., Al-Samkari, H., DeLoughery, T. G., & Shatzel, J. J. (2020). The many roles of tranexamic acid: An overview of the clinical indications for TXA in medical and surgical patients. *European Journal of Haematology*, 104(2), 79–87. <https://doi.org/10.1111/ejh.13348>
- Chandra, S., Roy, A., Jana, M., & Pahan, K. (2019). Cinnamic acid activates PPAR α to stimulate Lysosomal biogenesis and lower Amyloid plaque pathology in an Alzheimer's disease mouse model. *Neurobiology of Disease*, 124, 379–395. <https://doi.org/10.1016/j.nbd.2018.12.007>
- Chen, D. D., Zhang, B. Y., Liu, X. X., Li, X. Q., Yang, X. J., & Zhou, L. (2018). Bioactivity and structure–activity relationship of cinnamic acid derivatives and its heteroaromatic ring analogues as potential high-efficient acaricides against Psoroptes cuniculi. *Bioorganic and Medicinal Chemistry Letters*, 28(6), 1149–1153. <https://doi.org/10.1016/j.bmcl.2017.08.051>
- Chen, T., Xue, J., & Wang, Q. (2024). Tranexamic Acid for the Treatment of Hyperpigmentation and Telangiectatic Disorders Other Than Melasma: An Update. *Clinical, Cosmetic and Investigational Dermatology*, 17(September), 2151–2163. <https://doi.org/10.2147/CCID.S479411>
- Cherian, T., Maier, S. P., Bianco, K., Slobodyanyuk, K., Rattenni, R. N., Lafage, V., Schwab, F. J., Lonner, B. S., & Errico, T. J. (2015). Efficacy of tranexamic acid in reducing blood loss during spine surgery: A meta-analysis. *Spine Journal*, 15(4), 101–107. <https://doi.org/10.1016/j.spinee.2015.01.013>
- Kovač, B., Petrova, P., Gyoshkova, N., Ivanova, G., Štícha, M., & Černý, J. (2017). Synthesis and radical scavenging activity of cinnamic acid derivatives. *Chemical Communications*, 49(Dcc), 68–73.



- Cos, P., Rajan, P., Vedernikova, I., Calomme, M., Pieters, L., Vlietinck, A. J., Augustyns, K., Haemers, A., & Berghe, D. Vanden. (2002). In vitro antioxidant profile of phenolic acid derivatives. *Free Radical Research*, 36(6), 711–716. <https://doi.org/10.1080/10715760290029182>

Daina, A., Michielin, O., & Zoete, V. (2017). SwissADME: A free web tool to evaluate pharmacokinetics, drug-likeness and medicinal chemistry friendliness of small molecules. *Scientific Reports*, 7(October 2016), 1–13. <https://doi.org/10.1038/srep42717>

De, P., Koumba Yoya, G., Constant, P., Bedos-Belval, F., Duran, H., Saffon, N., Daffé, M., & Baltas, M. (2011). Design, synthesis, and biological evaluation of new cinnamic derivatives as antituberculosis agents. *Journal of Medicinal Chemistry*, 54(5), 1449–1461. <https://doi.org/10.1021/jm101510d>

Diyah, N. W., Warsito, G. M., Isnaeni, & Hidayati, S. W. (2023). Antimicrobial Activity and Molecular Docking of Benzoyl-N,N'-dialkylurea against Target Proteins in Microbial Cells. *Camellia : Clinical, Pharmaceutical, Analytical and Pharmacy Community Journal*, 2(2). <https://doi.org/10.30651/cam.v2i2.20903>

Fareza, M. S. (2017). TRANSFORMASI ETIL P-METOKSISINAMAT MENJADI ASAM P -METOKSISINAMAT DARI KENCUR (*Kaempferia galanga* L.) BESERTA UJI AKTIVITAS ANTIBAKTERINYA. *ALCHEMY Jurnal Penelitian Kimia*, 13(2). <https://doi.org/10.20961/alchemy.v13i2.8472>

Firdaus, Seniwati, Alamsyah, N., & Paramita, S. (2019). Synthesis and activity of N-(o-tolyl)caffeamide and N-(o-tolyl)-p-coumaramide against P388 leukemia murine cells. *Journal of Physics: Conference Series*, 1341(3). <https://doi.org/10.1088/1742-6596/1341/3/032005>

Firdausy, A. F., Muti'ah, R., & Rahmawati, E. K. (2020). Predicting Pharmacokinetic Profiles of Sunflower's (*Helianthus annuus* L.) Active Compounds using in Silico Approach. *Journal of Islamic Medicine*, 4(1), 1–7. <https://doi.org/10.18860/jim.v4i1.8840>

Forli, S., Huey, R., Pique, M. E., Sanner, M. F., Goodsell, D. S., & Olson, A. J. (2016). Computational protein-ligand docking and virtual drug screening with the AutoDock suite. *Nature Protocol*, 11(5), 905–915. <https://doi.org/10.1038/pj.2016.37>

Fregnani, A. M., Brancaglion, G. A., Galvão, A. F. C., D'Sousa Costa, C. O., Moreira, D. R. M., Soares, M. B. P., Bezerra, D. P., Silva, N. C., de Souza Morais, S. M., Oliveira, C. T., das, A. L. T., Coelho, L. F. L., Carvalho, D. T., Dias, D. F., & de 117. (2017). Synthesis of piplartine analogs and preliminary findings on microbial activity relationship. *Medicinal Chemistry Research*, 26(1). <https://doi.org/10.1007/s00044-016-1774-9>



Optimized using
trial version
www.balesio.com

Gaikwad, N., Nanduri, S., & Madhavi, Y. V. (2019). Cinnamamide: An insight into the pharmacological advances and structure–activity relationships. *European Journal of Medicinal Chemistry*, 181, 111561. <https://doi.org/10.1016/j.ejmech.2019.07.064>

Ghafary, S., Najafi, Z., Mohammadi-Khanaposhtani, M., Nadri, H., Edraki, N., Ayashi, N., Larijani, B., Amini, M., & Mahdavi, M. (2018). Novel cinnamic acid–tryptamine hybrids as potent butyrylcholinesterase inhibitors: Synthesis, biological evaluation, and docking study. *Archiv Der Pharmazie*, 351(10), 1–10. <https://doi.org/10.1002/ardp.201800115>

Gondokesumo, M. E., & Kurniawan, I. M. (2019). Molecular docking study of sappan wood extract to inhibit PBP2A enzyme on methicillin-resistant *Staphylococcus aureus* (MRSA). *Journal of Basic and Clinical Physiology and Pharmacology*, 30(6), 1–9. <https://doi.org/10.1515/jbcpp-2019-0282>

Hacker, K., Maas, R., Kornhuber, J., Fromm, M. F., & Zolk, O. (2015). Substrate-dependent inhibition of the human organic cation transporter OCT2: A comparison of metformin with experimental substrates. *PLoS ONE*, 10(9), 1–16. <https://doi.org/10.1371/journal.pone.0136451>

Holford, N., & Yim, D. S. (2016). Volume of distribution. *Translational and Clinical Pharmacology*, 24(2), 74–77. <https://doi.org/10.12793/tcp.2016.24.2.74>

Hu, Y., Shi, H., Zhou, M., Ren, Q., Zhu, W., Zhang, W., Zhang, Z., Zhou, C., Liu, Y., Ding, X., Shen, H. C., Yan, S. F., Dey, F., Wu, W., Zhai, G., Zhou, Z., Xu, Z., Ji, Y., Lv, H., ... Tan, X. (2020). Discovery of Pyrido[2,3- b]indole Derivatives with Gram-Negative Activity Targeting Both DNA Gyrase and Topoisomerase IV. *Journal of Medicinal Chemistry*, 63(17), 9623–9649. <https://doi.org/10.1021/acs.jmedchem.0c00768>

Iizuka, T., Funayama, H., Kusano, G., & Nagai, M. (2003). Vasorelaxant Activity of N -Caffeoylamino Acids. 123(11), 963–971.

Izatunnafis, I., Murti, Y. B., & Ari Sudarmanto, B. S. (2023). In silico Pharmacokinetic and Toxicity Prediction of Compounds from *Andrographis paniculata* (Burm.f.) Nees. *Journal of Food and Pharmaceutical Sciences*, 11(2), 830–838. <https://doi.org/10.22146/jfps.7436>

Joullié, M. M., & Lassen, K. M. (2010). Evolution of amide bond formation. *Arkivoc*, 2010(8), 189–250. <https://doi.org/10.3998/ark.5550190.0011.816>



vele, R., & Njobeh, P. B. (2024). Phytochemical screening, toxicity of selected methanolic plant extracts and their detoxification against AFB1 toxicity. *Helijon*, 10(2), e24435. <https://doi.org/10.1016/j.helijon.2024.e24435>

Kharisma, A. D., & Nisa, U. C. (2023). Evaluation of Antioxidant Activity and Toxicity of Cinnamomum Burmannii B. from Different Provinces of Indonesia. *Journal of Hunan University Natural Sciences*, 50(4). <https://doi.org/10.55463/issn.1674-2974.50.4.16>

Laksono, A., Asnani, A., & Iswanto, P. (2020). Interaction of mutant PBP2a and bioactive compounds from Streptomyces with anti-MRSA activities. *IOP Conference Series: Materials Science and Engineering*, 959(1). <https://doi.org/10.1088/1757-899X/959/1/012031>

Lan, J. S., Zeng, R. F., Jiang, X. Y., Hou, J. wei, Liu, Y., Hu, Z. H., Li, H. X., Li, Y., Xie, S. S., Ding, Y., & Zhang, T. (2020). Design, synthesis and evaluation of novel ferulic acid derivatives as multi-target-directed ligands for the treatment of Alzheimer's disease. *Bioorganic Chemistry*, 94, 103413. <https://doi.org/10.1016/j.bioorg.2019.103413>

Law, M. E., Davis, B. J., Ghilardi, A. F., Yaaghubi, E., Dulloo, Z. M., Wang, M., Guryanova, O. A., Heldermon, C. D., Jahn, S. C., Castellano, R. K., & Law, B. K. (2022). Repurposing Tranexamic Acid as an Anticancer Agent. *Frontiers in Pharmacology*, 12(January), 1–14. <https://doi.org/10.3389/fphar.2021.792600>

Lee, K., & Kim, D. (2019). In-silico molecular binding prediction for human drug targets using deep neural multi-task learning. *Genes*, 10(11), 1–16. <https://doi.org/10.3390/genes10110906>

Lengauer, T., & Rarey, M. (1996). Computational methods for biomolecular docking. *Current Opinion in Structural Biology*, 6(3), 402–406. [https://doi.org/10.1016/S0959-440X\(96\)80061-3](https://doi.org/10.1016/S0959-440X(96)80061-3)

Lim, D., & Strynadka, N. C. J. (2002). Structural basis for the β-lactam resistance of PBP2a from methicillin-resistant *Staphylococcus aureus*. *Nature Structural Biology*, 9(11), 870–876. <https://doi.org/10.1038/nsb858>

Ling, Y., Gao, W. J., Ling, C., Liu, J., Meng, C., Qian, J., Liu, S., Gan, H., Wu, H., Tao, J., Dai, H., & Zhang, Y. (2019). β-Carboline and N-hydroxycinnamamide hybrids as anticancer agents for drug-resistant hepatocellular carcinoma. *European Journal of Medicinal Chemistry*, 168, 515–526. <https://doi.org/10.1016/j.ejmech.2019.02.054>

Luo, Y., Zhou, Y., Song, Y., Chen, G., Wang, Y. X., Tian, Y., Fan, W. W., Yang, Y. S., Cheng, T., & Zhu, H. L. (2018). Optimization of substituted cinnamic acyl sulfonamide derivatives as tubulin polymerization inhibitors with anticancer activity. *Biological and Medicinal Chemistry Letters*, 28(23–24), 3634–3638. <https://doi.org/10.1016/j.bmcl.2018.10.037>



oto, H., Doud, E. H., Wang, T.-S. A., Walker, S., & Kahne, D. (2021). Transpeptidase-mediated incorporation of D-Amino Acids into bacterial proteins. *J Am Chem Soc*, 133(28), 10748–10751. <https://doi.org/10.1021/ja2040656>

McCormack, P. L. (2012). Tranexamic Acid A Review of its Use in the Treatment of Hyperfibrinolysis. *Drugs*, 72(5), 586–617. <https://doi.org/10.1016/B978-008055232-3.62790-4>

Miyamoto, T., & Homma, H. (2021). D-Amino acid metabolism in bacteria. *Journal of Biochemistry*, 170(1), 5–13. <https://doi.org/10.1093/jb/mvab043>

Murugavel, S., Ravikumar, C., Jaabil, G., & Alagusundaram, P. (2019). Synthesis, crystal structure analysis, spectral investigations (NMR, FT-IR, UV), DFT calculations, ADMET studies, molecular docking and anticancer activity of 2-(1-benzyl-5-methyl-1H-1,2,3-triazol-4-yl)-4-(2-chlorophenyl)-6-methoxypyridine – A novel potent. *Journal of Molecular Structure*, 1176, 729–742. <https://doi.org/10.1016/j.molstruc.2018.09.010>

Naika, R., Prasanna, K. P., & Ganapathy, P. S. (2010). Pharmacophore. *Pharmacophore*, 1(2), 141–148.

Naqvi, A. A. T., Mohammad, T., Hasan, G. M., & Hassan, M. I. (2019). Advancements in Docking and Molecular Dynamics Simulations Towards Ligand-receptor Interactions and Structure-function Relationships. *Current Topics in Medicinal Chemistry*, 18(20), 1755–1768. <https://doi.org/10.2174/1568026618666181025114157>

Nitish Kumar, & Amrita Parle. (2019). Cinnamic acid derivatives: An ERA. *The Pharma Innovation Journal*, 8(5), 580–595. www.thepharmajournal.com

Ordoñez, R., Atarés, L., & Chiralt, A. (2022). Properties of PLA films with cinnamic acid: Effect of the processing method. *Food and Bioproducts Processing*, 133, 25–33. <https://doi.org/10.1016/j.fbp.2022.02.002>

Pantsar, T., & Poso, A. (2018). Binding affinity via docking: Fact and fiction. *Molecules*, 23(8), 1DUMMY. <https://doi.org/10.3390/molecules23081899>

Pathania, S., & Singh, P. K. (2021). Analyzing FDA-approved drugs for compliance of pharmacokinetic principles: should there be a critical screening parameter in drug designing protocols? *Expert Opinion on Drug Metabolism and Toxicology*, 17(4), 351–354. <https://doi.org/10.1080/17425255.2021.1865309>

Pavia, D. L., Lampman, G. M., Kriz, G. S., & Vyvyan, J. R. 2009. Chapter 6 Furans and benzo[b]furans. In *Tetrahedron Organic Chemistry Series* (Vol. 20, Nomor C). [https://doi.org/10.1016/S1460-1567\(00\)80010-0](https://doi.org/10.1016/S1460-1567(00)80010-0)



Dell, T. L., & Ascher, D. B. (2015). pkCSM: Predicting small-macokinetic and toxicity properties using graph-based *Journal of Medicinal Chemistry*, 58(9), 4066–4072. <https://doi.org/10.1021/acs.jmedchem.5b00104>

Pulle, J. S. (2020). Sythesis of Amides By Activation of carboxylic Acid using Phosphonitrilic Chloride. *Indo American Journal of Pharmaceutical Research*, 10(599–604). <https://doi.org/10.1002/chin.200605269>

Rasyid, H., Soekamto, N. hariani, Firdausiah, S., Mardiyanti, R., Bahrun, Siswanto, Aswad, M., Saputri, W. D., Suma, A. A. T., Syahrir, N. H., & Listyarini, R. V. (2023). *Revealing the Potency of 1 , 3 , 5-Trisubstituted Pyrazoline as Antimalaria through Combination of in silico Studies*. 52(10), 2855–2867.

Ribeiro, D., Proença, C., Varela, C., Janela, J., Tavares da Silva, E. J., Fernandes, E., & Roleira, F. M. F. (2019). New phenolic cinnamic acid derivatives as selective COX-2 inhibitors. Design, synthesis, biological activity and structure-activity relationships. *Bioorganic Chemistry*, 91(August), 103179. <https://doi.org/10.1016/j.bioorg.2019.103179>

Roleira, F. M. F., Siquet, C., Orr, E., Garrido, E. M., Garrido, J., Milhazes, N., Podda, G., Paiva-Martins, F., Reis, S., Carvalho, R. A., Silva, E. J. T. Da, & Borges, F. (2010). Lipophilic phenolic antioxidants: Correlation between antioxidant profile, partition coefficients and redox properties. *Bioorganic and Medicinal Chemistry*, 18(16), 5816–5825. <https://doi.org/10.1016/j.bmc.2010.06.090>

Ruan, B. F., Ge, W. W., Cheng, H. J., Xu, H. J., Li, Q. S., & Liu, X. H. (2017). Resveratrol-based cinnamic ester hybrids: synthesis, characterization, and anti-inflammatory activity. *Journal of Enzyme Inhibition and Medicinal Chemistry*, 32(1), 1282–1290. <https://doi.org/10.1080/14756366.2017.1381090>

Sada, M., Kimura, H., Nagasawa, N., Akagawa, M., Okayama, K., Shirai, T., Sunagawa, S., Kimura, R., Saraya, T., Ishii, H., Kurai, D., Tsugawa, T., Nishina, A., Tomita, H., Okodo, M., Hirai, S., Ryo, A., Ishioka, T., & Murakami, K. (2022). Molecular Evolution of the *Pseudomonas aeruginosa* DNA Gyrase gyrA Gene. *Microorganisms*, 10(8), 1–11. <https://doi.org/10.3390/microorganisms10081660>

Saputri, K. E., Fakhmi, N., Kusumaningtyas, E., Priyatama, D., & Santoso, B. (2016). Docking Molekular Potensi Anti Diabetes Melitus Tipe 2 Turunan Zerumbon Sebagai Inhibitor Aldosa Reduktase Dengan Autodock-Vina. *Chimica et Natura Acta*, 4(1), 16. <https://doi.org/10.24198/cna.v4.n1.10443>

Senopati, G., Abdul, R., Rashid, R., Juliadmi, D., Prastyo, M. E., Mori, M., Yamanaka, K., Kartika, I., & Palanisamy, S. (2024). *Design and characterization of novel Ti-8Mo- x Fe- y Cu alloys as implant materials : Evaluation of biocompatibility , mechanical properties , and antibacterial potential.* <https://doi.org/10.1177/02670836241276288>



Doss, C. G. (2016). Molecular Dynamics: New Frontier in Medicine. In *Advances in Protein Chemistry and Structural Biology* 1st ed., Vol. 102). Elsevier Inc. <https://doi.org/10.1016/bs.apcsb.2015.09.004>

- Srinivasa Reddy, P., Jamil, K., Madhusudhan, P., Anjani, G., & Das, B. (2001). Antibacterial activity of isolates from *Piper longum* and *Taxus baccata*. *Pharmaceutical Biology*, 39(3), 236–238. <https://doi.org/10.1076/phbi.39.3.236.5926>
- Upadhyay, C., & Ojha, U. (2023). Stress-Induced Shape-Shifting Materials Possessing Autonomous Self-Healing and Scratch-Resistant Ability. *Chemistry - An Asian Journal*, 18(4). <https://doi.org/10.1002/asia.202201082>
- Ursu, O., Rayan, A., Goldblum, A., & Oprea, T. I. (2011). Understanding drug-likeness. *Wiley Interdisciplinary Reviews: Computational Molecular Science*, 1(5), 760–781. <https://doi.org/10.1002/wcms.52>
- Utomo, S. B., Sanubari, F., Utami, B., & Nurhayati, N. D. (2018). Analysis of a Quantitative Relationship Between the Structure and Analgesic Activity of Meperidin Derivatives Using Semi-Empirical AM1 Method. *JKPK (Jurnal Kimia Dan Pendidikan Kimia)*, 2(3), 158. <https://doi.org/10.20961/jkpk.v2i3.12092>
- Wang, R., Yang, W., Fan, Y., Dehaen, W., Li, Y., Li, H., Wang, W., Zheng, Q., & Huai, Q. (2019). Design and synthesis of the novel oleanolic acid-cinnamic acid ester derivatives and glycyrrhetic acid-cinnamic acid ester derivatives with cytotoxic properties. *Bioorganic Chemistry*, 88(April), 102951. <https://doi.org/10.1016/j.bioorg.2019.102951>
- Watanabe, R., Ohashi, R., Esaki, T., Kawashima, H., Natsume-Kitatani, Y., Nagao, C., & Mizuguchi, K. (2019). Development of an in silico prediction system of human renal excretion and clearance from chemical structure information incorporating fraction unbound in plasma as a descriptor. *Scientific Reports*, 9(1), 1–11. <https://doi.org/10.1038/s41598-019-55325-1>
- Xiong, G., Wu, Z., Yi, J., Fu, L., Yang, Z., Hsieh, C., Yin, M., Zeng, X., Wu, C., Lu, A., Chen, X., Hou, T., & Cao, D. (2021). ADMETlab 2.0: An integrated online platform for accurate and comprehensive predictions of ADMET properties. *Nucleic Acids Research*, 49(W1), W5–W14. <https://doi.org/10.1093/nar/gkab255>
- Zhang, M., Lu, X., Zhang, H. J., Li, N., Xiao, Y., Zhu, H. L., & Ye, Y. H. (2013). Synthesis, structure, and biological assay of cinnamic amides as potential EGFR kinase inhibitors. *Medicinal Chemistry Research*, 22(2), 986–994. <https://doi.org/10.1007/s00044-012-0093-z>
- Zhang, W. X., Wang, H., Cui, H. R., Guo, W. B., Zhou, F., Cai, D. S., Xu, B., Jia, X., Yang, Y. Q., Chen, H. S., Qi, J. C., Wang, P. L., & Lei, H. M. (2019). synthesis and biological evaluation of cinnamic acid derivatives neuroprotection and angiogenesis effect. *European Journal of Chemistry*, 183, 111695. <https://doi.org/10.1016/j.ejmech.2019.111695>



Zubair, M. S., Maulana, S., & Mukaddas, A. (2020). Penambatan Molekuler dan Simulasi Dinamika Molekuler Senyawa Dari Genus Nigella Terhadap Penghambatan Aktivitas Enzim Protease HIV-1. *Jurnal Farmasi Galenika (Galenika Journal of Pharmacy) (e-Journal)*, 6(1), 132–140. <https://doi.org/10.22487/j24428744.2020.v6.i1.14982>



Optimized using
trial version
www.balesio.com