

DAFTAR PUSTAKA

- Adane, L., Bhagat, S., Arfeen, M., Bhatia, S., Sirawaraporn, R., Sirawaraporn, W., Chakraborti, A.K., and Bharatam, P.V., 2014, Design and synthesis of guanythiourea derivatives as potential inhibitors of plasmodium falciparum dihydrofolate reductase enzyme, *Bioorg. Med. Chem. Lett.*, 24, 613–617.
- Arifuddin, M., Bone, M., Rusli, R., Kuncoro, H., Ahmad, I., dan Rijai, L., 2019, Aktivitas antimalaria penghambatan polimerisasi heme ekstrak etanol daun jambu biji (psidium guajava) dan daun pepaya (Carica papaya), *Jurnal Ilmiah Ibnu Sina*, 4(1), 235-243.
- Anonim, 2020, *World Malaria Report 2020*, World Health Organization. Geneva.
- Anonim, 2020, *Profil Kesehatan Indonesia 2019*, Kemenkes RI, Jakarta.
- Ashley, E.A., and Phyto, A.P., 2018, Drugs in Development for Malaria, *Drugs*, 78, 861–879.
- Astuti, E., Raharjo, T.J., Boangmanalu, P.M., Putra, I.S.R., Waskitha, S.S.W., and Solin, J., 2021, Synthesis, molecular docking, and evaluation of some new curcumin analogs as antimalarial agents, *Indones. J. Chem.*, 21, 452–461.
- Balaji, S.N., Ahsan, M.J., Jadav, S.S., and Trivedi, V., 2019, Molecular modelling, synthesis, dan antimalarial potentials of curcumin analogues containing heterocyclic ring, *Arab. J. Chem.*, 12, 2492–2500.
- Behera, K.S., Rana, M., Pdana, A., and Singh Bisht, S., 2016, Molecular docking studies and in-silico computational analysis of analogues of anti-malarial drugs, *J. Chem. Eng. Chem. Res.*, 3(11), 1085-1090.
- Bhagat, S., Arfeen, M., Adane, L., Singh, S., Singh, P.P., Chakraborti, A.K., and Bharatam, P. V., 2017, Guanythiourea derivatives as potential antimalarial agents: Synthesis, *in vivo* dan molecular modelling studies, *Eur. J. Med. Chem.*, 135, 339–348.
- Bhat, H.R., Singh, U.P., Gahtori, P., Ghosh, S.K., Gogoi, K., Prakash, A., and Singh, R.K., 2013, Antimalarial activity dan docking studies of novel bi-functional hybrids derived from 4-aminoquinoline dan 1,3,5-triazine against wild dan mutant malaria parasites as pf-DHFR inhibitor, *RSC Adv.*, 3, 2942–2952.
- Boruah, L., Das, A., Nainwal, L.M., Agarwal, N., dan Shankar. B., 2013, *In-Silico Drug Design: A revolutionary approach to change the concept of current Drug Discovery Process*, *Int. J. Biol. Pharm. Res.*, 1(1), 60-73.

- Coma-Cros, E.M, Biosca, A., Lantero, E., Manca, M.L., Caddeo, C., Gutiérrez, L., Ramírez, M., Borgheti-Cardoso, L.N., Manconi, M., and Fernández-Busquets, X., 2018. Antimalarial activity of orally administered curcumin incorporated in Eudragit®-containing liposomes. *Int. J. Mol. Sci.*, 19(5), 361.
- De Vijlder, T., Valkenburg, D., Lemièrre, F., Romijn, E.P., Laukens, K., and Cuyckens, F., 2018. A tutorial in small molecule identification via electrospray ionization-mass spectrometry: The practical art of structural elucidation. *Mass Spectrom. Rev.*, 37(5), 607-629.
- Dohutia, C., Chetia, D., Gogoi, K., Bhattacharyya, D.R., and Sarma, K., 2017, Molecular docking, synthesis dan *in vitro* antimalarial evaluation of certain novel curcumin analogues, *Braz. J. Pharm. Sci.*, 175, 51-58.
- Elias, G., and Rao, M.N.A., 1988. Synthesis and anti-inflammatory activity of substituted (E)-4-phenyl-3-buten-2-ones. *Eur. J. Med. Chem.*, 23(4), 379-380.
- Fan, J., Fu, A., and Zhang, L., 2019, Progress in molecular docking, *Quant. Microbiol.*, 7, 83-89.
- Ferreira, L.L.G., and Danricopulo, A.D., 2019, ADMET modeling approaches in drug discovery, *Drug Discov. Today*, 24, 1157-1165.
- Gerstenlauer, C., 2019, Recognition dan Management of Malaria, *Crit. Care Nurs. Clin. N. Am.*, 54, 245-260.
- Guedes, I.A., de Magalhães, C.S., and Dardenne, L.E., 2014, Receptor-ligand molecular docking, *Biophys. Rev.*, 6, 75-87.
- Hariyanti, H., Kurmardi, K., Yanuar, A., and Hayun, H., 2021, Ligand based pharmacophore modeling, virtual screening, and molecular docking studies of asymmetrical hexahydro-2h-indazole analogs of curcumin (AIACs) to discover novel estrogen receptors alpha (ER α) inhibitor, *Indones. J. Chem.*, 21(1), 137-147.
- Ipa, M., Widawati, M., Laksono, A.D., Kusrini, I., and Dhewantara, P.W., 2020, Variation of preventive practices dan its association with malaria infection in eastern Indonesia: Findings from community-based survey, *PLoS ONE*, 15, 1-18.
- Jia, C.Y., Li, J.Y., Hao, G.F., and Yang, G.F., 2020, A drug-likeness toolbox facilitates ADMET study in drug discovery, *Drug Discov. Today*, 25, 248-258.
- Joshi, S., Munshi, R., Talele, G., and Shah, R., 2017, An experimental in vitro study to evaluate the antimalarial activity of select homeopathy preparations, *Int. J. Med. Health Res.*, 3(7), 65-68.

- Khalidi-Khellafi, N., Makhloufi-Chebli, M., Oukacha-Hikem, D., Bouaziz, S.T., Lamara, K.O., Idir, T., Benazzouz-Touami, A. and Dumas, F., 2019, Green synthesis, antioxidant and antibacterial activities of 4-aryl-3, 4-dihydropyrimidinones/thiones derivatives of curcumin. Theoretical calculations and mechanism study, *J. Mol. Struct.*, 1181, 261-269.
- Kind, T., Tsugawa, H., Cajka, T., Ma, Y., Lai, Z., Mehta, S.S., Wohlgemuth, G., Barupal, D.K., Showalter, M.R., Arita, M., and Fiehn, O., 2018. Identification of small molecules using accurate mass MS/MS search. *Mass Spectrom. Rev.*, 37(4), 513-532.
- Kotepui, M., Kotepui, K.U., de Jesus Milanez, G., and Masangkay, F.R., 2020, Plasmodium spp. mixed infection leading to severe malaria: a systematic review dan meta-analysis, *Sci. Rep.*, 10, 1-12.
- Leelandana, S.P., and Lindert, S., 2016, Computational methods in drug discovery, *Beilstein J. Org. Chem.*, 12, 2694–2718.
- Li, J., Fu, A., and Zhang, L., 2019, An overview of scoring functions used for protein–ligand interactions in molecular docking, *Interdiscip. Sci.*, 11, 320–328.
- Li, Q., Chen, J., Luo, S., Xu, J., Huang, Q., and Liu, T., 2015, Synthesis dan assessment of the antioxidant dan antitumor properties of asymmetric curcumin analogues, *Eur. J. Med. Chem.*, 93, 461–469.
- Manohar, S., Khan, S.I., Kdani, S.K., Raj, K., Sun, G., Yang, X., Calderon Molina, A.D., Ni, N., Wang, B., dan Rawat, D.S., 2013, Synthesis, antimalarial activity dan cytotoxic potential of new monocarbonyl analogues of curcumin, *Bioorg. Med. Chem. Lett.*, 23, 112–116.
- Mendez-Vilaz, A., 2015, *Microbial Pathogens and Strategies for Combating Them: Science, Technology and Education*, FORMATEX, Bandajoz.
- Morris, G.M., Ruth, H., Lindstrom, W., Sanner, M.F., Belew, R.K., Goodsell, D.S., and Olson, A.J., 2009, Software news dan updates AutoDock4 dan AutoDockTools4: Automated docking with selective receptor flexibility, *J. Comput. Chem.*, 30, 2785–2791.
- Nsanzabana, C., 2019. Resistance to artemisinin combination therapies (ACTs): do not forget the partner drug!, *Trop. Med. Infect. Dis.*, 4(1), 26-37.
- Oglah, M.K., Mustafa, Y.F., Bashir, M.K., and Jasim, M.H., 2020, Curcumin dan its derivatives: A review of their biological activities, *Syst. Rev. Pharm.*, 11, 472–481.
- Omosa, L.K., Midiwo, J.O., and Kuete, V., 2017, *Medicinal Spices dan Vegetables from Africa*, Academic Press, Dschang.

- Ouellette, R.J. and Rawn, J.D., 2015, *Organic Chemistry Study Guide*, Elsevier, Amsterdam.
- Pavia, D.L., Lampman, G.M., Kriz, G.S., and Vyvyan, J.R., 2015, *Introduction to Spectroscopy*, 5th Ed., Cengage Learning, Stamford.
- Pantsar, T., and Poso, A., 2018. Binding affinity via docking: fact and fiction. *Molecules*, 23(8), 1899-1902.
- Polaquini, C.R., Marques, B.C., Ayusso, G.M., Morão, L.G., Sardi, J.C.O., Campos, D.L., Silva, I.C., Cavalcá, L.B., Scheffers, D.J., Rosalen, P.L., Pavan, F.R., Ferreira, H., and Regasini, L.O., 2021, Antibacterial activity of a new monocarbonyl analog of curcumin MAC 4 is associated with divisome disruption, *Bioorg. Chem.*, 109, 1-10.
- Prasetyaningrum, P.W., Bahtiar, A., and Hayun, H., 2018. Synthesis and cytotoxicity evaluation of novel asymmetrical mono-carbonyl analogs of curcumin (AMACs) against Vero, HeLa, and MCF7 Cell Lines. *Sci. Pharm.*, 86(2), 25.
- Putri, T.N., and Bachtiar, A., 2018. Synthesis, antioxidant, and anti-inflammatory activity of morpholine Mannich base of AMACs ((2E, 6E)-2-((4-hydroxy-3-[morpholin-4-yl]-methyl)phenyl)methylidene)-6-(phenylmethylidene)cyclohexan-1-one) and its analogues. *J. Appl. Pharm. Sci.*, 8(5), 19-25.
- Qiu, P., Zhang, S., Zhou, Y., Zhu, M., Kang, Y., Chen, D., Wang, J., Zhou, P., Li, W., Xu, Q., and Jin, R., 2017. Synthesis and evaluation of asymmetric curcuminoid analogs as potential anticancer agents that downregulate NF- κ B activation and enhance the sensitivity of gastric cancer cell lines to irinotecan chemotherapy. *Eur. J. Med. Chem.*, 139, 917-925.
- Rathore, S., Mukim, M., Sharma, P., Devi, S., Nagar, J.C., and Khalid, M., 2020, Curcumin: A review for health benefits. *Int. J. Res. Rev*, 7(1), 273-290.
- Rayar, A., Veitía, M.S.I., and Ferroud, C., 2015, An efficient and selective microwave-assisted Claisen-Schmidt reaction for the synthesis of functionalized benzalacetones, *Springerplus*, 221(4), 1-5.
- Reddy, R.C., Vatsala, P.G., Keshamouni, V.G., Padmanaban, G., and Rangarajan, P.N., 2005. Curcumin for malaria therapy, *Biochem. Biophys. Res. Commun.*, 326(2), 472-474.
- Ringwald, P. dan Basco, L.L., 1999, Comparison of in vivo and in vitro test of resistance in patients treated with chloroquine in Yaounde, Cameroon, *Bull. World Health Organ.*, 77, 34-43.

- Singh, M., Suryanshu, Kanika, Singh, G., Dubey, A., and Chaitanya, R.K., 2021, Plasmodium's journey through the Anopheles mosquito: A comprehensive review, *Biochimie*, 181, 176–190.
- Sohilait, M.R., Pranowo, H.D.W.I., and Haryadi, W., 2018, Synthesis, in vitro dan molecular docking studies of 1-(3,4-dimethoxy-phenyl)-5-(4-hydroxy-3-methoxy-phenyl)-penta-1,4-dien-3-one as new potential anti-inflammatory, *Asian J. Chem.*, 30, 1765–1770.
- Stuart, B., 2004, *Infrared Spectroscopy: Fundamentals and Applications*, John Wiley & Sons. Ltd, Chippingham.
- Syahri, J., Nasution, H., Nurohmah, B.A., Purwono, B., Yuanita, E., Zakaria, N.H., and Hassan, N.I., 2020, Design, synthesis dan biological evaluation of aminoalkylated chalcones as antimalarial agent, *Sains Malays.*, 49, 2667–2677.
- Talapko, J., Škrlec, I., Alebić, T., Jukić, M., and Včev, A., 2019, Malaria: The past dan the present, *Microorganisms*, 7(179), 1-17.
- Tjitraresmi, A., Susilawati, Y., and Moektiwardoyo, M., 2020, Inhibition of heme polymerization in vitro assay of extract of sirih leaf (*Piper betle* Linn.) and sunflower leaves (*Helianthus annuus* L.), *Int. J. Pharm. Sci. Technol.*, 7(1), 22-28.
- Torres, P.H.M., Sodero, A.C.R., Jofily, P., and Silva-Jr, F.P., 2019, Key topics in molecular docking for drug design, *Int. J. Mol. Sci.*, 20, 1-29.
- Tougan, T., Edula, J.R., Morita, M., Takashima, E., Honma, H., Tsuboi, T., and Horii, T., 2020, The malaria parasit Plasmodium falciparum in red blood cells selectively takes up serum proteins that affect host pathogenicity, *Malar. J.*, 19(155), 1-13.
- Van Schalkwyk, D.A., 2015, *History of Antimalarial Agents*, John Wiley & Sons. Ltd, Chichester.
- Walters, W.P., 2012, Going further than Lipinski's rule in drug design, *Expert Opin. Drug Discov.*, 7, 99–107.
- Xiong, G., Wu, Z., Yi, J., Fu, L., Yang, Z., Hsieh, C., Yin, M., Zeng, X., Wu, C., Lu, A., Chen, X., Hou, T., and Cao, D., 2021, ADMETlab 2.0: An integrated online platform for accurate dan comprehensive predictions of ADMET properties, *Nucleic Acids Res.*, 49, 5–14.
- Yuthavong, Y., Tarnchompoo, B., Vilaivan, T., Chitnumsub, P., Kamchonwongpaisan, S., Charman, S.A., McLennan, D.N., White, K.L., Vivas, L., Bongard, E., Thongphanchang, C., Taweekchai, S., Vanichtanankul, J., Rattanajak, R., Arwon, U., Fantauzzi, P., Yuvaniyama, J., Charman, W.N.,

and Matthews, D., Malarial dihydrofolate reductase as a paradigm for drug development against a resistance-compromised target, *Proc. Natl. Acad. Sci. U. S. A.*, 109(42), 16823–16828.

Yuvaniyama, J., Chitnumsub, P., Kamchonwongpaisan, S., Vanichtanankul, J., Sirawaraporn, W., Taylor, P., Walkinshaw, M.D., and Yuthavong, Y., 2003, Insights into antifolate resistance from malarial DHFR-TS structures, *Nat. Struct. Biol.*, 10, 357–365.

Zhang, Y., Zhao, C., He, W., Wang, Z., Fang, Q., Xiao, B., Liu, Z., Liang, G., and Yang, S., 2014. Discovery and evaluation of asymmetrical monocarbonyl analogs of curcumin as anti-inflammatory agents, *Drug Des. Dev. Ther.*, 8, 373-383.

Zhao, C., Liu, Z., and Liang, G., 2013, Promising curcumin-based drug design: mono-carbonyl analogues of curcumin (MACs), *Curr. Pharm. Des.*, 19, 2114-2135.