

## DAFTAR PUSTAKA

- Ahsani, D.N. 2014. Respon Imun pada Infeksi Jamur. *Jurnal Kedokteran dan Kesehatan Indonesia*, 6(2) : 55-66.
- Ali, M.Y., Kim, D.H., Seong, S.H., Kim, H., Jung, H.A., Choi, J.S. 2017.  $\alpha$ -Glucosidase and Protein Tyrosine Phosphatase 1B Inhibitory Activity of Plastoquinones from Marine Brown Alga *Sargassum serratifolium*. *Mar. Drugs*, 15: 368. doi:10.3390/md15120368
- Al-Zereini, W. 2006. Natural Products from Marine Bacteria, *Dissertation*, Biologie, der Technischen Universität Kaiserslautern, Kaiserslautern.
- An, J.P., Nguyen, P.H., Ha, T.K.Q., Kim, J., Cho, T.O., Oh, W.K. 2016. Protein Tyrosine Phosphatase 1B from The Stem of *Akebia quinata*. *Molecules*, 21: 1091. doi:10.3390/molecules21081091
- Bernard, M., Mouyna, I., Dubreucq, G., et al. 2002. Characterization of a Cell Wall Acid Phosphatase (PhoAp) in *Aspergillus fumigatus*. *Microbiology*, 148: 2819-2829. doi: 10.1099/00221287-148-9-2819
- Bose, A.K., Ganguly, S.N., Manhas, M.S., Srirajan, V., Bhattacharjee, A., Rumthao, S., Shrama, A.H. 2004. Microwave Assisted Synthesis of An Unusual Dinitro Phytochemical. *Tetrahedron Letters*, 45(6): 1179-1181. doi: 10.1016/j.tetlet.2003.12.002
- Bosenberg, L. H., Zyl D.G.V. 2008, The Mechanism of Action of Oral Antidiabetic Drugs: A Review of Recent Literature, *The Journal of Endocrinology, Metabolism and Diabetes of South Africa*, 13(3): 80-88. doi: 10.1080/22201009.2008.10872177
- Bowman, S.M., Free, S.J. 2006. The Structure and Synthesis of The Fungal Cell Wall. *BioEssay*, 28: 799-808. doi: 10.1002/bies.20441
- Chiou, W.C., Lee, Y.C., Su, Y.H., Wang, Y.Y., Tsai, C.H., Hou, Y.A., Wang, C.H., Huang, Y.F., Huang, C.J., Chou, S.H., Hsieh, P.W., Yuan, S.F. 2016. The Synthetic  $\beta$ -Nitrostyrene Derivative CYTRx20 Inhibits Esophageal Tumor Growth and Metastasis via PI3K/AKT and STAT3 Pathways. *Plos One*, 11(11)e0166453: 1-19. doi: 10.1371/journal.pone.0166453.
- Cornell, H., Nguyen, T., Nicoletti, G., Jackson, N., Hügel, H.M. 2014. Comparison of Halogenated  $\beta$ -Nitrostyrene as Antimicrobial Agents. *Appl. Sci*, 4: 380-389. doi: 10.3390/app4030380
- Dinata, D.I., Suryatno, H., Musfiroh, I., Suherman, S.E. 2014. Simulasi Docking Molekuler Senyawa Xanthorrhizol sebagai Antiinflamasi Terhadap Enzim COX-1 dan COX-2. *IJPST*, 1(1): 7-13.

- Downard, K.M., Sheldon, J.C., Bowie, J.H., Lewis, D.E., Hayes, R.N. 1989. Are The Elusive Ions Mercaptomethyl (-CH<sub>2</sub>SH), Hydroxymethyl (-CH<sub>2</sub>OH), and Aminomethyl (-CH<sub>2</sub>NH<sub>2</sub>) Detectable in The Gas Phase? A Joint ab Initio/experimental Approach. *J. Am. Chem. Soc.*, 111: 8112-8115. doi: 10.1021/ja00203a007
- Frangione, J., Beahm, P.H., Shifrin, V., Jost, C.A., Neel, B.G. 1992. The Non-transmembrane Tyrosine Phosphatase PTP-1B Localizes to The Endoplasmic Reticulum via its 35 Amino Acid C-terminal Sequences. *Cell*, 68: 545-560. doi: 10.1016/0092-8674(92)90190-n
- Garvey, W.T., Maianu, L., Zhu, J.H., Brechtel-Hook, G., Wallace, P., Baron, A.D. 1998. Evidence for Defects in the Trafficking and Translocation of GLUT4 Glucose Transporters in Skeletal Muscle as a Cause of Human Insulin Resistance. *The Journal of Clinical Investigation*, 101(11): 2377-2386. doi: 10.1172/JCI1557
- Ghezzi, P., Jaquet, V., Marcucci, F., Schmidt, H.H.H.W. 2017. The Oxidative Stress Theory of Disease: Levels of Evidence and Epistemological Aspects. *British Journal of Pharmacology*, 174: 1784-1796. doi: 10.1111/bph.13544
- Gow, N.A.R., Hube, B. 2012. Importance of The *Candida albicans* Cell Wall during Commensalism and Infection. *Current Opinion in Microbiology*, 15: 406-412. doi: 10.1016/j.mib.2012.04.005
- Gupta, M., Karmakar, N., Sasmal, S. 2017. *In Vitro* Antioxidant Activity of Aqueous and Alcoholic Extracts of Polyherbal Formulation Consisting of *Ficus glomerata* Roxb. and *Symplocos racemosa* Roxb. Stem Bark Assessed in Free Radical Scavenging Assays. *International Journal of Pharmacognosy and Phytochemical Research*, 9(2): 181-189. doi: 10.25258/phyto.v9i2.8060
- Hanawa, F., Tahara, S., Towers, G.H.N. 2000. Antifungal Nitro Compound from Skunk Cabbage (*Lysichitum americanum*) Leaves Treated with Cupric Chloride. *Phytochemistry*, 53: 55-58. doi: 10.1016/S0031-9422(99)00443-4
- Hudzicki, J. 2009. Kirby-Bauer Disk Diffusion Susceptibility Test Protocol. *American Society for Microbiology: Laboratory Protocols*, 1-23.
- Ingroff, A.E. 2004. Antifungal Agents, dalam Schaechter, M (Ed): *The Desk Encyclopedia of Microbiology*, 4: 47-67. Elsevier Academic Press, San Diego, California. ISBN 0-12-621361-5.
- Kaneto, H., Katakami, N., Matsuhisa, M., and Matsuoka, T. 2010. Role of Reactive Oxygen Species in the Progression of Type 2 Diabetes and Atherosclerosis. *Mediators of Inflammation*, Hindawi Publishing Corporation. doi: 10.1155/2010/453892
- Khabnadideh, S., Rezaei, Z., Pakshir, K., Zomorodian, K., Ghafari, N. 2012. Synthesis and Antifungal Activity of Benzimidazole, Benzotriazole and Aminothiazole Derivatives. *Res. Pharm. Sci.*, 7: 65-72. PMID: 23181082.

- Khan, M.S.A., Ahmad, I., Aqil, F., Owais, M., Shahid, M., Musarrat, J. 2010. Virulence and Pathogenicity of Fungal Pathogens with Special Reference to *Candida albicans*, dalam Ahmad *et al.* (Ed): *Combating Fungal Infections*, 2: 21-45. Springer-Verlag, Berlin. doi: 10.1007/978-3-642-12173-9\_2
- Khatua, S., Ghosh, S., Acharya, K. 2017. Simplified Methods for Microtiter Based Analysis of *In Vitro* Antioxidant Activity. *Asian Journal of Pharmaceutics*, 11(2): 327-335. doi: 10.22377/ajp.v11i02.1272
- Lo, K., Cornell, H., Nicoletti, G., Jackson, N., Hügel, H.M. 2012. A Study of Fluorinated  $\beta$ -Nitrostyrene as Antimicrobial Agents. *Appl. Sci.*, 2: 114-128. doi: 10.3390/app2010114
- Luo, L., Wang, R., Wang, X., Ma, Z., Li, N. 2012. Compounds from *Angelica keiskei* with NQO1 Induction, DPPH Scavenging and  $\alpha$ -Glucosidase Inhibitory Activities. *Food Chemistry*, 131 (3): 992-998. doi: 10.1016/j.foodchem.2011.09.099
- Luzzio, F.A. 2001. The Henry Reaction: Recent Examples. *Tetrahedron*, 57: 915-945. doi: 10.1016/S0040-4020(00)00965-0
- Mee, S.P.H., Lee, V., Baldwin, J.E., Cowley, A. 2004. Total Synthesis of 5,5',6,6'-Tetrahydroxy-3,3'-biindolyl, the Proposed Structure of a Potent Antioxidant Found in Beetroot (*Beta vulgaris*). *Tetrahedron*, 60: 3695-3712. doi: 10.1016/j.tet.2004.02.043
- Mesquita, A.L.F., Fernandes, J.R.M. 2014. Biochemical Properties and Possible Roles of Ectophosphatase Activities in Fungi. *Int. J. Mol. Sci.*, 15: 2289-2304. doi: 10.3390/ijms15022289
- Milhazes, N., Calheiros, R., Marques, M.P.M., Garrido, J., Cordeiro, M.N.D.S., Rodrigues, C., Quinteira, S., Novais, C., Peixe, L., Borges, F. 2006.  $\beta$ -Nitrostyrene Derivatives as Potential Antibacterial Agents: A Structure-property-activity Relationship Study. *Bioorg. Med. Chem.*, 14: 4078-4088. doi: 10.1016/j.bmc.2006.02.006
- Miller, B.R., McGee, T.D., Swails, J.M., Homeyer, N., Gohlke, H., Roitberg, A.E. 2012. MMPBSA.py: An Efficient Program for End-state Free Energy Calculation. *Journal of Chemical Theory and Computation*, 8: 3314-3312. doi: 10.1021/ct300418h
- Murray, R.K., Granner, D.K., Rodwell, V.W. 2009. *Biokimia Harper*, Edisi ke 27, (diterjemahkan oleh : Brahm U.pendit), Penerbit Buku Kedokteran EGC, Jakarta. Hal: 65-69.
- Na, B., Nguyen, P.H., Zhao, B.T., Vo, Q.H., Min, B.S., Wo, M.H. 2015. Protein Tyrosine Phosphatase 1B (PTP1B) Inhibitory Activity and Glucosidase Inhibitory Activity of Compounds Isolated from *Agrimonia pilosa*. *Pharm. Biol.*, 54: 474-480. doi: 10.3109/13880209.2015.1048372
- Nicoletti, G., Cornell, H., Hügel, H.M., White, K.S., Nguyen, T., Zalisniak, L., Nugegoda, D. 2013. Synthesis and Antimicrobial Activity of Nitroalkenylarennes. *Anti-Infective Agents*, 11: 179-191. doi: 10.2174/2211352511311020012

- Pessoa, J.C., Etcheverry, S., Gambino, D. 2015. Vanadium Compounds in Medicine. *Coordination Chemistry Reviews*, 301-302: 24-48. doi: 10.1016/j.ccr.2014.12.002
- Petterson, E.F., Goddard, T.D., Huang, C.C., Couch, G.S., Greenblatt, D.M., Meng, E.C., Ferrin, T.E. 2004. UCSF Chimera - a Visualization System for Exploratory Research and Analysis. *Journal of Computational Chemistry*, 25: 1605-1612. doi: 10.1002/jcc.20084
- Pujiastuti, M.W., dan Sanjaya, I.G.M. 2017. Penentuan Aktivitas Senyawa Turunan Manginiferin Sebagai Antidiabetes Pada Diabetes Mellitus Tipe 2 Secara *In Silico*. *UNESA Journal of Chemistry*, 6(3): 172-176.
- Reddy, M.V.V.V.S., Chakshusmathi, G., Narasu, M.L. 2012. Small Molecule Inhibitors of PTP1B and TCPTP. *Int. J. Pharm. Phytoparmacol. Res*, 1: 287-291. ISSN 2250 – 1029.
- Rizvi, S.M.D., Shakil, S., Haneef, M. 2013. A Simple Click by Click Protocol to Perform Docking: Autodock 4.2 Made Easy for Non-bioinformaticians. *EXCLI Journal*, 12: 831-857. ISSN 1611-2156.
- Saltiel, A.R., Kahn, C.R. 2001. Insulin Signaling and The Regulation of Glucose and Lipid Metabolism. *Nature*, 414(6865): 799-806. doi: 10.1038/414799a
- Shapiro, R.S., Robbins, N., Cowen, L.E. 2011. Regulatory Circuitry Governing Fungal Development, Drug Resistance, and Disease. *Microbiol. Mol. Biol. Rev*, 75: 213-267. doi: 10.1128/MMBR.00045-10
- Shaw, J.E., Sicree, R.A., Zimmet, P.Z. 2010. Global Estimates of The Prevalence of Diabetes for 2010 and 2030. *Diabetes Research And Clinical Practice*, 87: 4-14. doi: 10.1128/MCB.21.15.5082-5093.2001
- Smits, G.J., Kapteyn, J.C., Ende, H.V., Klis, F.M. 1999. Cell Wall Dynamics in Yeast. *Current Opinion in Microbiology*, 2: 348-352. ISSN 1369-5274.
- Solomon, F.R., Case, D.A., Walker, R.C. 2013. An Overview of The Amber Biomolecular Simulation Package. *Wiley Interdisciplinary Reviews: Computational Molecular Science*, 3: 198-210. doi: 10.1002/wcms.1121
- Song, Y.H., Uddin, Z., Jin, Y.M., Li, Z., Long , M.J.C., Kim, K.D., Cho, J.K., Park, K.H. 2017. Inhibition of Protein Tyrosine Phosphatase (PTP1B) and  $\alpha$ -Glucosidase by Geranylated Flavonoids from *Paulownia tomentosa*. *Journal of Enzyme Inhibition and Medical Chemistry*, 32(1): 1195–1202. doi: 10.1080/14756366.2017.1368502
- Sotiriou, A., 2016, Novel Target for The Development of Drug for Type 2 Diabetes Mellitus. *Dissertation*, Wageningen University, Wageningen.
- Sun, L.P., Gao, L.X., Ma, W.P., Nan, F.J., Li, J., Piao, H.R. 2012. Synthesis and Biological Evaluation of 2,4,6-Trihydroxychalcone Derivatives as Novel Protein Tyrosine Phosphatase 1B Inhibitors. *Chem. Biol. Drug*, 80: 584-590. doi: 10.1111/j.1747-0285.2012.01431.x

- Sun, J., Qu, C., Wang, Y., Huang, H., Zhang, M., Li, H., Zhang, Y., Wang, Y., Zou, W. 2016. PTP1B, A Potential Target of Type 2 Diabetes Mellitus. *Mol. Biol.*, 5: 174. doi: 10.4172/2168-9547.1000174
- Suryawanshi, S., Kulkarni, P. 2020. Theoretical Validation of Medicinal Properties of *Curcuma longa* Linn. *Rasayan J. Chem.*, 13(1): 245-248. doi: 10.31788/RJC.2020.1315581
- Tamrakar, A.K., Maurya, C.K., Rai, A.K. 2014. PTP1B Inhibitor for Type 2 Diabetes Treatment: A Patent Review (2011 – 2014). *Expert Opin. Ther. Patent*, 24: 1-15. doi: 10.1517/13543776.2014.947268
- Tashrifî, Z., khanaposhtani, M.M., Ardestani, M.S., Safavi, M., Moghadam, K.R., Mehrdad, M., Larijani, B., Mahdavi, M. 2019. Design, Synthesis and In vitro Cytotoxicity of New 1,2,3-triazol- and Nitrostyrene Hybrids as Potent Anticancer Agents. *Letters in Drug Design & Discovery*, 16 (2): 213-219. doi: 10.2174/1570180815666180427151830
- Tonks, N.K. 2003. PTP1B: From The Sidelines to The Frontlines!. *FEBS Letters*, 546: 140-148. doi: 10.1016/S0014-5793(03)00603-3
- Trinajstić, N. 1968. Calculation of Carbon-Sulphur Bond Lengths. *Tetrahedron Letters*, 9: 1529-1532. doi: 10.1016/S0040-4039(01)98993-2
- Tsai, C.H., Hung, A.C., Chen, Y.Y., Chiu, Y.W., Hsieh, P.W., Lee, Y.C., Su, Y.H., Chang, P.C., 5, Stephen Chu-Sung Hu, S.C., Yuan, S.F. 2017. 3'-Hydroxy-4'-methoxy- $\beta$ -methyl- $\beta$ -nitrostyrene Inhibits Tumorigenesis in Colorectal Cancer Cells through ROS-mediated DNA Damage and Mitochondrial Disfunction. *Oncotarget*, 8(11): 18106-18117. doi: 10.18632/oncotarget.14996
- Verma, M., Gupta, S.J., Chaudhary, A., Garg, V.K. 2017. Protein Tyrosine Phosphatase 1B as Antidiabetic Agents - A Brief Review. *Bioorg. Chem.*, 70: 267-283. doi: 10.1016/j.bioorg.2016.12.004
- Wang, J., Wang, W., Kollman, P.A., Case, D.A. 2006. Automatic Atom Type and Bond Type Perception in Molecular Mechanical Calculations. *Journal of Molecular Graphics and Modeling*, 25: 247-260. doi: 10.1016/j.jmgm.2005.12.005
- Wang, F., Zhou, B. 2018. Toward The Identification of A Reliable 3D-QSAR Model for The Protein Tyrosine Phosphatase 1B Inhibitors. *Journal of Molecular Structure*, 1158: 75-87. doi: 10.1016/j.molstruc.2018.01.011
- Wei., C.K., Chang, F.R., Hsieh, P.W., Wu, C.C. 2015. Inhibition of The Interactions Between Metastatic Human Breast Cancer Cells and Platelets by  $\beta$ -Nitrostyrene Derivatives. *Life Sciences*, 143: 147-155. doi: 10.1016/j.lfs.2015.11.003
- Widowati, W. 2008. Potensi Antioksidan sebagai Antidiabetes. *JKM*, 7(2): 1-11.
- Wilcox, G. 2005. Insulin and Insulin Resistance. *Clin. Biochem. Rev.*, 26(2): 19-39. PMID: 16278749.

Worrall, D.E. 1941. Nitrostyrene [Styrene,  $\beta$ -nitro-]. *Organic Syntheses*, 1: 413. doi: 10.15227/orgsyn.009.0066