

## DAFTAR PUSTAKA

- Agarwal, A., Das, K., Lerner, N., Sathe, S., Cicek, M., Casey, G., dkk., 2005. The AKT/I $\kappa$ B kinase pathway promotes angiogenic/metastatic gene expression in colorectal cancer by activating nuclear factor- $\kappa$ B and  $\beta$ -catenin. *Oncogene*, **24**: 1021–1031.
- Ágg, B., Császár, A., Szalay-Beko, M., Veres, D. V., Mizsei, R., Ferdinandy, P., dkk., 2019. The EntOptLayout Cytoscape plug-in for the efficient visualization of major protein complexes in protein-protein interaction and signalling networks. *Bioinformatics*, **35**: 4490–4492.
- Ahmad, A., Biersack, B., Li, Y., Kong, D., Bao, B., Schobert, R., dkk., 2013. Targeted regulation of PI3K/Akt/mTOR/NF- $\kappa$ B signaling by indole compounds and their derivatives: mechanistic details and biological implications for cancer therapy. *Anti-cancer agents in medicinal chemistry*, **13**: 1002–13.
- Ahn, E.R. dan Vogel, C.L., 2012. Dual HER2-targeted approaches in HER2-positive breast cancer. *Breast Cancer Research and Treatment*, .
- Alanazi, I.O. dan Khan, Z., 2016. Understanding EGFR Signaling in Breast Cancer and Breast Cancer Stem Cells: Overexpression and Therapeutic Implications. *Asian Pacific Journal of Cancer Prevention*, **17**: .
- Altomare, D.A. dan Testa, J.R., 2005. Perturbations of the AKT signaling pathway in human cancer. *Oncogene*, **24**: 7455–7464.
- Aman, N.A., Doukoure, B., Koffi, K.D., Kouï, B.S., Traore, Z.C., Kouyate, M., dkk., 2019. HER2 overexpression and correlation with other significant clinicopathologic parameters in Ivorian breast cancer women 11 Medical and Health Sciences 1112 Oncology and Carcinogenesis. *BMC Clinical Pathology*, **19**: .
- Biswas, D.K., Shi, Q., Baily, S., Strickland, I., Ghosh, S., Pardee, A.B., dkk., 2004. 'NF-B activation in human breast cancer specimens and its role in cell proliferation and apoptosis', .
- Brown, K.K. dan Toker, A., 2015. The phosphoinositide 3-kinase pathway and therapy resistance in cancer. *F1000Prime Reports*, **7**: .
- Chen, M.-L., Xu, P.-Z., Peng, X., Chen, W.S., Guzman, G., Yang, X., dkk., 2006. The deficiency of *Akt1* is sufficient to suppress tumor development in *Pten*<sup>+/-</sup> mice. *Genes & Development*, **20**: 1569–1574.
- Cidado, J. dan Park, B.H., 2012. Targeting the PI3K/Akt/mTOR Pathway for Breast Cancer Therapy. *Journal of Mammary Gland Biology and Neoplasia*, **17**: 205–216.
- Cohen, E.E.W., Lingen, M.W., Martin, L.E., Harris, P.L., Brannigan, B.W.,

- Haserlat, S.M., dkk., 2005. Response of Some Head and Neck Cancers to Epidermal Growth Factor Receptor Tyrosine Kinase Inhibitors May Be Linked to Mutation of *ERBB2* rather than *EGFR*. *Clinical Cancer Research*, **11**: 8105–8108.
- Comoglio, P.M., Giordano, S., dan Trusolino, L., 2008. Drug development of MET inhibitors: targeting oncogene addiction and expedience. *Nature Reviews Drug Discovery*, **7**: .
- D'Amato, V., Raimondo, L., Formisano, L., Giuliano, M., De Placido, S., Rosa, R., dkk., 2015. Mechanisms of lapatinib resistance in HER2-driven breast cancer. *Cancer Treatment Reviews*, **41**: 877–883.
- Dan, H.C., Cooper, M.J., Cogswell, P.C., Duncan, J.A., Ting, J.P.-Y., dan Baldwin, A.S., 2008. Akt-dependent regulation of NF- $\kappa$ B is controlled by mTOR and Raptor in association with IKK. *Genes & Development*, **22**: 1490–1500.
- Day, E.K., Sosale, N.G., dan Lazzara, M.J., 2016. Cell signaling regulation by protein phosphorylation: a multivariate, heterogeneous, and context-dependent process. *Current Opinion in Biotechnology*, **40**: 185–192.
- Dong, C., Wu, J., Chen, Y., Nie, J., dan Chen, C., 2021. Activation of PI3K/AKT/mTOR Pathway Causes Drug Resistance in Breast Cancer. *Frontiers in Pharmacology*, **12**: .
- Duronio, R.J. dan Xiong, Y., 2013. Signaling Pathways that Control Cell Proliferation. *Cold Spring Harbor Perspectives in Biology*, **5**: a008904–a008904.
- Ehrhardt, A., David, M.D., Ehrhardt, G.R.A., dan Schrader, J.W., 2004. Distinct Mechanisms Determine the Patterns of Differential Activation of H-Ras, N-Ras, K-Ras 4B, and M-Ras by Receptors for Growth Factors or Antigen. *Molecular and Cellular Biology*, **24**: 6311–6323.
- Engelman, J.A. dan Cantley, L.C., 2010. Chemoprevention Meets Glucose Control: Fig. 1. *Cancer Prevention Research*, **3**: 1049–1052.
- Fadus, M.C., Lau, C., Bikhchandani, J., dan Lynch, H.T., 2017. Curcumin: An age-old anti-inflammatory and anti-neoplastic agent. *Journal of Traditional and Complementary Medicine*, **7**: .
- Gao, J., Aksoy, B.A., Dogrusoz, U., Dresdner, G., Gross, B., Sumer, S.O., dkk., 2013. Integrative analysis of complex cancer genomics and clinical profiles using the cBioPortal. *Science Signaling*, **6**: .
- Garrett, J.T., Olivares, M.G., Rinehart, C., Granja-Ingram, N.D., Sanchez, V., Chakrabarty, A., dkk., 2011. Transcriptional and posttranslational up-regulation of HER3 (ErbB3) compensates for inhibition of the HER2 tyrosine kinase. *Proceedings of the National Academy of Sciences*, **108**: .
- Gfeller, D., Grosdidier, A., Wirth, M., Daina, A., Michielin, O., dan Zoete, V.,

2014. SwissTargetPrediction: A web server for target prediction of bioactive small molecules. *Nucleic Acids Research*, **42**: .
- Guerrero-Zotano, A., Mayer, I.A., dan Arteaga, C.L., 2016. PI3K/AKT/mTOR: role in breast cancer progression, drug resistance, and treatment. *Cancer and Metastasis Reviews*, **35**: 515–524.
- Gupta, T., Singh, J., Kaur, S., Sandhu, S., Singh, G., dan Kaur, I.P., 2020. Enhancing Bioavailability and Stability of Curcumin Using Solid Lipid Nanoparticles (CLEN): A Covenant for Its Effectiveness. *Frontiers in Bioengineering and Biotechnology*, **8**: .
- Hasbiyani, N.A.F., Wulandari, F., Nugroho, E.P., Hermawan, A., dan Meiyanto, E., 2021. Bioinformatics Analysis Confirms the Target Protein Underlying Mitotic Catastrophe of 4T1 Cells under Combinatorial Treatment of PGV-1 and Galangin. *Scientia Pharmaceutica*, **89**: 38.
- Hayden, M.S. dan Ghosh, S., 2004. Signaling to NF- $\kappa$ B. *Genes & Development*, **18**: 2195–2224.
- Henderson, V., Smith, B., Burton, L.J., Randle, D., Morris, M., dan Otero-Marah, V.A., 2015. Snail promotes cell migration through PI3K/AKT-dependent Rac1 activation as well as PI3K/AKT-independent pathways during prostate cancer progression. *Cell Adhesion & Migration*, **9**: 255–264.
- Hermawan, A., Fitriarsi, A., Junedi, S., Ikawati, M., Haryanti, S., Widaryanti, B., dkk., 2011. PGV-0 AND PGV-1 INCREASED APOPTOSIS INDUCTION OF DOXORUBYCIN ON MCF-7 BREAST CANCER CELLS. *PHARMACON*, **12**: 55–59.
- Hewlings, S. dan Kalman, D., 2017. Curcumin: A Review of Its Effects on Human Health. *Foods*, **6**: .
- Hopkins, B.D., Goncalves, M.D., dan Cantley, L.C., 2020. Insulin–PI3K signalling: an evolutionarily insulated metabolic driver of cancer. *Nature Reviews Endocrinology*, **16**: 276–283.
- Huang, J., Zhang, X., dan McNaughton, P., 2006. Inflammatory Pain: The Cellular Basis of Heat Hyperalgesia. *Current Neuropharmacology*, **4**: 197–206.
- Huang, W.-C. dan Hung, M.-C., 2009. Induction of Akt activity by chemotherapy confers acquired resistance. *Journal of the Formosan Medical Association = Taiwan yi zhi*, **108**: 180–94.
- Hudson, W.H. dan Ortlund, E.A., 2014. The structure, function and evolution of proteins that bind DNA and RNA. *Nature Reviews Molecular Cell Biology*, **15**: 749–760.
- Hynes, N.E. dan MacDonald, G., 2009. ErbB receptors and signaling pathways in cancer. *Current Opinion in Cell Biology*, **21**: 177–184.
- Iqbal, Nida dan Iqbal, Naveed, 2014. Human Epidermal Growth Factor Receptor 2

- (HER2) in Cancers: Overexpression and Therapeutic Implications. *Molecular Biology International*, **2014**: 1–9.
- Israël, A., 2000. The IKK complex: an integrator of all signals that activate NF- $\kappa$ B? *Trends in Cell Biology*, **10**: 129–133.
- Jiang, Y., Zou, L., Lu, W.-Q., Zhang, Y., dan Shen, A.-G., 2013. Foxo3a Expression Is a Prognostic Marker in Breast Cancer. *PLoS ONE*, **8**: .
- Jiang, Z. dan Zhou, Y., 2005. Using Bioinformatics for Drug Target Identification from the Genome. *American Journal of Pharmacogenomics*, **5**: 387–396.
- Junjun Liu, X.C.Y.M. and K.S., 2015. Effect of curcumin on lapatinib sensitivity and lapatinib resistance associated EMT and stem-like phenotype in HER2 positive breast cancer. *Journal of Clinical Oncology*, **33**: .
- Kanzi, A.M., San, J.E., Chimukangara, B., Wilkinson, E., Fish, M., Ramsuran, V., dkk., 2020. Next Generation Sequencing and Bioinformatics Analysis of Family Genetic Inheritance. *Frontiers in Genetics*, .
- Kauppinen, T.M., Gan, L., dan Swanson, R.A., 2013. Poly(ADP-ribose) polymerase-1-induced NAD<sup>+</sup> depletion promotes nuclear factor- $\kappa$ B transcriptional activity by preventing p65 de-acetylation. *Biochimica et Biophysica Acta (BBA) - Molecular Cell Research*, **1833**: 1985–1991.
- Krishnamurti, U. dan Silverman, J.F., 2014. HER2 in Breast Cancer. *Advances in Anatomic Pathology*, **21**: .
- Lestari, B., Nakamae, I., Yoneda-Kato, N., Morimoto, T., Kanaya, S., Yokoyama, T., dkk., 2019. Pentagamavunon-1 (PGV-1) inhibits ROS metabolic enzymes and suppresses tumor cell growth by inducing M phase (prometaphase) arrest and cell senescence. *Scientific Reports*, **9**: .
- Liachovitzky, C., 2015. Human Anatomy and Physiology Preparatory Course.
- Lin, K., Baritaki, S., Militello, L., Malaponte, G., Bevelacqua, Y., dan Bonavida, B., 2010. The Role of B-RAF Mutations in Melanoma and the Induction of EMT via Dysregulation of the NF- $\kappa$ B/Snail/RKIP/PTEN Circuit. *Genes & Cancer*, **1**: 409–420.
- Lingle, W.L. dan Salisbury, J.L., 2005. Analysis of Centrosome Amplification in Cancer. hal. 119–128.
- Liu, H.-T. dan Ho, Y.-S., 2018. Anticancer effect of curcumin on breast cancer and stem cells. *Food Science and Human Wellness*, **7**: .
- Liu, L., Greger, J., Shi, H., Liu, Y., Greshock, J., Annan, R., dkk., 2009. Novel Mechanism of Lapatinib Resistance in HER2-Positive Breast Tumor Cells: Activation of AXL. *Cancer Research*, **69**: .
- Liu, P., Cheng, H., Roberts, T.M., dan Zhao, J.J., 2009. Targeting the phosphoinositide 3-kinase pathway in cancer. *Nature reviews. Drug discovery*,

8: 627–44.

- Liu, X., Zheng, Y., Qiao, C., Qv, F., Wang, J., Ding, B., dkk., 2015. Expression of SATB1 and HER2 in breast cancer and the correlations with clinicopathologic characteristics. *Diagnostic Pathology*, **10**: 50.
- Lopresti, A.L., 2018. The Problem of Curcumin and Its Bioavailability: Could Its Gastrointestinal Influence Contribute to Its Overall Health-Enhancing Effects? *Advances in Nutrition*, **9**: .
- Luqman, S. dan Pezzuto, J.M., 2010. NFκB: a promising target for natural products in cancer chemoprevention. *Phytotherapy Research*, **24**: 949–963.
- Manning, B.D. dan Toker, A., 2017. AKT/PKB Signaling: Navigating the Network. *Cell*, **169**: 381–405.
- Margono, S.A., Pudjono, P., Prasajo, S.L., Julianus, J., dan Istyastono, E.P., 2010. SYNTHESIS AND PHYSICOCHEMISTRY PROPERTIES PREDICTION OF A NEW POTENTIAL ANTI-INFLAMMATORY AGENT: DIACETYL PENTAGAMAVUNON-1. *Indonesian Journal of Chemistry*, **6**: 94–98.
- Meiyanto, E., Husnaa, U., Kastian, R.F., Putri, H., Larasati, Y.A., Khumaira, A., dkk., 2021. The target differences of anti-tumorigenesis potential of curcumin and its analogues against HER-2 positive and triple-negative breast cancer cells. *Advanced Pharmaceutical Bulletin*, **11**: 188–196.
- Meiyanto, E., Putri, D.D.P., Susidarti, R.A., Murwanti, R., Sardjiman, S., Fitriasari, A., dkk., 2014. Curcumin and its Analogues (PGV-0 and PGV-1) Enhance Sensitivity of Resistant MCF-7 Cells to Doxorubicin through Inhibition of HER2 and NF-κB Activation. *Asian Pacific Journal of Cancer Prevention*, **15**: 179–184.
- Meiyanto, E., Putri, H., Larasati, Y.A., Utomo, R.Y., Jenie, R.I., Ikawati, M., dkk., 2019. Anti-proliferative and anti-metastatic potential of curcumin analogue, pentagamavunon-1 (PGV-1), toward highly metastatic breast cancer cells in correlation with ROS generation. *Advanced Pharmaceutical Bulletin*, **9**: 445–452.
- Meiyanto, E., Septisetyani, E.P., Larasati, Y.A., dan Kawaichi, M., 2018. Curcumin Analog Pentagamavunon-1 (PGV-1) Sensitizes Widr Cells to 5-Fluorouracil through Inhibition of NF-κB Activation. *Asian Pacific journal of cancer prevention : APJCP*, **19**: 49–56.
- Mendoza, M.C., Er, E.E., dan Blenis, J., 2011. The Ras-ERK and PI3K-mTOR pathways: cross-talk and compensation. *Trends in Biochemical Sciences*, **36**: .
- Moasser, M.M., 2007. The oncogene HER2: Its signaling and transforming functions and its role in human cancer pathogenesis. *Oncogene*, .
- Myers, A.P. dan Cantley, L.C., 2010. Targeting a common collaborator in cancer development. *Science translational medicine*, **2**: 48ps45.



- Nagahama, K., Utsumi, T., Kumano, T., Maekawa, S., Oyama, N., dan Kawakami, J., 2016. Discovery of a new function of curcumin which enhances its anticancer therapeutic potency. *Scientific Reports*, **6**: .
- Nahta, R., Shabay, S., Ozbay, T., dan Rowe, D., 2009. Personalizing HER2-Targeted Therapy in Metastatic Breast Cancer Beyond HER2 Status: What We Have Learned from Clinical Specimens. *Current Pharmacogenomics and Personalized Medicine*, **7**: 263–274.
- National Center for Biotechnology Information, 2022. 'INSR insulin receptor [ Homo sapiens (human) ]', . URL: <https://www.ncbi.nlm.nih.gov/gene/3643> (diakses tanggal 17/1/2022).
- Opdam, F.L., Guchelaar, H., Beijnen, J.H., dan Schellens, J.H.M., 2012. Lapatinib for Advanced or Metastatic Breast Cancer. *The Oncologist*, **17**: 536–542.
- Parkin, D.M., Bray, F., Ferlay, J., dan Pisani, P., 2005. Global Cancer Statistics, 2002. *CA: A Cancer Journal for Clinicians*, **55**: .
- Pollak, M., 2012. The insulin and insulin-like growth factor receptor family in neoplasia: an update. *Nature Reviews Cancer*, **12**: 159–169.
- Porta, C., Paglino, C., dan Mosca, A., 2014. Targeting PI3K/Akt/mTOR Signaling in Cancer. *Frontiers in oncology*, **4**: 64.
- Rahmani, A., Alsahli, M., Aly, S., Khan, M., dan Aldebasi, Y., 2018. Role of Curcumin in Disease Prevention and Treatment. *Advanced Biomedical Research*, **7**: .
- Rajasekaran, S.A., 2011. Therapeutic potential of curcumin in gastrointestinal diseases. *World Journal of Gastrointestinal Pathophysiology*, **2**: .
- Ruggero, D. dan Sonenberg, N., 2005. The Akt of translational control. *Oncogene*, **24**: 7426–34.
- Sergina, N. V., Rausch, M., Wang, D., Blair, J., Hann, B., Shokat, K.M., dkk., 2007. Escape from HER-family tyrosine kinase inhibitor therapy by the kinase-inactive HER3. *Nature*, **445**: .
- Song, D., Tian, J., Hu, Y., Wei, Y., Lu, H., Wang, Y., dkk., 2020. Identification of biomarkers associated with diagnosis and prognosis of gastroesophageal junction adenocarcinoma-a study based on integrated bioinformatics analysis in GEO and TCGA database. *Medicine*, **99**: e23605.
- Sudhesh Dev, S., Zainal Abidin, S.A., Farghadani, R., Othman, I., dan Naidu, R., 2021. Receptor Tyrosine Kinases and Their Signaling Pathways as Therapeutic Targets of Curcumin in Cancer. *Frontiers in Pharmacology*, **12**: .
- Sutherland, S., Ashley, S., Miles, D., Chan, S., Wardley, A., Davidson, N., dkk., 2010. Treatment of HER2-positive metastatic breast cancer with lapatinib and capecitabine in the lapatinib expanded access programme, including efficacy in brain metastases – the UK experience. *British Journal of Cancer*, **102**: 995–

1002.

- Szymonowicz, K., Oeck, S., Malewicz, N., dan Jendrossek, V., 2018. New Insights into Protein Kinase B/Akt Signaling: Role of Localized Akt Activation and Compartment-Specific Target Proteins for the Cellular Radiation Response. *Cancers*, **10**: 78.
- Tan, B.L. dan Norhaizan, M.E., 2019. Curcumin Combination Chemotherapy: The Implication and Efficacy in Cancer. *Molecules*, **24**: .
- Tomeh, M., Hadianamrei, R., dan Zhao, X., 2019. A Review of Curcumin and Its Derivatives as Anticancer Agents. *International Journal of Molecular Sciences*, **20**: .
- Trusolino, L. dan Bertotti, A., 2012. Compensatory pathways in oncogenic kinase signaling and resistance to targeted therapies: Six degrees of separation. *Cancer Discovery*, **2**: 876–880.
- Wang, Y., Wu, J., dan Wang, Z., 2006. Akt Binds to and Phosphorylates Phospholipase C- $\gamma$ 1 in Response to Epidermal Growth Factor. *Molecular Biology of the Cell*, **17**: 2267–2277.
- Wang, Z., 2017. ErbB Receptors and Cancer. hal. 3–35.
- Wee, P. dan Wang, Z., 2017. Epidermal Growth Factor Receptor Cell Proliferation Signaling Pathways. *Cancers*, **9**: 52.
- Wu, M., Li, Q., dan Wang, H., 2021. Identification of Novel Biomarkers Associated With the Prognosis and Potential Pathogenesis of Breast Cancer via Integrated Bioinformatics Analysis. *Technology in cancer research & treatment*, **20**: .
- Wulandari, F., Ikawati, M., Meiyanto, E., Kirihata, M., dan Hermawan, A., 2020. Bioinformatic analysis of CCA-1.1, a novel curcumin analog, uncovers furthest noticeable target genes in colon cancer. *Gene Reports*, **21**: .
- Xuhong, J.-C., Qi, X.-W., Zhang, Y., dan Jiang, J., 2019. Mechanism, safety and efficacy of three tyrosine kinase inhibitors lapatinib, neratinib and pyrotinib in HER2-positive breast cancer. *American journal of cancer research*, **9**: .
- Yoo, M.H., Rhee, Y., Jung, J., Lee, S., Moon, J., Mo, J., dkk., 2020. TRPV1 regulates inflammatory process in the tongue of surgically induced xerostomia mouse. *Head & Neck*, **42**: 198–209.
- Zhang, X., Gureasko, J., Shen, K., Cole, P.A., dan Kuriyan, J., 2006. An Allosteric Mechanism for Activation of the Kinase Domain of Epidermal Growth Factor Receptor. *Cell*, **125**: 1137–1149.
- Zhu, H.M., Fei, Q., Qian, L.X., Liu, B.L., He, X., dan Yin, L., 2019. Identification of key pathways and genes in nasopharyngeal carcinoma using bioinformatics analysis. *Oncology Letters*, **17**: 4683–4694.
- Zulkifli, A.A., Tan, F.H., Putoczki, T.L., Stylli, S.S., dan Luwor, R.B., 2017.

STAT3 signaling mediates tumour resistance to EGFR targeted therapeutics.

*Molecular and Cellular Endocrinology*, **451**: .