

## DAFTAR PUSTAKA

- Alemzadeh, I., Borghei, G., Vaa, L., dan Roostaazad, R., 2010, Enzymatic Synthesis of Amoxicillin with Immobilized Penicillin G Acylase, *Transactions C: Chemistry and Chemical Engineering*, **17** (1), 106–113.
- Allison, L. A., 2010, *Fundamental Molecular Biology*, Chapter 8. Blackwell Publishing.
- Amarakoon, I. I., Hamilton C. L., Mitchell, S. A., Tennant, P. F., dan Roye, M. E., 2017, Biotechnology, *Pharmacognosy*, 549–563.
- Anonim, n.d., Nucleic Acid Electrophoresis Additional Consideration -7 Aspects. Thermo Fisher Scientific, <https://www.thermofisher.com/id/en/home/life-science/cloning/cloning-learning-center/invitrogen-school-of-molecular-biology/na-electrophoresis-education/na-electrophoresis-considerations.html>, 12 November 2019.
- Anonim, 2011, Understanding and Measuring Variations in DNA Sample Quality. Oxford Gene Technology, [http://www.ogt.com/resources/litearture/483\\_understanding\\_and\\_measuring\\_variations\\_in\\_dna\\_sample\\_quality](http://www.ogt.com/resources/litearture/483_understanding_and_measuring_variations_in_dna_sample_quality), 12 November 2019.
- Anonim, 2015, 19th WHO Model List of Essential Medicines, [https://www.who.int/medicines/publications/essentialmedicines/EML2015\\_8-May-15.pdf](https://www.who.int/medicines/publications/essentialmedicines/EML2015_8-May-15.pdf), 4 Oktober 2019.
- Arroyo, M., Mata, L., Acebal, C., dan Castillón, M. P., 2003, Biotechnological applications of penicillin acylases: state-of-the-arts, *Appl. Microbiol. Biotechnol.*, **60**, 507-514.
- Chandel, A.K., Rao, L.V., Narasu, M.L., dan Singh, O. V., 2008, The realm of penicillin G acylase in  $\beta$ -lactam antibiotics, *Enzyme Microb. Technol.*, **42**, 199–207.
- Bhagavan, N. V., dan Ha, C. E., 2015, Structure and Properties of DNA, *Essentials of Medical Biochemistry*, 381–400.
- Barbero, J. L., Buesa, J. M., Buitrago, G. G., Mendez, E., Perez-Aranda, A., dan Garcia, J. L., 1986, Complete nucleotide sequence of the penicillin acylase from *Kluyvera citrophila*, *Gene*, **49**, 69–80.
- Batchelor, F. R., Chain, E. B., Richards, M. dan Rolinson, G. N., 1961, 6-APA VI: Formation of 6-APA from penicillin by enzymatic hydrolysis, *Proc. R. Soc. Lond. B. Biol. Sci.*, **154**, 522–531
- Bertero, A., Brown, S., dan Vallier, L., 2017, Methods of Cloning, *Basic Science Methods for Clinical Researchers*, 19–39.

- Birnboim, H.C. dan Doly, J., 1979, A Rapid Alkaline Extraction Procedure for Screening Recombinant Plasmid DNA, *Nucleic Acids Res.*, **7**, 1513–1523.
- Bloch, W., 1991, A biochemical perspective of the polymerase chain reaction. *Biochemistry*, **30** (11), 2735–2747.
- Budowle, B. dan Allen, R. C., 1991, Discontinuous polyacrylamide gel electrophoresis of DNA fragments, dalam Mathew, C.G., (Eds.) *Methods in molecular biology: Protocols in human molecular genetics*. Humana Press Inc., Clifton, NJ.
- Butler, J. M., 2012, PCR Amplification, *Advanced Topics in Forensic DNA Typing*, 69–97.
- Carter, M., dan Jennifer, S., 2015, Molecular Cloning and Recombinant DNA Technology, *Guide to Research Techniques in Neuroscience*, 219–237.
- Chan, V., Dreolini L. D., Flintoff, K. A., Lloyd S. J., dan Mattenley, A. A., 2012, The Effect of Increasing Plasmid Size on Transformation Efficiency in Escherichia coli, *Journal of Experimental Microbiology and Immunology*, **2**, 207-223.
- Chiang, C. dan Bennett, R.E., 1967, Purification and properties of penicillin amidase from *Bacillus megaterium*, *J. Bacteriol.*, **93**, 302–308.
- Cole, M., 1969, Hydrolysis of penicillins and related compounds by the cell-bound penicillin acylase of Escherichia coli, *Biochem. J.*, **115**, 733–739.
- Dagert, M., dan Ehrlich, S. D., 1979, Prolonged incubation in calcium chloride improves the competence of Escherichia coli cells, *Gene*, **6** (1), 23–28.
- Dewey, F. E., Pan, S., Wheeler, M. T., Quake, S. R., dan Ashley, E. A., 2012, DNA Sequencing: Clinical Applications of New DNA Sequencing Technologies, *Circulation*, **125** (7), 931–944.
- Drabik, A., Bodzon-Kulakowska, A., dan Silberring, P. J., 2016, *Proteomic Profiling and Analytical Chemistry*, Elsevier B. V.
- Duggleby, H.J., Tolley, S.P., Dodson, E.J., Dodson, G., Moody, P.C.E., dan Hill, C.P., 1995, Penicillin acylase has a single-amino-acid catalytic centre, *Nature*, **373** (6511), 264-268.
- Elander, R. P., 2003, Industrial production of beta-lactam antibiotics, *Appl. Microbiol. Biotechnol.*, **61**, 385–392.
- Erlich, H. A., 1989, Polymerase chain reaction, *Journal of Clinical Immunology*, **9** (6), 437–447.
- Flores, G., Soberon, X., Osuna, J., 2004, Production of a fully functional, permuted single-chain penicillin G acylase, *Protein Sci.*, **13**, 1677-1683.

- Fritsch, R. J., dan Krause, I., 2003, Electrophoresis, *Encyclopedia of Food Sciences and Nutrition*, 2055–2062.
- Genscript, n.d. Plasmid pET22b. [https://www.genscript.com/gsfiles/vector-map/bacteria/pET-22b.pdf?14044808\\_31](https://www.genscript.com/gsfiles/vector-map/bacteria/pET-22b.pdf?14044808_31), 3 November 2019.
- Giordano, R. D. C., Giordano, R. D. L., Camargo, F. dan Andrea, L. D. O., 2006, Process for protection of insoluble enzymatic biocatalysts, biocatalyst obtained thereof and bioreactor with the immobilized biocatalyst. *US Patent 2006*, 20060127971.
- Goncalves, L. R. B., Fernandez-Lafuente, R., Guisan, J. M., Giordano, R. dan Giordano, R.C., 2003, Inhibitory effects in the side reactions occurring during the enzymic synthesis of amoxicillin: P-hydroxyphenylglycine methyl ester and amoxicillin hydrolysis, *Biotechnol. Appl. Biochem*, **38**, 77-85.
- Gronning, T., 2017, Cloning, dalam Turner, B. S., Kyung-Sup, C., Kivisto, C. E., Peter, Outhwaite, W., dan Michael R. J., (Eds.) *The Wiley Blackwell Encyclopedia of Social Theory*, Wiley Blackwell, London.
- Guilliatt, A. M., 2002, Agarose and Polyacrylamide Gel Electrophoresis, dalam Theophilus, B. D. M. dan Rapley, R., (Eds.) *PCR Mutation Detection Protocols, Methods in Molecular Biology*, **187**, Humana Press.
- Hanahan, D., Jessee, J., dan Bloom, F. R., 1991, Plasmid transformation of *Escherichia coli* and other bacteria, *Methods in Enzymology*, **204**, 63-113.
- Hanahan, D., dan Bloom, F. R., 1999, Gene Transfer : Transformation Mechanisms of DNA Transformation.
- Heather, J. M. dan Chain, B., 2015, The Sequence of Sequencers: The History of Sequencing DNA, *Genomics*.
- Kawashima, H., Horii, T., H., Ogawa, T., dan Ogawa H., 1984, Functional domains of *Escherichia coli* recA protein deduced from the mutational sites in the gene, *MGG Molecular & General Genetics*, **193** (2), 288–292.
- Kemenkes RI, 2017, Peraturan Menteri Kesehatan Republik Indonesia Nomor 17 Tahun 2017 tentang Rencana Aksi Pengembangan Industri Farmasi dan Alat Kesehatan. Direktorat Jenderal Kefarmasian dan Alat Kesehatan Kementerian Kesehatan RI, <http://farmalkes.kemkes.go.id/?wpdmact=process&did=NDQ0LmhvdGxpbms=>, 25 September 2019.
- Kemenkes RI, 2018, *Hasil Utama Riskesdas 2018*, Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan RI, Jakarta.
- Klei, H. E., Daumy, G. O., dan Kelly, J. A., 1995, Purification and preliminary crystallographic studies of penicillin G acylase from *Providencia rettgeri*. *Protein Sci.*, **4**, 433–441.

- Koetsier, Giron dan Eric, C., n.d, A Practical Guide to Analyzing Nucleic Acid Concentration and Purify with Microvolume Spectrophotometers, New England Biolabs.Inc
- Kumar, R. S., Prabhune, A. A., Pundle A. V., Karthikeyan M., dan Suresh C. G., 2007, A tryptophan residue is identified in the substrate binding of penicillin G acylase from *Kluyvera citrophila*. *Enzyme Microb. Technol.* **40** (5), 1389-1397.
- Lessard, J. C., 2013, Chapter Seven - Molecular Cloning, *Methods in Enzymology*, **529**, 85-98.
- Lin, C.-H., Chen, Y.-C., dan Pan, T.-M., 2011, Quantification Bias Caused by Plasmid DNA Conformation in Quantitative Real-Time PCR Assay, *PLoS ONE*, **6** (12).
- Lodish, H., Berk, A., Zipursky, S. L., Matsudaira, P., Baltimore, D., dan Darnell, J., 2000, *Molecular Cell Biology*, 4th Edition, W. H. Freeman, New York.
- Long, K., Cai, L., dan He, L., 2018, DNA Sequencing Data Analysis, *Computational Systems Biology*, 1–13.
- Marešová, H., Plačková, M., Grulich, M., dan Kyslík, P., 2014, Current state and perspectives of penicillin G acylase-based biocatalyses, *Appl. Microbiol. Biotechnol.*, **98** (7), 2867–2879.
- Maxam, A. M., dan Gilbert, W., 1976, A New Method for Sequencing DNA, *Proc. Natl. Acad. Sci. USA*, **74** (2), 560-564.
- Mulia, M. A., 2019, Analisis rekombinan klon gena penyandi penisilin G asilase dari *Bacillus megatorium* pada sel inang *Escherichia coli* DH5 $\alpha$ , Yogyakarta : Fak. Farmasi UGM.
- NHGRI, 2015, DNA Sequencing Fact Sheet, <https://www.genome.gov/about-genomics/fact-sheets/DNA-Sequencing-Fact-Sheet>, 5 November 2019.
- Novagen, n.d. pET System Manual. TB055 8th Edition 02/99, <https://research.fhcrc.org/content/dam/stripe/hahn/methods/biochem/pe t.pdf>, 28 November 2019.
- Ohashi, H., Katsuta, Y., Nagashima, M., Kamei, T., dan Yano, M., 1989, Expression of the *Arthrobacter viscosus* penicillin acylase gene in *Escherichia coli* and *Bacillus subtilis*, *Appl. Environ. Microbiol.*, **55** (6), 351–356.
- Pereira, S. C., Bussamara, R., Marin, G., Camargo, R. L., Giordano, Dupont, J., dan Giordano, R., 2012, Enzymatic synthesis of amoxicillin by penicillin G acylase in the presence of ionic liquids, *Green Chem.*, **14** (11), 3146-3156.

- Rahimzadeh, M., Sadeghizadeh, M., Najafi, F., Arab, S., dan Mobasheri, H., 2016, Impact of heat shock step on bacterial transformation efficiency, *Mol. Biol Res. Commun.*, **5** (4), 257–261.
- Rajendhran, J. dan Gunasekaran, P., 2004, Recent Biotechnological Interventions for Developing Improved Penicillin G Acylases. *J. Biosci. Bioeng.* **97**, 1–13.
- Rajendhran, K., Mahadevan, S., Sekar, S., Paramasamy G., dan Mandal A. B., 2011, Biocalorimetric and respirometric studies on production of Penicillin G acylase from *Bacillus badius* pac in *E. coli* DH5 alpha. *Biochem. Eng. J.*, **55**, 9-223.
- Sambrook J., dan Russel, D. W., 2001, *Molecular Cloning : A Laboratory Manual Volume 2*, 3rd Edition, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York.
- Sanger, F., Air, G. M., Barrell, B. G., Brown, N. L., Coulson, A. R., Fiddes, C. A., Hutchison, C. A, Slocombe, P. M., dan Smith, M., 1977, Nucleotide sequence of bacteriophage phi X174 DNA, *Nature*, **265**, 687–695.
- Saiki, R. K., Gelfand, D. H., Stoffel, S., Scharf, S., Higuchi, R. H., Horn, G. T., Mullis, K. B., dan Erlich, H. A., 1988, Primer-directed enzymatic amplification of DNA with a thermostable DNA polymerase, *Science*, **239**, 487-491.
- Schoenfeld, T., Mendez, J., dan Storts, D.R., 1995, Effects of Bacterial Strains Carrying endA1 Genotype on DNA Quality Isolated with Wizard (TM) Plasmid Purification Systems, *Promega Notes Magazine*, **53**, 12-15.
- Sgaramella, V., dan Bernardi, A., 2001, DNA Cloning, *Encyclopedia of Genetics*, 544–550.
- Shewale, J. G. dan SivaRaman, H., 1989, Penicillin acylase: enzyme production and its application in the manufacture of 6-APA, *Process Biochem*, **24**, 146–154.
- Stellwagen, N. C., 2009, Electrophoresis of DNA in agarose gels, polyacrylamide gels and in free solution, *Electrophoresis*, **30 Suppl 1** (Suppl 1), S188–S195.
- Tang, X., Nakata, Y., Li, H. O., Zhang, M., Gao, H., Fujita, A., Sakatsume, O., Ohta, T., dan Yokoyama, K., 1994, The optimization of preparations of competent cells for transformation of *E. coli*, *Nucleic Acids Res.*, **22** (14), 2857–2858.
- Thermo Fisher Scientific Inc., 2012, General Recommendations for DNA Electrophoresis This protocol is for the General Recommendations for DNA Electrophoresis, [https://www.thermofisher.com/content/dam/Life Tech/global/brands/Documents/1114/general-recommendations-dna-electrophoresis.pdf](https://www.thermofisher.com/content/dam/Life_Tech/global/brands/Documents/1114/general-recommendations-dna-electrophoresis.pdf), 4 November 2019.

- Tirabassi, Rebecca, 2014, How to Identify Supercoils, Nicks and Circles in Plasmid Preps. BiteSizeBio, <https://bitesizebio.com/13524/how-to-identify-supercoils-nicks-and-circles-in-plasmid-preps/>, 27 Mei 2020.
- Van Langen, L. M., De Vroom, E., Van Rantwijk, F., dan Sheldon, R. A., 2001, Enzymatic coupling using a mixture of side chain donors affords a greener process for ampicillin, *Green Chem.*, **3**, 316-319.
- Verhaert, R. M. D., Riemens, A. M., Laan, J., Duin, J., dan Quax, W. J., 1997, Molecular cloning and analysis of the gene encoding the thermostable penicillin G acylase from *Alcaligenes faecalis*, *Appl. Environ. Microbiol.*, **63**, 3412– 3418.
- Wadapurkar, R. M., dan Vyas, R., 2018, Computational analysis of next generation sequencing data and its applications in clinical oncology. *Informatics in Medicine Unlocked*, **11**, 75–82.
- Watson, J. D., Gilman, M., Witkowski, J., dan Zoller, M., 1992,. Recombinant DNA, 2nd Edition, W. H. Freeman and Company, New York.
- Westermeier, R., 2005, Gel Electrophoresis. *eLS*.
- Yanisch-Perron, C., Vieira, J., dan Messing, J., 1985, Improved M13 phage cloning vectors and host strains: nucleotide sequences of the M13mp18 and pUC19 vectors, *Gene*, **33** (1), 19-103.