

DAFTAR PUSTAKA

- Adams, J.M. and Cory, S. 1998. The Bcl-2 Protein Family: Arbiter of Cell Survival. *Science* 281: 1322-1325.
- Amundson SA, TG Myers, D Scudiero, S Kitada, JC Reed, AJ Fornace Jr. 2000. An Informatics Approach Identifying Markers of Chemosensitivity in Human Cancer Cell Lines, *Canc. Res.*, 60, 6101-6110.
- Andi., Didik., Judhi, Ferry. 2009. Uji Aktivitas Sitotoksik Ekstrak Etanol Buah Mengkudu Dan Kombinasinya Dengan Doksorubisin Terhadap Sel MDBK Dan MCF-7. FFUP. Jakarta.
- Anonim, 2007, ATCC Cell Biology, available from <http://www.atcc.org/common/catalog/numSearch/numResults.cfm?atcc Num=HTB-22>, cited in 8 May 2014.
- Arribas, F., Alvarez, T., Del Val, G., Martin-Garabato, E., Nunez-Villar, M.J., Lucas, R., Sanchez, J., Tejerina, A. & Schneider, J. 2007. Bcl-2 expression in breast cancer: a comparative study at the mRNA and protein level. *Anti-Cancer Res.* 27(1A): 219-22.
- Arun, B., Kilic, G., Yen, C., Foster, B., Yardley, D., Gaynor, R. & Ashfaq, R. 2003. Correlation of Bcl-2 and p.53 expression in primary breast tumors and corresponding metastatic lymph nodes. *Cancer* 98(12): 2554-2559.
- Badan Penelitian dan Pengembangan Kesehatan. 1991. Inventarisasi Tanaman Obat Indonesia Jilid 1. Jakarta. Departemen Kesehatan RI
- Barbareschi, M., Caffo, O., Veronese, S., Leek, RD., Fina, P., Fox, S., Bonzanini, M., Girlando, S., Morelli, L., Eccher, C., Pezzela, F., Doglioni, C., Dalla Palma, P. & Harris, A. 1996. Bcl-2 and p53 expression in node-negative breast carcinoma: a study with long-term follow-up. *Hum. Pathol.* 27: 1149-1155.
- Basman, J., Amini, S., Sugiyono dan Murniyati. 2009. Seminar Nasional Pengolahan Produk dan bioteknologi Kelautan dan Perikanan. Jakarta:iii 208 hlm.
- Beck R, et al. Abdominal Compartment Syndrome in Children. *Pediatr Crit Care Med*, 2001; 2:1, p51-56
- Benjamin, R.S., and Ewer, M.S., 2006. Doxorubicin Cardiotoxicity: Clinical Aspect, Recognition, Monitoring, Treatment, and Prevention. In: Yeh. E., Ewer, M.S., ed. *Cancer and the heart*. Ontario: BC Decker, 9-31
- Bintang, D., Hardika, D., S., Prabaningrum, D.H., Dzilqi, B.H., Nur, O., Rifki, F., 2013, 20 Maret, Kajian Secara In Vitro Ekstrak Buah Mengkudu Sebagai Obat Kanker Payudara yang Potensial. PKM-AI, Direktorat Jendral Pendidikan Tinggi, Jakarta

- Blanco, Y.C. 2006. The Noni Fruit (*Morinda citrifolia* L.) : A review of Agricultural Research, Nutritional and Therapeutic Properties. *Journal of Food Composition and Analysis*. 19 :645–654.
- Bruton L., Lazo JS, Parker KL. 2005. *Goodman & Gilman's The Pharmacological Basis of Therapeutics*, 11th Edition, McGrawHill, Lange.
- Bugger, H., Guzman, C., Zechner, C., Palmeri, M., Russel,K., Russell, R.R.,2010. Uncoupling Protein Downregulation in Doxorubicin-Induced Hear
- Butt, A.J., Firth, S.M., King, M.A., and Baxter, R.C., 2000, Insulin-Like Growth Factor-Binding Protein-3 Modulates Expression of Bax and Bcl-2 and Potentiates P53-Independent Radiation-Induced Apoptosis In Human Breast Cancer Cells, *J. Biol Chem*, 275(50):39174-39181.
- Carlson, R.W., 2008. Continuous Intravenous Infusion Chemotherapy. In:Michael Clinton Perry., ed. *The Chemotherapy Source Book Fourth Edition*. Philadelphia: Lippincott Williams & Wilkins, 79-85.
- CCRC., 2009, *Standard Operating Procedure*, Cancer Chemoprevention Research Cancer Fakultas Farmasi Universitas Gadjah Mada, Yogyakarta
- Davis, J.M., Navolanic, P.M., Weinstein-Oppenheimer, C.R., Steelman, L.S., Wei H., Konopleva, M., Blagosklonny, M.V., McCubrey, J.A., 2003, Raf-1 and Bcl-2 Induce Distinct and Common Pathways That Contribute to Breast Cancer Drug Resistance,*Clinical Cancer Research*,9, 1160–1170
- Departemen Kesehatan RI. 1989. *Materia Medika Indonesia Jilid V*. Departemen Kesehatan RI, Jakarta. Hal. 523 – 555.
- Dipiro, J. T., Talbert, R. L., Yee, G. C., Matzke, G. R., Wells, B. G., and Rosey, I. M., 2005, *Pharmacotherapy ; A Pathophysiologic Approach*, Sixth Edition, School of Pharmacy, University of Pittsburgh, 2347-2356, 2471.
- Distefano, G., 2009. Molecular Pathogenic Mechanism and New Therapeutic Perspectives in Anthracycline-induced Cardiomyopathy. *Italian Journal of Pediatrics*, 35:37 (1) : 1-8.
- Djauhariya E. 2003. Mengkudu (*Morinda citrifolia* L.) Tanaman Obat Potensial. Balai Penelitian Tanaman Rempah dan Obat. *J Pengembangan. Tek.TRO*. 15(1) : 1-16.
- Doroshov, J.H., 2010. Topoisomerase II inhibitors: Anthracyclines. In: Longo, D.L., Chabner, B.A., ed. *Cancer Chemotherapy and Biotherapy:Principles and Practice*. Philadelphia: Lippincott Williams & Wilkins,356-390.
- Doyle, A., Griffiths, J. B, 2000, *Cell and Tissue Culture for, Medical Research*. John Willey and Sons Ltd, New York East Asian Region, Report of an Inter-Country Consultation, 2005.
- Feigl, F., 1960, *Spot Test in Organic Analysis*, 6th ed., 418-419
- Fisher, D.E. "Apoptosis in Cancer Therapy: Crossing the Treshold." *Cell*, 1994: 539-542

- Foster, J.S., Henley, D.S., Ahamed, S., Wimalasena, J., 2001. Estrogen and Cell Cycle Regulation in Breast Cancer. *Trend in Endocrinology and Metabolism*. 12 (7): 320-327.
- Fotakis, G. & Timbrell, J.A. 2006. *In vitro* cytotoxic assays: Comparison of LDH, neutral red and protein assay in hepatoma cell lines following exposure to cadmium chloride, *Toxicology Letter*, 160: 171-177.
- Frank, N.Y., Margaryan, A., Huang, Y., Schatton, T., Waaga-Gasser, A.M., Sayegh, M.H., Sadee, W. and Frank, M.H., 2005, ABCB5-Mediated Doxorubicin Transport and Chemoresistance in Human Malignant Melanoma, *Cancer Research*, 65(10):4320-4333.
- Freshney, I.R., 1987. Culture of Animal Cell: A Manual Basic of Technique, 2nd edition, Alan R. Liss Inc., New York, pp. 227-292.
- Gewies, 2003, Introduction to Apoptosis. *Apo Review*, 3(1):1-26
- Gianni, L., Grasselli, G., Cresta, S., Lucatelli, A., Gano, L.V., and Minotti, G., 2003. Anthracycline. In: Schilsky, R., Sonde, P., Giaccone, G., ed. Cancer chemotherapy and biological response modifiers: annual 21, Amsterdam: Elsevier B.V., 29-37.
- Gruber, Elthon., 2002, Production and Action of Estrogen, *The New England Journal of Medicine*, Vol. 346 No. 5, 340-352
- Gustafsson, J.A. 1999, Estrogen receptor, a new dimension in estrogen mechanism of action, *J Endocrinol* 163:379-383
- Gyorffy, B., Serra, V., Jurchott, K, Abdul-Ghani, R., Garber, M., Stein, U., Petersen, I, Lage, H, Dietel, M. and Schafer, R., 2008, Prediction of doxorubicin sensitivity in breast tumors based on gene expression profiles of drug-resistant cell lines correlates with patient survival, *Nature*, ISSN:0950-9232, EISSN:1476-5594.
- Halimah, 2010, Uji Fitokimia dan Uji Toksisitas Ekstrak Tanaman Anting-anting (*acalpha indica* Linn.) terhadap larva udang (*Artemia salina* Leach.). Skripsi. Jurusan Kimia Fakultas Sains dan Teknologi. Universitas Islam Negeri Maulana Malik Ibrahim. Malang.
- Hanahan, D., Weinberg, R. A, 2000, Keunggulan dari kanker, *Sel* 100: 57-70. DOI: [10.1016/S0092-8674\(00\)81683-9](https://doi.org/10.1016/S0092-8674(00)81683-9)
- Hapsari, Feby. 2014. Uji Aktivitas Kemopreventif Fraksi Kloroform Ekstrak Etanolik Buah Mengkudu (*Morinda Citrifolia* L.) pada Sel Kanker Payudara MCF-7 secara *In Silico* dan *In Vitro*. UMY. Yogyakarta.
- Harborne, J. B. 1987. Metode Fitokimia. Penentuan Cara Modern Menganalisis Tumbuhan. Penerbit ITB: Bandung
- Harborne, J. B. 1996. Metode Fitokimia : Penuntun Cara Modern Menganalisa Tumbuhan Diterjemahkan oleh : K. Padmawinata dan I. Soediro. Penerbit ITB, Bandung.

- Heiser, D., Labi, V., Erlacher, M. & Villunger, A. 2004. The Bcl- 2 protein family and its role in the development of neoplastic disease. *Experimental Gerontol.* 9: 1125-1135.
- Herbert, S. 2003. Advances in Breast Cancer Therapy and Chemoprevention: Current Strategies and New Approaches. *Cancer Therapy*, 1: 363- 371.
- Hermawan, A., Meiyanto, E., and Susidarti, A., 2010, Hesperidin Meningkatkan Aktivitas Sitotoksik Doxorubicin pada Sel MCF-7, *Indonesian J. of Pharm.*, 21(1), 8-17.
- Herr, I. Debatin, K.M. 2001. Cellular Stress Response and Apoptosis in Cancer Therapy. *Blood.* 98 :2603-2614.
- Ikawati, Zullies. 2008. Pengantar Farmakologi Molekuler. Gadjah Mada University Press. Yogyakarta
- Ioachim, E.E., Malamou-Mitsi, V., Kamina, S.A., Goussia, A.C. & Agnantis, N.J. 2000. Immunohistochemical expression of bcl-2 protein in breast lesions: correlation with Bax, p53, Rb, C-erbB-2, EGFR and proliferation indices. *Anticancer Res.* 20 (6B): 4221-4225
- Jenie, R.I. Meiyanto, E. 2006. Efek antiangiogenik ekstrak etanolik daun sambung nyawa (*Gynura procumbens* (Lour.) Merr.) pada membran korio alantois (CAM) embrio ayam. *Indonesian J. Pharm.* 17(1):50-55.
- Jenie, R.I., Meiyanto, E. 2009. Aplikasi Ko-Kemoterapi Fraksi Etil Asetat Ekstrak Etanolik Daun Sambung Nyawa (*Gynura procumbens* (Lour.)Merr.) pada Sel Kanker Payudara MCF-7. *Majalah Ilmu Kefarmasian*, Vol. VI, No. 3. 132-141.
- Junaedi, Sendy, Endah P. Septi. 2008. Uji Sitotoksik Metode MTT. Cancer Chemoprevention Research Center. Fak. Farmasi UGM.
- Kitagawa, S. "Inhibitory Effect of Polyphenols on P-Glycoprotein-Mediated Transport." *Biol. Pharm. Bull.*, 2006: 1-6
- Khan, M., Pelengaris, S., 2006. Introduction. In: Khan, M., Pelengaris, S., ed. *The Molecular Biology of Cancer*, Oxford: Blackwell Publishing, 1-32.
- Kumar, Ravi, Majeti, N. V., 2000. A Review of Chitin and Chitosan Applications. *Reactive & Functional Polymers*. Vol. 46, pp. 1-3.
- Laras L. 2009. Analisa Faktor Pendidikan pada Wanita Peserta Program Penapisan Kanker Leher Rahim dengan Pendekatan "See dan Treat". FKUI. www.lontar.ui.ac.id/file?file=digital/122569-S09011fk.
- Machek, K., 1972, *Pharmaceutical Application of Thin Layer and Paper Chromatography*, 563-565, Elsevier Publishing Company, London.
- Manahan, D., Wienberg, R.A., 2002. The Hallmarks of Cancer, *Cell*, 100, 57-70
- Medicafarma., 2006., Ekstraksi. Medicafarma.blogspot.com/2006
- Meiyanto, E. 1999.'Kurkumin Sebagai Obat Anti Kanker : Menelusuri Mekanisme Aksinya', *Majalah Farmasi Indonesia*, 10 (4): 224-236.

- Meiyanto, E., 2003, *Biologi Molekuler*, Buku Ajar, Proyek QUE Fakultas Farmasi, Universitas Gadjah Mada, Yogyakarta.
- Meiyanto, E., Fitriana, M., Armandari, I., Septhea, D.B., Ikawati, A.H.M., 2011, Ekstrak Etanolik Herba Ciplukan (*Physalis angulata* L.) berefek sitotoksik dan Menginduksi Apoptosis Pada Sel Kanker Payudara MCF-7, *Bionatura – Jurnal Ilmu-ilmu Hayati dan Fisik*, Vol. 13 : 101 – 107
- Meiyanto. E. S., Riyanto. S., Anugrah. B., Adina. Franciscus., Febyhandoko, Indah. Ikawati. Septisetiyani. 2008. Ekstrak etanolik kulit jeruk nipis (*Citrus aurantifolia* (crism.) Swingle) meningkatkan sensitivitas sel MCF-7 terhadap doxorubicin. *Prosiding Kongres Ilmiah XVI ISFI*.
- Meiyanto. E. S., Susidarti, S. S., Handayani, S. Dan Rahmi. F. 2008. Ekstrak etanolik biji buah pinang (*Areca catechu* L.) mampu menghambat proliferasi dan memacu apoptosis sel MCF-7. *Majalah Farmasi Indonesia*. 19(1): 12-19
- Melannisa, R. 2004. Pengaruh PGV-1 pada Sel Kanker Payudara T47D yang diinduksi 17 α -Estradiol: Kajian antiproliferasi, pemacuan apoptosis, dan antiangiogenesis, Thesis Fakultas Farmasi UGM, Yogyakarta
- Minotti, G., Menna, P., Salvatorelli, E., Cairo, G., & Gianni, L. 2004. Anthracyclins: Molecular Advances and Pharmacologic Developments in Antitumor Activity and Cardiotoxicity. *Pharmacology Review*, 56: 185-228
- Motiejunas, D., Wade, R. 2006. Structural, Energetics, and Dynamic Aspects of Ligand-Receptor Interactions. In J. B. Taylor & D. J. Triggle (Eds.), *Comprehensive Medicinal Chemistry II Volume 4: Computer-Assisted Drug Design* (Vol. 4, pp. 193–214). Elsevier.
- Mross K., Massing U., and Kratz, F., 2006. DNA intercalator- the anthracyclines. In: Smorenburg, C.H., Pinedo, H.M., ed. *Drugs affecting growth of tumours*, Amsterdam: Die Deutsche Bibliothek, 19-79.
- Murray R.K., Granner D.K., Mayes P.A., and Rodwell V.W. 2003. 'Kanker, Oncogen dan Faktor-faktor Pertumbuhan .'dalam *Biokomia Harper*, diterjemahkan oleh Hartono A. edisi 2, penerbit EGC, Jakarta.
- Onuki, R., Kawasaki, H., Baba, T., and Taira, K., 2003, Analysis of A Mitochondrial Apoptotic Pathway Using Bid-Targeted Ribozymes in Human MCF7 Cells in the Absence of A Caspase-3-Dependent Pathway, *Antisense and Nucleic Acid Drug Development*, 13 (2): 75-82.
- Peter. 2005. Chemical Constituents and Noni's Function. *Noni News Indian Magazine*. Edisi Oktober (2) X.
- Purnomo. H. 2011. Kimia komputasi: *molecular docking plants penambatan molekul plants (protein-ligand-ant-system)* (" ilmu semut"), pustaka pelajar, Yogyakarta.

- Rafii, S. 2002. Efficient mobilization and recruitment of marrow-derived endothelial and hematopoietic stem cells by adenoviral vectors expressing angiogenic factors. *J Gene Ther* 9: 631–641
- Riset Kesehatan Dasar. 2007. Penderita Kanker Diperkirakan Menjadi Penyebab Utama Beban Ekonomi Terus Meningka. Kementerian Kesehatan RI. Diakses tanggal 8 Mei 2014.
<http://www.depkes.go.id/index.php?vw=2&id=1937>.
- Ren W., Qiao Z., Wang H., Zhu L., & Zhang L. Flavonoids. 2003. Promising Anti cancer Agents. *Med Res Rev*, 23(4): 519-534.
- Reynolds, C.P. and Maurer, B.J., 2005, Evaluating Response to Antineoplastic Drug Combinations in Tissue Culture Models, *Methods in Molecular Medicine*, 110, 173-183.
- Robert, J., 2005. Anthracyclines. In: Mcleod, H.L., Newell, D.R., Schellness, J.H., ed. *Cancer Clinical Pharmacology*, Oxford: Oxford University Press, 117-132.
- Sanchez-Barcelo, Emilio J. *et al.*, 2005. Melatonin-estrogen interactions in breast cancer. *Journal of Pineal Research*, 38(4), pp.217–222.
- Shapiro, G. I. and Harper, J. W. “Anticancer Drug Targets: Cell Cycle and Checkpoint Control.” *J. Clin. Invest*, 1999: 1645-1653
- Sato, T., Yuyama, Y., Watabe, K., Okazaki, A., Toda, K., Okazaki, M. & Hirata, K. 1997. Detection of p53 gene mutations in fine-needle aspiration biopsied breast cancer specimens: correlation with nuclear p53 accumulations and tumor DNA aneuploidy patterns. *Cancer Let*. 115: 47-55.
- Seokjoon, L., Khrisnamoorthy, S., Woon-seob, s., Fang, X., Qian, W. “Synthesis and Anti Angiogenesis Activity of Coumarin Derivates.” *Bioorganic and Medical Chemistry Letters*. 2006: 4596-4599
- Sherwin E.R., in. A. L., Branen, P. M., Davidson, S., Salminen, 1990, Eds., *Food Additives*, Marvel Dekker Inc., New York,;139–193.
- Sierra, A., Castellsague, X., Tortola, S., Escobedo, A., Lloveras, B., Peinado, M.A., Moreno, A. & Fabra, A. 1996. Apoptosis loss and bcl-2 expression: key determinants of lymph nodes metastases in T1 breast cancer. *Clin. Cancer Res*. 2(11): 1887-1894.
- Sismindari, 2012, *Seri Biologi Molekuler Farmasi: Replikasi DNA dan Mutasi*. Pustaka Pelajar, Yogyakarta
- Suryowinoto, S. M. 1997. *Flora Eksotika, Tanaman Peneduh*. Penerbit Kanisius, Yogyakarta.
- Sutarno, S. Dkk. 1993. *Standard of Asean Herbal Medicine. Volume I*. Jakarta: Asean Countries Publishing. Pages. 474-476.

- Swisher, M., and Olsen, M., 2009. Hematopoietic and Immune System Drugs. In: Venable, S.J., Aschenbrenner, D.S., ed. *Drug Therapy in Nursing* 3rd edition. Philadelphia: Lippincott Williams & Wilkins, 732-737.
- Syarif, Amir, 2009. *Farmakologi dan Terapi*, edisi 13. IV, Penerbit IV, Penerbit: Bagian Farmakologi FKUI, Jakarta.
- Synold, T., and Doroshow, J.H., 2004 . *Pharmacological Basis for High-Dose Chemotherapy*. In: Blume, K.G., Forman, S.J., Appelbaum, F.R., Thomas, E.D., ed. *Thomas' hematopoietic cell transplantation*, 4th edition. Massachusetts: Blackwell Publishing Ltd, 145-147.
- Tronccone, G., Zeppa, P., Vetrani, A., D'Arcangelo, A., Fulciniti, F., De Divitiis, B. & Palombini, L. 1995. Bcl-2 protein in breast cancer cells obtained by fine needle aspiration (FNA): a preliminary report. *Cytopathol.* 6(4): 219-25.
- Villar, E., Redondo, M., Rodrigo, I., Garcia, J., Avilla, E. & Matilla, A. 2001. Bcl-2 expression and apoptosis in primary and metastatic breast carcinomas. *Tumour Biol.* 22(3): 137-145.
- Virshup, D.M. 2010. *Biology, Clinical Manifestation, and Treatment of Cancer*. Dalam: S.E. Huether, et al. *Pathophysiology: The Biologic Basis for Disease in Adults and Childhood*. Missouri : Mosby Elsevier, 2010.
- Wagner, H., Bslt, S., Zgainski, E. M. 1984. *Plant Drug Analysis translated by A. Scott*. German: Spingerverlag Berlin Heidelberg.
- Waha, M. G. 2000. *Sehat dengan Mengkudu*. Jakarta: MSF Group: 1-16.
- Wallace, K.B., 2001. Doxorubicin-Induced Mitochondrial Cardiomyopathy. *Mitochondrial in Pathogenesis* 25(1) : 467-488
- Wang, M.Y., West, B.J., Jensen, C.J., Nowicki, D., Chen, S., Palu, A.K., dan Anderson, G., 2002. *Morinda citrifolia* (Noni): A literature review and recent advances in Noni research, *Acta Pharmacologica Sinica*, 23 (13): 1127 – 1141
- Wattanapitayakul, S.K., Chularojmontri L., Herunsalee A., Charuchongkolwongse S., Niumsakul S., and Bauer J.A., 2005, Screening of Antioxidants from Medicinal Plants for Cardioprotective Effect against Doxorubicin Toxicity, *Basic and Clin. Pharmacol.*
- Wichi H.P. 1988. *Food Chem. Toxicol.* 26: 717
- Winarti, C. 2005. Peluang Pengembangan Minuman Fungsional dari Buah Mengkudu (*Morinda citrifolia* L.). *Jurnal Litbang Pertanian.* 24 (4) : 149-155.
- Wu S, L., Ng, D.Lin., S.Huang., S.Wang, & C.Lin. 2009. Extract Induces Apoptosis in Human Hep G2 Cells through CD95/ CD95L system and the Mitochondrial Signaling Transduction Pathway. *Cancer Letters*, 215(2):199-208.

- Yang, Q., Sakurai, T., Jing, X., Utsunomiya, H., Shan, L., Nakamura, Y., Nakamura, M., Oura, S., Suzuma, T., Yoshimura, G., Umemura, T., Kokawa, Y. & Kakudom K. 1999. Expression of Bcl-2, but not Bax, correlates with estrogen receptor status and tumor proliferation in invasive breast carcinoma. *Pathol. Int.* 49: 775-780.
- Zampieri L, P Bianchi, P Ruff, P Arbuthnot. 2002. Differential modulation by estradiol of P-gly- coprotein drug resistance protein expression in cultured MCF7 and T47D breast cancer cells, *Anticancer Res.*, 22(4): 2253-9.
- Zhao L, Wientjes MG, Au JL., 2004, Evaluation of combination chemotherapy: integration of nonlinear regression, curve shift, isobologram, and combination index analyses. *Clin Cancer Res* 10: 7994-8.
- Zuhud, E., 2011. Bukti Kedahsyatan Sirsak Menumpas Kanker. Yunita Indah. Cet-1. Agromedia Pustaka : Jakarta
- World Health Organization.* 2010. Penderita Kanker Diperkirakan Menjadi Penyebab Utama Beban Ekonomi Terus Meningka. Kementerian Kesehatan RI. Diakses tanggal 8 Mei 2014.
<http://www.depkes.go.id/index.php?vw=2&id=1937>.

LAMPIRAN

Lampiran 1. Surat Izin Penelitian di Laboratorium Penelitian UMY



LABORATORIUM FITOMEDISINAL
 PRODI FARMASI FKIK UMY
 Jl. Lingkar Selatan, Tamantirto, Kasihan, Bantul, Yogyakarta 55183
 Telp. (0274) 387656, Fax. (0274) 387646

PRODI FARMASI FAKULTAS KEDOKTERAN DAN ILMU KESEHATAN UMY FORMULIR PENDAFTARAN "PEMBUATAN EKSTRAK"	No. Dokumen : 4/FITO/FKUMY/I/2012
	Tanggal Terbit : 1 Januari 2012
	No. Revisi : 0
	Halaman : 1 dari 1

Nama	Dita Prabaningrum Handayani
Alamat	Petum Winong FG II 1A15 Kotagede Yogyakarta
Instansi	Farmasi
No. Telp/ HP	081229 77 85 44
Nama sampel	Mengkeudu
Kode sampel	
Pengujian	
Tanggal masuk	24 Februari 2014
Tanggal jadi	

Yogyakarta, 19 Februari 2014

Petugas penerima,

(Linggar W. U)

Yang mengajukan

(Dita P.H.)

Menyetujui,
 Kepala Lab. Fitomedisinal

(Rifki F, M.Sc, Apt.)

Lampiran 2. Surat Izin Penelitian di Laboratorium Parasitologi, Kedokteran UGM



BAGIAN PARASITOLOGI
FAKULTAS KEDOKTERAN UNIVERSITAS GADJAH MADA
Gedung Prof. Drs. R. Radlopoetro Lt. IV Sayap Timur, Sekip, Yogyakarta 55281.
Telp. (0274) 546215. Fax. 546215. E-mail : parasitfkugm@yahoo.com

Nomor : UGM/KU/Prst/ 525 /M/05/07
Hal : Ijin Penelitian. 4 November 2014

Kepada Yth. : DITA PRABANINGRUM HANDAYANI
PS Farmasi Fakultas Kedokteran dan Ilmu Kesehatan
Universitas Muhammadiyah Yogyakarta

Dengan hormat,


Menanggapi surat saudara tertanggal 8 Oktober 2014 tentang ijin untuk melakukan penelitian di Laboratorium Parasitologi yang berjudul:

"UJI KOMBINASI EKSTRAK ETIL ASETAT BUAH MENKUDU (*Morinda citrifolia* L.) DENGAN SENYAWA DOXORUBICIN PADA SEL KANKER PAYUDARA MCF-7 SECARA *IN VITRO* DAN *IN SILICO*"

Kami dapat mengijinkan penelitian tersebut dilakukan di Bag. Parasitologi FK. UGM., dengan catatan :

1. Mentaati peraturan yang berlaku di FK. UGM. dan Bag. Parasitologi FK. UGM.
2. Sebagai supervisor dalam melaksanakan penelitian ini adalah Prof. dr. Supargiyono, DTM&H., SU., PhD., SpParK., dengan Teknisi: Rumbiwati.
3. Menulis semua kegiatan dan hasil penelitian yang dilakukan di laboratorium dalam buku Log Penelitian; buku Log ditinggal di Laboratorium.
4. Menerapkan prinsip **Good Clinical Laboratory Practice** pada saat bekerja di laboratorium.
5. Setelah selesai melaporkan hasilnya kepada Kepala Bagian.

Atas perhatian dalam hal ini kami ucapkan terima kasih.

Kepala Bagian,

dr. Tri Baskoro T. Satoto, MSc., PhD.
NIP. 19580412 198601 1 001.

Tembusan Yth. : 1. Prof. dr. Supargiyono, DTM&H., SU., PhD., SpParK.
2. Rumbiwati
3. Arsip

Lampiran 3. Surat Determinasi Tanaman



**BAGIAN BIOLOGI FARMASI
FAKULTAS FARMASI
UNIVERSITAS GADJAH MADA YOGYAKARTA**

Alamat: Sekip Utara Jl. Katurang Km 4, Yogyakarta 55281
Telp. : 0274.542738, 0274.649.2568 Fax. +274-543120

SURAT KETERANGAN

No. : BF/285/ Ident/Det/VI/2014

Kepada Yth. :
Sdr/Sdr. Rajendra Agillion
NIM. 20130350068
Fakultas Farmasi UMY
Di Yogyakarta

Dengan hormat,

Bersama ini kami sampaikan hasil identifikasi/determinasi sampel yang Saudara kirimkan ke Bagian Biologi Farmasi, Fakultas Farmasi UGM, adalah :

No.Pendaftaran	Jenis	Suku
285	<i>Morinda citrifolia</i> L.	Rubiaceae

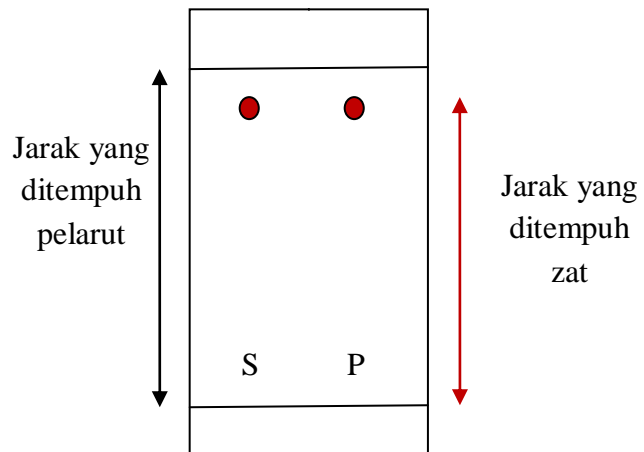
Demikian, semoga dapat digunakan sebagaimana mestinya.

Yogyakarta, 26 Juni 2014
Ketua

Prof. Dr. Wahyono, S.U., Apt.
NIP. 195007011977021001

Lampiran 4. Perhitungan Hasil Uji KLT

Pengukuran nilai R_f KLT sebagai berikut :



$$R_f = \frac{\text{Jarak yang ditempuh zat}}{\text{jarak yang ditempuh pelarut}}$$

- $R_f = \frac{3,5}{8} = 0,44$
- $R_f = \frac{6}{8} = 0,75$
- $R_f = \frac{7}{8} = 0,87$

Lampiran 5. Perhitungan Hasil Uji Sitotoksik

a. Uji tunggal

- Ekstrak etil asetat buah mengkudu

Replikasi	Dosis ($\mu\text{g/mL}$)					
	750	375	187,5	93,75	46,88	23,44
1	0,115	0,116	0,315	0,546	0,484	0,466
2	0,114	0,107	0,412	0,452	0,484	0,44
3	0,119	0,126	0,289	0,447	0,448	0,401
Rata-rata	0,116	0,116	0,339	0,482	0,472	0,436
% Hidup	18,314	18,437	99,877	152,258	144,717	135,409

KONTROL	SEL	MEDIA
1	0,33	0,06
2	0,369	0,065
3	0,32	0,073
Rata rata	0,339	0,066

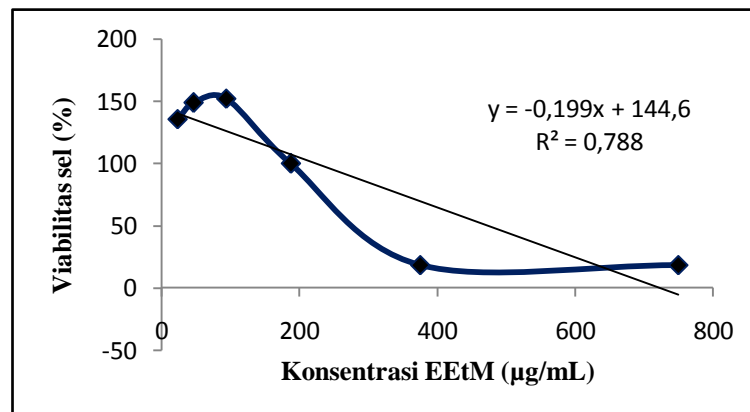
1. Rata-rata absorbansi tiap dosis

- Dosis 750 $= \frac{0,115+0,114+0,119}{3} = 0,116 \mu\text{g/ml}$
- Dosis 375 $= \frac{0,116+0,107+0,126}{3} = 0,116 \mu\text{g/ml}$
- Dosis 187,5 $= \frac{0,315+0,412+0,289}{3} = 0,339 \mu\text{g/ml}$
- Dosis 93,75 $= \frac{0,546+0,452+0,447}{3} = 0,482 \mu\text{g/ml}$
- Dosis 46,88 $= \frac{0,484+0,484+0,448}{3} = 0,472 \mu\text{g/ml}$
- Dosis 23,44 $= \frac{0,466+0,44+0,401}{3} = 0,436 \mu\text{g/ml}$

2. Presentasi Hidup Sel MCF-7

$$\% \text{ Hidup} = \frac{\text{Absorbansi perlakuan} - \text{Absorbansi kontrol media}}{\text{Absorbansi kontrol sel} - \text{Absorbansi kontrol media}} \times 100\%$$

- Dosis 750 = $\frac{0,116 - 0,066}{0,339 - 0,066} \times 100\% = 18,314 \%$
- Dosis 375 = $\frac{0,116 - 0,066}{0,339 - 0,066} \times 100\% = 18,437 \%$
- Dosis 187,5 = $\frac{0,339 - 0,066}{0,339 - 0,066} \times 100\% = 99,877 \%$
- Dosis 93,75 = $\frac{0,482 - 0,066}{0,339 - 0,066} \times 100\% = 152,258 \%$
- Dosis 46,88 = $\frac{0,472 - 0,066}{0,339 - 0,066} \times 100\% = 148,717 \%$
- Dosis 23,44 = $\frac{0,436 - 0,066}{0,339 - 0,066} \times 100\% = 135,409 \%$



Persamaan regresi linier : $Y = - 0,199x + 144,6$

$$Y = - 0,199x + 144,6$$

$$50 = - 0,199x + 144,6$$

$$X = \frac{144,6 - 50}{0,199}$$

$$X = 475 \mu\text{g/ml}$$

- *Doxorubicin*

Replikasi	Dosis ($\mu\text{g/mL}$)					
	25	12,5	6,25	3,125	1,563	0,782
1	0,071	0,099	0,207	0,27	0,264	0,259
2	0,083	0,097	0,197	0,222	0,261	0,226
3	0,074	0,104	0,231	0,256	0,269	0,247
Rata-rata	0,076	0,1	0,212	0,249	0,265	0,244
% Hidup	3,663	12,454	53,357	67,155	73	65,201

KONTROL	SEL	MEDIA
1	0,33	0,06
2	0,369	0,065
3	0,32	0,073
Rata rata	0,339	0,066

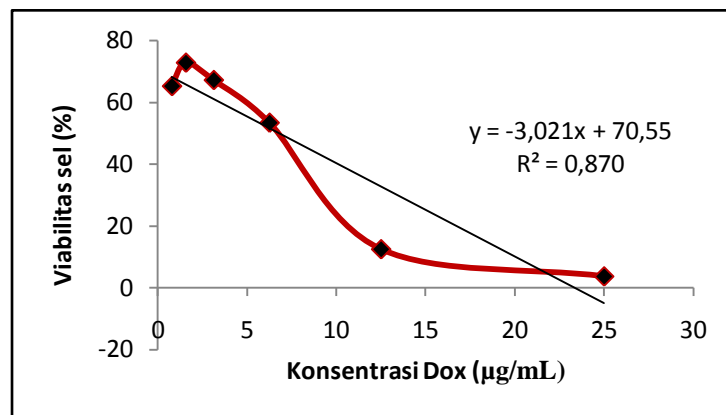
1. Rata-rata absorbansi tiap dosis

- Dosis 25 $= \frac{0,071+0,083+0,074}{3} = 0,076 \mu\text{g/ml}$
- Dosis 12,5 $= \frac{0,099+0,097+0,104}{3} = 0,1 \mu\text{g/ml}$
- Dosis 6,25 $= \frac{0,207+0,197+0,231}{3} = 0,212 \mu\text{g/ml}$
- Dosis 3,125 $= \frac{0,27+0,222+0,256}{3} = 0,249 \mu\text{g/ml}$
- Dosis 1,563 $= \frac{0,264+0,261+0,269}{3} = 0,265 \mu\text{g/ml}$
- Dosis 0,782 $= \frac{0,259+0,226+0,247}{3} = 0,244 \mu\text{g/ml}$

2. Presentasi Hidup Sel MCF-7

$$\% \text{ Hidup} = \frac{\text{Absorbansi perlakuan} - \text{Absorbansi kontrol media}}{\text{Absorbansi kontrol sel} - \text{Absorbansi kontrol media}} \times 100\%$$

- Dosis 25 = $\frac{0,076 - 0,066}{0,339 - 0,066} \times 100\% = 3,663 \%$
- Dosis 12,5 = $\frac{0,1 - 0,066}{0,339 - 0,066} \times 100\% = 12,454 \%$
- Dosis 6,25 = $\frac{0,212 - 0,066}{0,339 - 0,066} \times 100\% = 53,357 \%$
- Dosis 3,125 = $\frac{0,249 - 0,066}{0,339 - 0,066} \times 100\% = 67,155 \%$
- Dosis 1,563 = $\frac{0,265 - 0,066}{0,339 - 0,066} \times 100\% = 73 \%$
- Dosis 0,782 = $\frac{0,244 - 0,066}{0,339 - 0,066} \times 100\% = 65,201 \%$



Persamaan regresi linier : $Y = - 0,3021x + 70,55$

$$Y = - 0,3021x + 70,55$$

$$50 = - 0,3021x + 70,55$$

$$X = \frac{70,55 - 50}{0,3021}$$

$$X = 6,8 \mu\text{g/ml}$$

b. Uji Kombinasi

- Absorbansi

		Dox 0 µg/mL	Dox 0,875 µg/mL	Dox 1,75 µg/mL	Dox 2,625 µg/mL	Dox 3,5 µg/mL
	0	-	0,219	0,266	0,274	0,3
	60	0,391	0,227	0,271	0,229	0,256
EEtM	120	0,395	0,251	0,267	0,23	0,269
(µg/mL)	180	0,355	0,193	0,263	0,244	0,263
	240	0,384	0,257	0,258	0,251	0,249

KONTROL	SEL	MEDIA
1	0,527	0,124
2	0,482	0,122
3	0,445	0,134
Rata rata	0,485	0,127

- Viabilitas sel (%)

		Dox 0 µg/mL	Dox 0,875 µg/mL	Dox 1,75 µg/mL	Dox 2,625 µg/mL	Dox 3,5 µg/mL
	0	100	25,98	39,11	41,25	48,52
	60	74,02	28,12	40,32	28,77	36,22
EEtM	120	74,95	34,92	37,99	28,86	39,94
(µg/mL)	180	63,87	28,58	38,08	32,68	38,08
	240	71,97	36,87	36,78	34,64	34,26

- CI (*Combination Index*)

		Dox 0,875 µg/mL	Dox 1,75 µg/mL	Dox 2,625 µg/mL	Dox 3,5 µg/mL
	60	0,90	0,83	2,59	2,13
EEtM	120	0,59	0,97	2,58	1,69
(µg/mL)	180	0,88	0,97	2,02	1,91
	240	0,54	1,06	1,79	2,44

1. Rata-rata absorbansi tiap dosis

- EEtM 60µg/mL- Dox 0µg/mL $= \frac{0,399+0,406+0,37}{3} = 0,391 \mu\text{g/ml}$

- EEtM 60µg/mL- Dox 0,875µg/mL = $\frac{0,185+0,243+0,254}{3} = 0,227 \mu\text{g/ml}$
- EEtM 60µg/mL- Dox 1,75µg/mL = $\frac{0,307+0,251+0,255}{3} = 0,271 \mu\text{g/ml}$
- EEtM 60µg/mL- Dox 2,625µg/mL = $\frac{0,226+0,25+0,213}{3} = 0,229 \mu\text{g/ml}$
- EEtM 60µg/mL- Dox 3,5µg/mL = $\frac{0,247+0,267+0,255}{3} = 0,256 \mu\text{g/ml}$
- EEtM 120µg/mL- Dox 0µg/mL = $\frac{0,402+0,411+0,372}{3} = 0,395 \mu\text{g/ml}$
- EEtM 120µg/mL- Dox 0,875µg/mL = $\frac{0,252+0,253+0,25}{3} = 0,251 \mu\text{g/ml}$
- EEtM 120µg/mL- Dox 1,75µg/mL = $\frac{0,257+0,268+0,263}{3} = 0,267 \mu\text{g/ml}$
- EEtM 120µg/mL- Dox 2,625µg/mL = $\frac{0,241+0,254+0,222}{3} = 0,23 \mu\text{g/ml}$
- EEtM 120µg/mL- Dox 3,5µg/mL = $\frac{0,281+0,265+0,263}{3} = 0,269 \mu\text{g/ml}$
- EEtM 180µg/mL- Dox 0µg/mL = $\frac{0,358+0,355+0,353}{3} = 0,355 \mu\text{g/ml}$
- EEtM 180µg/mL- Dox 0,875µg/mL = $\frac{0,241+0,217}{2} = 0,193 \mu\text{g/ml}$
- EEtM 180µg/mL- Dox 1,75µg/mL = $\frac{0,261+0,278+0,25}{3} = 0,263 \mu\text{g/ml}$
- EEtM 180µg/mL- Dox 2,625µg/mL = $\frac{0,249+0,247+0,235}{3} = 0,244 \mu\text{g/ml}$
- EEtM 180µg/mL- Dox 3,5µg/mL = $\frac{0,26+0,267+0,262}{3} = 0,263 \mu\text{g/ml}$
- EEtM 240µg/mL- Dox 0µg/mL = $\frac{0,389+0,38+0,384}{3} = 0,384 \mu\text{g/ml}$
- EEtM 240µg/mL- Dox 0,875µg/mL = $\frac{0,255+0,273+0,248}{3} = 0,257 \mu\text{g/ml}$

- EEtM 240 μ g/mL- Dox 1,75 μ g/mL $= \frac{0,296+0,23+0,249}{3} = 0,258 \mu\text{g/ml}$
- EEtM 240 μ g/mL- Dox 2,625 μ g/mL $= \frac{0,244+0,262+0,246}{3} = 0,251 \mu\text{g/ml}$
- EEtM 240 μ g/mL- Dox 3,5 μ g/mL $= \frac{0,263+0,245+0,24}{3} = 0,249 \mu\text{g/ml}$
- EEtM 0 μ g/mL- Dox 0,875 μ g/mL $= \frac{0,215+0,225+0,219}{3} = 0,219 \mu\text{g/ml}$
- EEtM 0 μ g/mL- Dox 1,75 μ g/mL $= \frac{0,287+0,249+0,264}{3} = 0,266 \mu\text{g/ml}$
- EEtM 0 μ g/mL- Dox 2,625 μ g/mL $= \frac{0,288+0,272+0,263}{3} = 0,274 \mu\text{g/ml}$
- EEtM 0 μ g/mL- Dox 3,5 μ g/mL $= \frac{0,305+0,278+0,318}{3} = 0,3 \mu\text{g/ml}$

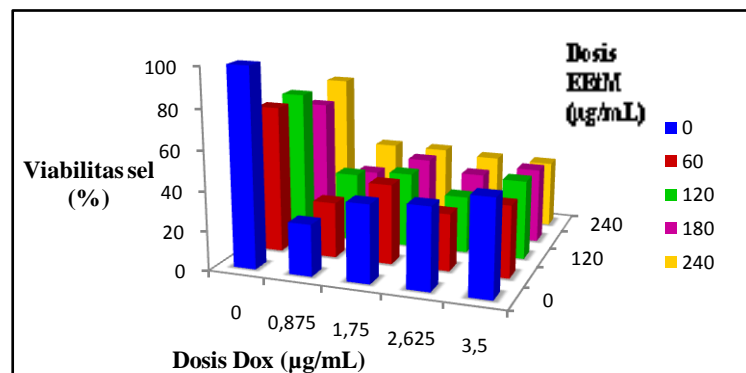
2. Presentasi Hidup Sel MCF-7

$$\% \text{ Hidup} = \frac{\text{Absorbansi perlakuan} - \text{Absorbansi kontrol media}}{\text{Absorbansi kontrol sel} - \text{Absorbansi kontrol media}} \times 100\%$$

- EEtM 60 μ g/mL- Dox 0 μ g/mL $= \frac{0,391 - 0,127}{0,485 - 0,127} \times 100\% = 74,02 \%$
- EEtM 60 μ g/mL- Dox 0,875 μ g/mL $= \frac{0,227 - 0,127}{0,485 - 0,127} \times 100\% = 28,12 \%$
- EEtM 60 μ g/mL- Dox 1,75 μ g/mL $= \frac{0,271 - 0,127}{0,485 - 0,127} \times 100\% = 40,32 \%$
- EEtM 60 μ g/mL- Dox 2,625 μ g/mL $= \frac{0,229 - 0,127}{0,485 - 0,127} \times 100\% = 28,77 \%$
- EEtM 60 μ g/mL- Dox 3,5 μ g/mL $= \frac{0,256 - 0,127}{0,485 - 0,127} \times 100\% = 36,22 \%$

- EEtM 120 μ g/mL- Dox 0 μ g/mL $= \frac{0,395 - 0,127}{0,485 - 0,127} \times 100\% = 74,95 \%$
- EEtM 120 μ g/mL- Dox 0,875 μ g/mL $= \frac{0,251 - 0,127}{0,485 - 0,127} \times 100\% = 34,92 \%$
- EEtM 120 μ g/mL- Dox 1,75 μ g/mL $= \frac{0,267 - 0,127}{0,485 - 0,127} \times 100\% = 37,99 \%$
- EEtM 120 μ g/mL- Dox 2,625 μ g/mL $= \frac{0,23 - 0,127}{0,485 - 0,127} \times 100\% = 28,86 \%$
- EEtM 120 μ g/mL- Dox 3,5 μ g/mL $= \frac{0,269 - 0,127}{0,485 - 0,127} \times 100\% = 39,94 \%$
- EEtM 180 μ g/mL- Dox 0 μ g/mL $= \frac{0,335 - 0,127}{0,485 - 0,127} \times 100\% = 63,87 \%$
- EEtM 180 μ g/mL- Dox 0,875 μ g/mL $= \frac{0,193 - 0,127}{0,485 - 0,127} \times 100\% = 28,58 \%$
- EEtM 180 μ g/mL- Dox 1,75 μ g/mL $= \frac{0,263 - 0,127}{0,485 - 0,127} \times 100\% = 38,08 \%$
- EEtM 180 μ g/mL- Dox 2,625 μ g/mL $= \frac{0,244 - 0,127}{0,485 - 0,127} \times 100\% = 32,68 \%$
- EEtM 180 μ g/mL- Dox 3,5 μ g/mL $= \frac{0,263 - 0,127}{0,485 - 0,127} \times 100\% = 38,08 \%$
- EEtM 240 μ g/mL- Dox 0 μ g/mL $= \frac{0,384 - 0,127}{0,485 - 0,127} \times 100\% = 71,97 \%$
- EEtM 240 μ g/mL- Dox 0,875 μ g/mL $= \frac{0,257 - 0,127}{0,485 - 0,127} \times 100\% = 36,87 \%$
- EEtM 240 μ g/mL- Dox 1,75 μ g/mL $= \frac{0,258 - 0,127}{0,485 - 0,127} \times 100\% = 36,78 \%$
- EEtM 240 μ g/mL- Dox 2,625 μ g/mL $= \frac{0,251 - 0,127}{0,485 - 0,127} \times 100\% = 34,64 \%$

- EEtM 240 μ g/mL- Dox 3,5 μ g/mL $= \frac{0,249 - 0,127}{0,485 - 0,127} \times 100\% = 34,26 \%$
- EEtM 0 μ g/mL- Dox 0,875 μ g/mL $= \frac{0,219 - 0,127}{0,485 - 0,127} \times 100\% = 25,98 \%$
- EEtM 0 μ g/mL- Dox 1,75 μ g/mL $= \frac{0,266 - 0,127}{0,485 - 0,127} \times 100\% = 39,11 \%$
- EEtM 0 μ g/mL- Dox 2,625 μ g/mL $= \frac{0,274 - 0,127}{0,485 - 0,127} \times 100\% = 41,52 \%$
- EEtM 0 μ g/mL- Dox 3,5 μ g/mL $= \frac{0,3 - 0,127}{0,485 - 0,127} \times 100\% = 48,52 \%$

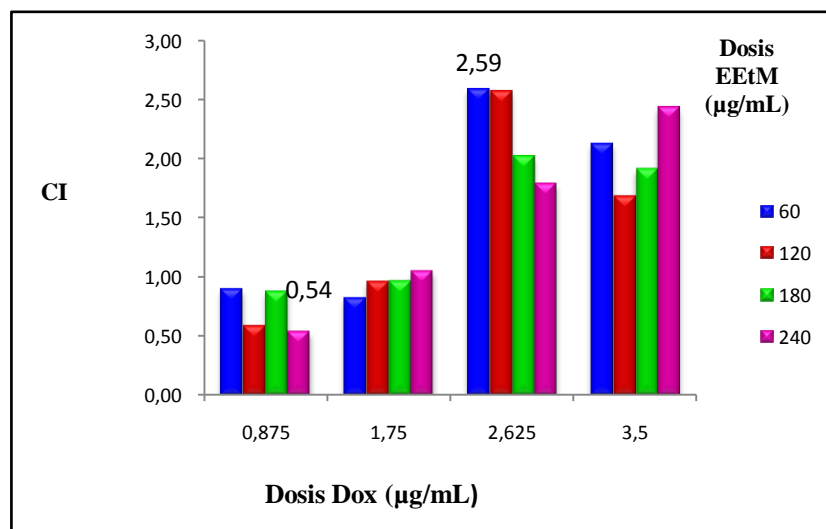


3. Nilai Index Kombinasi

$$CI = \frac{(D)1}{(Dx)1} + \frac{(D)2}{(Dx)2}$$

- EEtM 60 μ g/mL- Dox 0,875 μ g/mL $= \frac{60}{21564,3} + \frac{0,875}{0,972} = 0,90$
- EEtM 60 μ g/mL- Dox 1,75 μ g/mL $= \frac{60}{4779,3} + \frac{1,75}{2,151} = 0,83$
- EEtM 60 μ g/mL- Dox 2,625 μ g/mL $= \frac{60}{19896,1} + \frac{2,625}{1,014} = 2,59$
- EEtM 60 μ g/mL- Dox 3,5 μ g/mL $= \frac{60}{7927,8} + \frac{3,5}{1,647} = 2,13$
- EEtM 120 μ g/mL- Dox 0,875 μ g/mL $= \frac{120}{9312,9} + \frac{0,875}{1,513} = 0,59$

- EEtM 120µg/mL- Dox 1,75µg/mL $= \frac{120}{6371,5} + \frac{1,75}{1,848} = 0,97$
- EEtM 120µg/mL- Dox 2,625µg/mL $= \frac{120}{19668,6} + \frac{2,625}{1,020} = 2,58$
- EEtM 120µg/mL- Dox 3,5µg/mL $= \frac{120}{5004,3} + \frac{3,5}{2,099} = 1,69$
- EEtM 180µg/mL- Dox 0,875µg/mL $= \frac{180}{20359,1} + \frac{0,875}{1,002} = 0,88$
- EEtM 180µg/mL- Dox 1,75µg/mL $= \frac{180}{6298,7} + \frac{1,75}{1,859} = 0,97$
- EEtM 180µg/mL- Dox 2,625µg/mL $= \frac{180}{12273,6} + \frac{2,625}{1,308} = 2,02$
- EEtM 180µg/mL- Dox 3,5µg/mL $= \frac{180}{6298,7} + \frac{3,5}{1,859} = 1,91$
- EEtM 240µg/mL- Dox 0,875µg/mL $= \frac{240}{7314,5} + \frac{0,875}{1,718} = 0,54$
- EEtM 240µg/mL- Dox 1,75µg/mL $= \frac{240}{7399,1} + \frac{1,75}{1,708} = 1,06$
- EEtM 240µg/mL- Dox 2,625µg/mL $= \frac{240}{9639,9} + \frac{2,625}{1,486} = 1,79$
- EEtM 240µg/mL- Dox 3,5µg/mL $= \frac{240}{10093,7} + \frac{3,5}{1,450} = 2,44$



Lampiran 6. Hasil Perhitungan RMSD untuk Protein ER α

```
61 Hz Mem 98 Sys L YASARA View 58 Atoms
WARNING - Calculating RMSD between different atoms 28 ' C21' and 57 ' C25'
WARNING - Calculating RMSD between different residues 'OHT A 600' and 'non A 0'
WARNING - Calculating RMSD between different atoms 29 ' C22' and 58 ' C26'
WARNING - Calculating RMSD between different residues 'OHT A 600' and 'non A 0'
Molecule A and Molecule A have 1.7250 A RMSD
>
_
```

Lampiran 7. Hasil Perhitungan RMSD untuk Protein Bcl-xl

```
60 Hz Mem 98 Sys L YASARA View 32 Atoms
WARNING - Calculating RMSD between different residues '4FC A 1000' and 'non A 0'
WARNING - Calculating RMSD between different residues '4FC A 1000' and 'non A 0'
WARNING - Calculating RMSD between different residues '4FC A 1000' and 'non A 0'
WARNING - Calculating RMSD between different residues '4FC A 1000' and 'non A 0'
Molecule A and Molecule A have 0.3111 A RMSD
>
_
```

Lampiran 8. Hasil *Molecular Docking Native Ligand* dengan ER α

```
argevollen@argevollen-Satellite-L645: ~/docking/results
argevollen@argevollen-Satellite-L645:~/docking$ cd results
argevollen@argevollen-Satellite-L645:~/docking/results$ more bestranking.csv
TOTAL_SCORE,SCORE_RB_PEN,SCORE_NORM_HEVATOMS,SCORE_NORM_CRT_HEVATOMS,SCORE_NORM_WEIGHT,SCORE_NORM_CRT_WEIGHT,SCORE_RB_PEN_NORM_CRT_HEVATOMS,SCORE_NORM_CONTACT,EVAL,TIME
PROTEIN (ESTROGEN RECEPTOR ALPHA)_entry_00001_conf_01,-101.267,-83.2675,-3.49198,-32.9613,-0.260656,-13.8783,-27.1025,-3.26669,4916292,43.256
PROTEIN (ESTROGEN RECEPTOR ALPHA)_entry_00002_conf_01,-100.846,-82.8456,-3.47743,-32.8239,-0.25957,-13.8205,-26.9652,-3.25308,4791226,44.764
PROTEIN (ESTROGEN RECEPTOR ALPHA)_entry_00003_conf_01,-104.261,-86.2614,-3.59522,-33.9358,-0.268362,-14.2886,-28.077,-3.36327,4743809,41.796
PROTEIN (ESTROGEN RECEPTOR ALPHA)_entry_00004_conf_01,-99.1274,-81.1274,-3.41819,-32.2647,-0.255148,-13.585,-26.4059,-3.19766,4847420,42.772
PROTEIN (ESTROGEN RECEPTOR ALPHA)_entry_00005_conf_01,-100.862,-82.862,-3.478,-32.8293,-0.259612,-13.8227,-26.9705,-3.25361,5027965,44.68
PROTEIN (ESTROGEN RECEPTOR ALPHA)_entry_00006_conf_01,-100.886,-82.8862,-3.47884,-32.8372,-0.259675,-13.826,-26.9784,-3.25439,4786595,42.312
PROTEIN (ESTROGEN RECEPTOR ALPHA)_entry_00007_conf_01,-104.722,-86.7219,-3.6111,-34.0856,-0.269548,-14.3517,-28.2269,-3.37813,5034162,44.3
PROTEIN (ESTROGEN RECEPTOR ALPHA)_entry_00008_conf_01,-103.003,-85.0029,-3.55182,-33.5261,-0.265123,-14.1161,-27.6673,-3.32267,4780651,42.24
PROTEIN (ESTROGEN RECEPTOR ALPHA)_entry_00009_conf_01,-100.515,-82.5151,-3.46604,-32.7164,-0.25872,-13.7752,-26.8576,-3.24242,4819490,42.448
argevollen@argevollen-Satellite-L645:~/docking/results$
```


Lampiran 9. Hasil *Molecular Docking Native Ligand* dengan Bcl-xl

```
zephyrus@zephyrus-K43BY: ~/Docking/results
zephyrus@zephyrus-K43BY:~/Docking$ cd results
zephyrus@zephyrus-K43BY:~/Docking/results$ more bestranking.csv
TOTAL_SCORE,SCORE_RB_PEN,SCORE_NORM_HEVATOMS,SCORE_NORM_CRT_HEVATOMS,SCORE_NORM_WEIGHT,SCORE_NORM_CRT_WEIGHT,SCORE_RB_PEN_NORM_CRT_HEVATOMS,SCORE_NORM_CONTACT,EVAL,TIME
APOPTOSIS REGULATOR BCL-X_entry_00001_conf_01,-83.6148,-77.6148,-5.22592,-33.1825,-0.386744,-13.9315,-30.8014,-5.22592,1132249,10.608
APOPTOSIS REGULATOR BCL-X_entry_00002_conf_01,-83.4667,-77.4667,-5.21667,-33.1238,-0.386059,-13.9068,-30.7427,-5.21667,1141475,12.388
APOPTOSIS REGULATOR BCL-X_entry_00003_conf_01,-83.4712,-77.4712,-5.21695,-33.1256,-0.38608,-13.9075,-30.7445,-5.21695,1165378,12.56
APOPTOSIS REGULATOR BCL-X_entry_00004_conf_01,-83.4002,-77.4002,-5.21251,-33.0974,-0.385751,-13.8957,-30.7163,-5.21251,1138294,12.244
APOPTOSIS REGULATOR BCL-X_entry_00005_conf_01,-83.4053,-77.4053,-5.21283,-33.0994,-0.385775,-13.8966,-30.7183,-5.21283,1155458,12.592
APOPTOSIS REGULATOR BCL-X_entry_00006_conf_01,-83.4621,-77.4621,-5.21638,-33.122,-0.386038,-13.906,-30.7409,-5.21638,1153514,12.728
APOPTOSIS REGULATOR BCL-X_entry_00007_conf_01,-83.4266,-77.4266,-5.21416,-33.1079,-0.385873,-13.9001,-30.7267,-5.21416,1169508,12.54
APOPTOSIS REGULATOR BCL-X_entry_00008_conf_01,-83.4856,-77.4856,-5.21785,-33.1313,-0.386146,-13.9099,-30.7502,-5.21785,1153320,12.588
APOPTOSIS REGULATOR BCL-X_entry_00009_conf_01,-83.542,-77.542,-5.22138,-33.1537,-0.386407,-13.9193,-30.7726,-5.22138,1130720,12.424
zephyrus@zephyrus-K43BY:~/Docking/results$
```

Lampiran 10. Skor *Docking* antara *Doxorubicin* dan ER α

```
argevollen@argevollen-Satellite-L645: ~/docking/results
TOTAL_SCORE,SCORE_RB_PEN,SCORE_NORM_HEVATOMS,SCORE_NORM_CRT_HEVATOMS,SCORE_NORM_WEIGHT,SCORE_NORM_CRT_WEIGHT,SCORE_RB_PEN_NORM_CRT_HEVATOMS,SCORE_NORM_CONTACT,EVAL,TIME
_entry_00001_conf_01,-68.869,-46.869,-1.76587,-20.3081,-0.126477,-8.43372,-13.8207,-1.60161,6320955,78.548
_entry_00002_conf_01,-67.871,-45.871,-1.74028,-20.0138,-0.124644,-8.31151,-13.5264,-1.61598,6540667,81.584
_entry_00003_conf_01,-65.67,-43.67,-1.68385,-19.3648,-0.120602,-8.04197,-12.8774,-1.60171,6515757,80.024
_entry_00004_conf_01,-63.941,-41.941,-1.63951,-18.8549,-0.117426,-7.83024,-12.3676,-1.59853,6173987,75.66
_entry_00005_conf_01,-67.1072,-45.1072,-1.7207,-19.7886,-0.123241,-8.21797,-13.3012,-1.59779,6428356,79.928
_entry_00006_conf_01,-68.7631,-46.7631,-1.76316,-20.2769,-0.126282,-8.42076,-13.7895,-1.67715,6725796,82.992
_entry_00007_conf_01,-67.2526,-45.2526,-1.72442,-19.8314,-0.123508,-8.23577,-13.3441,-1.64031,6299832,77.232
_entry_00008_conf_01,-70.7854,-48.7854,-1.81501,-20.8732,-0.129996,-8.6684,-14.3858,-1.68537,6491710,79.876
_entry_00009_conf_01,-65.2153,-43.2153,-1.67219,-19.2307,-0.119767,-7.98629,-12.7433,-1.59062,6559980,80.352
argevollen@argevollen-Satellite-L645:~/docking/results$
argevollen@argevollen-Satellite-L645:~/docking/results$
```

Lampiran 11. Skor Docking antara Doxorubicin dan Bcl-xl

```
argevollen@argevollen-Satellite-L645: ~/docking/results
argevollen@argevollen-Satellite-L645:~/docking$ cd results
argevollen@argevollen-Satellite-L645:~/docking/results$ more bestranking.csv
TOTAL_SCORE,SCORE_RB_PEN,SCORE_NORM_HEVATOMS,SCORE_NORM_CRT_HEVATOMS,SCORE_NORM_
WEIGHT,SCORE_NORM_CRT_WEIGHT,SCORE_RB_PEN_NORM_CRT_HEVATOMS,SCORE_NORM_CONTACT,E
VAL,TIME
_entry_00001_conf_01,-77.0892,-55.0892,-1.97665,-22.732,-0.141573,-9.44036,-16.2
447,-2.08349,6220206,72.836
_entry_00002_conf_01,-76.7634,-54.7634,-1.96829,-22.636,-0.140974,-9.40047,-16.1
486,-2.07469,6176570,72.3
_entry_00003_conf_01,-77.2205,-55.2205,-1.98001,-22.7708,-0.141814,-9.45644,-16.
2834,-1.93051,6067442,70.972
_entry_00004_conf_01,-77.5441,-55.5441,-1.98831,-22.8662,-0.142408,-9.49607,-16.
3788,-1.98831,6132318,71.528
_entry_00005_conf_01,-77.265,-55.265,-1.98115,-22.7839,-0.141896,-9.46189,-16.29
65,-2.03329,6395685,74.948
_entry_00006_conf_01,-77.2821,-55.2821,-1.98159,-22.7889,-0.141927,-9.46399,-16.
3016,-2.03374,6129845,71.608
_entry_00007_conf_01,-77.5672,-55.5672,-1.9889,-22.873,-0.142451,-9.4989,-16.385
6,-2.09641,5941803,69.632
_entry_00008_conf_01,-76.7997,-54.7997,-1.96922,-22.6467,-0.141041,-9.40491,-16.
1593,-2.07567,6030216,70.852
_entry_00009_conf_01,-77.3254,-55.3254,-1.9827,-22.8017,-0.142007,-9.46929,-16.3
143,-1.9827,6212126,72.62
argevollen@argevollen-Satellite-L645:~/docking/results$
```

Lampiran 12. Skor Docking antara Skopoletin dan ERa

```
argevollen@argevollen-Satellite-L645: ~/docking/results
argevollen@argevollen-Satellite-L645:~/docking$ cd results
argevollen@argevollen-Satellite-L645:~/docking/results$ more bestranking.csv
TOTAL_SCORE,SCORE_RB_PEN,SCORE_NORM_HEVATOMS,SCORE_NORM_CRT_HEVATOMS,SCORE_NORM_
WEIGHT,SCORE_NORM_CRT_WEIGHT,SCORE_RB_PEN_NORM_CRT_HEVATOMS,SCORE_NORM_CONTACT,E
VAL,TIME
22. Buah Mengkudu.cdx_entry_00001_conf_01,-56.3957,-52.3957,-4.02826,-23.3993,-0
.293477,-9.77286,-21.7397,-4.02826,1026907,4.288
22. Buah Mengkudu.cdx_entry_00002_conf_01,-56.6726,-52.6726,-4.04805,-23.5142,-0
.294918,-9.82086,-21.8546,-3.77818,1026530,4.276
22. Buah Mengkudu.cdx_entry_00003_conf_01,-56.2614,-52.2614,-4.01867,-23.3436,-0
.292778,-9.7496,-21.684,-4.01867,1031303,4.296
22. Buah Mengkudu.cdx_entry_00004_conf_01,-56.7535,-52.7535,-4.05382,-23.5478,-0
.295339,-9.83487,-21.8881,-3.78357,1033602,4.316
22. Buah Mengkudu.cdx_entry_00005_conf_01,-56.0689,-52.0689,-4.00492,-23.2637,-0
.291776,-9.71624,-21.6041,-4.00492,1039773,4.392
22. Buah Mengkudu.cdx_entry_00006_conf_01,-58.6543,-54.6543,-4.18959,-24.3364,-0
.30523,-10.1643,-22.6768,-4.18959,1011476,4.192
22. Buah Mengkudu.cdx_entry_00007_conf_01,-58.9069,-54.9069,-4.20763,-24.4412,-0
.306545,-10.208,-22.7816,-3.92712,1037921,4.356
22. Buah Mengkudu.cdx_entry_00008_conf_01,-59.3852,-55.3852,-4.2418,-24.6397,-0.
309034,-10.2909,-22.9801,-3.95902,1026159,4.32
22. Buah Mengkudu.cdx_entry_00009_conf_01,-58.0562,-54.0562,-4.14687,-24.0883,-0
.302118,-10.0606,-22.4286,-3.87041,1062268,4.524
argevollen@argevollen-Satellite-L645:~/docking/results$
```

Lampiran 13. Skor *Docking* antara Skopoletin dan Bcl-xl

```
argevollen@argevollen-Satellite-L645: ~/docking/results
argevollen@argevollen-Satellite-L645:~/docking$ cd results
argevollen@argevollen-Satellite-L645:~/docking/results$ more bestranking.csv
TOTAL_SCORE,SCORE_RB_PEN,SCORE_NORM_HEVATOMS,SCORE_NORM_CRT_HEVATOMS,SCORE_NORM_
WEIGHT,SCORE_NORM_CRT_WEIGHT,SCORE_RB_PEN_NORM_CRT_HEVATOMS,SCORE_NORM_CONTACT,E
VAL,TIME
22. Buah Mengkudu.cdx_entry_00001_conf_01,-70.7573,-66.7573,-5.0541,-29.3582,-0.
368213,-12.2616,-27.6985,-5.0541,816862,2.78
22. Buah Mengkudu.cdx_entry_00002_conf_01,-70.2597,-66.2597,-5.01855,-29.1517,-0
.365624,-12.1754,-27.492,-5.01855,818834,2.812
22. Buah Mengkudu.cdx_entry_00003_conf_01,-70.7418,-66.7418,-5.05298,-29.3517,-0
.368132,-12.2589,-27.692,-5.05298,798964,2.776
22. Buah Mengkudu.cdx_entry_00004_conf_01,-70.6176,-66.6176,-5.04411,-29.3002,-0
.367486,-12.2374,-27.6405,-5.04411,809669,2.844
22. Buah Mengkudu.cdx_entry_00005_conf_01,-70.2807,-66.2807,-5.02005,-29.1604,-0
.365733,-12.179,-27.5007,-5.02005,815441,2.864
22. Buah Mengkudu.cdx_entry_00006_conf_01,-72.6331,-68.6331,-5.18808,-30.1364,-0
.377975,-12.5867,-28.4768,-5.18808,789553,2.772
22. Buah Mengkudu.cdx_entry_00007_conf_01,-72.5184,-68.5184,-5.17988,-30.0888,-0
.377378,-12.5668,-28.4292,-5.17988,796046,2.784
22. Buah Mengkudu.cdx_entry_00008_conf_01,-73.8583,-69.8583,-5.2756,-30.6448,-0.
384351,-12.799,-28.9851,-5.2756,821161,2.88
22. Buah Mengkudu.cdx_entry_00009_conf_01,-72.627,-68.627,-5.18765,-30.1339,-0.3
77943,-12.5856,-28.4743,-5.18765,802636,2.836
argevollen@argevollen-Satellite-L645:~/docking/results$
```

Lampiran 14. Skor *Docking* antara Umbeliferon dan ER α

```
argevollen@argevollen-Satellite-L645: ~/docking/results
total virtual screening time: 24.04s
Ligands skipped due to errors: 0
argevollen@argevollen-Satellite-L645:~/docking$ cd results
argevollen@argevollen-Satellite-L645:~/docking/results$ more bestranking.csv
TOTAL_SCORE,SCORE_RB_PEN,SCORE_NORM_HEVATOMS,SCORE_NORM_CRT_HEVATOMS,SCORE_NORM_
WEIGHT,SCORE_NORM_CRT_WEIGHT,SCORE_RB_PEN_NORM_CRT_HEVATOMS,SCORE_NORM_CONTACT,E
VAL,TIME
_entry_00001_conf_01,-66.2475,-64.2475,-5.52063,-28.9363,-0.408587,-12.149,-28.0
627,-5.09596,719512,2.716
_entry_00002_conf_01,-66.3019,-64.3019,-5.52516,-28.96,-0.408923,-12.159,-28.086
4,-5.10014,705270,2.66
_entry_00003_conf_01,-66.0715,-64.0715,-5.50596,-28.8594,-0.407502,-12.1167,-27.
9858,-5.08242,705277,2.664
_entry_00004_conf_01,-66.174,-64.174,-5.5145,-28.9041,-0.408134,-12.1355,-28.030
6,-5.0903,705990,2.68
_entry_00005_conf_01,-66.2298,-64.2298,-5.51915,-28.9285,-0.408478,-12.1458,-28.
055,-5.0946,691983,2.62
_entry_00006_conf_01,-66.2478,-64.2478,-5.52065,-28.9364,-0.408589,-12.1491,-28.
0628,-5.09598,715419,2.708
_entry_00007_conf_01,-66.2524,-64.2524,-5.52103,-28.9384,-0.408617,-12.1499,-28.
0648,-5.09634,725098,2.752
_entry_00008_conf_01,-66.2012,-64.2012,-5.51677,-28.916,-0.408302,-12.1405,-28.0
425,-5.0924,689418,2.616
argevollen@argevollen-Satellite-L645:~/docking/results$
```

Lampiran 15. Skor *Docking* antara Umbeliferon dan Bcl-xl

```
argevollen@argevollen-Satellite-L645: ~/docking/results
total virtual screening time: 13.04s
Ligands skipped due to errors: 0
argevollen@argevollen-Satellite-L645:~/docking$ cd results
argevollen@argevollen-Satellite-L645:~/docking/results$ more bestranking.csv
TOTAL_SCORE,SCORE_RB_PEN,SCORE_NORM_HEVATOMS,SCORE_NORM_CRT_HEVATOMS,SCORE_NORM_
WEIGHT,SCORE_NORM_CRT_WEIGHT,SCORE_RB_PEN_NORM_CRT_HEVATOMS,SCORE_NORM_CONTACT,E
VAL,TIME
_entry_00001_conf_01,-71.5027,-69.5027,-5.95856,-31.2317,-0.440999,-13.1128,-30.
3581,-5.50021,491918,1.4
_entry_00002_conf_01,-71.7619,-69.7619,-5.98016,-31.3449,-0.442598,-13.1603,-30.
4713,-5.52014,510698,1.468
_entry_00003_conf_01,-71.3903,-69.3903,-5.94919,-31.1826,-0.440306,-13.0921,-30.
309,-5.49156,501753,1.448
_entry_00004_conf_01,-71.5092,-69.5092,-5.9591,-31.2345,-0.441039,-13.114,-30.36
09,-5.50071,519319,1.48
_entry_00005_conf_01,-71.9896,-69.9896,-5.99914,-31.4444,-0.444002,-13.2021,-30.
5708,-5.53766,516906,1.484
_entry_00006_conf_01,-71.8384,-69.8384,-5.98653,-31.3783,-0.443069,-13.1743,-30.
5047,-5.52603,526133,1.504
_entry_00007_conf_01,-71.481,-69.481,-5.95675,-31.2222,-0.440865,-13.1088,-30.34
86,-5.49854,504575,1.436
_entry_00008_conf_01,-71.2881,-69.2881,-5.94068,-31.138,-0.439676,-13.0734,-30.2
644,-5.4837,517077,1.488
argevollen@argevollen-Satellite-L645:~/docking/results$
```