

## DAFTAR PUSTAKA

- Aghajani, N.A., Lerman, L.O., dan Eirin, A., 2017. Mesenchymal stem cell-derived extracellular vesicles for kidney repair: current status and looming challenges. *Stem Cell Research and Therapy* 8, 273.
- Agrawal, V., Prasad, N., Jain, M., Pandey, R., 2013. Reduced podocin expression in minimal change disease and focal segmental glomerulosclerosis is related to the level of proteinuria. *Clinical and Experimental Nephrology* 17(6):811-8.
- Appel, G.B., & D'agati, V.D., 2019. Primary and secondary (nongenetic) causes of focal and segmental glomerulosclerosis. *Comprehensive Clinical Nephrology*. 6<sup>th</sup> ed. Philadelphia, PA: Elsevier:Chap 18.
- Asgarpour, K., Shojaei, Z., Amiri, F., Ai, J., Mahjoubin-Tehran, M., *et al.*, 2020. Exosomal microRNAs derived from mesenchymal stem cells: cell-to-cell messages. *Cell Communication and Signalling* 18(1):149.
- Bao Y.W., Yuan Y., Chen, J.H., & Lin W.Q., 2018. Kidney disease models: tools to identify mechanisms and potential therapeutic targets. *Zoological Research*. 39(2):72–86.
- Barcia, R.N., Santos, J.M., Filipe, M., Teixeira, M., Martins, J.P., Almeida, J., 2015. What Makes Umbilical Cord Tissue-Derived Mesenchymal Stromal Cells Superior Immunomodulators When Compared to Bone Marrow Derived Mesenchymal Stromal Cells? *Stem Cells International*. 583984.
- Barrett, K. E., Barman, S. M., Boitano, S., & Brooks, H. L. 2012. Ganong Buku Ajar Fisiologi Kedokteran. In *Memórias do Instituto Oswaldo Cruz* (Vol. 90, Issue 2).
- Bello, A.K., Hemmelgarn, B., Lloyd, A., 2011. Associations among estimated glomerular filtration rate, proteinuria, and adverse cardiovascular outcomes. *Clinical Journal of the American Society of Nephrology* 6(6):1418–1426.
- Brianna., Ling, A.P.K., Wong, Y.P., 2022. Applying stem cell therapy in intractable disease: a narrative review of decades of progress and challenges. *Stem Cell Investigation*. AME Publishing Company.
- Brown, S.A., 2013. Renal pathophysiology: Lessons learned from the canine remnant kidney model. *Journal of Veterinary Emergency and Critical Care*. 23(2):115–21.
- Cahyawati, P.N., Ngatidjan, N., Sari, D.C.R., Romi, M.M., Arfian, N., 2017. Simvastatin Attenuates Renal Failure in Mice With a 5/6 Subtotal

Nephrectomy. *International Journal of Pharmacy and Pharmaceutical Science* 9(5):12-17.

Cahyawati, P.N & Bagus, K.S., 2021. Subtotal Nephrectomy as a Model of Chronic Kidney Disease: A Systematic Review. *Indian Journal of Public Health Research & Development* Vol. 12, No. 3.

Cao, Q., Huang, C., Chen, X.M., Pollock, C.A., 2022. Mesenchymal Stem Cell-Derived Exosomes: Toward Cell-Free Therapeutic Strategies in Chronic Kidney Disease. *Frontiers in Medicine* 9:816656.

Chagnac, A., Zingerman, B., Rozen-Zvi, B., Herman-Edelstein, M., 2019. Consequences of Glomerular Hyperfiltration: The Role of Physical Forces in the Pathogenesis of Chronic Kidney Disease in Diabetes and Obesity. *Nephron* 143(1):38-42

Chapman, C.L., Johnson, B. D., Parker, M. D., Hostler, D., Pryor, R. R., & Schlader, Z., 2021. Kidney physiology and pathophysiology during heat stress and the modification by exercise, dehydration, heat acclimation and aging. *Temperature* vol. 8, no. 2, pp. 108–159.

Chen, T.K., Knicely, D.H., Grams, M.E., 2019. Chronic Kidney Disease Diagnosis and Management: A Review. *The Journal of the American Medical Association* 322(13):1294-1304.

D'Amico, G., & Bazzi, C., 2003. Pathophysiology of proteinuria. *Kidney International* 63(3):809-25.

Daehn, I.S., & Duffield, J.S., 2021 The glomerular filtration barrier: a structural target for novel kidney therapies. *Nature Review Drug Discovery* 20, 770–788.

Dai, H., Liu, Q. & Liu, B., 2017. Research Progress on Mechanism of Podocyte Depletion in Diabetic Nephropathy. *Journal of Diabetes Research* pp.1–10.

Darouich, S., Goucha, R., Jaafoura, M.H., Zekri, S., Ben, M.H, Kheder, A., 2011. Clinicopathological characteristics of obesity-associated focal segmental glomerulosclerosis. *Ultrastructural Pathology*. 35 (4): 176-182.

Dendooven, A., van Oostrom O., van der Giezen D.M., Leeuwis J.W., Snijckers C., Joles J.A., Robertson E.J., *et al.*, 2011. Loss of endogenous bone morphogenetic protein-6 (BMP-6) aggravates renal fibrosis. *The American Journal of Pathology* 178:1069–1079.

Didion, S.P., 2017. A novel genetic model to explore the Brenner hypothesis: Linking nephron endowment and number with hypertension. *Medical Hypotheses* 106; 6-9.

- Dimarino, A.M., Caplan, A.I., Bonfield, T.L., 2013. Mesenchymal stem cells in tissue repair. *Frontiers of Immunology* 4:201.
- Douvris, A., Burger, D., Rodriguez, R.A., Clark, E.G., Vinas, J., Lalu, M.M., *et al.*, 2021. MicroRNA in Human Acute Kidney Injury: A Systematic Review Protocol. *The Canadian Journal of Kidney Health and Disease* 8:20543581211009999.
- Duan, Y., Luo, Q., Wang, Y., Ma, Y., Chen, F., Zhu, X., *et al.*, 2020. Adipose mesenchymal stem cell-derived extracellular vesicles containing microRNA-26a-5p target TLR4 and protect against diabetic nephropathy. *Journal of Biological Chemistry*. 295(37):12868–84.
- Dudoignon, E., Depret, F., Legrand, M., 2019. Is the Renin-Angiotensin-Aldosterone System Good for the Kidney in Acute Settings? *Nephron* 143(3):179-183.
- Ebrahim N., Ahmed I. A., Hussien N. I., 2018. Mesenchymal stem cell-derived exosomes ameliorated diabetic nephropathy by autophagy induction through the mTOR signaling pathway. *Cell* 7(12):p. 226.
- Feng D., 2020. Phosphorylation of key podocyte proteins and the association with proteinuric kidney disease. *The American Journal of Physiology-Renal Physiology* 319(2): F284-F291.
- Gajjala, P.R., Sanati, M., Jankowski, J., 2015. Cellular and Molecular Mechanisms of Chronic Kidney Disease with Diabetes Mellitus and Cardiovascular Diseases as Its Comorbidities. *Frontiers of Immunology* 6:340.
- Gava, A.L., Freitas, F.P.S., Balarini, C.M., Vasquez, E.C., Meyrelles, S.S., 2012. Effects of 5/6 nephrectomy on renal function and blood pressure in mice. *International Journal of Physiology, Pathophysiology and Pharmacology* 4(3):167–73.
- Gbadegesin, R., Lavin, P., Foreman, J., Winn, M. 2010. Pathogenesis and therapy of focal segmental glomerulosclerosis: An update. *Pediatric nephrology* 26. 1001-15. 10.1007
- Gebert, L.F., & MacRae, I.J., 2019. Regulation of microRNA function in animals. *Nature Reviews Molecular Cell Biology* 20(1):21–37.
- Gowda, S., Desai, P.B., Kulkarni, S.S., Hull, V.V., Math, A.A., Vernekar, S.N., 2010. Markers of renal function tests. *The American Journal of The Medical Sciences* 2(4):170-3.
- Grange, C., & Benedetta, B., 2022. Extracellular vesicles in kidney disease. *Nature Reviews Nephrology* volume 18 499-513.

- Griffin, M.D., Ritter, T., Mahon, B.P., 2010. Immunological aspects of allogeneic mesenchymal stem cell therapies. *Human Gene Therapy* 21:1641–55.
- Gurung, S., Dany, P., Loukia, T., & Julien, B., 2021. The exosome journey: from biogenesis to uptake and intracellular signalling. *Cell Communication and Signalling* 19:47.
- Gyuraszova, M., Gurecka, R., Babickova, J., Tothova, L., 2020. Oxidative Stress in the Pathophysiology of Kidney Disease: Implications for Noninvasive Monitoring and Identification of Biomarkers. *Oxidative Medicine and Cellular Longevity* 5478708.
- Hall, J. E., & Hall, M. E. 2020. *Guyton and Hall Textbook of Medical Physiology jongE-Book*. <https://books.google.co.id/books?id=H1rrDwAAQBAJ>.
- Harahap, D.H, & Gampo, A.I., 2022. Human umbilical cords mesenchymal stem cells for kidney diseases. *Bali Medical Journals* Vol.11 Number 1:155-159.
- Hmadcha, A., Alejandro, M., Benoit, R., Bernat, S., & Vivia, C., 2020. Therapeutic potential of Mesenchymal stem cell for cancer therapy. *Frontiers of Bioengineering and Biotechnology* Vol.8.
- Hosoyamada, M., Yan, K., Nishibori, Y., Takiue, Y., Kudo, A., Kawakami, H., *et al.*, 2005. Nephric and podocin expression around the onset of puromycin aminonucleoside nephrosis. *Journal Pharmacological Science* 97(2):234-41.
- Huntzinger, E., & Izaurralde, E., 2011. Gene silencing by microRNAs: contributions of translational repression and mRNA decay. *Nature Review Genetics*. 12(2):99–110.
- Ismail, B., deKemp, R.A., Hadizad, T., 2016. Decreased renal AT<sub>1</sub> receptor binding in rats after subtotal nephrectomy: PET study with [<sup>18</sup>F]FPyKYNE-losartan. *EJNMMI Res* 6, 55.
- Jalanko, H., 2009. Congenital nephrotic syndrome. *Pediatric Nephrology* 24(11):2121-8.
- Ji, C., Zhang, J., Zhu, Y., Shi, H., Yin, S., Sun, F., *et al.*, 2020. Exosomes derived from hucMSC attenuate renal fibrosis through CK1delta/beta-TRCP-mediated YAP degradation. *Cell death and Disease* 11:327.
- Jiang, Y.M., Liu, X., Niu, J.Y., Yin, B., Hu, S.C., Guo, Y., *et al.*, Exosomes secreted by human umbilical cord-derived stem cells could prevent kidney complications from type I diabetes in rats. *Stem Cell Research and Therapy*, 7 (2016), p. 24
- Jin J., Shi Y., Gong J., 2019. Exosome secreted from adipose-derived stem cells attenuates diabetic nephropathy by promoting autophagy flux and inhibiting apoptosis in podocyte. *Stem Cell Research & Therapy* 10(1):p. 95.

- Kalluri, R., & Le, B.V.S., 2020. The biology, function, and biomedical applications of exosomes. *Science* 367,6977.
- KDIGO. 2013. Chapter 1: Definition and classification of CKD. *Kidney International Supplements* 3(1):19-62.
- Khalilpourfarshbafi, M., Hajiaghaalipour, F., Selvarajan, K.K., Adam, A., 2017. Mesenchymal Stem Cell-Based Therapies against Podocytes Damage in Diabetic Nephropathy. *Tissue Engineering and Regenerative Medicine* 201-210. Korean Tissue Engineering and Regenerative Medicine Society.
- Kim, B.S., Goligorsky MS., 2003. Role of VEGF in kidney development, microvascular maintenance and pathophysiology of renal disease. *Korean Journal of Internal Medicine* 18(2):65-75.
- Kopp, J.B., Anders, H.J., Susztak, K., 2020. Podocytopathies. *Nature Reviews Disease Primers* 6, 68.
- Kovesdy, C. P., 2022. Epidemiology of chronic kidney disease: an update. *Kidney International Supplements* 12(1):7-11.
- Kriz, W., 2003. The pathogenesis of “classic” focal segmental glomerulosclerosis—lessons from rat models. *The Nephrology Dialysis Transplantation* 18(Suppl 6):vi39–vi44.
- Kwon, S.H., 2019. Extracellular vesicles in renal physiology and clinical applications for renal disease. *The Korean Journal of Internal Medicine* 34:470–479.
- Lee, S.A & Tae, H.Y., 2022. Therapeutic application of extracellular vesicles for various kidney diseases: a brief review. *Biochemistry and Molecular Biology Report* 55(1): 3-10
- Levy, O., Kuai, R., Siren, E.M.J., Bhare, D., Milton, Y., Nissar, N., *et al.*, 2020. Shattering barriers toward clinically meaningful MSC therapies. *Science Advance* 6:eaba6884.
- Liang, M., Zhang, D., Zheng, D., He, W., and Jin, J., 2022. Exosomes from miR- 374a-5p-modified mesenchymal stem cells inhibit the progression of renal fibrosis by regulating MAPK6/MK5/YAP axis. *Bioengineered* 13 (2), 4517–4527.
- Li, W., Wang, L., Chu, X., 2017. Icariin combined with human umbilical cord mesenchymal stem cells significantly improve the impaired kidney function in chronic renal failure. *Molecular and Cellular Biochemistry* 428, 203–212.
- Li, X., Bai, J., Ji, X., Li, R, Xuan, Y., Wang, Y., 2014. Comprehensive characterization of four different populations of human mesenchymal stem cells as regards their immune properties, proliferation and differentiation. *International Journal of Molecular Medicine* 34:695–704.

- Li, X., Liu, L., Yang, J., Yu, Y., Chai, J., Wang, L., *et al.*, 2016. Exosome Derived From Human Umbilical Cord Mesenchymal Stem Cell Mediates MiR-181c Attenuating Burn- induced Excessive Inflammation. *eBioMedicine* 8:72–82.
- Li, H., Rong P., Ma X., 2019. Human umbilical cord mesenchymal stem cell paracrine alleviates renal fibrosis in diabetic nephropathy by reducing myofibroblast transdifferentiation and cell proliferation and upregulating MMPs in mesangial cells. *Journal Diabetes Research* 3847171:14.
- Lim, B. J., Yang, H. C., Fogo, A. B., 2014. Animal models of regression/progression of kidney disease. *Drug Discovery Today: Disease Models* 11: 45-51.
- Liu, B., Hu, D., Zhou, Y., Yu, Y., Shen, L., Long, C., *et al.*, 2020. Exosomes released by human umbilical cord mesenchymal stem cells protect against renal interstitial fibrosis through ROS-mediated P38MAPK/ERK signaling pathway. *American Journal of Translational Research* 12(9):4998-5014.
- Lu, C.C., Wang, G.H., Lu, J., Chen, P.P., Zhang, Y., Hu, Z.B., *et al.*, 2019. Role of Podocyte Injury in Glomerulosclerosis. *Advances in Experimental Medicine and Biology* 1165:195-232.
- Ma, H., Sun, L., Zhang, X., Wu, Y., Xu, Y., 2013. Human Umbilical Mesenchymal Stem Cells Attenuate the Progression of Focal Segmental Glomerulosclerosis. *The American Journal of the Medical Sciences* 346(6):486–93.
- Mastrolia, I., Foppiani, E.M., Murgia, A., Candini, O., Samarelli, A.V., Grisendi, G., *et al.*, 2019. Challenges in Clinical Development of Mesenchymal Stromal/Stem Cells: Concise Review. *Stem Cells Translational Medicine*. 8:1135–1148.
- Maqsood, M., 2020. Adult mesenchymal stem cells and their exosomes: sources, characteristics, and application in regenerative medicine. *Life Science* 256, 118002.
- Mejia, J.R., Fernandez, C.J.E., Dolores, M.G., Becerra, C.N., Goicochea, L.S., Herrera, A.P., *et al.*, 2021. Diagnostic accuracy of urine dipstick testing for albumin-to-creatinine ratio and albuminuria: A systematic review and meta-analysis. *Heliyon*. 7(11):e08253.
- Mohammadipoor, A., Antebi, B., Batchinsky, A.I., 2018. Therapeutic potential of products derived from mesenchymal stem/stromal cells in pulmonary disease. *Respiratory Research* 19, 218.
- Mohany, M., Alanazi, A.Z., Alqahtani, F., Belali, O.M., Ahmed, M.M., Al-Rejaie, S.S., 2020. LCZ69 mitigates diabetic-induced nephropathy through inhibiting oxidative stress, NF- $\kappa$ B mediated inflammation and glomerulosclerosis in rats. *PeerJ*. 8:e9196.



- Mollet, G., Ratelade, J., Boyer, O., Muda, A.O., Morisset, L., Lavin, T.A., *et al.*, 2009. Podocin inactivation in mature kidneys causes focal segmental glomerulosclerosis and nephrotic syndrome. *Journal of the American Society of Nephrology* 20(10):2181-9.
- Musiał, W.A., Kot, M., Majka, M., 2019. The Pros and Cons of Mesenchymal Stem Cell-Based Therapies. *Cell Transplantation* 28:801–812.
- Nagamura, I.T., & He, H., 2014. Umbilical cord-derived mesenchymal stem cells: Their advantages and potential clinical utility. *World Journal of Stem Cells* 6(2):195-202.
- Natsir, T.A., 2014. Pengembangan Metode Analisis Kreatinin secara Spektrofotometri dengan Menggunakan Spektrofotometer UV-Visible. *Berkala Ilmiah MIPA*. vol. 24, no. 1, 2014.
- Nicola, L.D., & Roberto, M., 2016. Worldwide growing epidemic of CKD: fact or fiction?. *Kidney International* 90, 482–484.
- Nogueira, A., Pires, M.J., Oliveira, P.A., 2017. Pathophysiological Mechanisms of Renal Fibrosis: A Review of Animal Models and Therapeutic Strategies. *In Vivo* 31(1):1-22.
- O’Sullivan, J., Finnie, S.L., Teenan, O., Cairns, C., Boyd, A., Bailey, M.A., *et al.*, 2019. Refining the Mouse Subtotal Nephrectomy in Male 129S2/SV Mice for Consistent Modeling of Progressive Kidney Disease With Renal Inflammation and Cardiac Dysfunction. *Frontiers in Physiology* 10:1–17.
- Park, S. J., Kim, J. M., Kim, J., Hur, J., Park, S., Kim, K., *et al.*, 2018. Molecular mechanisms of biogenesis of apoptotic exosome-like vesicles and their roles as damage-associated molecular patterns. *Proceedings of the National Academy of Sciences* 115, E11721–E11730.
- Pauff, S. M., & Miller, S. C., 2012. Podocyte Biology for the Bedside. *Bone* 78(2), 711–716.
- Pegtel, D.M., Cosmopoulos, K., Thorley-Lawson, D.A., van Eijndhoven, M.A., Hopmans, E.S., Lindenberg, J.L., 2010. Functional delivery of viral miRNAs via exosomes. *Proceedings of the National Academy of Sciences* 6328-6333
- Qian, Y., Feldman, E., Pennathur, S., Kretzler, M., Brosius, F.C., 2008. From fibrosis to sclerosis: mechanisms of glomerulosclerosis in diabetic nephropathy. *Diabetes* 1439-45.
- Ranghino, A., Bruno, S., Bussolati, B., 2017. The effects of glomerular and tubular renal progenitors and derived extracellular vesicles on recovery from acute kidney injury. *Stem Cell Research and Therapy* 8:24.

- Reidy, K., & Kaskel, F.J., 2007. Pathophysiology of focal segmental glomerulosclerosis. *Pediatric Nephrology* 22(3):350-4.
- Reiser, J., & Altintas, M.M., 2016. Podocytes. 5:F1000 *Faculty Rev*-114.
- Ren, J., & Dai, C., 2020. Pathophysiology of Chronic Kidney Disease. In: Yang, J., He, W., Chronic Kidney Disease. *Springer*, Singapore.
- Riset Kesehatan Dasar (Riskesdas) (2018). Badan Penelitian dan Pengembangan Kesehatan Kementerian RI tahun 2018. [http://www.Rodri.depkes.go.id/resources/download/infoterkini/materi\\_rakor\\_pop\\_2018/Hasil%20Riskesdas%202018.pdf](http://www.Rodri.depkes.go.id/resources/download/infoterkini/materi_rakor_pop_2018/Hasil%20Riskesdas%202018.pdf) – Diakses September 2023.
- Robson, J., Scott, V., David, L., and Mitchell, G.A.G., 2020. Renal system. *Encyclopedia Britannica*.
- Rodriguez, F.D.E., Fernández, G.L.E., Samia, M.J.A., Barrera, B.S.A., Caplan, A.I., Barrera, S.H.A., 2021. Mesenchymal Stem Cells Current Clinical Applications: A Systematic Review. *Archives of Medical Research* 52:93–101.
- Saleem, M.A., O'Hare, M.J., Reiser, J., Coward, R.J., Inward, C.D., Farren, T., *et al.*, 2002. A conditionally immortalized human podocyte cell line demonstrating nephrin and podocin expression. *Journal of the American Society of Nephrology* (3):630-638.
- Sari, D.C.R., Putri, M.W., Leksono, T.P., Chairunnisa, N., Reynaldi, G.N., Simanjuntak B.C., *et al.*, 2020. Calcitriol Ameliorates Kidney Injury Through Reducing Podocytopathy, Tubular Injury, Inflammation and Fibrosis in 5/6 Subtotal Nephrectomy Model in Rats. *Kobe Journal of Medical Sciences* 65(5):E153-E163.
- Shahbaz, H., & Gupta, M., 2023. Creatinine Clearance. [Updated 2023 May 20]. In: StatPearls [Internet]. Treasure Island (FL): *StatPearls Publishing*
- Sheerwood L., 2016. Fisiologi Manusia dari Sel ke Sistem. Ed 8. Jakarta: EGC.
- Shibata, S., Nagase, M., Yoshida, S., Kawachi, H., Fujita, T., 2007. Podocyte as the target for aldosterone: Roles of oxidative stress and Sgk1. *Hypertension* 49, 355–364.
- Simerville, J. A., Maxted, W. C. & Pahira, J. J., 2005. Urinalysis: a comprehensive review. *American Family Physician* 71, 1153–1162.
- Tan, R.Z., Zhong, X., Li, J.C., Zhang, Y.W., Yan, Y., Liao, Y., *et al.*, 2019. An optimized 5/6 nephrectomy mouse model based on unilateral kidney ligation and its application in renal fibrosis research. *Renal Failure* 41(1):555–66.



- Thomas, C., & Thomas, L., 2009. Renal failure--measuring the glomerular filtration rate. *Deutsches Ärzteblatt International*. (51-52):849-54.
- Thongboonkerd,V., 2020. Roles for Exosome in Various Kidney Diseases and Disorders. *Froniers in Pharmacology* 10:1655.
- Toblli, J.E., Bevione, P., Gennaro, F., Madalena, L., Cao, G., Angerosa, M., 2012. Understanding the mechanisms of proteinuria: therapeutic implications. *International Journal of Nephrology* 546039.
- Trohatou, O., & Roubelakis M.G., 2017. Mesenchymal Stem/Stromal Cells in Regenerative Medicine: Past, Present, and Future. *Cell Reprogram* 19(4):217-224.
- Tynkevich, E., Flamant, M., Haymann, J.P., Metzger, M., Thervet, E., *et al.*, 2014. NephroTest Study Group. Decrease in urinary creatinine excretion in early stage chronic kidney disease. *PLoS One* 9(11):e111949.
- Vaidya, S.R., & Aeddula, N.R., 2023. Chronic Renal Failure. [Updated 2022 Oct 24]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing
- Wan, Y., Yihang, Y., Chengjun, Y., Jin, L., Sheng, W., Lianju, S., *et al.*, 2023. Human umbilical cord mesenchymal stem cell exosomes alleviate acute kidney injury by inhibiting pyroptosis in rats and NRK-52E cells. *Renal Failure* 45, 1, 2221138
- Wang X., & Garrett M.R., 2017. Nephron number, hypertension, and CKD: physiological and genetic insight from humans and animal models. *Physiology of Genomics* 49(3):180-192.
- Watson, N., Divers, R., Kedar, R., Mehindru, A., Mehindru, A., Borlongan, M.C., *et al.*, 2015. Discarded Wharton jelly of the human umbilical cord: a viable source for mesenchymal stromal cells. *Cytotherapy* 17 18–24. 10.1016/j.jcyt.2014.08.009.
- Wen, S.W., 2019. Breast cancer-derived exosomes reflect the cell-of-origin phenotype. *Proteomics* 19, e1800180.
- Wong, C.Y., 2021. Current advances of stem cell-based therapy for kidney diseases. *World Journal Stem Cells* 13(7):914-933.
- Wu, M.T., Lam, K.K., Lee, W.C., Hsu, K.T., Wu, C.H., Cheng, B.C., *et al.*, 2012. Albuminuria, proteinuria, and urinary albumin to protein ratio in chronic kidney disease. *Journal of Clinical Laboratory Analysis* 26(2):82-92
- Xiang, E., Han, B., Zhang, Q., Rao, W., Wang, Z., Chang, C., Zhang Y, *et al.*, 2020. Human umbilical cord-derived mesenchymal stem cells prevent the

progression of early diabetic nephropathy through inhibiting inflammation and fibrosis. *Stem Cell Research and Therapy* 11(1):336.

- Xu, H.K., Chen, L.J., Zhou, S.N., Li, Y.F., Xiang, C., 2020. Multifunctional role of microRNAs in mesenchymal stem cell-derived exosomes in treatment of diseases. *World Journal of Stem Cells* 12(11):1276-1294.
- Xu, M., Feng, T., Liu, B., Qiu, F., Xu, Y., Zhao, Y., *et al.*, 2021. Engineered exosomes: desirable target-tracking characteristics for cerebrovascular and neurodegenerative disease therapies. *Theranostics* 11(18):8926-8944.
- Yamaguchi, J., Tanaka, T., & Nangaku, M., 2015. Recent advances in understanding of chronic kidney disease [version 1; referees: 3 approved] *F1000Research* 4(F1000 Faculty Rev):1212.
- Yu, S.M., Nissaisorakarn, P., Husain, I., Jim, B., 2018. Proteinuric Kidney Diseases: A Podocyte's Slit Diaphragm and Cytoskeleton Approach. *Frontiers in Medicine* ;5:221.
- Yu, Y., Meiling, C., Qitong, G., Lianju, S., Xing, L., Jianbo, P., *et al.*, 2023. Human umbilical cord mesenchymal stem cell exosome-derived miR-874-3p targeting RIPK1/PGAM5 attenuates kidney tubular epithelial cell damage. *Cellular & Molecular Biology Letters* 28:12.
- Zhang, H., Wu, J., Fan, Q., Zhou, J., Wu, J., *et al.*, 2019. Exosome-mediated targeted delivery of mir-210 for angiogenic therapy after cerebral ischemia in mice. *Journal of Nanobiotechnology* 17: 29.
- Zhang, R., Zhu, Y., Li, Y., 2020. Human umbilical cord mesenchymal stem cell exosomes alleviate sepsis-associated acute kidney injury via regulating microRNA-146b expression. *Biotechnology Letters* 42, 669–679.
- Zhang, Y., Le, X., Zheng, S., Zhang, K., He, J., Liu, M., *et al.*, 2022. MicroRNA-146a-5p-modified human umbilical cord mesenchymal stem cells enhance protection against diabetic nephropathy in rats through facilitating M2 macrophage polarization. *Stem Cell Research and Therapy* 13(1):171.
- Zhang, Y., Liu, Y., Liu, H., Tang, W.H., 2019. Exosomes: biogenesis, biologic function and clinical potential. *Cell & Biosciences* 9:19.
- Zheng, D., Huo, M., Li, B., Wang, W., Piao, H., Wang, Y., *et al.*, 2021. The Role of Exosomes and Exosomal MicroRNA in Cardiovascular Disease. *Frontiers in Cell and Developmental Biology* 8:616161.
- Zhou, Y., Xu, H., Xu, W. *et al.*, 2013. Exosomes released by human umbilical cord mesenchymal stem cells protect against cisplatin-induced renal oxidative

stress and apoptosis *in vivo* and *in vitro*. *Stem Cell Research and Therapy* 4, 34.

Zoja, C., Cristina, Z., Ariela, B., 2015. Key pathways in renal disease progression of experimental diabetes, *Nephrology Dialysis Transplantation*, Volume 30, Issue suppl\_4