

## DAFTAR PUSTAKA

- Akbar, S. M. F., Al-Mahtab, M., Uddin, M. H., & Khan, M. S. I. (2013). HBsAg, HBcAg, and combined HBsAg/HBcAg-based therapeutic vaccines in treating chronic hepatitis B virus infection. In Hepatobiliary and Pancreatic Diseases International (Vol. 12, Issue 4, pp. 363–369). Firts Affiliated Hospital. [https://doi.org/10.1016/S1499-3872\(13\)60057-0](https://doi.org/10.1016/S1499-3872(13)60057-0)
- Alex, A., Brundha, M.P., and Prathap, L. (2020). Sanger sequencing and its recent advances: A review. PalArch's Journal of Archaeology of Egypt/Egyptology. 17 (7): 698-705. ISSN 1567-214x.
- Allocati, N., Masulli, M., Alexeyev, M.F., and Ilio, C.D. (2013). *Escherichia coli* in Europe: An Overview. International Journal of Environmental Research and Public Health Vol 10: 6235-6254.
- Anwar, R. I., Mustopa, A. Z., Ningrum, R. A., & Suharsono, S. (2019). Construction and expression of indonesian hepatitis B core antigen (HBcAg) in lactococcus lactis as potential therapeutic vaccine. Biotechnologia, 100(1), 37–45. <https://doi.org/10.5114/bta.2019.83210>
- Asif, A., Mohsin, H., Tanvir, R., and Rehman, Y. (2017). Revisiting the mechanisms involved in Calcium Chloride induced bacterial transformation. Frontiers. Microbiol., vol. 8. <https://doi.org/10.3389/fmicb.2017.02169>
- Assefa, Ayalew. (2019). Prevalence of *Escherichia coli* O157:H7 in foods of animal origin in Ethiopia: A meta-analysis. Cogent food and agriculture. <https://doi.org/10.1080/23311932.2019.1642981>
- Bachmair, A., Finley, D., & Varshavsky, A. (1986). In vivo half-life of a protein is a function of its amino-terminal residue. Science (New York, N.Y.), 234(4773), 179–186. doi: 10.1126/SCIENCE.3018930
- Bergkessel, M., & Guthrie, C. (2013). Colony PCR. Methods in Enzymology, 529, 299–309. <https://doi.org/10.1016/B978-0-12-418687-3.00025-2>
- Boesenberg-Smith, K.A., Pessarakli, M.M., and Wolk, D.M. (2012). Assessment of DNA yield and purity: an overlooked detail of PCR troubleshooting. Clinical 96 Microbiology Newsletter. 34 (1): 1-6. doi:10.1016/j.clinmicnews.2011.12.002.
- Bornhorst, J. A., & Falke, J. J. (2000). Purification of proteins using polyhistidine affinity tags. In Elsevier eBooks (pp. 245–254). [https://doi.org/10.1016/s0076-6879\(00\)26058-8](https://doi.org/10.1016/s0076-6879(00)26058-8)
- Brown, T.A. (2010). *Gene Cloning and DNA Analysis* 6<sup>th</sup> Edition. Manchester (UK): Wiley-Blackwell Publishing.
- Chang, A.Y., Chau, V.W.Y., Landas, J.A., and Pang, Y. (2017). Preparation of calcium competent *Escherichia coli* and heat-shock transformation. Journal of Experimental Microbiology and Immunology (JEMI) Methods. 1: 22-25.

- Chang, Y.H., Li, H., and Sun, H. (2017). Immobilized metal affinity chromatography (IMAC) for metalloproteomics and phosphoproteomics. In *Elsevier eBooks* (pp. 329-353). Doi.org/10.1016/b978-0-12-803814-7.00009-5.
- Counts, S.E. (2010). Western Blot. *Encyclopedia of Movement Disorders*, In Elsevier eBooks.
- Cronan J. E. (2014). *Escherichia coli* as an Experimental Organism. *Journal of Molecular Biology*. John Wiley and Sons Ltd.
- Daegelen, P., Studier, F.W., Lenski, R.E., Cure, S., and Kim, F.J. (2009). Tracing ancestors and relatives of *Escherichia coli* B, and the derivation of B strains REL606 and BL21(DE3). *Journal. Mol. Biol.* 394(4): 634-43. doi: 10.1016/j.jmb.2009.09.022.
- Das, S., and Dash, H.R. (2015). Cloning and Transformation. Microbial Biotechnology- A laboratory Manual for Bacterial System. India: Springer. Pp. 35-44. doi:10.1007/978-81-322-2095-4\_2.
- Doo, E., dan Ghany, M.G. (2010). Hepatitis B virology for clinicians. In: Naoky C, Melorose J, Perroy R, Careas S, eds. *Clinics in Liver Disease*, Vol.14. doi: 10.1017/CBO9781107415324.004.
- Doytchinova, I.A., and Flower, D.R. (2007). VaxiJen: a server for prediction of protective antigens, tumour antigens and subunit vaccines. *BMC Bioinformatics*. doi:10.1186/1471-2105-8-4
- Franco, E., Bagnato, B., Marino, M. G., Meleleo, C., Serino, L., & Zaratti, L. (2012). Hepatitis B: Epidemiology and prevention in developing countries. *World Journal of Hepatology*, 4(3), 74–80. <https://doi.org/10.4254/wjh.v4.i3.74>
- Gallagher, S. (2001). Quantitation of nucleic acids with absorption spectroscopy. *Current Protocols in Protein Science*, Appendix4, A.4K.1-A.4K.3. doi: 10.1002/0471140864.PSA04KS13
- Galloway, C. A., Sowden, M. P., & Smith, H. C. (2003). Increasing the yield of soluble recombinant protein expressed in *E. coli* by Induction during late log phase. *BioTechniques*, 34(3), 524–530. <https://doi.org/10.2144/03343st04>.
- Gerlich, W.H. (2013). Medical virology of Hepatitis B: How it began and where we are now. *Virology Journal*. 10(39):1-25.doi:10.1186/1743-422X-10-239
- Geunes-Boyer, S., Beers, M.F., Perfect, J.R., Heitman, J., and Wright, J.R. (2012). Surfactan protein D facilitates *Cryptococcus neoformans* infection. *Fungal and Parasitic Infections*, vol. 80, Issue 7. <https://doi.org/10.1128/iai.05613-11>
- Guedes, D.C., Santiani, M.H., Carvalho, J., Soccol, C.R., Minozzo, J.C., de Avila, R.A.M., de Moura, J.F., Ramos, E.L.P., Castro, G.R., Chavez-Olortegi, C., dan Thomaz-Soccol, V. (2021). In silico and in vitro evaluation of mimetic peptides as potential antigen candidates for prophylaxis of leishmaniosis. *Frontiers in Chemistry*, vol. 8. doi: 10.3389/fchem.2020.601409

- Gustafsson, C., Minshull, J., Govindarajan, S., Ness, J., Villalobos, A., and Welch, M. (2012). Engineering genes for predictable protein expression. Elsevier, Protein Expr Purif, 83(1): 37-46. doi:10.1016/j.pep.2012.02.01.3.
- Gutiérrez-González, M., Farías, C., Tello, S., Pérez-Etcheverry, D., Romero, A., Zúñiga, R., Ribeiro, C. H., Lorenzo-Ferreiro, C., & Molina, M. C. (2019). Optimization of culture conditions for the expression of three different insoluble proteins in *Escherichia coli*. Scientific Reports, 9(1), 1–11. <https://doi.org/10.1038/s41598-019-53200-7>
- Hanahan, D. (1983). Studies on transformation of *Escherichia coli* with plasmids. Journal of Molecular Biology. 166: 557–580. doi:10.1016/S0022-2836(83)80284-8.
- Haque, M.M., Islam, M.N., Huque, M.M., Hasan, M., Islam, M.S., and Islam, M.S. (2010). Coir fiber reinforced polypropylene composites: physical and mechanical properties. Advanced Composite Materials, 19;91-106.
- Hardianto, D., Indarto, A., & Sasongko, N. D. (2015). BIOTEKNOLOGI & BIOSAINS INDONESIA OPTIMASI METODE LISIS ALKALI UNTUK MENINGKATKAN KONSENTRASI PLASMID Optimization of Alkaline Lysis Method for the Improvement of Plasmid Concentration (Vol. 2). <http://ejurnal.bppt.go.id/index.php/JBBI>
- Hayat, S. M. G., Farahani, N., Golichenari, B., & Sahebkar, A. (2018). Recombinant Protein Expression in *Escherichia coli* (E.coli): What We Need to Know. Current Pharmaceutical Design, 24(6), 718–725. doi: 10.2174/1381612824666180131121940
- Ho, B. K., & Brasseur, R. (2005). The Ramachandran plots of glycine and proline. BMC Structural Biology, 5(1). <https://doi.org/10.1186/1472-6807-5-14>
- Hollingsworth, S. A., & Karplus, P. A. (2010). A fresh look at the Ramachandran plot and the occurrence of standard structures in proteins. Biomolecular Concepts, 1(3–4), 271–283. <https://doi.org/10.1515/bmc.2010.022>
- Huang, C. J., Peng, H. L., Patel, A. K., Singhanian, R. R., Dong, C. D., & Cheng, C. Y. (2021). Effects of lower temperature on expression and biochemical characteristics of HCV ns3 antigen recombinant protein. Catalysts, 11(11), 1297. <https://doi.org/10.3390/catal11111297>
- Huang, Y.H., Zhen, G.P., Xiang, Y., Jiang, Y.H., and Liu, D.Y. (2014). A research about awareness and acceptance of HPV vaccines degrees in Shenzhen Luohu community. Modern Hospital, 05; 144-146.
- İnan, N., & Tabak, F. (2015). Hepatitis B Virus: Biology and Life Cycle. Viral Hepatitis Dergisi, 21(1), 1–7. <https://doi.org/10.4274/vhd.36036>
- Jannah, R., Nidhal Unsun L. (2019). Konstruksi dan Kloning Plasmid PCDNA3.1 (+) dengan Subgenotip B3 Hepatitis B CoreAntigen (HBcAg) Sebagai Kandidat Vaksin DNA Hepatitis B. Jurnal Penelitian dan Kajian Ilmiah Kesehatan. 5(2): 125-131.

- Jia, B., & Jeon, C. O. (2016). High-throughput recombinant protein expression in *Escherichia coli*: Current status and future perspectives. In *Open Biology* (Vol. 6, Issue 8). Royal Society of London. <https://doi.org/10.1098/rsob.160196>
- Jiang, L., Qian, F., He, X., Wang, F., Ren, D., He, Y., Li, K., Sun, S., & Yin, C. (2007). Novel chitosan derivative nanoparticles enhance the immunogenicity of a DNA vaccine encoding hepatitis B virus core antigen in mice. Journal of Gene Medicine, 9(4), 253–264. <https://doi.org/10.1002/jgm.1017>
- Johnston, C., Martin, B., Fichant, G., Polard, P., and Claverys, J.P. (2014). Bacterial Transformation: Distribution, Shared Mechanisms, and Divergent Control. Nature Reviews Microbiology, Vol. 12, No. 3: 181-196
- Kaushik, D., Mohan, M., Borade, D.M., dan Swami, O.C. (2014). Ampicillin: Rise, fall, and resurgence. Journal of Clinical and Diagnostic Research, vol. 8(5):1-3.
- Kurniawan, I.Y., Basuki, F., and Susilowati, T. (2013). Penambahan Air Kelapa dan Gliserol pada Penyimpanan Sperma Terhadap Motilitas dan Fertilitas Spermatozoa Ikan Mas (*Cyprinus carpio* L). Journal of Aquaculture Management and Technology, vol. 2, No. 1:51-65.
- Liang, T.J. (2009). Hepatitis B: The virus and disease. Hepatology, 49(5): 13-21. Doi:10.1002/hep.22881
- Listwan, P., Pédelacq, J. D., Lockard, M., Bell, C., Terwilliger, T. C., & Waldo, G. S. (2010). The optimization of in vitro high-throughput chemical lysis of *Escherichia coli*. Application to ACP domain of the polyketide synthase ppsC from *Mycobacterium tuberculosis*. Journal of Structural and Functional Genomics, 11(1), 41–49. <https://doi.org/10.1007/s10969-009-9077-8>
- Lodge, J., Lund, P., & Minchin, S. (2007). *Gene Cloning*.
- Lokhande. (2011). HBV and HCV immunopathogenesis, in mukolov SL, Viral hepatitis, selected issues of pathogenesis and diagnostics intech open, Croatia.
- Lovell, S.C., Davis, I.W., Arendall W.B., de Bakker, P.W., Word, J.M., Prisant, M.G., Richardson, J.S., and Richardson, D.C. (2003). Structure validation by calpha geometry: phi, psi and cbeta deviation. Pubmed, Proteins, 15;50(3): 437-50. doi: 10.1002/prot.10286.
- Lucena-Aguilar, G., Sánchez-López, A.M., Barberán-Aceituno, C., Carrillo-Ávila, J.A., López-Guerrero, J.A., and Aguilar-Quesada, R. (2016). DNA source selection for downstream applications based on DNA quality indicator analysis. Biopreservation and Biobanking. 14 (4): 264-270. doi:10.1089/bio.2015.0064.
- Madamanchi, N. R., & Runge, M. S. (2003). Western blotting. In Humana Press eBooks (pp. 245–256). <https://doi.org/10.1385/1-59259-087-x:245>
- Malik, I. R., Chen, A., Brass, A., Ahlén, G., Rahman, M., Sällberg, M., Qureshi, J. A., & Frelin, L. (2012). A bi-functional hepatitis B virus core antigen (HBcAg) chimera activates HBcAg-specific T cells and preS1-specific antibodies. Scandinavian Journal of Infectious Diseases, 44(1), 55–59. <https://doi.org/10.3109/00365548.2011.608711>

- Mauro, V. P. (2018). Codon Optimization in the Production of Recombinant Biotherapeutics: Potential Risks and Considerations. *In BioDrugs* (Vol. 32, Issue 1, pp. 69–81). Springer International Publishing. <https://doi.org/10.1007/s40259-018-0261-x>
- Mierendorf, R. C., Morris, B. B., Hammer, B., & Novy, R. E. (1999). Expression and Purification of Recombinant Proteins Using the pET System.
- Moradi, M., Mazoochi, M., and Ahmadi, M. (2022). A comprehensive method for improving the quality of open government data and increasing citizens willingness to use data by analyzing the complex system of citizens and organizations. [Doi.org/10.1155/2022/5876035](https://doi.org/10.1155/2022/5876035)
- Nehete, J. Y., Bhambar, R. S., Narkhede, M. R., & Gawali, S. (2013). Natural proteins: Sources, isolation, characterization and applications. *Pharmacognosy Reviews*, 7(14), 107. <https://doi.org/10.4103/0973-7847.120508>
- Nurainy, N., Muljono, D.H., Sudoyo, H., dan Marzuki, S. (2008). Genetic study of hepatitis B virus in Indonesia reveals a new subgenotype of genotype B in east Nusa Tenggara. *Arch. Virol.* 153 (6), 1057-1065.
- Panja, S., Aich, P., Jana, B., and Basu, T. (2008). Plasmid DNA binds to the core oligosaccharide domain of LPS molecules of *E. coli* cell surface in the CaCl<sub>2</sub>-mediated transformation process. *Biomacromolecules*. 9: 2501– 2509. doi: 10.1021/bm8005215.
- Parret, A.H., Besir, H., and Meijers, R. (2016). Critical reflections on synthetic gene design for recombinant protein expression. *Curr Opin Struct Biol*, 38:155-62. doi:10.1016/j.sbi.2016.07.004.
- Plotkin, J. B., & Kudla, G. (2011). Synonymous but not the same: The causes and consequences of codon bias. *In Nature Reviews Genetics* (Vol. 12, Issue 1, pp. 32–42). <https://doi.org/10.1038/nrg2899>
- Pollard, A. J., & Bijker, E. M. (2021). A guide to vaccinology: from basic principles to new developments. *In Nature Reviews Immunology* (Vol. 21, Issue 2, pp. 83–100). Nature Research. <https://doi.org/10.1038/s41577-020-00479-7>
- Pollet, J., Chen, W. H., & Strych, U. (2021). Recombinant protein vaccines, a proven approach against coronavirus pandemics. *In Advanced Drug Delivery Reviews* (Vol. 170, pp. 71–82). Elsevier B.V. <https://doi.org/10.1016/j.addr.2021.01.001>
- Puetz, J., and Wurm, F.M. (2019). Recombinant Proteins for Industrial versus Pharmaceutical Purposes: A review of Process and Pricing. *Processes*, 7,476; doi: 10.3390/pr7080476
- Ramachandran, V. S. (1988). Perception of shape from shading. *Nature* 1988 331:6152, 331(6152), 163–166. doi: 10.1038/331163a0
- Ravishankar, S., Ambady, A., Ramu, H., Mudugal, N.V., Tunduguru, R., Anbarasu, A., Sharma, U.K., Sambandamurthy, V.K., Ramaiah, S. (2015). An IPTG inducible conditional expression system for mycobacteria. *PLoS ONE*, 10(8):e0134562

- Rolland D, Gauthier M, Dugua JM, Fournier C, Delpech L, Watelet B, et al. (2001). "Purification of recombinant HBc antigen expressed in *Escherichia coli* and *Pichia pastoris*: comparison of size-exclusion chromatography and ultracentrifugation". J Chromatogr B Biomed SciAppl 2001; 753: 51-65.
- Rosano, G. L., & Ceccarelli, E. A. (2014). Recombinant protein expression in *Escherichia coli*: Advances and challenges. In Frontiers in Microbiology (Vol. 5, Issue APR). Frontiers Research Foundation. <https://doi.org/10.3389/fmicb.2014.00172>
- Rubin, Lorry. (2013). Infant meningococcal vaccination: Advisory committee on immunization practices (ACIP) recommendations and rationale. Morbidity and Mortality Weekly Report (MMWR), vol. 62, No. 3.
- Sambrook, J., dan Russel, D.W. (2001). *Molecular Cloning: A Laboratory Manual*. CHSL press: New York.
- Seo, S., Choi, J., Park, S., & Ahn, J. (2021). Binding affinity prediction for protein– ligand complex using deep attention mechanism based on intermolecular interactions. BMC Bioinformatics, 22(1). <https://doi.org/10.1186/s12859-021-04466-0>
- Singh, A., Upadhyay, V., Upadhyay, A. K., Singh, S. M., & Panda, A. K. (2015). Protein recovery from inclusion bodies of *Escherichia coli* using mild solubilization process. Microbial Cell Faktories, 14(1), 1–10. <https://doi.org/10.1186/s12934-015-0222-8>.
- Singh, M., Yadav A., Ma, X., and Eugene, A. (2010). Plasmid DNA transformation in *Escherichia coli*: effect of heat shock temperature, duration, and cold incubation of CaCl<sub>2</sub> treated cells. International Journal of Biotechnology and Biochemistry. 6 (4): 561-568.
- Shilling, P. J., Mirzadeh, K., Cumming, A. J., Widesheim, M., Köck, Z., & Daley, D. O. (2020). Improved designs for pET expression plasmids increase protein production yield in *Escherichia coli*. Communications Biology, 3(1). <https://doi.org/10.1038/s42003-020-0939-8>
- Tokmakov, A. A., Kurotani, A., & Sato, K. (2021). Protein PI and intracellular localization. Frontiers in Molecular Biosciences, 8. <https://doi.org/10.3389/fmolb.2021.775736>
- Urban, S., Schulze, A., Dandri, M., & Petersen, J. (2010). The replication cycle of hepatitis B virus. In Journal of Hepatology (Vol. 52, Issue 2, pp. 282–284). Elsevier B.V. <https://doi.org/10.1016/j.jhep.2009.10.031>
- Vetter, V., Denizer, G., Friedland, L.R., Krishnan, J., and Shapiro, M. (2018). Understanding modern-day vaccines: what you need to know. Annals of Medicine, 50(2): 110-120. doi: 10.1080/07853890.2017.1407035
- Viswanathan, U., Mani, N., Hu, Z., Ban, H., Du, Y., Hu, J., Chang, J., & Guo, J. T. (2020). Targeting the multifunctional HBV core protein as a potential cure for chronic hepatitis B. In Antiviral Research (Vol. 182). Elsevier B.V. <https://doi.org/10.1016/j.antiviral.2020.104917>
- Waty, R., Mustopa, A. Z., Suharsono, Ningrum, R. A., & Murtiyaningsih, H. (2017). Soluble expression and purification of hepatitis B core antigen (HBcAg) subgenotype



B3 in Escherichia coli using thioredoxin fusion tag. *Asian Pacific Journal of Tropical Disease*, 7(8), 496–501. <https://doi.org/10.12980/apjtd.7.2017D7-58>

Woodman, M. E. (2008). Direct PCR of intact bacteria (colony PCR). *Current Protocols in Microbiology*, SUPPL. 9, 1–6. <https://doi.org/10.1002/9780471729259.mca03ds9>

Wulanjati, M.P., Witasari, L.D., Wijayanti, N., dan Haryanto, A. (2021). *Recombinant fusion protein expression of Indonesia isolate Newcastle disease virus in Escherichia coli BL21(DE3)*. *Biodiversitas Journal of Biological Diversity*, 22(6). DOI:[10.13057/biodiv/d220629](https://doi.org/10.13057/biodiv/d220629)

Yano, Y., Utsumi, T., Lusida, M. I., & Hayashi, Y. (2015). Hepatitis B virus infection in Indonesia. *World Journal of Gastroenterology*, 21(38), 10714–10720. <https://doi.org/10.3748/wjg.v21.i38.10714>

Yao, B., Zhang, L., Liang, S., & Zhang, C. (2012). SVMTRIP: a method to predict antigenic epitopes using support vector machine to integrate Tri-Peptide similarity and propensity. *PLOS ONE*, 7(9), e45152. <https://doi.org/10.1371/journal.pone.0045152>

Zhang, Z., Kuipers, G., Niemiec, Ł., Baumgarten, T., Slotboom, D. J., de Gier, J. W., & Hjelm, A. (2015). High-level production of membrane proteins in E. coli BL21(DE3) by omitting the inducer IPTG. *Microbial Cell Factories*, 14(1). <https://doi.org/10.1186/s12934-015-0328-z>

Zhou, Z., Danga, Y., Zhou, M., Li, L., Yu, C. H., Fu, J., Chen, S., & Liu, Y. (2016). Codon usage is an important determinant of gene expression levels largely through its effects on transcription. *Proceedings of the National Academy of Sciences of the United States of America*, 113(41), E6117–E6125. <https://doi.org/10.1073/pnas.1606724113>

Zlotnick, A., Venkatakrishnan, B., Tan, Z., Lewellyn, E., Turner, W., & Francis, S. (2015). Core protein: A pleiotropic keystone in the HBV lifecycle. *In Antiviral Research* (Vol. 121, pp. 82–93). Elsevier B.V. <https://doi.org/10.1016/j.antiviral.2015.06.020>