DAFTAR PUSTAKA

Abidi, S. H., Ahmed, K., Sherwani, S. K., Bibi, N., & Kazmi, S. U. (2014). Detection of *Mycobacterium smegmatis* biofilm and its control by natural agents. *Int. J. Curr. Microbiol. Appl. Sci*, *3*, 801-812.

Abisado, R. G., Benomar, S., Klaus, J. R., Dandekar, A. A., & Chandler, J. R. (2018). Bacterial quorum sensing and microbial community interactions. *MBio*, *9*(3), 10-1128.

Abouhmad, A., Korany, A. H., Grey, C., Dishisha, T., & Hatti-Kaul, R. (2020). Exploring the enzymatic and antibacterial activities of novel mycobacteriophage lysin B enzymes. *International Journal of Molecular Sciences*, *21*(9), 3176.

Adeyemo, R. O., Famuyide, I. M., Dzoyem, J. P., & Lyndy Joy, M. (2022). Anti-biofilm, antibacterial, and anti-quorum sensing activities of selected South African plants traditionally used to treat diarrhoea. *Evidence-Based Complementary and Alternative Medicine*, 2022(1), 1307801.

Akwani, W. C. (2023). Antibiotic resistance of nontuberculous *Mycobacterium* (NTM) biofilms studied through microbiology and multimodal imaging. [Doctoral dissertation]. University of Surrey.

Allué-Guardia, A., García, J. I., & Torrelles, J. B. (2021). Evolution of drug-resistant *Mycobacterium tuberculosis* strains and their adaptation to the human lung environment. *Frontiers in Microbiology*, *12*, 612675.

Alotaibi, G. F., & Bukhari, M. A. (2021). Factors influencing bacterial biofilm formation and development. *Am. J. Biomed. Sci. Res*, *12*(6), 617-626.

Altamirano, F. L. G., & Barr, J. J. (2019). Phage therapy in the postantibiotic era. *Clinical Microbiology Reviews*, 32(2), 1–25.

American Type Culture Collection. (2023). *Mycobacterium smegmatis (Trevisan) Lehmann and Neumann 14468™*. https://www.atcc.org/products/14468#product-references.

Angelin, J., & Kavitha, M. (2020). Exopolysaccharides from probiotic bacteria and their health potential. *International journal of biological macromolecules*, 162, 853-865.

Anggraeni, D. E., & Rahayu, S. R. (2018). Gejala klinis tuberkulosis pada keluarga penderita tuberkulosis bta positif. *HIGEIA (Journal of Public Health Research and Development)*, *2*(1), 91-101.

Aprina, R. (2023). Sintesis komposit Fe3O4/kitosan-glutaraldehid/TiO2 sebagai fotokatalis untuk degradasi zat warna congo red. [Skripsi]. Universitas Sriwijaya.

Araz, H., Gulden, G., Sert, B., & Taştan, C. (2023). Sensitization of the antibiotic resistant *M. smegmatis* bacteria using crispr/fncpf1 gene editing. *Gene Editing*, *1*(4), 1-13.

Arora, A., Sharma, P., & Katti, D. S. (2015). Pullulan-based composite scaffolds for bone tissue engineering: Improved osteoconductivity by pore wall mineralization. *Carbohydrate polymers*, *123*, 180-189.

Arthur, P. K., Amarh, V., Cramer, P., Arkaifie, G. B., Blessie, E. J., Fuseini, M. S., ... & Robertson, B. D. (2019). Characterization of two new multidrug-resistant strains of *Mycobacterium smegmatis*: Tools for routine in vitro screening of novel anti-mycobacterial agents. *Antibiotics*, *8*(1), 4.

Artiyani, A., & Firmansyah, N. H. (2016). Kemampuan filtrasi *upflow* pengolahan filtrasi *up flow* dengan media pasir zeolit dan arang aktif dalam menurunkan kadar fosfat dan deterjen air limbah domestik. *Industri Inovatif.Jurnal Teknik Industri*, *6*(1), 8-15.

Asghar, S., Ahmed, A., Khan, S., Lail, A., & Shakeel, M. (2022). Genomic characterization of lytic bacteriophages A¥ L and A¥ M infecting ESBL *K. pneumoniae* and its therapeutic potential on biofilm dispersal and in-vivo bacterial clearance. *Microbiological Research*, 262, 127104.

Azeredo, J., Garcia, P., & Drulis-Kawa, Z. (2021). Targeting biofilms using phages and their enzymes. *Current Opinion in Biotechnology*, *68*, 251-261.

Azzam, M. I. (2015). Eco-diversity of aquatic bacteria and viruses isolated from River Nile and drainage water in Egypt. [Doctoral dissertation]. Ain Shams University.

Bai, X., Nakatsu, C. H., & Bhunia, A. K. (2021). Bacterial biofilms and their implications in pathogenesis and food safety. *Foods*, *10*(9), 2117.

Bakhtiyariniya, P., Khosravi, A. D., Hashemzadeh, M., & Savari, M. (2022). Detection and characterization of mutations in genes related to isoniazid resistance in *Mycobacterium tuberculosis* clinical isolates from Iran. *Molecular biology reports*, *49*(7), 6135-6143.

Belardinelli, J. M., Li, W., Avanzi, C., Angala, S. K., Lian, E., Wiersma, C. J., ... & Jackson, M. (2021). Unique features of *Mycobacterium abscessus* biofilms formed in synthetic cystic fibrosis medium. *Frontiers in Microbiology*, 12, 743126.

Bonacorsi, A., Ferretti, C., Di Luca, M., & Rindi, L. (2024). Mycobacteriophages and Their Applications. *Antibiotics*, *13*(10), 926.

Bonnet, M., Lagier, J. C., Raoult, D., & Khelaifia, S. (2020). Bacterial culture through selective and non-selective conditions: the evolution of culture media in clinical microbiology. *New Microbes and New Infections*, *34*, 100622.

Borgeaud, S., Metzger, L. C., Scrignari, T., & Blokesch, M. (2015). The type VI secretion system of *Vibrio cholerae* fosters horizontal gene transfer. *Science*, *347*(6217), 63-67.

Bourguignon, T., Godinez-Leon, J. A., & Gref, R. (2023). Nanosized drug delivery systems to fight tuberculosis. *Pharmaceutics*, *15*(2), 393.

Bowler, P. G. (2018). Antibiotic resistance and biofilm tolerance: a combined threat in the treatment of chronic infections. *Journal of Wound Care*, *27*(5), 273-277.

Bowler, P., Murphy, C., & Wolcott, R. (2020). Biofilm exacerbates antibiotic resistance: Is this a current oversight in antimicrobial stewardship?. *Antimicrobial Resistance & Infection Control*, *9*, 1-5.

Brauner, A., Fridman, O., Gefen, O., & Balaban, N. Q. (2016). Distinguishing between resistance, tolerance and persistence to antibiotic treatment. *Nature Reviews Microbiology*, *14*(5), 320-330.

Brčić, J., Tong, A., Wender, P. A., & Cegelski, L. (2023). Conjugation of vancomycin with a single arginine improves efficacy against mycobacteria by more effective peptidoglycan targeting. *Journal of medicinal chemistry*, 66(15), 10226-10237.

Broncano-Lavado, A., Santamaría-Corral, G., Esteban, J., & García-Quintanilla, M. (2021). Advances in bacteriophage therapy against relevant multidrug-resistant pathogens. *Antibiotics*, 10(6), 1-23.

Brown, A. R., Wodzanowski, K. A., Santiago, C. C., Hyland, S. N., Follmar, J. L., Asare-Okai, P., & Grimes, C. L. (2021). Protected N-acetyl muramic acid probes improve bacterial peptidoglycan incorporation via metabolic labeling. *ACS chemical biology*, *16*(10), 1908-1916.

Bussi, C., & Gutierrez, M. G. (2019). *Mycobacterium tuberculosis* infection of host cells in space and time. *FEMS microbiology reviews*, *43*(4), 341-361.

Caruana, J. C., & Walper, S. A. (2020). Bacterial membrane vesicles as mediators of microbe–microbe and microbe–host community interactions. *Frontiers in microbiology*, *11*, 432.

Catalão, M. J., & Pimentel, M. (2018). Mycobacteriophage lysis enzymes: targeting the mycobacterial cell envelope. *Viruses*, *10*(8), 428

Chakraborty, P., Bajeli, S., Kaushal, D., Radotra, B. D., & Kumar, A. (2021). Biofilm formation in the lung contributes to virulence and drug tolerance of *Mycobacterium tuberculosis*. *Nature communications*, 12(1), 1606.

Chakraborty, S., Rohit, A., Prasanthi, S. J., & Chauhan, A. (2024). A new casjensviridae bacteriophage isolated from hospital sewage for inactivation of biofilms of carbapenem resistant *Klebsiella pneumoniae* clinical isolates. *Pharmaceutics*, *16*(7), 904.

Chaubey, K. K., Abdullah, M., Gupta, S., Navabharath, M., & Singh, S. V. (2021). *Mycobacterium* biofilms synthesis, ultrastructure, and their perspectives in drug tolerance, environment, and medicine. *Microbial Polymers Applications and Ecological Perspectives*, 465-478.

Chaudhry, W. N., Concepcion-Acevedo, J., Park, T., Andleeb, S., Bull, J. J., & Levin, B. R. (2017). Synergy and order effects of antibiotics and phages in killing *Pseudomonas aeruginosa* biofilms. *PloS one*, *12*(1), e0168615.

Chegini, Z., Khoshbayan, A., Taati Moghadam, M., Farahani, I., Jazireian, P., & Shariati, A. (2020). Bacteriophage therapy against *Pseudomonas aeruginosa* biofilms: a review. *Annals of clinical microbiology and antimicrobials*, *19*, 1-17.

Daffé, M., & Marrakchi, H. (2019). Unraveling the structure of the mycobacterial envelope. *Microbiology spectrum*, *7*(4), 10-1128.

Danis-Wlodarczyk, K. M. (2016). Characterization of lytic bacteriophages infecting *Pseudomonas aeruginosa* and their peptidoglycan and exopolysaccharide degrading enzymes. [Skripsi]. University of Wrocław.

Das, A., Das, M. C., Sandhu, P., Das, N., Tribedi, P., De, U. C., ... & Bhattacharjee, S. (2017). Antibiofilm activity of *Parkia javanica* against *Pseudomonas aeruginosa* a study with fruit extract. *RSC advances*, *7*(9), 5497-5513.

Deshanda, R. P., Lingga, R., Hidayati, N. A., Sari, E., & Hertati, R. (2018). Fag *Salmonella* asal limbah pasar ikan dan air sungai di sekitar kampus Universitas Bangka Belitung. *Ekotonia: Jurnal penelitian biologi, botani, zoologi dan mikrobiologi*, *3*(2),45-49.

Dos Santos, A. C. D., Marinho, V. H. D. S., Silva, P. H. D. A., Macchi, B. D. M., Arruda, M. S. P., Silva, E. O. D., ... & Sena, C. B. C. D. (2019). Microenvironment of *Mycobacterium smegmatis* culture to induce cholesterol consumption does cell wall remodeling and enables the formation of granuloma-like structures. *BioMed Research International*, *2019*(1), 1871239.

Eagen, W. J., Baumoel, L. R., Osman, S. H., Rahlwes, K. C., & Morita, Y. S. (2018). Deletion of PimE mannosyltransferase results in increased copper sensitivity in *Mycobacterium smegmatis*. *FEMS microbiology letters*, *365*(6), fny025.

Ealand, C. S., Asmal, R., Mashigo, L., Campbell, L., & Kana, B. D. (2019). Characterization of putative DD-carboxypeptidase-encoding genes in *Mycobacterium smegmatis*. *Scientific Reports*, *9*(1), 5194.

Edward, Y., & Novianti, D. (2015). Biofilm pada otitis media supuratif kronik. *Jambi Medical Journal: Jurnal Kedokteran dan Kesehatan*, *3*(1).

Egorova, A., Salina, E. G., & Makarov, V. (2021). Targeting non-replicating *Mycobacterium tuberculosis* and latent infection alternatives and perspectives (mini-review). *International Journal of Molecular Sciences*, *22*(24), 13317.

Emencheta, S. C., Eze, C. C., Attama, A. A., Agbo, D. E., & Onuigbo, E. B. (2021). Isolation of *Pseudomonas aeruginosa* phages from residential waste waters. *Health Science Journal*, *15*(11), 1-4.

EmeryPHARMA. *Biofilm Eradication Testing*. https://emerypharma.com/solutions/cell-microbiology-services/biofilm-eradication-testing/.

Erskine, E., MacPhee, C. E., & Stanley-Wall, N. R. (2018). Functional amyloid and other protein fibers in the biofilm matrix. *Journal of Molecular Biology*, *430*(20), 3642-3656.

Esmat, M. M., Abdelhamid, A. G., Abo-ELmaaty, S. A., Nasr-Eldin, M. A., Hassan, M. G., Khattab, A. A., & Esmael, A. (2017). Antibiotics and phage sensitivity as interventions for controlling *Escherichia coli* isolated from clinical specimens. *Journal of Pure and Applied Microbiology*, *11*(4), 1749-1755.

Espinosa-Pereiro, J., Sánchez-Montalvá, A., Aznar, M. L., & Espiau, M. (2022). MDR tuberculosis treatment. *Medicina*, *58*(2), 188.

Fallatah, H., Overton, T., Ali-Boucetta, H., & Gkatzionis, K. (2023). Impact of environmental stresses on the antibacterial activity of graphene oxide (GO) nanoparticles against *P. putida* biofilms. *Microorganisms*, *11*(3), 609.

Faulkner, V., Cox, A. A., Goh, S., Van Bohemen, A., Gibson, A. J., Liebster, O., ... & Kendall, S. L. (2021). Re-sensitization of *Mycobacterium smegmatis* to rifampicin using CRISPR interference demonstrates its utility for the study of non-essential drug resistance traits. *Frontiers in microbiology*, 11, 619427.

Flemming, H. C., Wingender, J., Szewzyk, U., Steinberg, P., Rice, S. A., & Kjelleberg, S. (2016). Biofilms: an emergent form of bacterial life. *Nature Reviews Microbiology*, *14*(9), 563-575.

Franco, D., Calabrese, G., Guglielmino, S. P. P., & Conoci, S. (2022). Metal-based nanoparticles: Antibacterial mechanisms and biomedical application. *Microorganisms*, *10*(9), 1778.

Ganeshan, S. D., & Hosseinidoust, Z. (2019). Phage therapy with a focus on the human microbiota. *Antibiotics*, 8(3), 1-19.

Garcia-Ochoa, F., Gomez, E., & Santos, V. E. (2020). Fluid dynamic conditions and oxygen availability effects on microbial cultures in STBR: An overview. *Biochemical Engineering Journal*, *164*, 107803.

Golkar, Z., Bagasra, O., & Pace, D. G. (2014). Bacteriophage therapy a potential solution for the antibiotic resistance crisis. *Journal of infection in developing countries*, *8*(2), 129–136.

Gopal, P., Yee, M., Sarathy, J., Low, J. L., Sarathy, J. P., Kaya, F., ... & Dick, T. (2016). Pyrazinamide resistance is caused by two distinct mechanisms: prevention of coenzyme A depletion and loss of virulence factor synthesis. *ACS infectious diseases*, 2(9), 616-626.

Gopinath, V., Mitra, K., Chadha, A., & Doble, M. (2024). Disrupting *Mycobacterium smegmatis* biofilm using enzyme-immobilized rifampicin loaded silk fibroin nanoparticles for dual anti-bacterial and anti-biofilm action. *Microbial Pathogenesis*, *196*, 106999.

Gorski, A., Borysowski, J., & Międzybrodzki, R. (2020). Phage therapy: towards a successful clinical trial. *Antibiotics*, 9(11), 1-7.

Grover, N., Paskaleva, E. E., Mehta, K. K., Dordick, J. S., & Kane, R. S. (2014). Growth inhibition of *Mycobacterium smegmatis* by mycobacteriophage-derived enzymes. *Enzyme and microbial technology*, *63*, 1-6.

Grygorcewicz, B., Gliźniewicz, M., Olszewska, P., Miłek, D., Czajkowski, A., Serwin, N., ... & Rakoczy, R. (2023). Response surface methodology application for bacteriophage–antibiotic antibiofilm activity optimization. *Microorganisms*, *11*(9), 2352.

Gupta, K. R., Baloni, P., Indi, S. S., & Chatterji, D. (2016). Regulation of growth, cell shape, cell division, and gene expression by second messengers (p) ppGpp and cyclic Di-GMP in *Mycobacterium smegmatis*. *Journal of bacteriology*, *198*(9), 1414-1422.

Gupta, R., Gupta, N., Khasa, Y. P., & Mohanty, S. (2021). Growth physiology and kinetics. *Fundamentals of Bacterial Physiology and Metabolism*, 137-179.

Gutiérrez, D., Fernández, L., Martínez, B., Ruas-Madiedo, P., García, P., & Rodríguez, A. (2017). Real-time assessment of *Staphylococcus aureus* biofilm disruption by phage-derived proteins. *Frontiers in microbiology*, *8*, 1632.

Gygli, S. M., Borrell, S., Trauner, A., & Gagneux, S. (2017). Antimicrobial resistance in *Mycobacterium tuberculosis*: mechanistic and evolutionary perspectives. *FEMS microbiology reviews*, 41(3), 354-373.

Hall, C. W., & Mah, T. F. (2017). Molecular mechanisms of biofilm-based antibiotic resistance and tolerance in pathogenic bacteria. *FEMS microbiology reviews*, *41*(3), 276-301.

Harper, D. R., Abedon, S. T., Burrowes, B. H., & McConville, M. L. (Eds.). (2021). Bacteriophages Biology, Technology, Therapy (1st ed.). Springer International Publishing.

He, H., Chen, Y., Li, X., Cheng, Y., Yang, C., & Zeng, G. (2017). Influence of salinity on microorganisms in activated sludge processes: A review. *International Biodeterioration & Biodegradation*, *119*, 520-527.

HIMEDIA. (2023). Middlebrook 7H9 Broth Base Technical Data. HiMedia Laboratories.

Honeyborne, I., Lipman, M., Zumla, A., & McHugh, T. D. (2019). The changing treatment landscape for MDR/XDR-TB—can current clinicaltrials revolutionise and inform a brave new world?. *International Journal of Infectious Diseases*, *80*, S23-S28.

Hosseiniporgham, S., & Sechi, L. A. (2022). A review on mycobacteriophages: from classification to applications. *Pathogens*, *11*(7), 777.

Indira, D. (2020). Pengolahan Limbah Rumah Sakit secara Electrokoagulan dan Electrodisinfektan dengan Elektroda Aluminium Besi. Filsafat Ilmu.

Issa, R., Chanishvili, N., Caplin, J., Kakabadze, E., Bakuradze, N., Makalatia, K., & Cooper, I. (2019). Antibiofilm potential of purified environmental bacteriophage preparations against early stage *Pseudomonas aeruginosa* biofilms. *Journal of applied microbiology*, *126*(6), 1657-1667.

Jain, D., Ghosh, S., Teixeira, L., & Mukhopadhyay, S. (2017, November). Pathology of pulmonary tuberculosis and non-tuberculous mycobacterial lung disease: facts, misconceptions, and practical tips for pathologists. In *Seminars in Diagnostic Pathology*. Vol. 34, No. 6, pp. 518-529.

Jamal, M., Bukhari, S. M., Andleeb, S., Ali, M., Raza, S., Nawaz, M. A., & Shah, S. S. (2019). Bacteriophages: an overview of the control strategies against multiple bacterial infections in different fields. *Journal of basic microbiology*, *59*(2), 123-133.

Jamal, M., Tasneem, U., Hussain, T., & Andleeb, S. (2015). Bacterial biofilm: its composition, formation and role in human infections. *Journal of Microbiology and Biotechnology*, *4*, 1-14.

Janakiraman, V., & Teja, K. P. S. (2024). Quorum sensing in Mycobacteria: understanding the recognition machinery conundrum through an in-silico approach. *bioRxiv*, 2024-03.

Jassim, S. A., & Limoges, R. G. (2017). Bacteriophages: Practical Applications for Nature's Biocontrol. Springer.

Jensen, M. R. (2018). Synthesis of lactic acid functionalized N-acetylmuramic acid derivatives and progress toward pathogen cell wall labeling. [Thesis]. University of Delaware.

Jeong, S. Y., Lee, J. W., Kim, E. J., Lee, C. W., & Kim, T. G. (2025). Comparison of crystal violet staining, microscopy with image analysis, and quantitative PCR to examine biofilm dynamics. *FEMS Microbiology Letters*, *372*, fnae115.

Jo, S. J., Kim, S. G., Park, J., Lee, Y. M., Giri, S. S., Lee, S. B., ... & Park, S. C. (2023). Optimizing the formulation of *Erwinia* bacteriophages for improved UV stability and adsorption on apple leaves. *Heliyon*, 9(11).

Johansen, M. D., Herrmann, J. L., & Kremer, L. (2020). Non-tuberculous mycobacteria and the rise of *Mycobacterium abscessus*. *Nature Reviews Microbiology*, *18*(7), 392-407.

Johnson, D. I. (2018). Bacterial Virulence Factors (pp. 1-38). Springer International Publishing.

Jorge, P., Magalhães, A. P., Grainha, T., Alves, D., Sousa, A. M., Lopes, S. P., & Pereira, M. O. (2019). Antimicrobial resistance three ways: healthcare crisis, major concepts and the relevance of biofilms. *Microbiology ecology*, *95*(8).

Keren-Paz, A., & Kolodkin-Gal, I. (2020). A brick in the wall: discovering a novel mineral component of the biofilm extracellular matrix. *New biotechnology*, *56*, 9-15.

Khoshnood, S., Taki, E., Sadeghifard, N., Kaviar, V. H., Haddadi, M. H., Farshadzadeh, Z., ... & Heidary, M. (2021). Mechanism of action, resistance, synergism, and clinical implications of delamanid against multidrug-resistant *Mycobacterium tuberculosis*. *Frontiers in microbiology*, 717045.

Kiefer, B., & Dahl, J. L. (2015). Disruption of *Mycobacterium smegmatis* biofilms using bacteriophages alone or in combination with mechanical stress. *Advances in Microbiology*, *5*(10), 699-710.

Kim, S., Woo, S. G., Lee, J., Lee, D. H., & Hwang, S. (2019). Evaluation of feasibility of using the bacteriophage t4 lysozyme to improve the hydrolysis and biochemical methane potential of secondary sludge. Energies, 12(19), 3644.

King, H. C., Khera-Butler, T., James, P., Oakley, B. B., Erenso, G., Aseffa, A., ... & Courtenay, O. (2017). Environmental reservoirs of pathogenic mycobacteria across the Ethiopian biogeographical landscape. *PloS one*, *12*(3), e0173811.

Kirmusaoglu, S. (2019). Antimicrobials, Antibiotic Resistance, Antibiofilm Strategies and Activity Methods. IntechOpen.

Kırmusaoğlu, S. (2019). Biofilm and Screening Antibiofilm Activity of Agents. *Antimicrobials, antibiotic resistance, antibiofilm strategies and activity methods*, 99.

Klai, N., & Sellamuthu, B. (2020). Bacteriophages isolated from hospital wastewater and its role in controlling drug-resistant pathogens. *In Current Developments In Biotechnology and Bioengineering* (pp. 327-376). Elsevier.

Kolodziej, M., Łebkowski, T., Płociński, P., Hołówka, J., Paściak, M., Wojtaś, B., ... & Zakrzewska-Czerwińska, J. (2021). Lsr2 and its novel paralogue mediate the adjustment of *Mycobacterium smegmatis* to unfavorable environmental conditions. *Msphere*, *6*(3), 10-1128.

Koul, B., Yadav, D., Singh, S., Kumar, M., & Song, M. (2022). Insights into the domestic wastewater treatment (DWWT) regimes: a review. *Water*, *14*(21), 3542.

Kovacs, C. J., Rapp, E. M., McKenzie, S. M., Mazur, M. Z., Mchale, R. P., Brasko, B., ... & Barnhill, J. C. (2024). Disruption of biofilm by bacteriophages in clinically relevant settings. *Military medicine*, *189*(5-6), e1294-e1302.

Kumar, A., Alam, A., Rani, M., Ehtesham, N. Z., & Hasnain, S. E. (2017). Biofilms: survival and defense strategy for pathogens. *International Journal of Medical Microbiology*, *307*(8), 481-489.

Kumar, V., Goyal, J., & Bhardwaj, N. (2016). Drug sensitivity assay on development of biofilm in non-tuberculosis mycobacteria. *Indian Research Journal of Genetics and Biotechnology*, *8*(02), 101-111.

Kumar, V., Sachan, T. K., & Gupta, U. D. (2017). Emerging concept and technology on mycobacterial biofilm. *GSL Journal of Clinical Pathology*, *1*(1).

Kumari, J., Kumawat, R., Prasanna, R., Jothieswari, D., Debnath, R., Ikbal, A. M. A., ... & Tiwari, O. N. (2025). Microbial exopolysaccharides: Classification, biosynthetic pathway, industrial extraction and commercial production to unveil its bioprospection: A comprehensive review. *International Journal of Biological Macromolecules*, 139917.

Lafuente, B. I., Ummels, R., Kuijl, C., Bitter, W., & Speer, A. (2021). *Mycobacterium tuberculosis* toxin cpnt is an esx-5 substrate and requires three type vii secretion systems for intracellular secretion. *mBio*,*12*(2), 1-16.

Lai, M. J., Liu, C. C., Jiang, S. J., Soo, P. C., Tu, M. H., Lee, J. J., ... & Chang, K. C. (2015). Antimycobacterial activities of endolysins derived from a mycobacteriophage, BTCU-1. *Molecules*, *20*(10), 19277-19290.

Latka, A., Maciejewska, B., Majkowska-Skrobek, G., Briers, Y., & Drulis-Kawa, Z. (2017). Bacteriophage-encoded virion-associated enzymes to overcome the carbohydrate barriers during the infection process. *Applied microbiology and biotechnology*, *101*, 3103-3119.

Layton, C., Bancroft, J. D., & Suvarna, S. K. (2018). Fixation of tissues. Bancroft's Theory and Practice of Histological Techniques, 8th ed. 40-63.

Lázaro-Díez, M., Remuzgo-Martínez, S., Rodríguez-Mirones, C., Acosta, F., Icardo, J. M., Martinez-Martinez, L., & Ramos-Vivas, J. (2016). Effects of subinhibitory concentrations of ceftaroline on methicillin-resistant *Staphylococcus aureus* (MRSA) biofilms. *PLoS One*, *11*(1), e0147569.

Li, H., Guo, H., Chen, T., Yu, L., Chen, Y., Zhao, J., ... & Chen, L. (2018). Genome-wide SNP and InDel mutations in *Mycobacterium tuberculosis* associated with rifampicin and isoniazid resistance. *International journal of clinical and experimental pathology*, *11*(8), 3903.

Lin, Y. T., Wang, Y. C., Xue, Y. M., Tong, Z., Jiang, G. Y., Hu, X. R., ... & Wang, C. (2024). Decoding the influence of low temperature on biofilm development: The hidden roles of c-di-GMP. *Science of The Total Environment*, *927*, 172376.

Loisya, L. (2019). Daya hambat ekstraksi cacing tanah (*Lumbricus rubellus*) dalam beberapa konsentrasi terhadap pertumbuhan S*almonella typhi* secara in vitro. [Skripsi]. Universitas HKBP Nommensen.

Ma, L., Green, S. I., Trautner, B. W., Ramig, R. F., & Maresso, A. W. (2018). Metals enhance the killing of bacteria by bacteriophage in human blood. *Scientific reports*, *8*(1), 2326.

Madigan, M. T., Bender, K. S., Buckley, D. H., Sattley, W. M., & Stahl, D. A. (2018). Brock Biology of Microorganisms, Global Edition (15th ed.). Pearson Education.

Mahato, S. K. (2020). A putative cystathionine beta-synthase homolog of *Mycolicibacterium smegmatis* is involved in de novo cysteine biosynthesis [Master's thesis]. University of Arkansas.

Mahmoud, Y. A. G., El-Naggar, M. E., Abdel-Megeed, A., & El-Newehy, M. (2021). Recent advancements in microbial polysaccharides: Synthesis and applications. *Polymers*, 13(23), 4136.

Maitra, A., Munshi, T., Healy, J., Martin, L. T., Vollmer, W., Keep, N. H., & Bhakta, S. (2019). Cell wall peptidoglycan in *Mycobacterium tuberculosis*: an achilles' heel for the TB-causing pathogen. *FEMS microbiology reviews*, 43(5), 548-575.

Malik, D. J., Sokolov, I. J., Vinner, G. K., Mancuso, F., Cinquerrui, S., Vladisavljevic, G. T., Clokie, M. R. J., Garton, N. J., Stapley, A. G. F., & Kirpichnikova, A. (2017). Formulation, stabilisation and encapsulation of bacteriophage for phage therapy. *Advances in Colloid and Interface Science*, 249, 100-133.

Mancuso, G., Midiri, A., De Gaetano, S., Ponzo, E., & Biondo, C. (2023). Tackling drug-resistant tuberculosis: new challenges from the old pathogen *Mycobacterium tuberculosis*. *Microorganisms*, *11*(9), 2277.

Matsarskaia, O., Roosen-Runge, F., & Schreiber, F. (2020). Multivalent ions and biomolecules: Attempting a comprehensive perspective. *ChemPhysChem*, 21(16), 1742-1767.

Mavrich, T. N., & Hatfull, G. F. (2017). Bacteriophage evolution differs by host, lifestyle and genome. *Nature Microbiology*, *2*(9), 1-9.

Mayorga-Ramos, A., Carrera-Pacheco, S. E., Barba-Ostria, C., & Guamán, L. P. (2024). Bacteriophage-mediated approaches for biofilm control. *Frontiers in cellular and infection microbiology*, *14*, 1428637.

McFeely, D. (2019). The role of the N-glycolyl modification in Mycobacterial peptidoglycan synthesis and survival. [Doctoral dissertation]. University of Warwick.

Melo, L. D., Franca, A., Brandao, A., Sillankorva, S., Cerca, N., & Azeredo, J. (2018). Assessment of Sep1virus interaction with stationary cultures by transcriptional and flow cytometry studies. *Microbiology ecology*, *94*(10).

Mendhe, S., Badge, A., Ugemuge, S., & Chandi, D. (2023). Impact of biofilms on chronic infections and medical challenges. *Cureus*, *15*(11).

Mi, Y., Bao, L., Gu, D., Luo, T., Sun, C., & Yang, G. (2017). *Mycobacterium tuberculosis* PPE25 and PPE26 proteins expressed in *Mycobacterium smegmatis* modulate cytokine secretion in mouse macrophages and enhance mycobacterial survival. *Research in Microbiology*, *168*(3), 234-243.

Mohd Nadzir, M., Nurhayati, R. W., Idris, F. N., & Nguyen, M. H. (2021). Biomedical applications of bacterial exopolysaccharides: a review. *Polymers*, 13(4), 530.

Mohd-Said, S., Mohd-Dom, T. N., Suhaimi, N., Rani, H., & McGrath, C. (2021). Effectiveness of pre-procedural mouth rinses in reducing aerosol contamination during periodontal prophylaxis: a systematic review. *Frontiers in Medicine*, *8*, 600769.

Monteiro, R., Pires, D. P., Costa, A. R., & Azeredo, J. (2019). Phage therapy: going temperate?. *Trends in Microbiology*, 27(4), 368-378.

Mooney, J. A., Pridgen, E. M., Manasherob, R., Suh, G., Blackwell, H. E., Barron, A. E., ... & Amanatullah, D. F. (2018). Periprosthetic bacterial biofilm and quorum sensing. *Journal of Orthopaedic Research®*, *36*(9), 2331-2339.

Mothiba, M. T., Anderson, R., Fourie, B., Germishuizen, W. A., & Cholo, M. C. (2015). Effects of clofazimine on planktonic and biofilm growth of *Mycobacterium tuberculosis* and *Mycobacterium smegmatis*. *Journal of Global Antimicrobial Resistance*, *3*(1), 13-18.

Muhammad, M. H., Idris, A. L., Fan, X., Guo, Y., Yu, Y., Jin, X., ... & Huang, T. (2020). Beyond risk: bacterial biofilms and their regulating approaches. *Frontiers in microbiology*,*11*, 928.

Nadell, C. D., Drescher, K., & Foster, K. R. (2016). Spatial structure, cooperation and competition in biofilms. *Nature Reviews Microbiology*, *14*(9), 589-600.

Netrusov, A. I., Liyaskina, E. V., Kurgaeva, I. V., Liyaskina, A. U., Yang, G., & Revin, V. V. (2023). Exopolysaccharides producing bacteria: a review. *Microorganisms*, 11(6), 1541.

Nurrizkiawan, Z., Brahmanti, A. A., & Wardani, A. K. (2023). Isolasi bakteriofag dan aplikasinya untuk mengontrol bakteri patogen bakteriofag untuk mengontrol bakteri patogen. *Tropical Microbiome*, *1*(1), 1-12.

Occhineri, S., Matucci, T., Rindi, L., Tiseo, G., Falcone, M., Riccardi, N., & Besozzi, G. (2022). Pretomanid for tuberculosis treatment: an update for clinical purposes. *Current research in pharmacology and drug discovery*, 100128.

Okshevsky, M., Regina, V. R., & Meyer, R. L. (2015). Extracellular DNA as a target for biofilm control. *Current opinion in biotechnology*, *33*, 73-80.

Pandey, A., & Hashmi, T. (2024). The impact of chloroform on viability of temperate bacteriophage lambda and survival of its host, *Escherichia coli*. *Journal ISSN*, *2766*, 2276.

Pandey, N., Ahmad, F., Singh, K., Pandey, P., & Sharma, R. (2023). Novel therapeutics a nemesis for biofilm-forming *Mycobacterium* spp. *Journal of Pure & Applied Microbiology*, *17*(4).

Parasion, S., Kwiatek, M., Gryko, R., Mizak, L., & Malm, A. (2014). Bacteriophages as an alternative strategy for fighting biofilm development. *Pol. J. Microbiol*, *63*(2), 137-145.

Parvez, A., Giri, S., Giri, G. R., Kumari, M., Bisht, R., & Saxena, P. (2018). Novel type III polyketide synthases biosynthesize methylated polyketides in *Mycobacterium marinum*. *Scientific reports*, *8*(1), 6529.

Patton, C. J., & Kotturi, H. (2019). Investigating the growth characteristics and infectivity of a newly isolated bacteriophage against *Mycobacterium smegmatis* mc^{2}155. *In Proceedings of the Oklahoma Academy of Science*, Vol. 99, pp. 126-134.

Pires, D. P., Oliveira, H., Melo, L. D., Sillankorva, S., & Azeredo, J. (2016). Bacteriophage-encoded depolymerases: their diversity and biotechnological applications. *Applied microbiology and biotechnology*, *100*, 2141-2151.

Portier, R. J., & Palmer, S. J. (2020). Wetlands microbiology: form, function, processes. *In Constructed Wetlands for Wastewater Treatment*. Florida. CRC Press. pp. 89-105

Purbowati, R. (2018). Hubungan biofilm dengan infeksi implikasi pada kesehatan masyarakat dan strategi mengontrolnya. *Jurnal ilmiah kedokteran wijaya kusuma*, *5*(1), 1-14.

Rabin, N., Zheng, Y., Opoku-Temeng, C., Du, Y., Bonsu, E., & Sintim, H. O. (2015). Agents that inhibit bacterial biofilm formation. *Future medicinal chemistry*, *7*(5), 647-671.

Raghupathi, P. K., Liu, W., Sabbe, K., Houf, K., Burmølle, M., & Sørensen, S. J. (2018). Synergistic interactions within a multispecies biofilm enhance individual species protection against grazing by a pelagic protozoan. *Frontiers in microbiology*, *8*, 2649.

Rakhmawatie, M. D., Fikriyah, A. Z., Kurniati, I. D., Marfu'ati, N., & Ethica, S. N. (2023). Secondary metabolites production of *Bacillus* spp. isolated from sea cucumbers (*Holothuria scabra*) and their activity against *Mycobacterium smegmatis*. *Journal of Pharmaceutical Sciences and Community*, *20*(2), 169-178.

Ranjitha, J., Rajan, A., & Shankar, V. (2020). Features of the biochemistry of *Mycobacterium smegmatis*, as a possible model for *Mycobacterium tuberculosis*. *Journal of infection and public health*, *13*(9), 1255-1264.

Rapacka-Zdonczyk, A., Wozniak, A., Nakonieczna, J., & Grinholc, M. (2021). Development of antimicrobial phototreatment tolerance why the methodology matters. *International Journal of Molecular Sciences*, *22*(4), 2224.

Rastegar, S., Skurnik, M., Tadjrobehkar, O., Samareh, A., Samare-Najaf, M., Lotfian, Z., ... & Sabouri, S. (2024). Synergistic effects of bacteriophage cocktail and antibiotics combinations against extensively drug-resistant *Acinetobacter baumannii*. *BMC Infectious Diseases*, *24*(1), 1-13.

Remmington, A., & Turner, C. E. (2018). The DNases of pathogenic lancefield streptococci. *Microbiology*, *164*(3), 242-250.

Ricci, D., & Demangel, C. (2023). From bacterial toxin to therapeutic agent: the unexpected fate of mycolactone. *Toxins*, *15*(6), 369.

Richter, A. M., Konrat, K., Osland, A. M., Brook, E., Oastler, C., Vestby, L. K., ... & Arvand, M. (2023). Evaluation of biofilm cultivation models for efficacy testing of disinfectants against *Salmonella typhimurium* biofilms. *Microorganisms*, 11(3), 761.

Roose-Amsaleg, C., & Laverman, A. M. (2016). Do antibiotics have environmental side-effects? Impact of synthetic antibiotics on biogeochemical processes. *Environmental Science and Pollution Research*, *23*, 4000-4012.

Rosseel, T. (2015). Genome sequencing by random priming methods for viral identification. [Doctoral dissertation]. Ghent University.

Roy, R., Tiwari, M., Donelli, G., & Tiwari, V. (2018). Strategies for combating bacterial biofilms: A focus on anti-biofilm agents and their mechanisms of action. *Virulence*, *9*(1), 522-554.

Ruchi, T., Sujata, B., & Anuradha, D. (2015). Comparison of phenotypic methods for the detection of biofilm production in uro-pathogens in a tertiary care hospital in India. *International Journal Current Microbiology Application Science*, *4*(9), 840-49.

Rumbaugh, K. P., & Sauer, K. (2020). Biofilm dispersion. *Nature Reviews Microbiology*, *18*(10), 571-586.

Rutbeek, N. R., Rezasoltani, H., Patel, T. R., Khajehpour, M., & Prehna, G. (2021). Molecular mechanism of quorum sensing inhibition in *Streptococcus* by the phage protein paratox. Journal of Biological Chemistry, 297(3).

Saefunida, D. S., Wijanarka, W., Rukmi, M. I., & Hidayat, N. N. (2016). Isolasi bakteriofag *Escherichia coli* dari sistem distribusi air minum isi ulang sebagai antibiofilm. *Jurnal Akademika Biologi*, *5*(2), 68-75.

Saha, S. K., Rahman, M. A., Mahmud, M. S., Islam, M. T., Islam, M. N., Islam, S., ... & Ali, M. S. (2023). Isolation and characterization of bacteriophage against drug-resistant *Staphylococcus aureus*. *Journal of Advances in Microbiology*, *23*(10), 128-138.

São-José, C. (2018). Engineering of phage-derived lytic enzymes: improving their potential as antimicrobials. *Antibiotics*, *7*(2), 29.

Satish, R., & Desouza, A. (2019). Study of characteristics of mycobacteriophage– a novel tool to treat *Mycobacterium* spp. *The International Journal of Mycobacteriology*, 8(2), 170-174.

Schaaf, K., Hayley, V., Speer, A., Wolschendorf, F., Niederweis, M., Kutsch, O., & Sun, J. (2016). A macrophage infection model to predict drug efficacy against *Mycobacterium tuberculosis*. *Assay and drug development technologies*, *14*(6), 345-354.

Schilcher, K., & Horswill, A. R. (2020). Staphylococcal biofilm development: structure, regulation, and treatment strategies. *Microbiology and Molecular Biology Reviews*, *84*(3), 10-1128.

Shah, M., Taylor, V. L., Bona, D., Tsao, Y., Stanley, S. Y., Pimentel-Elardo, S. M., ... & Maxwell, K. L. (2021). A phage-encoded anti-activator inhibits quorum sensing in *Pseudomonas aeruginosa*. *Molecular Cell*, 81(3), 571-583.

Sharma, I. M., Petchiappan, A., & Chatterji, D. (2014). Quorum sensing and biofilm formation in mycobacteria: role of c-di-GMP and methods to study this second messenger. *Iubmb Life*, 66(12), 823-834.

Silva, A. P., Roque-Borda, C. A., Carnero Canales, C. S., Duran Gleriani Primo, L. M., Silva, I. C., Ribeiro, C. M., ... & Pavan, F. R. (2023). Activity of bacteriophage D29 loaded on Nanoliposomes against macrophages infected with *Mycobacterium tuberculosis*. *Diseases*, 11(4), 150.

Singh, A. (2016). Bioactive compounds from south african plants against *Mycobacterium tuberculosis*. [Doctoral dissertation]. University of Technology.

Singh, S., Kant, C., Yadav, R. K., Reddy, Y. P., & Abraham, G. (2019). Cyanobacterial exopolysaccharides: composition, biosynthesis, and biotechnological applications. *In Cyanobacteria* (pp. 347-358). Academic Press.

Siqueira, F. M., Lopes, C. E., Snell, G. G., & Gomes, M. J. P. (2016). Identification of *Mycobacterium smegmatis* in bovine Mastitis. *Acta Scientiae Veterinariae*, *44*, 1-4.

Sondén, B., Kocíncová, D., Deshayes, C., Euphrasie, D., Rhayat, L., Laval, F., ... & Reyrat, J. M. (2005). Gap, a mycobacterial specific integral membrane protein, is required for glycolipid transport to the cell surface. *Molecular microbiology*, 58(2), 426-440.

Sparks, I. L., Derbyshire, K. M., Jacobs Jr, W. R., & Morita, Y. S. (2023). *Mycobacterium smegmatis*: the vanguard of mycobacterial research. *Journal of bacteriology*, *205*(1), e00337-22.

Speranza, B., Liso, A., & Corbo, M. R. (2018). Use of design of experiments to optimize the production of microbial probiotic biofilms. *PeerJ*, *6*, e4826.

Ssengooba, W., Kamya, D., Nakavuma, J., Achan, B., & Semanda, J. (2022). Mycobacteriophages exhibit antibiofilm activity at high multiplicities of infection. *Research Square*.

Szermer-Olearnik, B., Filik-Matyjaszczyk, K., Ciekot, J., & Czarny, A. (2024). The hydrophobic stabilization of *Pseudomonas aeruginosa* bacteriophage F8 and the influence of modified bacteriophage preparation on biofilm degradation. *Current Microbiology*, *81*(11), 370.

Tagliaferri, T. L., Jansen, M., & Horz, H. P. (2019). Fighting pathogenic bacteria on two fronts: phages and antibiotics as combined strategy. *Frontiers in cellular and infection microbiology*, 9, 22.

Tak, U., Vlach, J., Garza-Garcia, A., William, D., Danilchanka, O., de Carvalho, L. P. S., ... & Niederweis, M. (2019). The tuberculosis necrotizing toxin is an NAD+ and NADP+ glycohydrolase with distinct enzymatic properties. *Journal of Biological Chemistry*, *294*(9), 3024-3036.

Tang, Q., Luo, Y., Zheng, C., Yin, K., Ali, M. K., Li, X., & He, J. (2015). Functional analysis of a c-di-AMP-specific phosphodiesterase MsPDE from *Mycobacterium smegmatis*. *International journal of biological sciences*, *11*(7), 813.

Toyofuku, M., Inaba, T., Kiyokawa, T., Obana, N., Yawata, Y., & Nomura, N. (2016). Environmental factors that shape biofilm formation. *Bioscience, biotechnology, and biochemistry*, *80*(1), 7-12.

Trivedi, A., Mavi, P. S., Bhatt, D., & Kumar, A. (2016). Thiol reductive stress induces cellulose-anchored biofilm formation in *Mycobacterium tuberculosis*. *Nature communications*, *7*(1), 11392.

Urooj, H., Javed, T., Taj, M. B., & Nouman Haider, M. (2024). Adsorption of crystal violet dye from wastewater on *Phyllanthus emblica* fruit (PEF) powder: kinetic and thermodynamic. *International Journal of Environmental Analytical Chemistry*, *104*(19), 7474-7499.

Valencia-Toxqui, G., & Ramsey, J. (2024). How to introduce a new bacteriophage on the block a short guide to phage classification. *Journal of virology*, *98*(10), e0182123.

Van der Klugt, T., van den Biggelaar, R. H., & Saris, A. (2024). Host and bacterial lipid metabolism during tuberculosis infections possibilities to synergise host-and bacteria-directed therapies. *Critical Reviews in Microbiology*, 1-21.

Van Wyk, M. (2021). Comparative genomics of mycobacteria: identification of novel anti-tubercular drug target. [Thesis]. University of Technology.

Vijay, S., Nagaraja, M., Sebastian, J., & Ajitkumar, P. (2014). Asymmetric cell division in *Mycobacterium tuberculosis* and its unique features. *Archives of microbiology*, *196*, 157-168.

Wiguna, O. D., Waturangi, D. E., & Yogiara. (2022). Bacteriophage DW-EC with the capability to destruct and inhibit biofilm formed by several pathogenic bacteria. *Scientific Reports*, *12*(1), 18539.

Winkelströter, L. K., Tulini, F. L., & De Martinis, E. C. (2015). Identification of the bacteriocin produced by cheese isolate *Lactobacillus paraplantarum* FT259 and its potential influence on *Listeria monocytogenes* biofilm formation. *LWT-Food Science and Technology*, *64*(2), 586-592.

World Health Organization. (2020, Oktober). Global Tuberculosis Report 2020. World Health Organization.

World Health Organization. (2021, Januari). WHO announces updated definitions of extensively drug-resistant tuberculosis. https://www.who.int/news/item/27-01-2021-who-announces-updated-defini tions-of-extensively-drug-resistant-tuberculosis.

World Health Organization. (2024, Oktober). Global Tuberculosis Report 2024. World Health Organization.

Xie, W., Wang, L., Luo, D., Soni, V., Rosenn, E. H., & Wang, Z. (2023). *Mycobacterium smegmatis*, a promising vaccine vector for preventing tb and other diseases vaccinomics insights and applications. *Vaccines*, *11*(8), 1302.

Yamada, H., Yamaguchi, M., Igarashi, Y., Chikamatsu, K., Aono, A., Murase, Y., ... & Mitarai, S. (2018). *Mycolicibacterium smegmatis*, basonym *Mycobacterium smegmatis*, expresses morphological phenotypes much more similar to *Escherichia coli* than *Mycobacterium tuberculosis* in quantitative structome analysis and CryoTEM examination. *Frontiers in Microbiology*, *9*, 1992.

Yan, S., Xu, M., Duan, X., Yu, Z., Li, Q., Xie, L., ... & Xie, J. (2016). Mycobacteriophage putative GTPase-activating protein can potentiate antibiotics. *Applied Microbiology and Biotechnology*, *100*, 8169-8177.

Yang, Y., Liu, Z., He, X., Yang, J., Wu, J., Yang, H., ... & Wei, L. (2019). A small mycobacteriophage-derived peptide and its improved isomer restrict mycobacterial infection via dual mycobactericidal-immunoregulatory activities. *Journal of Biological Chemistry*, 294(19), 7615-7631.

Yap, M. L., Klose, T., Arisaka, F., Speir, J. A., Veesler, D., Fokine, A., & Rossmann, M. G. (2016). Role of bacteriophage T4 baseplate in regulating assembly and infection. *Proceedings of the National Academy of Sciences of the United States of America*, *113*(10), 2654–2659.

Zhao, X., Duan, X., Dai, Y., Zhen, J., Guo, J., Zhang, K., ... & Xie, J. (2020). *Mycobacterium* Von Willebrand factor protein MSMEG_3641 is involved in biofilm formation and intracellular survival. *Future Microbiology*, *15*(11), 1033-1044.

Zhu, C., Liu, Y., Hu, L., Yang, M., & He, Z. G. (2018). Molecular mechanism of the synergistic activity of ethambutol and isoniazid against *Mycobacterium tuberculosis*. *Journal of Biological Chemistry*, *293*(43), 16741-16750.