

DAFTAR REFERENSI

- Abdel-Aziz, A. A. M. *et al.* (2016) ‘Synthesis and potential antitumor activity of 7-(4-substituted piperazin-1-yl)-4-oxoquinolines based on ciprofloxacin and norfloxacin scaffolds: in silico studies’, *Journal of Enzyme Inhibition and Medicinal Chemistry*, 31(5), pp. 796–809. doi: 10.3109/14756366.2015.1069288.
- Afifah, A., Purwonegoro, T. A. and Peramiarti, I. (2017) ‘RESISTENSI Klebsiella sp TERHADAP MEROPENEM DI RSUD PROF. DR. MARGONO SOEKARJO PURWOKERTO’, *Scripta Biologica*, 4(2), p. 135. doi: 10.20884/1.sb.2017.4.2.378.
- Agarwal, A. and Jain, A. (2012) ‘Association between drug resistance & production of biofilm in staphylococci Sir’, (April), pp. 562–564.
- Ahmad, N. *et al.* (2018) *Sherris Medical Microbiology Seventh Edition*. Seventh. Edited by K. J. Ryan. New York: Mc Graw Hill Edication.
- Akinpelu, S. *et al.* (2020) ‘Efflux pump activity, biofilm formation and antibiotic resistance profile of Klebsiella spp. isolated from clinical samples at Lagos University Teaching Hospital’, *BMC Research Notes*, 13(1), pp. 1–5. doi: 10.1186/s13104-020-05105-2.
- Akter, J., Chowdhury, M.A., A, M. and Al Forkan, M. (2014) ‘Study on prevalence and antibiotic resistance pattern of Klebsiella’, *American journal of drug discovery and development*, pp. 73–79.
- Al-Marzooq, F., Mohd Yusof, M. Y. and Tay, S. T. (2014a) ‘Molecular analysis of ciprofloxacin resistance mechanisms in Malaysian ESBL-producing Klebsiella pneumoniae isolates and development of mismatch amplification mutation assays (MAMA) for rapid detection of gyrA and parC mutations’, *BioMed Research International*, 2014. doi: 10.1155/2014/601630.
- Al-Marzooq, F., Mohd Yusof, M. Y. and Tay, S. T. (2014b) ‘Molecular analysis of ciprofloxacin resistance mechanisms in Malaysian ESBL-producing Klebsiella pneumoniae isolates and development of mismatch amplification mutation assays (MAMA) for rapid detection of gyrA and parC mutations’, *BioMed Research International*, 2014. doi: 10.1155/2014/601630.
- Al-Naqshbandi, A. A., Chawsheen, M. A. and Abdulqader, H. H. (2019) ‘Prevalence and antimicrobial susceptibility of bacterial pathogens isolated from urine specimens received in rizgary hospital — Erbil’, *Journal of Infection and Public Health*, 12(3), pp. 330–336. doi: 10.1016/j.jiph.2018.11.005.
- Alarcon, T., Pita, J. and Piddock, L. J. V (1993) ‘High-level quinolone resistance amongst clinical isolates of Escherichia coli and Klebsiella pneumoniae from Spain’, pp. 605–609.
- Aldred, K. J., Kerns, R. J. and Oshero, N. (2014) ‘Mechanism of Quinolone Action and Resistance’, *Biochemistry including biophysical chemistry & molecular biology*, 53, pp. 1565–1574.
- Alegun, O. *et al.* (2021) ‘Donnan potential across the outer membrane of gram-negative bacteria and its effect on the permeability of antibiotics’, *Antibiotics*,

- 10(6). doi: 10.3390/antibiotics10060701.
- AlMatar, M. *et al.* (2021) ‘Efflux pump inhibitors: new updates’, *Pharmacological Reports*, 73(1). doi: 10.1007/s43440-020-00160-9.
- Alvarez-Ortega, C., Olivares, J. and Martínez, J. L. (2013) ‘RND multidrug efflux pumps: What are they good for?’, *Frontiers in Microbiology*, 4(FEB), pp. 1–11. doi: 10.3389/fmicb.2013.00007.
- Alvi, R. F. *et al.* (2021) ‘Transcriptional Response of Multidrug-Resistant Klebsiella pneumoniae Clinical Isolates to Ciprofloxacin Stress’, *Canadian Journal of Infectious Diseases and Medical Microbiology*, 2021, pp. 3–8. doi: 10.1155/2021/5570963.
- Anderl, J. N., Franklin, M. J. and Stewart, P. S. (2000) ‘Role of antibiotic penetration limitation in Klebsiella pneumoniae biofilm resistance to ampicillin and ciprofloxacin’, *Antimicrobial Agents and Chemotherapy*, 44(7), pp. 1818–1824. doi: 10.1128/AAC.44.7.1818-1824.2000.
- Anderson, V. and Osheroff, N. (2005) ‘Type II Topoisomerases as Targets for Quinolone Antibacterials Turning Dr. Jekyll into Mr. Hyde’, *Current Pharmaceutical Design*, 7(5), pp. 337–353. doi: 10.2174/1381612013398013.
- Andersson, D. I. and Hughes, D. (2017) ‘Selection and Transmission of Antibiotic-Resistant Bacteria’, *Microbiology Spectrum*, 5(4), pp. 1–17. doi: 10.1128/microbiolspec.mtbp-0013-2016.
- Andres, P. *et al.* (2013) ‘Differential Distribution of Plasmid-Mediated Quinolone Resistance Genes Genes in clinical enterobacteria with unusual phenotypes of quinolone susceptibility from Argentina’, *Antimicrobial Agents and Chemotherapy*, 57(6), pp. 2467–2475. doi: 10.1128/AAC.01615-12.
- Andriole, V. T. (2005) ‘The Quinolones : Past , Present , and Future’, 41(Suppl 2), pp. 113–119.
- Anuar, A. S. S., Yusof, M. Y. M. and Tay, S. T. (2013) ‘Prevalence of plasmid-mediated’, pp. 1744–1747.
- Appelbaum, P. C. and Hunter, P. A. (2000) ‘The fluoroquinolone antibacterials: Past, present and future perspectives’, *International Journal of Antimicrobial Agents*, 16(1), pp. 5–15. doi: 10.1016/S0924-8579(00)00192-8.
- Arachchige, J., Sampath, A. and Kothalawala, M. (2021) ‘Case report Use of high-dose ciprofloxacin for recurrent biofilm-forming multidrug- resistant Klebsiella pneumoniae bacteremia’, 11(September), pp. 449–453.
- Ardebili, A. *et al.* (2015) ‘Association between mutations in gyrA and parC genes of Acinetobacter baumannii clinical isolates and ciprofloxacin resistance’, *Iranian Journal of Basic Medical Sciences*, 18(6), pp. 623–626.
- Arzanlou, M., Chai, W. C. and Venter, H. (2017) ‘Intrinsic, adaptive and acquired antimicrobial resistance in Gram-negative bacteria’, *Essays in Biochemistry*, 61(1), pp. 49–59. doi: 10.1042/EBC20160063.
- Asadi Karam, M. R., Habibi, M. and Bouzari, S. (2019) ‘Urinary tract infection: Pathogenicity, antibiotic resistance and development of effective vaccines against Uropathogenic Escherichia coli’, *Molecular Immunology*, 108(69), pp. 56–67. doi: 10.1016/j.molimm.2019.02.007.

- Ashley, R. E. *et al.* (2017) 'Activities of gyrase and topoisomerase IV on positively supercoiled DNA', *Nucleic Acids Research*, 45(16), pp. 9611–9624. doi: 10.1093/nar/gkx649.
- Auquer, F. *et al.* (2002) 'Single-dose ciprofloxacin versus 3 days of norfloxacin in uncomplicated urinary tract infections in women', *Clinical Microbiology and Infection*, 8(1), pp. 50–54. doi: 10.1046/j.1198-743x.2001.00359.x.
- Azeredo, J. *et al.* (2017) 'Critical review on biofilm methods', *Critical Reviews in Microbiology*, 43(3), pp. 313–351. doi: 10.1080/1040841X.2016.1208146.
- Baggio, D. and Ananda-Rajah, M. R. (2021) 'Fluoroquinolone antibiotics and adverse events', 44(5), pp. 161–164.
- Bajaj, H. *et al.* (2017) 'Bacterial Outer Membrane Porins as Electrostatic Nanosieves: Exploring Transport Rules of Small Polar Molecules', *ACS Nano*, 11(6), pp. 5465–5473. doi: 10.1021/acsnano.6b08613.
- Baker, K. S. *et al.* (2018) 'Horizontal antimicrobial resistance transfer drives epidemics of multiple *Shigella* species', *Nature Communications*, 9(1), pp. 1–10. doi: 10.1038/s41467-018-03949-8.
- Bakke, R., Kommedal, R. and Kalvenes, S. (2001) 'QUANTIFICATION OF BIOFILM ACCUMULATION BY AN OPTICAL APPROACH R.', *Journal of Microbiological Methods*, 44(1), pp. 13–26.
- Banerjee, T. *et al.* (2018) 'High Prevalence and Endemicity of Multidrug Resistant *Acinetobacter* spp. in Intensive Care Unit of a Tertiary Care Hospital, Varanasi, India', *Journal of Pathogens*, 2018, pp. 1–8. doi: 10.1155/2018/9129083.
- Bassetti, M. *et al.* (2018) 'Multidrug-resistant *klebsiella pneumoniae*: Challenges for treatment, prevention and infection control', *Expert Review of Anti-Infective Therapy*, 16(10), pp. 749–761. doi: 10.1080/14787210.2018.1522249.
- Baugh, S. *et al.* (2012) 'Loss of or inhibition of all multidrug resistance efflux pumps of *Salmonella enterica* serovar Typhimurium results in impaired ability to form a biofilm', *Journal of Antimicrobial Chemotherapy*, 67(10), pp. 2409–2417. doi: 10.1093/jac/dks228.
- Bengoechea, A. *et al.* (2019) 'Klebsiella pneumoniae infection biology : living to counteract host defences', (November 2018), pp. 123–144. doi: 10.1093/femsre/fuy043.
- Bharatham, N. *et al.* (2021) 'Structure and function relationship of OqxB efflux pump from Klebsiella pneumoniae', *Nature Communications*, 12(1). doi: 10.1038/s41467-021-25679-0.
- Bi, W. *et al.* (2017) 'Extensively drug-resistant klebsiella pneumoniae causing nosocomial bloodstream infections in China: Molecular investigation of antibiotic resistance determinants, Informing therapy, and clinical outcomes', *Frontiers in Microbiology*, 8(JUN). doi: 10.3389/fmicb.2017.01230.
- Blackwell, W. (2020) *Bacterial Resistance to Antibiotic-From Molecules to Man*. First edit. Edited by B. B. Bonev and M. B. Nocholas. USA: John Willey & Sons, Inc.
- Bradley, J. S. *et al.* (2021) *Nelson 's Pediatric Antimicrobial Therapy*. 27th Editi.

- American: American Academy of Pediatric.
- Brisse, S. *et al.* (2000) ‘Epidemiology of Quinolone Resistance of Klebsiella pneumoniae and Klebsiella oxytoca in Europe’, (January 1999), pp. 64–68.
- Brisse, S. *et al.* (2013) ‘Wzi gene sequencing, a rapid method for determination of capsulartype for klebsiella strains’, *Journal of Clinical Microbiology*, 51(12), pp. 4073–4078. doi: 10.1128/JCM.01924-13.
- Brisse, S., Passet, V. and Grimont, P. A. D. (2014) ‘Description of Klebsiella quasipneumoniae sp. nov., Isolated from human infections, With two subspecies, Klebsiella quasipneumoniae subsp. quasipneumoniae subsp. nov. and Klebsiella quasipneumoniae subsp. similipneumoniae subsp. nov., And demonstration th’, *International Journal of Systematic and Evolutionary Microbiology*, 64, pp. 3146–3152. doi: 10.1099/ijs.0.062737-0.
- Burillo, A. and Bouza, E. (2014) ‘Use of rapid diagnostic techniques in ICU patients with infections’, *BMC Infectious Diseases*, 14(1), pp. 1–12. doi: 10.1186/s12879-014-0593-1.
- Burke, L., Humphreys, H. and Fitzgerald-Hughes, D. (2012) ‘The revolving door between hospital and community: Extended-spectrum beta-lactamase-producing Escherichia coli in Dublin’, *Journal of Hospital Infection*, 81(3), pp. 192–198. doi: 10.1016/j.jhin.2012.04.021.
- Cassini, A. *et al.* (2019) ‘Attributable deaths and disability-adjusted life-years caused by infections with antibiotic-resistant bacteria in the EU and the European Economic Area in 2015: a population-level modelling analysis’, *The Lancet Infectious Diseases*, 19(1), pp. 56–66. doi: 10.1016/S1473-3099(18)30605-4.
- Cataldo, M. A. *et al.* (2020) ‘Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID- 19 . The COVID-19 resource centre is hosted on Elsevier Connect , the company ’ s public news and information ’, (January), pp. 19–21.
- Cepas, V. *et al.* (2019) ‘Relationship between Biofilm Formation and Antimicrobial Resistance in Gram-Negative Bacteria’, *Microbial Drug Resistance*, 25(1), pp. 72–79. doi: 10.1089/mdr.2018.0027.
- Champoux, J. J. (2001) ‘DNA T OPOISOMERASES : Structure , FunctChampoux, J. J. (2001). DNA T OPOISOMERASES : Structure , Function , 369–413.ion ’, *Annu. Rev. Biochem.*, 70, pp. 369–413.
- Chanbari, M., Mirnejad, R. and Babapour, E. (2020) ‘Evaluation of Resistance to Fluoroquinolones and its Relationship whit parC Gene mutation in Klebsiella pneumoniae Clinical Isolates’, *Iranian Journal of Medical Microbiology*, 14(3), pp. 270–289. doi: 10.30699/ijmm.14.3.270.
- Chang, D. *et al.* (2021) ‘Clinical Epidemiology, Risk Factors, and Control Strategies of Klebsiella pneumoniae Infection’, *Frontiers in Microbiology*, 12(December), pp. 1–9. doi: 10.3389/fmicb.2021.750662.
- Channar, P. A. *et al.* (2017) ‘Sulfonamide-Linked ciprofloxacin, sulfadiazine and amantadine derivatives as a novel class of inhibitors of jack bean urease; synthesis, kinetic mechanism and molecular docking’, *Molecules*, 22(8), pp. 1–20. doi: 10.3390/molecules22081352.

- Chen, W. *et al.* (2016) ‘Effects of Scutellaria Baicalensis on Activity and Biofilm Formation of Klebsiella Pneumoniae’, *Chinese Medical Sciences Journal*, 31(3), pp. 180–184. doi: 10.1016/S1001-9294(16)30048-7.
- Cheng, J. *et al.* (2020) ‘Correction to: Time to positivity of Klebsiella pneumoniae in blood culture as prognostic indicator for pediatric bloodstream infections (European Journal of Pediatrics, (2020), 179, 11, (1689-1698), 10.1007/s00431-020-03675-8)’, *European Journal of Pediatrics*, 179(11), p. 1699. doi: 10.1007/s00431-020-03707-3.
- Cherif-Antar, A. *et al.* (2016) ‘Diversity and biofilm-forming capability of bacteria recovered from stainless steel pipes of a milk-processing dairy plant’, *Dairy Science and Technology*, 96(1), pp. 27–38. doi: 10.1007/s13594-015-0235-4.
- Chevalier, J. *et al.* (2000) ‘Membrane permeability modifications are involved in antibiotic resistance in Klebsiella pneumoniae’, *Biochemical and Biophysical Research Communications*, 274(2), pp. 496–499. doi: 10.1006/bbrc.2000.3159.
- Cholley, P. *et al.* (2013) ‘Hospital cross-transmission of extended-spectrum β-lactamase producing Escherichia coli and Klebsiella pneumoniae’, *Medecine et Maladies Infectieuses*, 43(8), pp. 331–336. doi: 10.1016/j.medmal.2013.06.001.
- Christaki, E., Marcou, M. and Tofarides, A. (2019) ‘Antimicrobial Resistance in Bacteria: Mechanisms , Evolution , and Persistence’, *Journal of Molecular Evolution*, (0123456789). doi: 10.1007/s00239-019-09914-3.
- Chu, L. *et al.* (2022) ‘Efficacy and Safety of Ciprofloxacin Plus Fluocinolone Acetonide Among Patients With Acute Otitis Externa: A Randomized Clinical Trial’, *JAMA Network Open*, 5(7), p. E2221699. doi: 10.1001/jamanetworkopen.2022.21699.
- Chung, P. Y. (2016) ‘The emerging problems of Klebsiella pneumoniae infections: Carbapenem resistance and biofilm formation’, *FEMS Microbiology Letters*, 363(20), pp. 1–6. doi: 10.1093/femsle/fnw219.
- Coculescu, B. I. (2009) ‘Antimicrobial resistance induced by genetic changes.’, *Journal of medicine and life*, 2(2), pp. 114–123.
- Conlan, S. *et al.* (2015) ‘NIH Public Access’, 6(254). doi: 10.1126/scitranslmed.3009845.Single.
- Custovic, A. *et al.* (2014) ‘Epidemiological Surveillance of Bacterial Nosocomial Infections in the Surgical Intensive Care Unit’, *Materia Socio Medica*, 26(1), p. 7. doi: 10.5455/msm.2014.26.7-11.
- Dehnamaki, M., Ghane, M. and Babaekhou, L. (2020) ‘Detection of OqxAB and QepA Efflux Pumps and Their Association with Antibiotic Resistance in Klebsiella pneumoniae Isolated From Urinary Tract Infection’, *International Journal of Infection*, 7(4). doi: 10.5812/iji.107397.
- Derivatives, I., Cernicchi, G. and Felicetti, T. (2021) ‘Microbial Efflux Pump Inhibitors : A Journey around Quinoline’.
- Doménech-Sánchez, A. *et al.* (2000) ‘Activity of nine antimicrobial agents against clinical isolates of Klebsiella pneumoniae producing extended-spectrum β-lactamases and deficient or not in porins [9]’, *Journal of Antimicrobial*

- Chemotherapy*, 46(5), pp. 858–860. doi: 10.1093/jac/46.5.858.
- Dunstan, R. A. et al. (2021) ‘Mechanistic Insights into the Capsule-Targeting Depolymerase from a *Klebsiella pneumoniae* Bacteriophage’, *Microbiology Spectrum*, 9(1), pp. 1–15. doi: 10.1128/spectrum.01023-21.
- Edwardson, S. and Cairns, C. (2019) ‘Nosocomial infections in the ICU’, *Anaesthesia and Intensive Care Medicine*, 20(1), pp. 14–18. doi: 10.1016/j.mpaic.2018.11.004.
- Efendi, N. Y. and Hertiani, T. (2013) ‘Antimicrobial Potency of Ant-Plant Extract (*Myrmecodia Tuberosa* Jack.) Against *Candida Albicans*, *Escherichia Coli*, and *Staphylococcus Aureus* Potensi Antimikroba Ekstrak Etanol Sarang Semut (*Myrmecodiatuberosa* Jack.) Terhadap *Candida Albicans*, *Escherichia*’, *Traditional Medicine Journal*, 18(1), p. 2013.
- Elgendi, S. G., Hameed, M. R. A. and El-mokhtar, M. A. (2018) ‘Tigecycline resistance among *Klebsiella pneumoniae* isolated from febrile neutropenic patients’, *Journal of Medical Microbiology*, 67, pp. 972–975. doi: 10.1099/jmm.0.000770.
- Emmerson, A. M. and Jones, A. M. (2003) ‘The quinolones: Decades of development and use’, *Journal of Antimicrobial Chemotherapy*, 51(SUPPL. 1), pp. 13–20. doi: 10.1093/jac/dkg208.
- Eyler, R. F. and Shvets, K. (2019) ‘Clinical pharmacology of antibiotics’, *Clinical Journal of the American Society of Nephrology*, 14(7), pp. 1080–1090. doi: 10.2215/CJN.08140718.
- Favour, O. et al. (2014) ‘*Klebsiella* has taken lead among uropathogens in University of Benin Teaching Hospital, Benin City, Nigeria-An observation’, *New York Science Journal*, 3(11), pp. 61–64.
- Fida, M. et al. (2021) ‘Detection of Pathogenic Bacteria from Septic Patients Using 16S rRNA gene Targeted Metagenomic Sequencing Accepted’, Published by Oxford University Press for the Infectious Diseases Society of America. All rights reserved. For permissions, e-mail: journals.permissions@oup.com, pp. 1–18.
- Fontana, C. et al. (2021) ‘Co-infections observed in SARS-CoV-2 positive patients using a rapid diagnostic test’, *Scientific Reports*, 11(1), pp. 1–10. doi: 10.1038/s41598-021-95772-3.
- Forterre, P. and Gadelle, D. (2009) ‘Phylogenomics of DNA topoisomerases: Their origin and putative roles in the emergence of modern organisms’, *Nucleic Acids Research*, 37(3), pp. 679–692. doi: 10.1093/nar/gkp032.
- Freedberg, D. E. et al. (2018) ‘Pathogen colonization of the gastrointestinal microbiome at intensive care unit admission and risk for subsequent death or infection’, *Intensive Care Medicine*, 44(8), pp. 1203–1211. doi: 10.1007/s00134-018-5268-8.
- Fu, Y. et al. (2008) ‘Alteration of GyrA amino acid required for ciprofloxacin resistance in *Klebsiella pneumoniae* isolates in China’, *Antimicrobial Agents and Chemotherapy*, 52(8), pp. 2980–2983. doi: 10.1128/AAC.00151-08.
- Garrity, G., Bell, J. and Lilburn, T. (2010) ‘Family I. Pseudomonadaceae’, *Bergey’s Manual of Systematic Bacteriology*, vol 2B, pp. 323–379.

- Garvey, M. I. *et al.* (2011) ‘Overexpression of patA and patB, which encode ABC transporters, is associated with fluoroquinolone resistance in clinical isolates of *Streptococcus pneumoniae*’, *Antimicrobial Agents and Chemotherapy*, 55(1), pp. 190–196. doi: 10.1128/AAC.00672-10.
- Geetha, V. P. *et al.* (2020) ‘Fluoroquinolone Resistance in Clinical Isolates of *Klebsiella pneumoniae*’, *Journal of Laboratory Physicians*, 12(2), pp. 121–125.
- Geng, S. *et al.* (2021) ‘Metagenomic next-generation sequencing technology for detection of pathogens in blood of critically ill patients’, *International Journal of Infectious Diseases*, 103, pp. 81–87. doi: 10.1016/j.ijid.2020.11.166.
- Grillon, A. *et al.* (2016) ‘Comparative activity of ciprofloxacin, levofloxacin and moxifloxacin against *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Stenotrophomonas maltophilia* assessed by minimum inhibitory concentrations and time-kill studies’, *PLoS ONE*, 11(6), pp. 1–10. doi: 10.1371/journal.pone.0156690.
- Gupta, R. *et al.* (2017) ‘Epidemiology of multidrug-resistant Gram-negative pathogens isolated from ventilator-associated pneumonia in ICU patients’, *Journal of Global Antimicrobial Resistance*, 9, pp. 47–50. doi: 10.1016/j.jgar.2016.12.016.
- Hamdan, H. Z. *et al.* (2015) ‘Urinary tract infections and antimicrobial sensitivity among diabetic patients at Khartoum, Sudan’, *Annals of Clinical Microbiology and Antimicrobials*, 14(1), pp. 1–6. doi: 10.1186/s12941-015-0082-4.
- Hamzaoui, Z. *et al.* (2018) ‘An outbreak of NDM-1-producing klebsiella pneumoniae, associated with OmpK35 and OmpK36 porin loss in Tunisia’, *Microbial Drug Resistance*, 24(8), pp. 1137–1147. doi: 10.1089/mdr.2017.0165.
- Handal, R. *et al.* (2017) ‘Characterization of Carbapenem-Resistant *Acinetobacter baumannii* Strains Isolated from Hospitalized Patients in Palestine’, *International Journal of Microbiology*, 2017(2006). doi: 10.1155/2017/8012104.
- Haque, M. (2017) ‘Antimicrobial use, prescribing, and resistance in selected ten selected developing countries: A brief overview’, *Asian Journal of Pharmaceutical and Clinical Research*, 10(8), pp. 37–45. doi: 10.22159/ajpcr.2017.v10i8.19468.
- Hasan, T. H. *et al.* (2021) ‘The Epidemiology of *Klebsiella pneumoniae*: A Review Epidemiology: Human beings represent *K. pneumoniae* as the main reservoir (Kadhum & Hasan , 2019).’, 25(4), pp. 8848–8860.
- Hasani, Alka *et al.* (2020) ‘Serotyping of klebsiella pneumoniae and its relation with capsule-associated virulence genes, antimicrobial resistance pattern, and clinical infections: A descriptive study in medical practice’, *Infection and Drug Resistance*, 13, pp. 1971–1980. doi: 10.2147/IDR.S243984.
- Hassan, A. *et al.* (2011a) ‘Evaluation of different detection methods of biofilm formation in the clinical isolates’, *Brazilian Journal of Infectious Diseases*,

- 15(4), pp. 305–311. doi: 10.1590/S1413-86702011000400002.
- Hassan, A. *et al.* (2011b) ‘Evaluation of different detection methods of biofilm formation in the clinical isolates’, *The Brazilian Journal of Infectious Diseases*, 15(4), pp. 305–311. doi: 10.1016/s1413-8670(11)70197-0.
- Haverkate, M. R. *et al.* (2015) ‘Within-host and population transmission of blaOXA-48 in *K. pneumoniae* and *E. coli*’, *PLoS ONE*, 10(10), pp. 4–6. doi: 10.1371/journal.pone.0140960.
- Henderson, J. C. *et al.* (2016) ‘The Power of Asymmetry: Architecture and Assembly of the Gram-Negative Outer Membrane Lipid Bilayer’, *Annual Review of Microbiology*, 70(June), pp. 255–278. doi: 10.1146/annurev-micro-102215-095308.
- Hendrik, T. C., Voor, A. F. and Vos, M. C. (2015) ‘Clinical and Molecular Epidemiology of Producing *Klebsiella* spp.: A Systematic Review and Meta-Analyses’, pp. 1–23. doi: 10.1371/journal.pone.0140754.
- Herbert, D. A. (2014) ‘Successful Oral Ciprofloxacin Therapy of *Neisseria elongata* Endocarditis’, *Annals of Pharmacotherapy*, 48(11), pp. 1529–1530. doi: 10.1177/1060028014545355.
- Herridge, W. P. *et al.* (2020) ‘Bacteriophages of *Klebsiella* spp., their diversity and potential therapeutic uses’, *Journal of Medical Microbiology*, 69(2), pp. 176–194. doi: 10.1099/jmm.0.001141.
- Holmes, A. H. *et al.* (2016) ‘Understanding the mechanisms and drivers of antimicrobial resistance’, *The Lancet*, 387(10014), pp. 176–187. doi: 10.1016/S0140-6736(15)00473-0.
- Holt, K. E. *et al.* (2015) ‘Genomic analysis of diversity, population structure, virulence, and antimicrobial resistance in *Klebsiella pneumoniae*, an urgent threat to public health’, *Proceedings of the National Academy of Sciences of the United States of America*, 112(27), pp. E3574–E3581. doi: 10.1073/pnas.1501049112.
- Hooper, D. C. and Jacoby, G. A. (2015) ‘Mechanisms of drug resistance: Quinolone resistance’, *Annals of the New York Academy of Sciences*, 1354(1), pp. 12–31. doi: 10.1111/nyas.12830.
- Horii, T., Osaki, M. and Muramatsu, H. (2008) ‘Fluoroquinolone resistance in clinical isolates of *Klebsiella oxytoca*’, *Cancer Chemotherapy*, 54(4), pp. 323–327. doi: 10.1159/000151266.
- Hsieh, P. F. *et al.* (2016) ‘The *Klebsiella pneumoniae* YfgL (BamB) lipoprotein contributes to outer membrane protein biogenesis, type-1 fimbriae expression, anti-phagocytosis, and in vivo virulence’, *Virulence*, 7(5), pp. 587–601. doi: 10.1080/21505594.2016.1171435.
- Hu, Y. *et al.* (2020) ‘Prevalence, risk factors and molecular epidemiology of carbapenem-resistant *Klebsiella pneumoniae* in patients from Zhejiang, China, 2008–2018’, *Emerging Microbes and Infections*, pp. 1771–1779. doi: 10.1080/22221751.2020.1799721.
- Hu, Y. Q., Zhang, S., *et al.* (2017) ‘4-Quinolone hybrids and their antibacterial activities’, *European Journal of Medicinal Chemistry*, 141, pp. 335–345. doi: 10.1016/j.ejmech.2017.09.050.

- Hu, Y. Q., Gao, C., et al. (2017) ‘Quinoline hybrids and their antiplasmodial and antimalarial activities’, *European Journal of Medicinal Chemistry*, 139, pp. 22–47. doi: 10.1016/j.ejmech.2017.07.061.
- Huang, Y. et al. (2015) ‘Comparative analysis of quinolone resistance in clinical isolates of klebsiella pneumoniae and escherichia coli from chinese children and adults’, *BioMed Research International*, 2015. doi: 10.1155/2015/168292.
- Iredell, J., Brown, J. and Tagg, K. (2016) ‘Antibiotic resistance in Enterobacteriaceae: Mechanisms and clinical implications’, *BMJ (Online)*, 352. doi: 10.1136/bmj.h6420.
- Jamal, M. et al. (2018) ‘Bacterial biofilm and associated infections’, *Journal of the Chinese Medical Association*, 81(1), pp. 7–11. doi: 10.1016/j.jcma.2017.07.012.
- Jazeela, K. et al. (2019) ‘Comparison of Mismatch Amplification Mutation Assay PCR and PCR-Restriction Fragment Length Polymorphism for Detection of Major Mutations in gyrA and parC of Escherichia coli Associated with Fluoroquinolone Resistance’, *Microbial Drug Resistance*, 25(1), pp. 23–31. doi: 10.1089/mdr.2017.0351.
- Jiang, S. et al. (2018) ‘Drug Resistance and Gene Transfer Mechanisms in Respiratory/Oral Bacteria’, *Journal of Dental Research*, 97(10), pp. 1092–1099. doi: 10.1177/0022034518782659.
- Kareem, S. M. et al. (2021) ‘Detection of gyrA and parC Mutations and Prevalence of Plasmid-Mediated Quinolone Resistance Genes in Klebsiella pneumoniae’, pp. 555–563.
- Kashefieh, M. et al. (2021) ‘The Molecular Epidemiology of Resistance to Antibiotics among Klebsiella pneumoniae Isolates in Azerbaijan, Iran’, *Journal of Tropical Medicine*, 2021. doi: 10.1155/2021/9195184.
- Kaur, A. et al. (2022) ‘Antibiotic resistance pattern of Klebsiella pneumoniae a major problem for society’, *International journal of health sciences*, 6(April), pp. 4699–4712. doi: 10.53730/ijhs.v6ns2.6124.
- Kazanjian, P. (2017) *History of antimicrobial stewardship., Antimicrobial stewardship: principles and practice*. doi: 10.1079/9781780644394.0015.
- Kementerian Kesehatan Republik Indonesia (2017) *Keputusan Menteri Kesehatan Republik Indonesia, Nomor HK.01.07/MENKES/342/2017 tentang Pedoman Nasional Pelayanan Kedokteran Tata Laksana Sepsis*.
- Khalid, T. W. B. M. and Ghaima, K. K. (2022) ‘Effect the Natural Efflux Pump Inhibitor (Berberine) in Multidrug Resistant Klebsiella pneumoniae Isolated from Urinary Tract Infections in Several Baghdad Hospitals’, *Egyptian Journal of Hospital Medicine*, 89(2), pp. 6882–6888. doi: 10.21608/ejhm.2022.271906.
- Khodadadian, R. et al. (2018) ‘Detection of VIM-1 and IMP-1 genes in Klebsiella pneumoniae and relationship with biofilm formation’, *Microbial Pathogenesis*, 115(November 2017), pp. 25–30. doi: 10.1016/j.micpath.2017.12.036.
- Khoshnood, S. et al. (2020) ‘Involvement of the AcrAB Efflux Pump in

- Ciprofloxacin Resistance in Clinical *Klebsiella Pneumoniae* Isolates', *Infectious Disorders - Drug Targets*, 21(4), pp. 564–571. doi: 10.2174/1871526520999200905121220.
- Kim, T. H. et al. (2020) 'Novel cassette assay to quantify the outer membrane permeability of five β -lactams simultaneously in carbapenem-resistant *klebsiella pneumoniae* and *enterobacter cloacae*', *American Society for Microbiology mBio*, 11(1), pp. 1–15.
- Kochan, T. J. et al. (2022) 'Genomic surveillance for multidrug-resistant or hypervirulent *Klebsiella pneumoniae* among United States bloodstream isolates', *BMC Infectious Diseases*, 22(1), pp. 1–21. doi: 10.1186/s12879-022-07558-1.
- Kong, K. F., Vuong, C. and Otto, M. (2006) 'Staphylococcus quorum sensing in biofilm formation and infection', *International Journal of Medical Microbiology*, 296(2–3), pp. 133–139. doi: 10.1016/j.ijmm.2006.01.042.
- Kowalska-Krochmal, B. and Dudek-Wicher, R. (2021) 'The minimum inhibitory concentration of antibiotics: Methods, interpretation, clinical relevance', *Pathogens*, 10(2), pp. 1–21. doi: 10.3390/pathogens10020165.
- Kumar, A. et al. (2010) 'A survival benefit of combination antibiotic therapy for serious infections associated with sepsis and septic shock is contingent only on the risk of death: A meta-analytic/meta-regression study', *Critical Care Medicine*, 38(8), pp. 1651–1664. doi: 10.1097/CCM.0b013e3181e96b91.
- Kumar, V. and Park, S. (2018) 'Potential and limitations of *Klebsiella pneumoniae* as a microbial cell factory utilizing glycerol as the carbon source', *Biotechnology Advances*, 36(1), pp. 150–167. doi: 10.1016/j.biotechadv.2017.10.004.
- Laudy, A. E., Kulińska, E. and Tyski, S. (2017) 'The impact of efflux pump inhibitors on the activity of selected non-antibiotic medicinal products against gram-negative bacteria', *Molecules*, 22(1), pp. 1–12. doi: 10.3390/molecules22010114.
- Leboffe, M. J. and Pierce, B. E. (2011) *A Photographic Atlas Microbiology Laboratory*. 4 th Editi, Morton Publishing. 4 th Editi. United States of America. doi: 10.2174/187152008785133128.
- Lee, J. H. (2019) 'Perspectives towards antibiotic resistance: from molecules to population', *Journal of Microbiology*, 57(3), pp. 181–184. doi: 10.1007/s12275-019-0718-8.
- Lequette, Y. and Greenberg, E. P. (2005) 'Timing and localization of rhamnolipid synthesis gene expression in *Pseudomonas aeruginosa* biofilms', *Journal of Bacteriology*, 187(1), pp. 37–44. doi: 10.1128/JB.187.1.37-44.2005.
- Lerminiaux, N. A. and Cameron, A. D. S. (2019) 'Horizontal transfer of antibiotic resistance genes in clinical environments', *Canadian Journal of Microbiology*, 65(1), pp. 34–44. doi: 10.1139/cjm-2018-0275.
- Li, B. et al. (2012) 'Analysis of drug resistance determinants in *Klebsiella pneumoniae* isolates from a tertiary-care hospital in Beijing, China', *PLoS ONE*, 7(7). doi: 10.1371/journal.pone.0042280.
- Li, Z. et al. (1998) 'Alteration in the GyrA subunit of DNA gyrase and the ParC

- subunit of DNA topoisomerase IV in quinolone-resistant clinical isolates of *Staphylococcus epidermidis*', *Antimicrobial Agents and Chemotherapy*, 42(12), pp. 3293–3295. doi: 10.1128/aac.42.12.3293.
- Liao, C. H. et al. (2013) 'Risk factors and clinical characteristics of patients with qnr-positive klebsiella pneumoniae bacteraemia', *Journal of Antimicrobial Chemotherapy*, 68(12), pp. 2907–2914. doi: 10.1093/jac/dkt295.
- Litwin, A., Fedorowicz, O. and Duszynska, W. (2020) 'Characteristics of microbial factors of healthcare-associated infections including multidrug-resistant pathogens and antibiotic consumption at the university intensive care unit in Poland in the years 2011–2018', *International Journal of Environmental Research and Public Health*, 17(19), pp. 1–14. doi: 10.3390/ijerph17196943.
- Livak, K. J. and Schmittgen, T. D. (2001) 'Analysis of relative gene expression data using real-time quantitative PCR and the 2- $\Delta\Delta CT$ method', *Methods*, 25(4), pp. 402–408. doi: 10.1006/meth.2001.1262.
- Livennore, D. M. and Yuan, M. (1996) 'Antibiotic resistance and production of extended-spectrum / Mactamases amongst Klebsiella spp . from intensive care units in Europe Klebsiellae account for 10-20 % of opportunistic Gram-negative pathogens from in-patients (Chen et al ., 1993). Their suc', pp. 409–424.
- M100-S25, C. D. (2015) *Clinical and Laboratory Standards Institute. Performance Standards for Antimicrobial Susceptibility Testing: 25th Informational Supplemen*; Clinical and Laboratory Standards Institute. Wayne, PA, USA,: Clinical and Laboratory Standards Institute. doi: 10.1108/08876049410065598.
- Machado, D. et al. (2017) 'Mode of action of the 2-phenylquinoline efflux inhibitor PQQ4R against Escherichia coli', *PeerJ*, 2017(4). doi: 10.7717/peerj.3168.
- Mah, T. (2012) 'Biofilm-specific antibiotic resistance', pp. 1061–1072.
- Mah, T. F. C. and O'Toole, G. A. (2001) 'Mechanisms of biofilm resistance to antimicrobial agents', *Trends in Microbiology*, 9(1), pp. 34–39. doi: 10.1016/S0966-842X(00)01913-2.
- Mahapatra, A. et al. (2022) 'Ciprofloxacin-resistant Gram-negative isolates from a tertiary care hospital in Eastern India with novel gyrA and parC gene mutations', *Medical Journal Armed Forces India*, 78(1), pp. 24–31. doi: 10.1016/j.mjafi.2019.10.002.
- Malekshahi, S. S. et al. (2021) 'Prevalence of Human Metapneumovirus Infections in Iran: A Systematic Review and Meta-Analysis', *Fetal and Pediatric Pathology*, 40(6), pp. 663–673. doi: 10.1080/15513815.2020.1725939.
- Martin, Rebekah M. and Bachman, M. A. (2018) 'Colonization, infection, and the accessory genome of Klebsiella pneumoniae', *Frontiers in Cellular and Infection Microbiology*, 8(JAN), pp. 1–15. doi: 10.3389/fcimb.2018.00004.
- Martin, Rebekah M and Bachman, M. A. (2018) 'Colonization , Infection , and the Accessory Genome of Klebsiella pneumoniae', 8(January), pp. 1–15. doi: 10.3389/fcimb.2018.00004.
- Martins, M. et al. (2010) 'in Bacterial Clinical Isolates by Two Simple Methods', 642, pp. 143–157. doi: 10.1007/978-1-60327-279-7.

- Martins, M. *et al.* (2013) ‘A Simple Method for Assessment of MDR Bacteria for Over-Expressed Efflux Pumps’, *The Open Microbiology Journal*, 7(1), pp. 72–82. doi: 10.2174/1874285801307010072.
- Masturoh, I. and Anggita, N. T. (2018) *Metodologi Penelitian Kesehatan, Kementerian Kesehatan Republik Indonesia Pusat Pendidikan Sumber Daya Manusia Kesehatan Badan Pengembangan dan Pemberdayaan Sumber Daya Manusia Kesehatan*.
- Matovina, M. *et al.* (2021) ‘An outbreak of ertapenem-resistant, carbapenemase-negative and porin-deficient ESBL-producing klebsiella pneumoniae complex’, *Germs*, 11(2), pp. 199–210. doi: 10.18683/germs.2021.1257.
- Meatherall, B. L. *et al.* (2009) ‘Incidence, Risk Factors, and Outcomes of Klebsiella pneumoniae Bacteremia’, *American Journal of Medicine*, 122(9), pp. 866–873. doi: 10.1016/j.amjmed.2009.03.034.
- Mehrad, B. *et al.* (2015) ‘Antimicrobial resistance in hospital-acquired gram-negative bacterial infections’, *Chest*, 147(5), pp. 1413–1421. doi: 10.1378/chest.14-2171.
- Melzer, M., Petersen, I. and Cheasty, T. (2008) ‘The difference in serotypes between extended-β-lactamase (ESBL) and non-ESBL-producing E. coli blood culture isolates at a UK district general hospital’, *Journal of Hospital Infection*, 68(4), pp. 367–369. doi: 10.1016/j.jhin.2008.01.006.
- Mi, Z. *et al.* (2020) ‘Improved Production of Pyrroloquinoline Quinone by Simultaneous Augmentation of Its Synthesis Gene Expression and Glucose Metabolism in Klebsiella pneumoniae’, *Current Microbiology*, 77(7), pp. 1174–1183. doi: 10.1007/s00284-020-01918-3.
- Millanao, A. R. *et al.* (2021) *Biological Effects of Quinolones : A Family of Broad-Spectrum Antimicrobial Agents*.
- Miquel, S. *et al.* (2016) ‘Anti-biofilm activity as a health issue’, *Frontiers in Microbiology*, 7(APR), pp. 1–14. doi: 10.3389/fmicb.2016.00592.
- Mirzaii, M. *et al.* (2018) ‘Determination of gyrA and parC mutations and prevalence of plasmid-mediated quinolone resistance genes in Escherichia coli and Klebsiella pneumoniae isolated from patients with urinary tract infection in Iran’, *Journal of Global Antimicrobial Resistance*, 13, pp. 197–200. doi: 10.1016/j.jgar.2018.04.017.
- Mitscher, L. A. (2005) ‘Bacterial topoisomerase inhibitors: Quinolone and pyridone antibacterial agents’, *Chemical Reviews*, 105(2), pp. 559–592. doi: 10.1021/cr030101q.
- Mohammed, M. A. *et al.* (2021) ‘Impact of target site mutations and plasmid associated resistance genes acquisition on resistance of Acinetobacter baumannii to fluoroquinolones’, *Scientific Reports*, 11(1), pp. 1–16. doi: 10.1038/s41598-021-99230-y.
- Moradigaravand, D. *et al.* (2017) ‘Evolution and epidemiology of multidrug-resistant Klebsiella pneumoniae in the United Kingdom and Ireland’, *mBio*, 8(1), pp. 1–13. doi: 10.1128/mBio.01976-16.
- Mostafavi, M. *et al.* (2018) ‘Interplay of Klebsiella pneumoniae fabZ and lpxC Mutations Leads to LpxC Inhibitor-Dependent Growth Resulting from Loss

- of Membrane Homeostasis ', *mSphere*, 3(5), pp. 1–15. doi: 10.1128/msphere.00508-18.
- Motta, S. S., Cluzel, P. and Aldana, M. (2015) 'Adaptive resistance in bacteria requires epigenetic inheritance, genetic noise, and cost of efflux pumps', *PLoS ONE*, 10(3), pp. 3–8. doi: 10.1371/journal.pone.0118464.
- Moya, C. and Maicas, S. (2020) 'Antimicrobial Resistance in Klebsiella pneumoniae Strains: Mechanisms and Outbreaks', p. 11. doi: 10.3390/proceedings2020066011.
- Murphy, C. N. and Clegg, S. (2012) 'Klebsiella pneumoniae and type 3 fimbriae: nosocomial infection, regulation and biofilm formation', *Future Microbiology*, 7(8), pp. 991–1002.
- Murray, P. R. and Masur, H. (2012) 'Current approaches to the diagnosis of bacterial and fungal bloodstream infections in the intensive care unit', *Critical Care Medicine*, 40(12), pp. 3277–3282. doi: 10.1097/CCM.0b013e318270e771.
- Nahar, P. et al. (2020) 'What contributes to inappropriate antibiotic dispensing among qualified and unqualified healthcare providers in Bangladesh? A qualitative study', *BMC Health Services Research*, 20(1), pp. 1–11. doi: 10.1186/s12913-020-05512-y.
- Nathwani, D., Tillotson, G. and Davey, P. (1997) 'Sequential antimicrobial therapy - The role of quinolones', *Journal of Antimicrobial Chemotherapy*, 39(4), pp. 441–446. doi: 10.1093/jac/39.4.441.
- Navon-Venezia, S., Kondratyeva, K. and Carattoli, A. (2017) 'Klebsiella pneumoniae: A major worldwide source and shuttle for antibiotic resistance', *FEMS Microbiology Reviews*, 41(3), pp. 252–275. doi: 10.1093/femsre/fux013.
- Nirwati, H. et al. (2019) 'Biofilm formation and antibiotic resistance of Klebsiella pneumoniae isolated from clinical samples in a tertiary care hospital, Klaten, Indonesia', *BMC Proceedings*, 13(Suppl 11), pp. 1–8. doi: 10.1186/s12919-019-0176-7.
- Nisar, S., Kirkpatrick, L. D. and Shupp, J. W. (2021) 'Bacterial Virulence Factors and Their Contribution to Pathophysiology after Thermal Injury', *Surgical Infections*, 22(1), pp. 69–76. doi: 10.1089/sur.2020.188.
- Nowak, K. P. et al. (2021) 'Molecular and functional characterization of mobk protein—a novel-type relaxase involved in mobilization for conjugational transfer of klebsiella pneumoniae plasmid pigrk', *International Journal of Molecular Sciences*, 22(10). doi: 10.3390/ijms22105152.
- Opoku-Temeng, C., Kobayashi, S. D. and DeLeo, F. R. (2019) 'Klebsiella pneumoniae capsule polysaccharide as a target for therapeutics and vaccines', *Computational and Structural Biotechnology Journal*, 17, pp. 1360–1366. doi: 10.1016/j.csbj.2019.09.011.
- Osagie, R. . et al. (2017) 'Antibiotic susceptibility profile of Klebsiella pneumoniae isolated from sputum samples amongst hospitalized adults in parts of Edo State, South-South, Nigeria', *Merit Research Journal of Medicine and Medical Sciences*, 5(8), pp. 378–383.
- Osman, E. A. et al. (2020) 'Comparing conventional, biochemical and genotypic

- methods for accurate identification of *Klebsiella pneumoniae* in Sudan', *Access Microbiology*, 2(3), pp. 2–5. doi: 10.1099/acmi.0.000096.
- Pacios, O. *et al.* (2022) 'Adaptation of clinical isolates of *Klebsiella pneumoniae* to the combination of niclosamide with the efflux pump inhibitor phenylarginine- β -naphthylamide (Pa β N): co-resistance to antimicrobials', *Journal of Antimicrobial Chemotherapy*, 77(5), pp. 1272–1281. doi: 10.1093/jac/dkac044.
- Paczosa, M. K. (2016) 'Klebsiella pneumoniae : Going on the Offense with a Strong Defense', *Microbiology and Molecular Biology Reviews*, 80(3), pp. 629–661. doi: 10.1128/MMBR.00078-15.Address.
- Paczosa, M. K. and Mecsas, J. (2016) 'Klebsiella pneumoniae: Going on the Offense with a Strong Defense', *Microbiology and Molecular Biology Reviews*, 80(3), pp. 629–661. doi: 10.1128/mmbrr.00078-15.
- Palmeiro, J. K. *et al.* (2019) 'Molecular Epidemiology of Multidrug-Resistant *Klebsiella pneumoniae* Isolates in a Brazilian Tertiary Hospital', *Frontiers in Microbiology*, 10(July), pp. 1–11. doi: 10.3389/fmicb.2019.01669.
- Paluch, E. *et al.* (2020) 'Prevention of biofilm formation by quorum quenching', *Applied Microbiology and Biotechnology*, 104(5), pp. 1871–1881. doi: 10.1007/s00253-020-10349-w.
- Papagiannitsis, C. C. *et al.* (2013) 'OmpK35 and OmpK36 porin variants associated with specific sequence types of *Klebsiella pneumoniae*', *Journal of Chemotherapy*, 25(4), pp. 250–254. doi: 10.1179/1973947813Y.0000000075.
- Patel, J. . *et al.* (2015) *M100-S11, Performance standards for antimicrobial susceptibility testing*, *Clinical Microbiology Newsletter*. doi: 10.1016/s0196-4399(01)88009-0.
- Patel Singh, S. *et al.* (2021) 'Epidemiology, Antimicrobial susceptibility patterns and outcomes of bacteremia in an Apex trauma center of a tertiary health care institute with special reference to Methicillin Re...', *International Journal of Medical Science and Current Research*, 4(2), pp. 435–443.
- Patilaya, P., Husori, D. I. and Marhafanny, L. (2019) 'Susceptibility of klebsiella pneumoniae isolated from pus specimens of post-surgery patients in Medan, Indonesia to selected antibiotics', *Open Access Macedonian Journal of Medical Sciences*, 7(22), pp. 3861–3864. doi: 10.3889/oamjms.2019.520.
- Pham, T. D. M., Ziora, Z. M. and Blaskovich, M. A. T. (2019) 'Quinolone antibiotics', *MedChemComm*, 10(10), pp. 1719–1739. doi: 10.1039/c9md00120d.
- Phan, H. T. T. *et al.* (2018) 'Illumina short-read and MinION long-read WGS to characterize the molecular epidemiology of an NDM-1 *Serratia marcescens* outbreak in Romania', *Journal of Antimicrobial Chemotherapy*, 73(3), pp. 672–679. doi: 10.1093/jac/dkx456.
- Piekarska, K. *et al.* (2015) 'Co-existence of plasmid-mediated quinolone resistance determinants and mutations in gyra and parC among fluoroquinolone-resistant clinical Enterobacteriaceae isolated in a tertiary hospital in Warsaw, Poland', *International Journal of Antimicrobial Agents*, 45(3), pp. 238–243. doi: 10.1016/j.ijantimicag.2014.09.019.

- Pilla, G., McVicker, G. and Tang, C. M. (2017) 'Genetic plasticity of the *Shigella* virulence plasmid is mediated by intra- and inter-molecular events between insertion sequences', *PLoS Genetics*, 13(9), pp. 1–19. doi: 10.1371/journal.pgen.1007014.
- Prajapati, J. D., Kleinekath, U. and Winterhalter, M. (2021) 'How to Enter a Bacterium: Bacterial Porins and the Permeation of Antibiotics'. doi: 10.1021/acs.chemrev.0c01213.
- Pu, Y., Ke, Y. and Bai, F. (2017) 'Active efflux in dormant bacterial cells – New insights into antibiotic persistence', *Drug Resistance Updates*, 30, pp. 7–14. doi: 10.1016/j.drup.2016.11.002.
- Qin, X. et al. (2020) 'The colonization of carbapenem-resistant *klebsiella pneumoniae*: epidemiology, resistance mechanisms, and risk factors in patients admitted to intensive care units in China', *Journal of Infectious Diseases*, 221(Suppl 2), pp. S206–S214. doi: 10.1093/INFDIS/JIZ622.
- Radji, M., Fauziah, S. and Aribinuko, N. (2011) 'Antibiotic sensitivity pattern of bacterial pathogens in the intensive care unit of Fatmawati Hospital, Indonesia', *Asian Pacific Journal of Tropical Biomedicine*, 1(1), pp. 39–42. doi: 10.1016/S2221-1691(11)60065-8.
- Ravi, A. et al. (2019) 'Loss of microbial diversity and pathogen domination of the gut microbiota in critically ill patients', *Microbial Genomics*, 5(9). doi: 10.1099/mgen.0.000293.
- Raymundo, L. J. et al. (2008) *Coral Disease Handbook Guidelines for Assessment, Management*.
- Richard, G. A. et al. (2002) 'Single-dose fluoroquinolone therapy of acute uncomplicated urinary tract infection in women: Results from a randomized, double-blind, multicenter trial comparing single-dose to 3-day fluoroquinolone regimens', *Urology*, 59(3), pp. 334–339. doi: 10.1016/S0090-4295(01)01562-X.
- Rosas, N. C. and Lithgow, T. (2021) 'Targeting bacterial outer-membrane remodelling to impact antimicrobial drug resistance', *Trends in Microbiology*, xx(xx), pp. 1–9. doi: 10.1016/j.tim.2021.11.002.
- RSUD Prof. Dr. Margono Soekarjo (no date a) *Data Pasien Kasus Infeksi Klebsiella pneumoniae Di RSUD Prof. Dr. Margono Soekarjo Purwokerto Tahun 2019-2021*.
- RSUD Prof. Dr. Margono Soekarjo (no date b) *Pemerintah Provinsi Jawa Tengah RSUD Prof. Dr. Margono Soekarjo, 2014*. Available at: <https://www.rsmargono.go.id/> (Accessed: 6 June 2022).
- Ruggiu, F. et al. (2019) 'Size Matters and How You Measure It: A Gram-Negative Antibacterial Example Exceeding Typical Molecular Weight Limits', *ACS Infectious Diseases*, 5(10), pp. 1688–1692. doi: 10.1021/acsinfecdis.9b00256.
- Ruiz, J. (2003) 'Mechanisms of resistance to quinolones: target alterations , decreased accumulation and DNA gyrase protection', (April), pp. 1109–1117. doi: 10.1093/jac/dkg222.
- Russo, T. A. and Marr, C. M. (2019) 'Hypervirulent *Klebsiella pneumoniae* Thomas', 25.

- Saha, S. *et al.* (2018) 'Biofilm production and its correlation with antibiotic resistance pattern among clinical isolates of *Pseudomonas aeruginosa* in a tertiary care hospital in north-east India', *International Journal of Advances in Medicine*, 5(4), p. 964. doi: 10.18203/2349-3933.ijam20183129.
- Saharman, Y. R. *et al.* (2020) 'Clinical impact of endemic NDM-producing *Klebsiella pneumoniae* in intensive care units of the national referral hospital in Jakarta, Indonesia', *Antimicrobial Resistance and Infection Control*, 9(1), pp. 1–14. doi: 10.1186/s13756-020-00716-7.
- Sahoo, A. *et al.* (2021) 'Antimicrobial Peptides Derived From Insects Offer a Novel Therapeutic Option to Combat Biofilm: A Review', *Frontiers in Microbiology*, 12(June). doi: 10.3389/fmicb.2021.661195.
- Samia, B. *et al.* (2013) 'Evaluation of biofilm formation of *Klebsiella pneumoniae* isolated from medical devices at the University Hospital of Tlemcen, Algeria', *African Journal of Microbiology Research*, 7(49), pp. 5558–5564. doi: 10.5897/ajmr12.2331.
- Schacht, P. *et al.* (1988) 'Worldwide clinical data on efficacy and safety of ciprofloxacin', *Infection*, 16(1 Supplement), pp. 29–43. doi: 10.1007/BF01650504.
- Schmidt, B. H. *et al.* (2010) 'A novel and unified two-metal mechanism for DNA cleavage by type II and IA topoisomerases', *HHS Public Access Nature*, 465(7298), pp. 641–644. doi: 10.1038/nature08974.A.
- Schneiders, T., Amyes, S. G. B. and Levy, S. B. (2003) 'Role of AcrR and RamA in fluoroquinolone resistance in clinical *Klebsiella pneumoniae* isolates from Singapore', *Antimicrobial Agents and Chemotherapy*, 47(9), pp. 2831–2837. doi: 10.1128/AAC.47.9.2831-2837.2003.
- Segev, S. *et al.* (1999) 'Safety of long-term therapy with ciprofloxacin: Data analysis of controlled clinical trials and review', *Clinical Infectious Diseases*, 28(2), pp. 299–308. doi: 10.1086/515132.
- Shakib, P. *et al.* (2012) 'Prevalence of OmpK35 and OmpK36 porin expression in beta-lactamase and non-beta-lactamase-producing *Klebsiella pneumoniae*', *Biologics: Targets and Therapy*, 6, pp. 1–4. doi: 10.2147/btt.s27582.
- Shilpa, K., Thomas, R. and Ramyshree, A. (2015) 'Isolation and Antimicrobial sensitivity pattern of *Klebsiella pneumoniae* from sputum samples in a tertiary care hospital', *International Journal of Biomedical and Advance Research IJBAR International Journal of Biomedical and Advance Research Journal*, 6(605), pp. 427–430. doi: 10.7439/ijbar.
- Shokoohzadeh, L. *et al.* (2019) 'Mutations in gyra and parc genes in quinolone-resistant *klebsiella pneumoniae* isolates from borujerd hospitals', *Journal of Advances in Medical and Biomedical Research*, 27(120), pp. 1–7. doi: 10.30699/jambs.27.120.1.
- Sick, A. C. *et al.* (2014) 'Empiric combination therapy for gram-negative bacteremia', *Pediatrics*, 133(5). doi: 10.1542/peds.2013-3363.
- Silver, L. L. (2016) 'A Gestalt approach to Gram-negative entry', *Bioorganic and Medicinal Chemistry*, 24(24), pp. 6379–6389. doi: 10.1016/j.bmc.2016.06.044.

- Siswandari, W. *et al.* (2018) 'PROFIL BAKTERI PENYEBAB SEPSIS DI RUANG PERAWATAN INTENSIVE RSUD PROF . DR . MARGONO SOEKARJO PURWOKERTO Wahyu Siswandari , Rani Afifah Nur Hestiyani , Vitasari Indriani , I Dewa Sang Ayu Putu Peramiarti Fakultas', *Prosiding Seminar Nasional Pengembangan Sumber Daya Perdesaan dan Kearifan Lokal Berkelanjutan VIII*, 1(November), pp. 14–15.
- Smith, A. C. and Hussey, M. A. (2005) 'Gram stain protocols', *American Society for Microbiology*, 1(September 2005), p. 14.
- Sriram, D. *et al.* (2007) 'Newer tetracycline derivatives: Synthesis, anti-HIV, antimycobacterial activities and inhibition of HIV-1 integrase', *Bioorganic and Medicinal Chemistry Letters*, 17(8), pp. 2372–2375. doi: 10.1016/j.bmcl.2006.11.055.
- Starzyk-Łuszcz, K. *et al.* (2017) 'Mortality due to nosocomial infection with Klebsiella pneumoniae ESBL+', *Advances in Experimental Medicine and Biology*, 1022, pp. 19–26. doi: 10.1007/5584_2017_38.
- Su, L. X. *et al.* (2019) 'Infection management strategy based on prevention and control of nosocomial infections in intensive care units', *Chinese Medical Journal*, 132(1), pp. 115–119. doi: 10.1097/CM9.0000000000000029.
- Sugawara, E., Kojima, S. and Nikaido, H. (2016) 'Klebsiella pneumoniae Major Porins OmpK35 and OmpK36 Allow More Efficient Diffusion of Beta-Lactams than Their Escherichia coli Homologs OmpF and OmpC', *Journal of Bacteriology*, 198(23), pp. 3200–3208. doi: 10.1128/JB.00590-16.Editor.
- Sugianli, A. K. *et al.* (2020) 'Laboratory-based versus population-based surveillance of antimicrobial resistance to inform empirical treatment for suspected urinary tract infection in Indonesia', *PLoS ONE*, 15(3), pp. 1–10. doi: 10.1371/journal.pone.0230489.
- Surgers, L. *et al.* (2019) 'Biofilm formation by ESBL-producing strains of Escherichia coli and Klebsiella pneumoniae', *International Journal of Medical Microbiology*, 309(1), pp. 13–18. doi: 10.1016/j.ijmm.2018.10.008.
- Svane, S. *et al.* (2020) 'Inhibition of urease activity by different compounds provides insight into the modulation and association of bacterial nickel import and ureolysis', *Scientific Reports*, 10(1), pp. 1–14. doi: 10.1038/s41598-020-65107-9.
- Szabo, O. *et al.* (2018) 'Contribution of OqxAB efflux pump in selection of fluoroquinolone-resistant klebsiella pneumoniae', *Canadian Journal of Infectious Diseases and Medical Microbiology*, 2018. doi: 10.1155/2018/4271638.
- Tamma, P. D., Cosgrove, S. E. and Maragakis, L. L. (2012) 'Combination therapy for treatment of infections with gram-negative bacteria', *Clinical Microbiology Reviews*, 25(3), pp. 450–470. doi: 10.1128/CMR.05041-11.
- Tang, M. *et al.* (2020) 'The role and relationship with efflux pump of biofilm formation in Klebsiella pneumoniae', *Microbial Pathogenesis*, 147, p. 104244. doi: 10.1016/j.micpath.2020.104244.
- Tängdén, T. (2014) 'Combination antibiotic therapy for multidrug-resistant Gram-negative bacteria', *Upsala Journal of Medical Sciences*, 119(2), pp. 149–153.

- doi: 10.3109/03009734.2014.899279.
- Terp, D. K. and Rybak, M. (1987) 'Ciprofloxacin', *Drug Intelligence and Clinical Pharmacy*, 21, pp. 568–574.
- Tiwari, S. K. et al. (2021) 'Starvation Survival and Biofilm Formation under Subminimum Inhibitory Concentration of QAMs', *BioMed Research International*, 2021. doi: 10.1155/2021/8461245.
- Unlu, O. et al. (2018) 'Epidemic Klebsiella pneumoniae ST258 incidence in ICU patients admitted to a university hospital in Istanbul'. doi: 10.3855/jidc.13430.
- Unlu, O. et al. (2021) 'Epidemic Klebsiella pneumoniae ST258 incidence in ICU patients admitted to a university hospital in Istanbul', *Journal of Infection in Developing Countries*, 15(5), pp. 665–671. doi: 10.3855/JIDC.13430.
- Usai, D. et al. (2019) 'Brief Original Article Enhancement of antimicrobial activity of pump inhibitors associating drugs', *The Journal of Infection in Developing Countries*, 13(2), pp. 162–164. doi: 10.3855/jidc.11102.
- Versporten, A. et al. (2018) 'Antimicrobial consumption and resistance in adult hospital inpatients in 53 countries: results of an internet-based global point prevalence survey', *The Lancet Global Health*, 6(6), pp. e619–e629. doi: 10.1016/S2214-109X(18)30186-4.
- Villa, L. et al. (2014) 'Genomics of KPC-producing Klebsiella pneumoniae sequence type 512 clone highlights the role of RamR and ribosomal S10 protein mutations in conferring tigecycline resistance', *Antimicrobial Agents and Chemotherapy*, 58(3), pp. 1707–1712. doi: 10.1128/AAC.01803-13.
- Vincent, J. L. et al. (2020) 'Prevalence and Outcomes of Infection among Patients in Intensive Care Units in 2017', *JAMA - Journal of the American Medical Association*, 323(15), pp. 1478–1487. doi: 10.1001/jama.2020.2717.
- Viveiros, M. et al. (2008) 'New Methods for the Identification of Efflux Mediated MDR Bacteria, Genetic Assessment of Regulators and Efflux Pump Constituents, Characterization of Efflux Systems and Screening for Inhibitors of Efflux Pumps', *Current Drug Targets*, 9(9), pp. 760–778. doi: 10.2174/138945008785747734.
- Vuotto, C. et al. (2017) 'Biofilm formation and antibiotic resistance in Klebsiella pneumoniae urinary strains', *Journal of Applied Microbiology*, 123(4), pp. 1003–1018. doi: 10.1111/jam.13533.
- Walaszek, M. et al. (2018) 'Epidemiology of Ventilator-Associated Pneumonia, microbiological diagnostics and the length of antimicrobial treatment in the Polish Intensive Care Units in the years 2013-2015', *BMC Infectious Diseases*, 18(308), pp. 1–9.
- Walker, S. S. and Black, T. A. (2021) 'Are outer-membrane targets the solution for MDR Gram-negative bacteria?', *Drug Discovery Today*, 26(9), pp. 2152–2158. doi: 10.1016/j.drudis.2021.03.027.
- Walters III, M. C. et al. (2003) 'Contributions of Antibiotic Penetration, Oxygen Limitation', *Antimicrobial Agents and Chemotherapy*, 47(1), pp. 317–323. doi: 10.1128/AAC.47.1.317.

- Wang, C. *et al.* (2019) ‘Epidemiologic analysis and control strategy of klebsiella pneumoniae infection in intensive care units in a teaching hospital of People’s Republic of China’, *Infection and Drug Resistance*, 12, pp. 391–398. doi: 10.2147/IDR.S189154.
- Wang, G. *et al.* (2020) ‘The characteristic of virulence, biofilm and antibiotic resistance of klebsiella pneumoniae’, *International Journal of Environmental Research and Public Health*, 17(17), pp. 1–17. doi: 10.3390/ijerph17176278.
- Wang, J. *et al.* (2020) *Electrophysiological Characterization of Transport Across Outer-Membrane Channels from Gram-Negative Bacteria in Presence of Lipopolysaccharides*. German. doi: doi.org/10.1002/anie.201913618.
- Wassem, M. *et al.* (2015) ‘The role of OmpK35, OmpK36 porins, and production of β -lactamases on imipenem susceptibility in klebsiella pneumoniae clinical isolates, Cairo, Egypt’, *Microbial Drug Resistance*, 21(6), pp. 577–580. doi: 10.1089/mdr.2014.0226.
- Wentzell, L. M. and Maxwell, A. (2000) ‘The complex of DNA gyrase and quinolone drugs on DNA forms a barrier to the T7 DNA polymerase replication complex’, *Journal of Molecular Biology*, 304(5), pp. 779–791. doi: 10.1006/jmbi.2000.4266.
- WHO (2019) *Critically Important Antimicrobials for Human Medicine*. 6th revisi. World Health Organization.
- Windels, E. M. *et al.* (2019) ‘Antibiotics: Combatting tolerance to stop resistance’, *mBio*, 10(5). doi: 10.1128/mBio.02095-19.
- Winterhalter, M. (2021) ‘Antibiotic uptake through porins located in the outer membrane of Gram-negative bacteria’, *Expert Opinion on Drug Delivery*, 18(4), pp. 449–457. doi: 10.1080/17425247.2021.1847080.
- World Health Organization (WHO) (2020) *GLASS Report: Early Implementation 2020*.
- Wyres, K. L. *et al.* (2019) ‘Distinct evolutionary dynamics of horizontal gene transfer in drug resistant and virulent clones of Klebsiella pneumoniae’, *PLoS Genetics*, 15(4), pp. 1–25. doi: 10.1371/journal.pgen.1008114.
- Wyres, K. L. and Holt, K. E. (2018) ‘Klebsiella pneumoniae as a key trafficker of drug resistance genes from environmental to clinically important bacteria’, *Current Opinion in Microbiology*, 45, pp. 131–139. doi: 10.1016/j.mib.2018.04.004.
- Wyres, K. L., Lam, M. M. C. and Holt, K. E. (2020) ‘Population genomics of Klebsiella pneumoniae’, *Nature Reviews Microbiology*, 18(6), pp. 344–359. doi: 10.1038/s41579-019-0315-1.
- Xu, Z. *et al.* (2017) ‘Recent advances of pyrazole-containing derivatives as anti-tubercular agents’, *European Journal of Medicinal Chemistry*, 139, pp. 429–440. doi: 10.1016/j.ejmech.2017.07.059.
- Yamasaki, S. *et al.* (2021) ‘Genetic analysis of ESBL-producing Klebsiella pneumoniae isolated from UTI patients in Indonesia’, *Journal of Infection and Chemotherapy*, 27(1), pp. 55–61. doi: 10.1016/j.jiac.2020.08.007.
- Yang, L. *et al.* (2007) ‘Effects of iron on DNA release and biofilm development by

- Pseudomonas aeruginosa', *Microbiology*, 153(5), pp. 1318–1328. doi: 10.1099/mic.0.2006/004911-0.
- Yang, S. *et al.* (2021) 'Bacterial and fungal co-infections among COVID-19 patients in intensive care unit', *Microbes and Infection*, 23(4–5), p. 104806. doi: 10.1016/j.micinf.2021.104806.
- Zechiedrich, E. L. *et al.* (2000) 'Roles of topoisomerases in maintaining steady-state DNA supercoiling in Escherichia coli', *Journal of Biological Chemistry*, 275(11), pp. 8103–8113. doi: 10.1074/jbc.275.11.8103.
- Zgurskaya, H. I. and Nikaido, H. (2000) 'MicroReview Multidrug resistance mechanisms : drug efflux across two membranes', 37.
- Zhang, G. *et al.* (2018) 'European Journal of Medicinal Chemistry Cipro fl oxacin derivatives and their antibacterial activities', *European Journal of Medicinal Chemistry*, 146, pp. 599–612. doi: 10.1016/j.ejmech.2018.01.078.
- Zhang, L. *et al.* (2015) 'Design and biological evaluation of novel quinolone-based metronidazole derivatives as potent Cu²⁺ mediated DNA-targeting antibacterial agents', *Bioorganic and Medicinal Chemistry Letters*, 25(17), pp. 3699–3705. doi: 10.1016/j.bmcl.2015.06.041.
- Zhang, Y. *et al.* (2015) 'Emergence of a hypervirulent carbapenem-resistant Klebsiella pneumoniae isolate from clinical infections in China', *Journal of Infection*, 71(5), pp. 553–560. doi: 10.1016/j.jinf.2015.07.010.
- Zheng, J. X. *et al.* (2018) 'Biofilm formation in Klebsiella pneumoniae bacteremia strains was found to be associated with CC23 and the presence of wcaG', *Frontiers in Cellular and Infection Microbiology*, 8(FEB). doi: 10.3389/fcimb.2018.00021.
- Zhong, H. Q. *et al.* (2013) 'Influence of induced ciprofloxacin resistance on efflux pump activity of Klebsiella pneumoniae', *Journal of Zhejiang University: Science B*, 14(9), pp. 837–843. doi: 10.1631/jzus.B1200221.
- Zhou, G. *et al.* (2015) 'The three bacterial lines of defense against antimicrobial agents', *International Journal of Molecular Sciences*, 16(9), pp. 21711–21733. doi: 10.3390/ijms160921711.
- Zhou, X. Y. *et al.* (2016) 'In vitro characterization and inhibition of the interaction between ciprofloxacin and berberine against multidrug-resistant Klebsiella pneumoniae', *Journal of Antibiotics*, 69(10), pp. 741–746. doi: 10.1038/ja.2016.15.
- Zlatian, O. *et al.* (2018) 'Antimicrobial resistance in bacterial pathogens among hospitalised patients with severe invasive infections', *Experimental and Therapeutic Medicine*, 16(6), pp. 4499–4510. doi: 10.3892/etm.2018.6737.