DAFTAR PUSTAKA

1. Muntasir, Abdulkadir WS, Harun AI, Tenda PE, Makkasau, Muliyadi, et al. Antibiotik Dan Resistensi Antibiotik. Risnawati, editor. Yogyakarta: Rizmedia Pustaka Indonesia; 2021
2. Akyuni Q. Screening Aktivitas Senyawa Aktif Antibakteri dari Tanaman Bahan Tambahan Pangan Berkhasiat Obat Terhadap Protein Protease dan BLF1 Burkholderia pseudomallei Secara In Silico. 2019
3. World Health Organization. Antimicrobial Resistance. 2023. Available from: https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance
4. Busroni. Bahaya Bakteri yang Kebal Antibiotik. Mediakom Kemenkes RI. 2022;146(1):1–57
5. Elliott ZS, Barry KE, Cox HL, Stoesser N, Carroll J, Vegesana K, et al. The Role of fosA in Challenges with Fosfomycin Susceptibility Testing of Multispecies *Klebsiella pneumoniae* Carbapenemase-Producing Clinical Isolates. J Clin Microbiol. 2019;57(10):1–8.
6. J RR, Salavert Lleti M. Fosfomycin in infections caused by multidrugresistant Gram-negative pathogen. Rev Esp Quimioter. 2019;32:45–54.
7. Klontz EH, Tomich AD, Günther S, Lemkul JA, Deredge D, Silverstein Z, et al. Structure and Dynamics of FosA-Mediated Fosfomycin Resistance in *Klebsiella pneumoniae* and *Escherichia coli*. 2017
8. Ito R, Mustapha MM, Tomich AD, Callaghan JD, McElheny CL, Mettus RT, et al. Widespread fosfomycin resistance in gram-negative bacteria attributable to the chromosomal fosA gene. mBio. 2017;8(4).
9. Falagas ME, Athanasaki F, Voulgaris GL, Triarides NA, Vardakas KZ. Resistance to fosfomycin: Mechanisms, Frequency and Clinical Consequences. Int J Antimicrob Agents. 2019;53(1):22–8.
10. Wright GD. Antibiotic Adjuvants: Rescuing Antibiotics from Resistance. Trends Microbiol. 2016;24(11):862–71.
11. Seok H, Choi JY, Wi YM, Park DW, Peck KR, Ko KS. Fosfomycin resistance in *Escherichia coli* isolates from south korea and in vitro activity of fosfomycin alone and in combination with other antibiotics. Antibiotics. 2020;9(3):1–13.
12. Papp-Wallace KM, Zeiser ET, Becka SA, Park S, Wilson BM, Winkler ML, et al. Ceftazidime-Avibactam in Combination with Fosfomycin: A Novel Therapeutic Strategy against Multidrug-Resistant *Pseudomonas aeruginosa*. Journal of Infectious Diseases. 2020;221(1):666–76.
13. Abdelhady ASM, Darwish NM, Abdel-Rahman SM, El Magd NMA. The combined antimicrobial activity of citrus honey and fosfomycin on multidrug resistant *Pseudomonas aeruginosa* isolates. AIMS Microbiol. 2020;6(2):162–75.
14. Attaallah Ibrahim A, Kadhim Mohammed R. Synergistic Antimicrobial Activity of Eugenol in Combination with Fosfomycin to Combat *Escherichia coli* and Potential Effect on Plasmid-Mediated Fosfomycin Resistance Genes. Chem Biodivers. 2023;20(12).

15. Wulan Dari S, Azizah Z, Chandra B. Phytochemical and Pharmacological Review of Red Ginger Extracts (*Zingiber Officinale var rubrum*). IOSR Journal Of Pharmacy And Biological Sciences (IOSR-JPBS). 2022;17(1):2319–7676
16. Juariah S, Bakar FIA, Bakar MFA, Endrini S, Kartini S, Ningrum RS. Antibacterial Activity and Inhibition Mechanism of Red Ginger (*Zingiber officinale var. rubrum*) Ethanol Extract Against Pathogenic Bacteria. Journal of Advanced Research in Applied Sciences and Engineering Technology. 2023 Mar 1;30(1):145–57.
17. Gan J hong, Liu J xiang, Liu Y, Chen S wen, Dai W tao, Xiao ZX, et al. DrugRep: an automatic virtual screening server for drug repurposing. Acta Pharmacol Sin. 2023;44(4):888–96.
18. Mohammad A. Jahe Merah Hidroponik. 2024.
19. Fafa N, Ayu WD. Jahe Merah Senyawa Bioaktif, Manfaat, dan Metode Analisisnya. Widina Bhakti Persada Bandung. 2022;1:15–9.
20. Putri K M. Khasiat dan Manfaat Jahe Merah. Rahayu H, editor. Semarang, Jawa Tengah: ALPRIN; 2009 : 4
21. Zhang S, Kou X, Zhao H, Mak KK, Balijepalli MK, Pichika MR. *Zingiber officinale var. rubrum*: Red Ginger's Medicinal Uses. Molecules. 2022;27(3).
22. Ghasemzadeh A, Jaafar HZE, Karimi E, Ashkani S. Changes in nutritional metabolites of young ginger (*Zingiber officinale roscoe*) in response to elevated carbon dioxide. Molecules. 2014;19(10):16693–706.
23. Indrawati I, Miranti M, Mayfi IR. Antibacterial activity of ethanolic extracts of rhizome from three ginger varieties against acne isolated bacteria. Nusantara Bioscience. 2017;9(1):92–6.
24. Sukandar EY, Kurniati NF, Wikaningtyas P, Agprikani D. Antibacterial interaction of combination of ethanolic extract of *Zingiber officinale var rubrum* rhizome, *Boesenbergia pandurata* rhizome, and *Stevia rebaudiana* leaves with certain antibiotics against infectious mouth microbial. Asian Journal of Pharmaceutical and Clinical Research. 2016;9(1):311–4.
25. Falagas ME, Vouloumanou EK, Samonis G, Vardakas KZ. Fosfomycin. American Society For Microbiology. 2016;29(2):321–47.
26. Dijkmans AC, Zacarías NVO, Burggraaf J, Mouton JW, Wilms EB, van Nieuwkoop C, et al. Fosfomycin: Pharmacological, clinical and future perspectives. Antibiotics. 2017;6(4):1–17.
27. Raz R. Fosfomycin : an old — new antibiotic. Clinical Microbiology and Infection. 2011;18:4–7.
28. Avent ML, Rogers BA, Cheng AC, Athan E, Francis JR, Roberts MJ, et al. Fosfomycin: what was old is new again. Intern Med J. 2018;48(12):1425–9.
29. Silver LL. Fosfomycin: Mechanism and resistance. Cold Spring Harb Perspect Med. 2017;7(2):1–12.
30. Hashemian SMR, Farhadi Z, Farhadi T. Fosfomycin: The characteristics, activity, and use in critical care. Ther Clin Risk Manag. 2019;15:525–30.
31. Kaase M, Szabados F, Anders A, Gatermann SG. Fosfomycin susceptibility in carbapenem-resistant enterobacteriaceae from Germany. J Clin Microbiol. 2014;52(6):1893–7.

32. Jiang Y, Shen P, Wei Z, Liu L, He F, Shi K, et al. Dissemination of a clone carrying a fosA3-harbouring plasmid mediates high fosfomycin resistance rate of KPC-producing *Klebsiella pneumoniae* in China. Int J Antimicrob Agents. 2015 Jan 1;45(1):66–70.
33. Tseng SP, Wang SF, Ma L, Wang TY, Yang TY, Siu LK, et al. The plasmid-mediated fosfomycin resistance determinants and synergy of fosfomycin and meropenem in carbapenem-resistant *Klebsiella pneumoniae* isolates in Taiwan. Journal of Microbiology, Immunology and Infection. 2017;50(5):653–61
34. Kumar V, Yasmeen N, Pandey A, Ahmad Chaudhary A, Alawam AS, Ahmad Rudayni H, et al. Antibiotic adjuvants: synergistic tool to combat multi-drug resistant pathogens. Front Cell Infect Microbiol. 2023;13:1–14.
35. Bernal P, Molina-Santiago C, Daddaoua A, Llamas MA. Antibiotic adjuvants: Identification and clinical use. Microb Biotechnol. 2013;6(5):445–9.
36. J. M, Cheesman, Ilanko A, Blonk B, Cock IE. Developing New Antimicrobial Therapies: Are Synergistic Combinations of Plant Extracts/Compounds with Conventional Antibiotics the Solution? Pharmacogn Rev. 2017;11:57–72.
37. Bush K, Bradford PA. B-Lactams and B-Lactamase Inhibitors: An Overview. 2016
38. Sharma A, Gaidamakova EK, Grichenko O, Matrosova VY, Hoeke V, Klimenkova P, et al. Across the tree of life, radiation resistance is governed by antioxidant Mn2+, gauged by paramagnetic resonance. Proc Natl Acad Sci U S A. 2017;114(44):E9253–60.
39. Minato Y, Dawadi S, Kordus SL, Sivanandam A, Aldrich CC, Baughn AD. Mutual potentiation drives synergy between trimethoprim and sulfamethoxazole. Nat Commun. 2018;9(1)
40. Finnegan S, Percival SL. EDTA: An Antimicrobial and Antibiofilm Agent for Use in Wound Care. Advance in Wound Care. 2015;4(7):415–21.
41. Roy R, Tiwari M, Donelli G, Tiwari V. Strategies for combating bacterial biofilms: A focus on anti-biofilm agents and their mechanisms of action. Virulence. 2018;9(1):522–54
42. Zong TX, Silveira AP, Morais JV, Sampaio MC, Muehlmann LA, Zhang J, et al. Recent Advances in Antimicrobial Nano-Drug Delivery Systems. Nanomaterials. 2022;12(11).
43. Abdallah EM, Alhatlani BY, de Paula Menezes R, Martins CHG. Back to Nature: Medicinal Plants as Promising Sources for Antibacterial Drugs in the Post-Antibiotic Era. Plants. 2023;12(17).
44. Phitaktim S, Chomnawang M, Sirichaiwetchakoon K, Dunkhunthod B, Hobbs G, Eumkeb G. Synergism and the mechanism of action of the combination of α-mangostin isolated from *Garcinia mangostana* L. and oxacillin against an oxacillin-resistant *Staphylococcus saprophyticus*. BMC Microbiol. 2016;16(1):1–14
45. Siriwong S, Teethaisong Y, Thumanu K, Dunkhunthod B, Eumkeb G. The synergy and mode of action of quercetin plus amoxicillin against amoxicillin-resistant *Staphylococcus epidermidis*. BMC Pharmacol Toxicol. 2016;17(1):1–14

46. Morita Y, Nakashima K ichi, Nishino K, Kotani K, Tomida J, Inoue M, et al. Berberine is a novel type efflux inhibitor which attenuates the MexXY-mediated aminoglycoside resistance in *Pseudomonas aeruginosa*. Front Microbiol. 2016;7(AUG):1–10.
47. Chovanová R, Mikulášová M, Vaverková Š. In vitro antibacterial and antibiotic resistance modifying effect of bioactive plant extracts on methicillin-resistant *Staphylococcus epidermidis*. Int J Microbiol. 2013;2013.
48. Silva DM, DA COSTA PA, Ribon AOB, Purgato GA, Diaz-Muñoz G, Diaz MAN. Plant extracts display synergism with different classes of antibiotics. An Acad Bras Cienc. 2019;91(2).
49. Hardjono S. Sintesis Dan Uji Aktivitas Antikanker Senyawa 1-(2-Klorobenzoiloksi)Urea Dan 1-(4-Klorobenzoiloksi)Urea. Berkala Ilmiah Kimia Farmasi. 2013;2(1):16–21.
50. Beyleveld G, White KM, Ayllon J, Shaw ML. New-generation screening assays for the detection of anti-influenza compounds targeting viral and host functions. Antiviral Res. 2013 Oct 1;100(1):120–32.
51. Khaerunnisa S, Suhartati, Awaluddin R. Penelitian in Silico untuk pemula. Airlangga University Press; 2020:13
52. Shofi Muh. Studi In Silico Senyawa Kuarsetin Daun Kencana Ungu (*Ruellia tuberosa* L.) Sebagai Agen Antikanker Payudara. Jurnal Sintesis: Penelitian Sains, Terapan dan Analisisnya. 2022;2(1):1–9.
53. Mirza DM. Studi In Silico dan In Vitro Aktivitas Antineuroinflamasi Ekstrak Etanol 96% Daun *Marsilea crenata* C Presl. Skripsi. 2019;1–134.
54. Pratama AA, Rifai Y, Marzuki A. *Docking* Molekuler Senyawa 5,5’-Dibromometilsesamin. Majalah Farmasi dan Farmakologi. 2017;21(3):67–9.
55. Pinzi L, Rastelli G. Molecular *Docking*: Shifting Paradigms in Drug Discovery. Int J Mol Sci. 2019;20(18):1–23.
56. Jakhar R, Dangi M, Khichi A, Chhilla AK. Relevance of Molecular *Docking* Studies in Drug Designing. Curr Bioinform. 2020;14(4):9.
57. Acar C, Yalçın G, Ertan-Bolelli T, Kaynak Onurdağ F, Ökten S, Şener F, et al. Synthesis and molecular *docking* studies of some novel antimicrobial benzamides. Bioorg Chem. 2020 Jan 1;94:103368.
58. Nurfadhila L, Muldianah D, Nurdimayanthi DA, Rahmawati DS, Hartati H, Fadhilah H. Review Artikel: Pemanfaatan Kimia Komputasi Dengan Berbagai Metode Dalam Menentukan Desain Senyawa Baru. Journal of Pharmaceutical and Sciences. 2023;6(2):555–66.
59. Kirk E. Hevener, Wei Zhao, David M. Ball, Kerim Babaoglu, Jianjun Qi, Stephen W. White and REL. Validation of Molecular *Docking* Programs for Virtual Screening against Dihydropteroate Synthase. J Chem Inf Mode. 2009;49(1):444–60.
60. Iffah F, Fadillah F, Syuta A, Purnama E. Molecular *Docking*. FMIPA Unesa; 2022.
61. Putra P. Teori dan Tutorial Molecular *Docking* Menggunakan AutoDock Vina. 1st ed. Wahid N, editor. Wawasan Ilmu; 2022.
62. Neha Mathur, Siva Sai Chandragiri, Sarita, Shristhi Shandily Krupa Mukeshbhai Santoki, Nandini Navinchandra Vadhavana Chandra SS and M.

In Silico *Docking*: Protocols for Computational Exploration of Molecular Interactions. Intech. 2012;13.
63. Setiawan H, Irawan MI. Kajian Pendekatan Penempatan Ligan Pada Protein Menggunakan Algoritma Genetika. Jurnal Sains dan Seni ITS. 2017;6(2):2–6.
64. Torres PHM, Sodero ACR, Jofily P, Silva-Jr FP. Key topics in molecular *docking* for drug design. Int J Mol Sci. 2019;20(18):1–29.
65. Meng XY, Zhang HX, Mezei M CM. Over View on Molecular *Docking*: A Powerful Approach for Structure Based Drug Discovery. Curr Comput Aided Drug Des. 2011;7(2):146–57.
66. Muhammed MT, Aki-Yalcin E. Molecular *Docking*: Principles, Advances, and Its Applications in Drug Discovery. Lett Drug Des Discov. 2022;21(3):480–95.
67. Schrödinger. Drug Discovery. 2023. Available from: https://www.schrodinger.com/platform/drug-discovery
68. Ivanović V, Rančić M, Arsić B, Pavlović A. Lipinski's rule of five, famous extensions and famous exceptions. Chemia Naissensis. 2020;3(1):171–81.
69. Nusantoro YR, Fadlan A. Analisis Sifat Mirip Obat, Prediksi ADMET, dan Penambatan Molekular Isatinil-2-Aminobenzoilhidrazon dan kompleks logam transisi Co(II), Ni(II), Cu(II), Zn(II) Terhadap BCL2-XL. Akta Kimia Indonesia. 2020;5(2):114.
70. Syukri D, Nasution Y, Umbu Henggu K, Kurnia Rohmah M, Yusfiani M, Fauzan Lubis Ah, et al. Buku Ajar Biokimia. Vol. 1, CV. Feniks Muda Sejahtera. 2022. 1–160 p.
71. Voet. Proteins: Three-Dimensional Structure. Molecular architecture 1. 2002;124–60.
72. Fitriana W, Rahmasari R. Supramolekul Oligomer (Struktur Multimer Sitokrom c (Cyt c)). Sainstech Farma. 2019;12(2):101–5.
73. Wang Z, Wang S, Li Y, Guo J, Wei Y, Mu Y, et al. A new paradigm for applying deep learning to protein-ligand interaction prediction. Brief Bioinform. 2024 May 1;25(3).
74. Sari IW, Junaidin J, Pratiwi D. Studi Molecular *Docking* Senyawa Flavonoid Herba Kumis Kucing (*Orthosiphon stamineus* B.) Pada Reseptor α-Glukosidase Sebagai Antidiabetes Tipe 2. Jurnal Farmagazine. 2020;7(2):54.
75. Prima D, Sri Wahyuni F, Khambri D, Vanda H, Zakiah N, Abbas J, et al. Flavan-3-ol Terhadap Enzim Alpha Glucosidase. Vol. 5, Jurnal Fitofarmaka Indonesia. 2018
76. Susanti NMP, Saputra DPD, Hendrayati PL, Parahyangan IPDN, Swandari IADG. Molecular *Docking* Sianidin dan Peonidin Sebagai Antiinflamasi pada Aterosklerosis Secara In Silico. Jurnal Farmasi Udayana. 2018;7(1):28–33
77. Liu T, Bai L, Tian N, Liu J, Zhang Y, Huang H. Interfacial engineering in two-dimensional heterojunction photocatalysts. Int J Hydrogen Energy. 2023 Apr 19;48(33):12257–87.
78. Ouellette RJ, Rawn JD. Structure and Bonding in Organic Compounds. Organic Chemistry. 2014;1–39.
79. Ouellette RJ, Rawn JD. Structure of Organic Compounds. Principles of Organic Chemistry. 2015 Jan 1;1–32.

80. Van der Jagt H. Geochemistry | Soil, Major Inorganic Components. Encyclopedia of Analytical Science. 2019 Jan 1;302–18.
81. Sippel KH, Quiocho FA. Ion-dipole interactions and their functions in proteins. Protein Science. 2015;24(7):1040–6.
82. Cerda-Kipper AS, Montiel BE, Hosseini S. Immunoassays | Radioimmunoassays and enzyme-linked immunosorbent assay. Encyclopedia of Analytical Science. 2019:55–75.
83. Sit PS. Studying molecular-scale protein-surface interactions in biomaterials. Characterization of Biomaterials. 2012;182–223.
84. Siswandono. Kimia Medisinal 1. Surabaya: Airlangga University Press; 2016:554
85. Rollando. Pengantar Kimia Medisinal. 2017:716
86. Agus ASR, Purnaningtyas SRD, Wahidin, Sari DRT, Ischak NI, Gianti L, et al. Kimia Medisinal. 2023:1–166
87. Díez-Aguilar M, Cantón R. New microbiological Aspects Of Fosfomycin. Journal of the Spanish Society of Chemotherapy. 2019;32:8–18.
88. Beharry Z, Palzkill T. Functional analysis of active site residues of the fosfomycin resistance enzyme FosA from *Pseudomonas aeruginosa*. Journal of Biological Chemistry. 2005;280(18):17786–91.
89. Hatami S, Sirous H, Mahnam K, Najafipour A, Fassihi A. Preparing a database of corrected protein structures important in cell signaling pathways. Res Pharm Sci. 2023 Jan 1;18(1):67–78.
90. Wang J, Liu Y, Tian B. Protein-small molecule binding site prediction based on a pre-trained protein language model with contrastive learning. J Cheminform. 2024;16(1):125
91. Josino LPC, Alves CN, Lima AH. A molecular model to study FosA enzyme inhibition. J Mol Graph Model. 2021 Sep 1;107.
92. Friesner RA, Banks JL, Murphy RB, Halgren TA, Klicic JJ, Mainz DT, et al. Glide: A New Approach for Rapid, Accurate *Docking* and Scoring. 1. Method and Assessment of *Docking* Accuracy. J Med Chem. 2004 Mar 25;47(7):1739–49.
93. Friesner RA, Murphy RB, Repasky MP, Frye LL, Greenwood JR, Halgren TA, et al. Extra precision glide: *Docking* and scoring incorporating a model of hydrophobic enclosure for protein-ligand complexes. J Med Chem. 2006 Oct;49(21):6177–96.
94. Frimayanti N, Lukman A, Nathania L. Studi molecular *docking* senyawa 1,5-benzothiazepine sebagai inhibitor dengue DEN-2 NS2B/NS3 serine protease. Chempublish Journal. 2021;6(1):54–62.
95. Vernon RM, Chong PA, Tsang B, Kim T, Bah A, Farber P, et al. Pi-Pi contacts are an overlooked protein feature relevant to phase separation. eLife; 2018:1–48
96. Jiang X, Yu J, Zhou Z, Kongsted J, Song Y, Pannecouque C, et al. Molecular design opportunities presented by *solvent-exposed* regions of target proteins. Medicinal Research Reviews. John Wiley and Sons Inc.; 2019:1–45.
97. Segall M. Advances in multiparameter optimization methods for de novo drug design. Vol. 9, Expert Opinion on Drug Discovery. Informa Healthcare; 2014:803–17.
98. Schrödinger Press. QikProp 3.8 User Manual. Schrödinger; 2013.

99. Garrido A, Lepailleur A, Mignani SM, Dallemagne P, Rochais C. hERG toxicity assessment: useful guidelines for drug design. Eur J Med Chem. 2020;

100. Azizah RN, Alam G, Rifai Y, Lethe C. Aplikasi Komputasi Kimia Dalam Analisis Hubungan Kuantitatif Struktur-Aktivitas (HKSA) Dari Senyawa Aktif Antibakteri Analog N-Alkil Imidazol Pada Bakteri (*Staphilococcus aureus*) Dengan Parameter Elektronik Metode Austin Model (AM 1). As-Syifaa. 2013;05(01):1–11.

101. Kincses A, Ghazal TSA, Hohmann J. Synergistic effect of phenylpropanoids and flavonoids with antibiotics against Gram-positive and Gram-negative bacterial strains. Pharm Biol. 2024;62(1):659–65.