

## DAFTAR PUSTAKA

- Andrzejewska, A., Lukomska, B. and Janowski, M. (2019) ‘Concise Review: Mesenchymal Stem Cells: From Roots to Boost’, *Stem Cells*. Wiley-Blackwell, pp. 855–864. Available at: <https://doi.org/10.1002/stem.3016>.
- Arfian, N., Ats-tsani, H.M., Sayekti, P.I., Lakabela, D.A., Amelia, Febriyanto, T. *et al.* (2018) ‘Prolonged Kidney Ischemia-Reperfusion Injury Associates with Inflammation, Vascular Remodelling, and Myofibroblast Formation’, *Journal of the Medical Sciences (Berkala Ilmu Kedokteran)*, 50(01), pp. 1–14. Available at: <https://doi.org/10.19106/jmedsci005001201801>.
- Bakinowska, E., Kiełbowski, K. and Pawlik, A. (2024) ‘The Role of MicroRNA in the Pathogenesis of Acute Kidney Injury’, *Cells*. Multidisciplinary Digital Publishing Institute (MDPI). Available at: <https://doi.org/10.3390/cells13181559>.
- Barakat, M., Gabr, M.M., Zhran, F., El-Adl, M., Hussein, A.M., Barakat, N. *et al.* (2018) ‘Upregulation of heme oxygenase 1 (HO-1) attenuates kidney damage, oxidative stress and inflammatory reaction during renal ischemia/reperfusion injury’, *General Physiology and Biophysics*, 37(2), pp. 193–204. Available at: [https://doi.org/10.4149/gpb\\_2017018](https://doi.org/10.4149/gpb_2017018).
- Barakat, M., Hussein, A.M., Salama, M.F., Awadalla, A., Barakat, N., Serria, M. *et al.* (2022) ‘Possible Underlying Mechanisms for the Renoprotective Effect of Retinoic Acid-Pretreated Wharton’s Jelly Mesenchymal Stem Cells against Renal Ischemia/Reperfusion Injury’, *Cells*, 11(13). Available at: <https://doi.org/10.3390/cells11131997>.
- Barmore, W., Azad, F., Stone, W.L. (2023) ‘Physiology, Urea Cycle’, StatPearls, StatPearls Publishing. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK513323>
- Bellomo, R., Kellum, J.A. and Ronco, C. (2012) ‘Acute kidney injury’, *The Lancet*. Elsevier B.V., pp. 756–766. Available at: [https://doi.org/10.1016/S0140-6736\(11\)61454-2](https://doi.org/10.1016/S0140-6736(11)61454-2).
- Bonventre, J. V. and Yang, L. (2011) ‘Cellular pathophysiology of ischemic acute kidney injury’, *Journal of Clinical Investigation*, pp. 4210–4221. Available at: <https://doi.org/10.1172/JCI45161>.
- Bruno, S., Grange, C., Deregibus, M.C., Calogero, R.A., Saviozzi, S., Collino, F. *et al.* (2009) ‘Mesenchymal stem cell-derived microvesicles protect against acute tubular injury’, *Journal of the American Society of Nephrology*, 20(5), pp. 1053–1067. Available at: <https://doi.org/10.1681/ASN.2008070798>.
- Cao, H. *et al.* (2025) ‘Emerging roles of exosomes in the diagnosis and treatment of kidney diseases’, *Frontiers in Pharmacology*. Frontiers Media SA. Available at: <https://doi.org/10.3389/fphar.2025.1525314>.
- Cao, Q. *et al.* (2022) ‘Mesenchymal Stem Cell-Derived Exosomes: Toward Cell-Free Therapeutic Strategies in Chronic Kidney Disease’, *Frontiers in Medicine*. Frontiers Media S.A. Available at: <https://doi.org/10.3389/fmed.2022.816656>.
- Caplan, A.I. (1991) ‘Mesenchymal stem cells’, *Journal of Orthopaedic Research*, 9(5), pp. 641–650. Available at: <https://doi.org/10.1002/jor.1100090504>.
- Chawla, L.S., Eggers, P.W., Star, R.A., Kimmel, P.L. (2014) ‘Acute Kidney Injury and Chronic Kidney Disease as Interconnected Syndromes’, *New England Journal of*

- Medicine, 371(1), pp. 58–66. Available at: <https://doi.org/10.1056/nejmra1214243>.
- Chen, F., Chen, N., Xia, C., Wang, H., Shao, L., Zhou, C. *et al.* (2023) ‘Mesenchymal Stem Cell Therapy in Kidney Diseases: Potential and Challenges’, Cell Transplantation. SAGE Publications Ltd. Available at: <https://doi.org/10.1177/09636897231164251>.
- Devarajan, P. (2006) ‘Update on mechanisms of ischemic acute kidney injury’, Journal of the American Society of Nephrology. American Society of Nephrology, pp. 1503–1520. Available at: <https://doi.org/10.1681/ASN.2006010017>.
- Edelstein, C.L., Akcay, A. and Nguyen, Q. (2009) ‘Mediators of inflammation in acute kidney injury’, Mediators of Inflammation. Available at: <https://doi.org/10.1155/2009/137072>.
- El-Reshaid, W. and Abdul-Fattah, H. (2014) ‘Sonographic assessment of renal size in healthy adults’, Medical Principles and Practice, 23(5), pp. 432–436. Available at: <https://doi.org/10.1159/000364876>.
- Eshghi, F., Tahmasebi, S., Alimohammadi, M., Soudi, S., Khaligh, S.G., Khosrojerdi, A. *et al.* (2022) ‘Study of immunomodulatory effects of mesenchymal stem cell-derived exosomes in a mouse model of LPS induced systemic inflammation’, Life Sciences, 310. Available at: <https://doi.org/10.1016/j.lfs.2022.120938>.
- Gatti, S., Bruno, S., Deregibus, M.C., Sordi, A., Cantaluppi, V., Tetta, C. *et al.* (2011) ‘Microvesicles derived from human adult mesenchymal stem cells protect against ischaemia-reperfusion-induced acute and chronic kidney injury’, Nephrology Dialysis Transplantation, 26(5), pp. 1474–1483. Available at: <https://doi.org/10.1093/ndt/gfr015>.
- Goyal, A. *et al.* (2023) Acute Kidney Injury, StatPearls Publishing.
- Haase, M., Bellomo, R., Devarajan, P., Schlattmann, P., Haase-Fielitz, A. *et al.* (2009) ‘ORIGINAL INVESTIGATIONS Pathogenesis and Treatment of Kidney Disease Accuracy of Neutrophil Gelatinase-Associated Lipocalin (NGAL) in Diagnosis and Prognosis in Acute Kidney Injury: A Systematic Review and Meta-analysis’, YAJKD, 54, pp. 1012–1024. Available at: <https://doi.org/10.1053/j.ajkd>.
- Hade, M.D., Suire, C.N. and Suo, Z. (2021) ‘Mesenchymal stem cell-derived exosomes: Applications in regenerative medicine’, Cells, 10(8). Available at: <https://doi.org/10.3390/cells10081959>.
- Hall, Jennifer. (2015) Guyton and Hall textbook of medical physiology. 13th ed. Elsevier.
- Han, H., Gao, Y., Chen, B., Xu, H., Shi, C., Wang, X. *et al.* (2024) ‘Nrf2 inhibits M1 macrophage polarization to ameliorate renal ischemia–reperfusion injury through antagonizing NF-κB signaling’, International Immunopharmacology, 143. Available at: <https://doi.org/10.1016/j.intimp.2024.113310>.
- Han, H.I., Skvarca, L.B., Espiritu, E.B., Davidson, A.J., Hukriede, N.A. (2019) ‘The role of macrophages during acute kidney injury: destruction and repair’, Pediatric Nephrology. Springer Verlag, pp. 561–569. Available at: <https://doi.org/10.1007/s00467-017-3883-1>.
- He, J., Chen, Y., Li, Y., Feng, Y. (2025) ‘Molecular mechanisms and therapeutic interventions in acute kidney injury: a literature review’, BMC Nephrology. BioMed Central Ltd. Available at: <https://doi.org/10.1186/s12882-025-04077-4>.
- Hoste, E.A.J., Bagshaw, S.M., Bellomo, R., Cely, C.M., Colman, R., Cruz, D.N. *et al.* (2015) ‘Epidemiology of acute kidney injury in critically ill patients: the

- multinational AKI-EPI study', *Intensive Care Medicine*, 41(8), pp. 1411–1423. Available at: <https://doi.org/10.1007/s00134-015-3934-7>.
- Hu, J., Huang, S., Liu, X., Zhang, Y., Wei, S., Hu, X. (2022) 'MiR-155: An Important Role in Inflammation Response', *Journal of Immunology Research*. Hindawi Limited. Available at: <https://doi.org/10.1155/2022/7437281>.
- Huang, J., Cao, H., Cui, B., Ma, X., Gao, L., Yu, C., Shen, F. *et al.* (2022) 'Mesenchymal Stem Cells-Derived Exosomes Ameliorate Ischemia/Reperfusion Induced Acute Kidney Injury in a Porcine Model', *Frontiers in Cell and Developmental Biology*, 10. Available at: <https://doi.org/10.3389/fcell.2022.899869>.
- Huen, S.C. and Cantley, L.G. (2017) 'Macrophages in Renal Injury and Repair', *Annual Review of Physiology*. Annual Reviews Inc., pp. 449–469. Available at: <https://doi.org/10.1146/annurev-physiol-022516-034219>.
- Humphreys, B.D., Valerius, M.T., Kobayashi, A., Mugford, J.W., Soeung, S., Duffield, J.S. *et al.* (2008) 'Intrinsic Epithelial Cells Repair the Kidney after Injury', *Cell Stem Cell*, 2(3), pp. 284–291. Available at: <https://doi.org/10.1016/j.stem.2008.01.014>.
- Jacob, J., Dannenhoffer, J., Rutter, A. (2020) 'Acute Kidney Injury', *Primary Care*, Elsevier, pp/ 571-584. Available at: <https://doi.org/10.1016/j.pop.2020.08.008>
- Jafarinaia, M., Alsahebfsoul, F., Salehi, H., Eskandari, N., Ganjalikhani-Hakemi, M. (2020) 'Mesenchymal Stem Cell-Derived Extracellular Vesicles: A Novel Cell-Free Therapy', *Immunological Investigations*. Taylor and Francis Ltd., pp. 758–780. Available at: <https://doi.org/10.1080/08820139.2020.1712416>.
- Jameson, J.L., Loscalzo, J. (2013) *Harrison's Nephrology and Acid-Base Disorders*. 2th ed. McGraw-Hill Education/Medical
- Jang, H.R. and Rabb, H. (2015) 'Immune cells in experimental acute kidney injury', *Nature Reviews Nephrology*. Nature Publishing Group, pp. 88–101. Available at: <https://doi.org/10.1038/nrneph.2014.180>.
- Jun, W., Benjanuwattra, J., Chattipakorn, S.C., Chattipakorn, N. (2020) 'Necroptosis in renal ischemia/reperfusion injury: A major mode of cell death?', *Archives of Biochemistry and Biophysics*. Academic Press Inc. Available at: <https://doi.org/10.1016/j.abb.2020.108433>.
- Kim, H.J., Kim, H., Lee, J.H., Hwangbo, C. (2023) 'Toll-like receptor 4 (TLR4): new insight immune and aging', *Immunity and Ageing*. BioMed Central Ltd. Available at: <https://doi.org/10.1186/s12979-023-00383-3>.
- Kou, M., Huang, L., Yang, J., Chiang, Z., Chen, S., Liu, J., Guo, L. *et al.* (2022) 'Mesenchymal stem cell-derived extracellular vesicles for immunomodulation and regeneration: a next generation therapeutic tool?', *Cell Death and Disease*. Springer Nature. Available at: <https://doi.org/10.1038/s41419-022-05034-x>.
- Lameire, N.H., Bagga, A., Cruz, D., Maeseneer, J.D., Endre, Z., Kellum, J.A. *et al.* (2013) 'Acute kidney injury: An increasing global concern', *The Lancet*. Elsevier B.V., pp. 170–179. Available at: [https://doi.org/10.1016/S0140-6736\(13\)60647-9](https://doi.org/10.1016/S0140-6736(13)60647-9).
- Lech, M. and Anders, H.J. (2013) 'Macrophages and fibrosis: How resident and infiltrating mononuclear phagocytes orchestrate all phases of tissue injury and repair', *Biochimica et Biophysica Acta - Molecular Basis of Disease*. Elsevier, pp. 989–997. Available at: <https://doi.org/10.1016/j.bbadis.2012.12.001>.



- Lee, P.W., Wu, B.S., Yang, C.Y., Lee, O.K.S. (2021) 'Molecular mechanisms of mesenchymal stem cell-based therapy in acute kidney injury', *International Journal of Molecular Sciences*. MDPI. Available at: <https://doi.org/10.3390/ijms222111406>.
- Li, C., Yu, Y., Zhu, S., Hu, Y., Ling, X., Xu, L. *et al.* (2024) 'The emerging role of regulated cell death in ischemia and reperfusion-induced acute kidney injury: current evidence and future perspectives', *Cell Death Discovery*. Springer Nature. Available at: <https://doi.org/10.1038/s41420-024-01979-4>.
- Li, J., Cao, F., Yin, H.L., Huang, Z.J., Lin, Z.T., Mao, N., Sun, B. *et al.* (2020) 'Ferroptosis: past, present and future', *Cell Death and Disease*. Springer Nature. Available at: <https://doi.org/10.1038/s41419-020-2298-2>.
- Li, L., Wang, R., Jia, Y., Rong, R., Xu, M., Zhu, T. (2019) 'Exosomes Derived From Mesenchymal Stem Cells Ameliorate Renal Ischemic-Reperfusion Injury Through Inhibiting Inflammation and Cell Apoptosis', *Frontiers in Medicine*, 6. Available at: <https://doi.org/10.3389/fmed.2019.00269>.
- Li, Z., Ludwig, N., Thomas, K., Mersmann, S., Lehmann, M., Vestweber, D. *et al.* (2022) 'The Pathogenesis of Ischemia-Reperfusion Induced Acute Kidney Injury Depends on Renal Neutrophil Recruitment Whereas Sepsis-Induced AKI Does Not', *Frontiers in Immunology*, 13. Available at: <https://doi.org/10.3389/fimmu.2022.843782>.
- Liau, L.L., Ruzymah, B.H.I., Ng, M.H., Law, J.X. (2020) 'Characteristics and clinical applications of Wharton's jelly-derived mesenchymal stromal cells', *Current Research in Translational Medicine*. Elsevier Masson SAS, pp. 5–16. Available at: <https://doi.org/10.1016/j.retram.2019.09.001>.
- Lima, C., Macedo, E. (2018) 'Urinary Biochemistry in the Diagnosis of Acute Kidney Injury'. *Disease Markers*. Available at: <https://doi.org/10.1155/2018/4907024>
- Liu, B., Ding, F., Hu, D., Zhou, Y., Long, C., Shen, L. *et al.* (2018) 'Human umbilical cord mesenchymal stem cell conditioned medium attenuates renal fibrosis by reducing inflammation and epithelial-to-mesenchymal transition via the TLR4/NF- $\kappa$ B signaling pathway in vivo and in vitro', *Stem Cell Research and Therapy*, 9(1). Available at: <https://doi.org/10.1186/s13287-017-0760-6>.
- Makris, K. and Spanou, L. (2016) *Acute Kidney Injury: Definition, Pathophysiology and Clinical Phenotypes*, *Acute Kidney Injury Clin Biochem Rev*.
- Malek, M. and Nematbakhsh, M. (2015) 'Renal ischemia/reperfusion injury; from pathophysiology to treatment.', *Journal of renal injury prevention*, 4(2), pp. 20–7. Available at: <https://doi.org/10.12861/jrip.2015.06>.
- Maleki, M., Ghanbarvand, F., Behvarz, M.R., Ejtemaei, M., Ghadirkhomi, E. (2014) 'Comparison of mesenchymal stem cell markers in multiple human adult stem cells', *International Journal of Stem Cells*, 7(2), pp. 118–126. Available at: <https://doi.org/10.15283/ijsc.2014.7.2.118>.
- McAninch, J.W.. and Lue, T.F.. (2020) *Smith & Tanagho's general urology*. McGraw-Hill.
- Meena, J., Mathew, G., Kumar, J., Chanchiani, R. (2023) 'Incidence of Acute Kidney Injury in Hospitalized Children: A Meta-analysis', *Pediatrics*. American Academy of Pediatrics. Available at: <https://doi.org/10.1542/peds.2022-058823>.



- Meena, J., Kumar, J., Kochariakota, J.P., Gupta, H., Mittal, P., Kumar, A. *et al.* (2024) 'Acute Kidney Injury in Neonates: A Meta-Analysis', *Pediatrics*. American Academy of Pediatrics. Available at: <https://doi.org/10.1542/peds.2023-065182>.
- Moore, K.L., Agur, A.M.R. and Dalley, A.F. (2019) *Moore's Essential Clinical Anatomy*, 6e. 6th ed. Lippincott Williams and Wilkins, a Wolters Kluwer business.
- Morigi, M., Rota, C. and Remuzzi, G. (2016) 'Mesenchymal Stem Cells in Kidney Repair', in M. Gneocchi (ed.) *Mesenchymal Stem Cells: Methods and Protocol*. 2nd ed, pp. 89–107. Available at: [https://doi.org/10.1007/978-1-4939-3584-0\\_5](https://doi.org/10.1007/978-1-4939-3584-0_5).
- Omar, R.E., Beroud, J., Stoltz, J.F., Menu, P., Velot, E., Decot, V. (2014) 'Umbilical cord mesenchymal stem cells: The new gold standard for mesenchymal stem cell-based therapies?', *Tissue Engineering - Part B: Reviews*. Mary Ann Liebert Inc., pp. 523–544. Available at: <https://doi.org/10.1089/ten.teb.2013.0664>.
- Pan, L., Liu, C., Liu, Q., Li, Y., Du, C. Kang, X. *et al.* (2021) 'Human Wharton's jelly-derived mesenchymal stem cells alleviate concanavalin A-induced fulminant hepatitis by repressing NF- $\kappa$ B signaling and glycolysis', *Stem Cell Research and Therapy*, 12(1). Available at: <https://doi.org/10.1186/s13287-021-02560-x>.
- Pereira, M., Rodrigues, N., Godinho, I., Gameiro, J., Neves, M., Gouveia, J. *et al.* (2016) 'Acute kidney injury in patients with severe sepsis or septic shock: a comparison between the "Risk, Injury, Failure, Loss of kidney function, End-stage kidney disease" (RIFLE), Acute Kidney Injury Network (AKIN) and Kidney Disease: Improving Global Outcomes (KDIGO) classifications', *Clinical Kidney Journal*, p. sfw107. Available at: <https://doi.org/10.1093/ckj/sfw107>.
- Puthumana, J., Thiessen-Philbrook, H., Xu, L., Coca, S., Gang, A., Himmelfarb, J. *et al.* (2021) 'Biomarkers of inflammation and repair in kidney disease progression', *Journal of Clinical Investigation*, 131(3). Available at: <https://doi.org/10.1172/JCI139927>.
- Radi, Z.A. (2018) 'Immunopathogenesis of Acute Kidney Injury', *Toxicologic Pathology*. SAGE Publications Inc., pp. 930–943. Available at: <https://doi.org/10.1177/0192623318799976>.
- Schwartz, I.F., Schwartz, D., Traskonov, M., Chemichovsky, T., Wollman, Y., Gnessin, E. *et al.* (2002) 'L-Arginine transport is augmented through up-regulation of tubular CAT-2 mRNA in ischemic acute renal failure in rats', *Kidney International*, 62(5), pp. 1700–1706. Available at: <https://doi.org/10.1046/j.1523-1755.2002.t01-1-00622.x>.
- Shokeir, A.A. *et al.* (2024) 'Human Wharton's jelly-derived mesenchymal stromal stem cells preconditioned with valproic acid promote cell migration and reduce renal inflammation in ischemia/reperfusion injury by activating the AKT/P13K and SDF1/CXCR4 pathways', *Archives of Biochemistry and Biophysics*, 755. Available at: <https://doi.org/10.1016/j.abb.2024.109985>
- Silver, S.A., Harel, Z., McArthur, E., Nash, D., Acedillo, R., Kitchiu, A. *et al.* (2018) 'Causes of death after a hospitalization with AKI', *Journal of the American Society of Nephrology*, 29(3), pp. 1001–1010. Available at: <https://doi.org/10.1681/asn.2017080882>.
- Singh, S., Anshita, D. and Ravichandiran, V. (2021) 'MCP-1: Function, regulation, and involvement in disease', *International Immunopharmacology*. Elsevier B.V. Available at: <https://doi.org/10.1016/j.intimp.2021.107598>.

- Skorecki, K., Cherlow, G., Marsden, P., Taal, M., Yu, A. (2016) Brenner & Rector's the kidney. Volume 1. Elsevier, Elsevier.
- Sung, F.L., Zhu, T., Au-Yeong, K., Slow, Y. (2002) 'Enhanced MCP-1 expression during ischemia/reperfusion injury is mediated by oxidative stress and NF- $\kappa$ B', *Kidney International*, 62(4), pp. 1160–1170. Available at: <https://doi.org/10.1111/j.1523-1755.2002.kid577.x>.
- Susantitaphong, P., Cruz, D., Cerda, J., Abulfaraj, M., Alqahtani, F., Koulouridis, I. et al. (2013) 'World incidence of AKI: A meta-analysis', *Clinical Journal of the American Society of Nephrology*, 8(9), pp. 1482–1493. Available at: <https://doi.org/10.2215/CJN.00710113>.
- Tamarro, A., Kers, J., Scantlebery, A., Florquin, S. (2020) 'Metabolic Flexibility and Innate Immunity in Renal Ischemia Reperfusion Injury: The Fine Balance Between Adaptive Repair and Tissue Degeneration', *Frontiers in immunology*. NLM (Medline), p. 1346. Available at: <https://doi.org/10.3389/fimmu.2020.01346>.
- Tanaka, S. (2024) 'Targeting inflammation in perivascular cells and neuroimmune interactions for treating kidney disease', *Clinical and Experimental Nephrology*. Springer, pp. 505–512. Available at: <https://doi.org/10.1007/s10157-024-02494-7>.
- Tortora, G.J. and Derrickson, Bryan. (2021) *Principles of anatomy & physiology*. 16th ed. Wiley.
- Uccelli, A., Moretta, L. and Pistoia, V. (2008) 'Mesenchymal stem cells in health and disease', *Nature Reviews Immunology*, pp. 726–736. Available at: <https://doi.org/10.1038/nri2395>.
- Vallés, P.G., Lorenzo, A.F.G., Garcia, R.D., Cacciamani, V., Benardon, M.E., Constantino, V.V. (2023) 'Toll-like Receptor 4 in Acute Kidney Injury', *International Journal of Molecular Sciences*. MDPI. Available at: <https://doi.org/10.3390/ijms24021415>.
- Wang, S., Zhang, K., Huang, Q., Meng, F., Deng, S. (2024) 'TLR4 signalling in ischemia/reperfusion injury: a promising target for linking inflammation, oxidative stress and programmed cell death to improve organ transplantation outcomes', *Frontiers in Immunology*. Frontiers Media SA. Available at: <https://doi.org/10.3389/fimmu.2024.1447060>.
- Wang, W. *et al.* (2025) 'Protective role of exosomes in renal ischemia-reperfusion injury: a systematic review and meta-analysis', *Frontiers in Pharmacology*. Frontiers Media SA. Available at: <https://doi.org/10.3389/fphar.2025.1653907>.
- Westenfelder, C. and Togel, F.E. (2011) 'Protective actions of administered mesenchymal stem cells in acute kidney injury: Relevance to clinical trials', *Kidney International Supplements*. Nature Publishing Group, pp. 103–106. Available at: <https://doi.org/10.1038/kisup.2011.24>.
- Wu, H., Chen, G., Wyburn, K., Yin, J., Bertolino, P., Eris, J. *et al.* (2007) 'TLR4 activation mediates kidney ischemia/reperfusion injury', *Journal of Clinical Investigation*, 117(10), pp. 2847–2859. Available at: <https://doi.org/10.1172/JCI31008>.
- Younes-Ibrahim, M.S., Younes-Ibrahim, M. (2022) 'Biomarkers and kidney disease: a brief narrative review', *Journal of Laboratory and Precision Medicine*, AME Publishing Company, 7. Available at: <https://dx.doi.org/10.21037/jlpm-22-1>



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**EFEK PEMBERIAN EKSOSOM HUMAN WHARTON JELLY-DERIVED MESENCHYMAL STEM CELL (hWJMSC) TERHADAP PROSES INFLAMASI PADA MODEL CEDERA ISKEMIA/REPERFUSI GINJAL: Kajian terhadap Ekspresi mRNA Tlr4, Ccl2, Cd68, dan Nos2**

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- Zhao, X., Li, Y., Wu, S., Wang, Y., Liu, B., Zhou, H., Li, F. (2023) 'Role of extracellular vesicles in pathogenesis and therapy of renal ischemia-reperfusion injury', *Biomedicine and Pharmacotherapy*. Elsevier Masson s.r.l. Available at: <https://doi.org/10.1016/j.biopha.2023.115229>.
- Zilberman-Itskovich, S. *et al.* (2019) 'Human mesenchymal stromal cells ameliorate complement induced inflammatory cascade and improve renal functions in a rat model of ischemiareperfusion induced acute kidney injury', *PLoS ONE*, 14(9). Available at: <https://doi.org/10.1371/journal.pone.0222354>.
- Zuk, A. and Bonventre, J. V. (2016) 'Acute kidney injury', *Annual Review of Medicine*, 67, pp. 293–307. Available at: <https://doi.org/10.1146/annurev-med-050214-013407>.