

DAFTAR PUSTAKA

- Aghaabdollahian, S., Rabbani, M., Ghaedi, K., & Sadeghi, H. M. M. (2014). Molecular cloning of Reteplase and its expression in *E. coli* using tac promoter. *Advanced Biomedical Research*, 3(1), 190.
- Andersson, R., & Sandelin, A. (2020). Determinants of enhancer and promoter activities of regulatory elements. *Nature Reviews Genetics*, 21(2), 71-87.
- Babaki, M. K. Z., Soleimanpour, S., & Rezaee, S. A. (2017). Antigen 85 complex as a powerful *Mycobacterium tuberculosis* immunogene: Biology, immune-pathogenicity, applications in diagnosis, and vaccine design. *Microbial pathogenesis*, 112, 20-29.
- Bai, Y. et al. (2008). Expression and purification of Mycobacterium tuberculosis ESAT-6 and MPT64 fusion protein and its immunoprophylactic potential in mouse model. *Protein Expression and Purification*, 59, 189-196.
- Becskei, A., & Rahaman, S. (2022). The life and death of RNA across temperatures. *Computational and structural biotechnology journal*, 20, 4325-4336.
- Brisse, M., Vrba, S. M., Kirk, N., Liang, Y., & Ly, H. (2020). Emerging concepts and technologies in vaccine development. *Frontiers in immunology*, 11, 583077.
- Campbell, N. A., & Reece, J. B. (2008). *Biology* (8th edition). San Francisco: Pearson Benjamin Cummings.
- Chen, X., Zaro, J. L., & Shen, W. C. (2013). Fusion protein linkers: property, design and functionality. *Advanced drug delivery reviews*, 65(10), 1357-1369.
- Chichili, V. P.R, Kumar, V., & Sivaraman, J. (2013). Linkers in the structural biology of protein-protein interactions. *Protein science*, 22(2), 153-167.
- Cohen, E., Zafir, Z., & Tuller, T. (2018). A code for transcription elongation speed. *RNA biology*, 15(1), 81-94.
- Costa, S., Almeida, A., Castro, A., & Domingues, L. (2014). Fusion tags for protein solubility, purification and immunogenicity in *Escherichia coli*:

the novel Fh8 system. *Frontiers in microbiology*, 5, 63.

- Dana, R. (2018). Advances and innovations in recombinant protein expression technology. *Journal of Advanced Pharmacy Education & Research*, 8(S2), 89.
- Danielewicz, N., Dai, W., Rosato, F., Webb, M. E., Striedner, G., Römer, W., .& Mairhofer, J. (2022). In-Depth Characterization of a Re-Engineered Cholera Toxin Manufacturing Process Using Growth-Decoupled Production in *Escherichia coli*. *Toxins*, 14(6), 396.
- Deller, M. C., Kong, L., & Rupp, B. (2016). Protein stability: a crystallographer's perspective. *Structural Biology and Crystallization Communications*, 72(2), 72-95
- Du, F., Liu, Y. Q., Xu, Y. S., Li, Z. J., Wang, Y. Z., Zhang, Z. X., & Sun, X. M. (2021). Regulating the T7 RNA polymerase expression in *E. coli* BL21 (DE3) to provide more host options for recombinant protein production. *Microbial Cell Factories*, 20, 1-10.
- Esposito, D., & Chatterjee, D. K. (2006). Enhancement of soluble protein expression through the use of fusion tags. *Current opinion in biotechnology*, 17(4), 353-358.
- Fihiruddin, F., Artama, W. T., Wibawa, T., & Mertaniasih, N. M. (2019). Expression of immunoglobulin, granzyme-B and perforin against Ag85A and Ag85B proteins of *Mycobacterium tuberculosis* in Balb/c mice. *African Journal of Infectious Diseases*, 13(2), 13-20.
- Gupta, N., & Biswas, K. (2016). *Research Trends in Molecular Biology*. Research Signpost: Trivandrum, India. ISBN: 978-81-308-0564.
- Hu, Y., An, Y., Fang, N., Li, Y., Jin, H., Nazarali, A., & Ji, S. (2015). The optimization of soluble PTEN expression in *Escherichia coli*. *The Open Biochemistry Journal*, 9, 42.
- Hunter, R. L. (2018). The pathogenesis of tuberculosis: the early infiltrat of post-primary (adult pulmonary) tuberculosis: a distinct disease entity. *Frontiers in immunology*, 9, 390823.
- Ibrahim, I. R., Abdullah, S. M. A., & Abdulkarim Yasin Karim, A. Y. (2020). Determination of the optimal conditions of cloning Aerolysin gene from the common carp pathogen *Aeromonas hydrophila* in *Escherichia coli* BL21. *Iranian Journal of Fisheries Sciences*, 19(5), 2258-2273.
- Incir, İ., & Kaplan, Ö. (2024). *Escherichia coli* as a versatile cell factory:

Advances and challenges in recombinant protein production. *Protein expression and purification*, 106463.

Jang, A. R., Kim, G., Hong, J. J., Kang, S. M., Shin, S. J., & Park, J. H. (2019). *Mycobacterium tuberculosis* ESAT6 drives the activation and maturation of bone marrow-derived dendritic cells via TLR4-mediated signaling. *Immune network*, 19(2).

Jia, B., & Jeon, C. O. (2016). High-throughput recombinant protein expression in *Escherichia coli*: current status and future perspectives. *Open Biol* 6: 160196.

Joseph, B. C., Pichaimuthu, S., Srimeenakshi, S., Murthy, M., Selvakumar, K., Ganesan, M., & Manjunath, S. R. (2015). An overview of the parameters for recombinant protein expression in *Escherichia coli*, *J Cell Sci Ther*, 6(5), 221.

Kachel, W. (2016). *Applications of the GST- Affinity Tag in the Purification and Characterization of Proteins*. Graduate Theses and Dissertations: University of Arkansas.

Karav, S., Talak, E., Tuncer, M., & Ozleyen, A. (2017). The Effect of Fusion Tags on Enzyme Specificity and Protein Purification Efficiency. *International Journal of Agriculture Innovations and Research*, 6(3), 462-463.

Kashif, M., Alsaiari, A. A., Kumar, B., Asalam, M., Khan, M. I., Ahmad, A., & Akhtar, M. S. (2023). Recombinant expression and preliminary characterization of Peptidyl-prolyl cis/trans-isomerase Rrd1 from *Saccharomyces cerevisiae*. *Plos one*, 18(6), e0282749.

Khan, S., Ullah, M. W., Siddique, R., Nabi, G., Manan, S., Yousaf, M., & Hou, H. (2016). Role of recombinant DNA technology to improve life. *International journal of genomics*, 2016.

Ki, M. R., & Pack, S. P. (2020). Fusion tags to enhance heterologous protein expression. *Applied microbiology and biotechnology*, 104(6), 2411-2425.

Kim, S., Jeong, H., Kim, E. Y., Kim, J. F., Lee, S. Y., & Yoon, S. H. (2017). Genomic and transcriptomic landscape of *Escherichia coli* BL21 (DE3). *Nucleic acids research*. 45(9). 5285-5293.

Knapp, B. D., & Huang, K. C. (2022). The effects of temperature on cellular physiology. *Annual Review of Biophysics*, 51(1), 499-526.

- Kosuri, S., Goodman, D. B., Cambray, G., Mutalik, V. K., Gao, Y., Arkin, A. P., ... & Church, G. M. (2013). Composability of regulatory sequences controlling transcription and translation in *Escherichia coli*. *Proceedings of the National Academy of Sciences*, *110*(34), 14024-14029.
- Kozlovski, I., & Agami, R. (2019). More or less—the same? mRNA fluctuations are balanced during translation. *The EMBO Journal*, *38*(23), e103651.
- Kuczkowska, K., Copland, A., Øverland, L., Mathiesen, G., Tran, A. C., Paul, M. J., ... & Reljic, R. (2019). Inactivated *Lactobacillus plantarum* carrying a surface-displayed Ag85B-ESAT-6 fusion antigen as a booster vaccine against *Mycobacterium tuberculosis* infection. *Frontiers in immunology*, *10*, 454086.
- Kuo, C. J., Bell, H., Hsieh, C. L., Ptak, C. P., & Chang, Y. F. (2012). Novel mycobacteria antigen 85 complex binding motif on fibronectin”, *Journal of Biological Chemistry*, *287*(3), 1892-1902.
- Launois, P., Drowart, A., Bourreau, E., Couppie, P., Farber, C. M., Van Vooren, J. P., & Huygen, K. (2011). T cell reactivity against mycolyl transferase antigen 85 of *M. tuberculosis* in HIV-TB coinfecting subjects and in AIDS patients suffering from tuberculosis and nontuberculous mycobacterial infections. *Journal of Immunology Research*, *2011*.
- Li, M., Wang, J., Geng, Y., Li, Y., Wang, Q., Liang, Q., & Qi, Q. (2012). A strategy of gene overexpression based on tandem repetitive promoters in *Escherichia coli*. *Microbial Cell Factories*, *11*, 1-10.
- Lu, Y., Zhu, B., Li, Q., Du, J., & Chen, T. (2022). The folding and misfolding mechanisms of multidomain proteins. *Medicine in Drug Discovery*, *14*, 100126.
- Marbach, A., & Bettenbrock, K. (2012). Lac operon induction in *Escherichia coli*: Systematic comparison of IPTG and TMG induction and influence of the transacetylase LacA. *Journal of biotechnology*, *157*(1), 82-88.
- Mason, A. B., He, Q. Y., Adams, T. E., Gumerov, D. R., Kaltashov, I. A., Nguyen, V., & MacGillivray, R. T. (2001). Expression, purification, and characterization of recombinant nonglycosylated human serum transferrin containing a C-terminal hexahistidine tag. *Protein expression and purification*, *23*(1), 142-150.
- Mierendorf, R. C., Morris, B. B., Hammer, B., & Novy, R. E. (2000). Expression and purification of recombinant proteins using the pET system. *The nucleic acid protocols handbook*, 947-977.

- Mohsen, M. O., Zha, L., Cabral-Miranda, G., & Bachmann, M. F. (2017, December). Major findings and recent advances in virus-like particle (VLP)-based vaccines. In *Seminars in immunology* (Vol. 34, pp. 123-132). Academic Press.
- Morgan, G. J., Burkhardt, D. H., Kelly, J. W., & Powers, E. T. (2018). Translation efficiency is maintained at elevated temperature in *Escherichia coli*. *Journal of Biological Chemistry*, 293(3), 777-793.
- Murby, M., Uhlén, M., & Ståhl, S. (1996). Upstream strategies to minimize proteolytic degradation upon recombinant production in *Escherichia coli*. *Protein expression and purification*, 7(2), 129-136.
- Ning, H., Zhang, F., Kang, J., Wang, L., Lu, Y., Ren, R., & Bai, Y. (2022). Immune responses induced by subunit vaccine of Ag85B-ESAT-6 delivered by mucosal route to *Mycobacterium tuberculosis*. *Xi bao yu fen zi Mian yi xue za zhi= Chinese Journal of Cellular and Molecular Immunology*, 38(10), 886-892.
- Pal, R., Bisht, M. K., & Mukhopadhyay, S. (2022). Secretory proteins of *Mycobacterium tuberculosis* and their roles in modulation of host immune responses: focus on therapeutic targets. *The FEBS Journal*, 289(14), 4146-4171.
- Patel, D. K., Menon, D. V., Patel, D. H., & Dave, G. (2022). Linkers: A synergistic way for the synthesis of chimeric proteins. *Protein Expression and Purification*, 191, 106012.
- Peng, X., & Sun, J. (2016). Mechanism of ESAT-6 membrane interaction and its roles in pathogenesis of *Mycobacterium tuberculosis*. *Toxicon*, 116, 29-34.
- Peyret, H., Ponndorf, D., Meshcheriakova, Y., Richardson, J., & Lomonosoff, G. P. (2020). Covalent protein display on Hepatitis B core-like particles in plants through the in vivo use of the SpyTag/SpyCatcher system. *Scientific reports*, 10(1), 17095.
- Piubelli, L. et al. (2013). Optimizing *Escherichia coli* as a protein expression platform to produce *Mycobacterium tuberculosis* immunogenic proteins. *Microbial Cell Factories*, 12, 115.
- Pompéia, C., Ortis, F., & Armelin, M. C. (1997). Use of pEX and pGEX bacterial heterologous protein expression systems for recombinant oncoprotein production and antisera generation. *Biotechnology and applied biochemistry*, 25(3), 207-215.

- Raran-Kurussi, S., & Waugh, D. S. (2017). Expression and purification of recombinant proteins in *Escherichia coli* with a His 6 or dual His 6-MBP tag. *Protein crystallography: methods and protocols*, 1-15.
- Riggs, P. D. (2018). Overview of protein expression vectors for *E. coli*. *Current Protocols Essential Laboratory Techniques*, 17(1), e23.
- Rosmalen, M.V., Krom, M., & Merckx, M. (2017). Tuning the flexibility of glycine-serine linkers to allow rational design of multidomain proteins. *Biochemistry*, 56(50), 6565-6574.
- Rukmana, A., Burhanuddin, B., & Yasmon, A. (2018). Optimization of pGEX System to Express and Isolate *Mycobacterium tuberculosis* Inclusion Body Protein in Combining with Modified Refolding Method. *Makara Journal of Science*, 22(4), 1.
- Sciandrone, B., Forti, F., Perego, S., Falchi, F., & Briani, F. (2019). Temperature-dependent regulation of the *Escherichia coli* lpxT gene. *Biochimica et Biophysica Acta (BBA)-Gene Regulatory Mechanisms*, 1862(8), 786-795.
- Seniya, S. P., Yadav, P., & Jain, V. (2020). Construction of *E. coli*—*Mycobacterium* shuttle vectors with a variety of expression systems and polypeptide tags for gene expression in mycobacteria. *PLoS One*, 15(3), e0230282.
- Shamriz, S., Ofoghi, H., & Moazami, N. (2016). Effect of linker length and residues on the structure and stability of a fusion protein with malaria vaccine application. *Computers in biology and medicine*, 76, 24-29.
- Singh, G., Kumar, A., Maan, P., & Kaur, J. (2017). Cell wall associated factors of *Mycobacterium tuberculosis* as major virulence determinants: current perspectives in drugs discovery and design. *Current drug targets*, 18(16), 1904-1918.
- Singh, P. K., Kulsum, U., Rufai, S. B., Mudliar, S. R., & Singh, S. (2020). Mutations in SARS-CoV-2 leading to antigenic variations in spike protein: a challenge in vaccine development. *Journal of laboratory physicians*, 12(02), 154-160.
- Singha, T. K., Gulati, P., Mohanty, A., Khasa, Y. P., Kapoor, R. K., & Kumar, S. (2017). Efficient genetic approaches for improvement of plasmid-based expression of recombinant protein in *Escherichia coli*: A review. *Process Biochemistry*, 55, 17-31.

- Sørensen, H. P., & Mortensen, K. K. (2005). Advanced genetic strategies for recombinant protein expression in *Escherichia coli*. *Journal of biotechnology*, *115*(2), 113-128.
- Sørensen, C. S. & Kjaergaard, M. (2019). Effective concentrations enforced by intrinsically disordered linkers are governed by polymer physics. *Proceedings of the National Academy of Sciences*, *116*(46), 23124-23131.
- Sreejit, G., Ahmed, A., Parveen, N., Jha, V., Valluri, V. L., Ghosh, S., & Mukhopadhyay, S. (2014). The ESAT-6 protein of *Mycobacterium tuberculosis* interacts with beta-2- microglobulin (β 2M) affecting antigen presentation function of macrophage. *PLoS pathogens*, *10*(10), e1004446.
- Studer, R. A., Dessailly, B. H., & Orengo, C. A. (2013). Residue mutations and their impact on protein structure and function: detecting beneficial and pathogenic changes. *Biochemical journal*, *449*(3), 581-594.
- Studier, F. (1998). Use of T7 RNA polymerase to direct expression of cloned genes. *Methods Enzymol.*, *185*, 305-313.
- Terol, G, L., Gallego-Jara, J., Martinez, R. A. S., Vivancos, A. M., Diaz, M. C., & de Diego P. T. (2021). Impact of the expression system on recombinant protein production in *Escherichia coli* BL21. *Frontiers in microbiology*, *12*, 682001.
- Tian, R., Liu, Y., Chen, J., Li, J., Liu, L., Du, G., & Chen, J. (2019). Synthetic N-terminal coding sequences for fine-tuning gene expression and metabolic engineering in *Bacillus subtilis*. *Metabolic engineering*, *55*, 131-141.
- Wang, J., Xie, T., Ullah, I., Mi, Y., Li, X., Gong, Y., & Zhu, B. (2023). A VLP-Based Vaccine Displaying HBHA and MTP Antigens of *Mycobacterium tuberculosis* Induces Potentially Protective Immune Responses in *M. tuberculosis* H37Ra Infected Mice. *Vaccines*, *11*(5), 941.
- Whitlow, E., Mustafa, A. S., & Hanif, S. N. M. (2020). An overview of the development of new vaccines for tuberculosis. *Vaccines*, *8*(4), 586.
- Xu, J., Kato, T., & Park, E. Y. (2019). Development of SpyTag/SpyCatcher-bacmid expression vector system (SpyBEVS) for protein bioconjugations inside of silkworms. *International Journal of Molecular Sciences*, *20*(17), 4228.

- Yadav, D. K., Yadav, N., Yadav, S., Haque, S., & Tuteja, N. (2016). An insight into fusion technology aiding efficient recombinant protein production for functional proteomics. *Archives of biochemistry and biophysics*, 612, 57-77.
- Yin, Y., Li, H., Wu, S., Dong, D., Zhang, J., Fu, L., & Chen, W. (2011). Hepatitis B virus core particles displaying *Mycobacterium tuberculosis* antigen ESAT-6 enhance ESAT6-specific immune responses. *Vaccine*, 29(34), 5645-5651.
- Yu, C. H., Dang, Y., Zhou, Z., Wu, C., Zhao, F., Sachs, M. S., & Liu, Y. (2015). Codon usage influences the local rate of translation elongation to regulate co-translational protein folding. *Molecular cell*, 59(5), 744-754.
- Zhao, X., Li, G., & Liang, S. (2013). Several affinity tags commonly used in chromatographic purification. *Journal of analytical methods in chemistry*, 2013(1), 581093.
- Zhou, F., & Zhang, D. (2023). Nano-sized chimeric human papillomavirus-16 L1 virus-like particles displaying *Mycobacterium tuberculosis* antigen Ag85B enhance Ag85B-specific immune responses in female C57BL/c mice. *Viruses*, 15(10), 2123.
- Zhu, F., Zhang, Q., Zhou, Y., Zhang, Q., Cao, M., & Ji, Z. (2022). Effects of two vectors on the expression of the NbNAC1 transcription factor and preparation of its polyclonal antibody. *Biocell*, 46(9), 2123.