

## DAFTAR PUSTAKA

- Abdel, L.M., Helmy, M.W. and El-abhar, H.S. 2019. Pharmacological reports co-targeting of endothelin- A and vitamin D receptors : a novel strategy to ameliorate cisplatin-induced nephrotoxicity. *Pharmacological Reports*. 71(5):917–925.
- Ali, N. 2020. Role of vitamin D in preventing of COVID-19 infection, progression and severity. *Journal of Infection and Public Health*. 13(10):1373–1380.
- Ali, R., Al-Shorbagy, M., Helmy, M.W., EL-Abhar, H.S. 2018. Role of Wnt4/ $\beta$ -catenin, Ang II/TGF $\beta$ , ACE2, NF- $\kappa$ B, and IL-18 in attenuating renal ischemia/reperfusion-induced injury in rats treated with Vit D and pioglitazone. *European Journal of Pharmacology*. 831(April): 68–76. doi: 10.1016/j.ejphar.2018.04.032.
- Alpers, C. E. and Hudkins, K. L. 2014. Mouse models of diabetic nephropathy charles. *Bone*, 23(1):1–7. doi: 10.1097/MNH.0b013e3283451901.Mouse.
- Alvarez, R.J., Sun, M.J., Haverty, T.P., Iozzo, R.V., Myers, J.C., Neilson, E.G. 1992. Biosynthetic and proliferative characteristics of tubulointerstitial fibroblasts probed with paracrine cytokines. *Kidney International*. 41(1):14–23.
- Anders, H.J. and Ryu, M. 2011. Renal microenvironments and macrophage phenotypes determine progression or resolution of renal inflammation and fibrosis. *Kidney international*. 80(9):915–925.
- Andress, D. L. 2006. Vitamin D in chronic kidney disease: A systemic role for selective vitamin D receptor activation. *Kidney International*. 69(1):33–43.
- Arfian, N., Emoto, N., Vignon-Zellweger, N., Nakayama, K., Yagi, K., Hirata, K.I. 2012. ET-1 deletion from endothelial cells protects the kidney during the extension phase of ischemia/reperfusion injury. *Biochemical and Biophysical Research Communications*. 425(2):443–449. doi: 10.1016/j.bbrc.2012.07.121.
- Arfian, N., Muflikhah, K., Soeyono S.K., Sari, D.C.R., Tranggono, U., ANggorowati, N., Romi., M.M. 2016. Vitamin D attenuates kidney fibrosis via reducing fibroblast expansion, inflammation, and epithelial cell apoptosis. *Kobe Journal of Medical Sciences*. 62(2):E38–E44.
- Arfian, N. Kusuma, M.H.H., Anggorowati, N., Nugroho, D.B., Jeffilano, A., Suzuki, Y., Ikeda, K., Emoto, N. 2018. Vitamin D upregulates endothelin-1, ETBR, eNOS mRNA expression and attenuates vascular remodelling and ischemia in kidney fibrosis model in mice. *Physiological Research*. 67.
- Atalay, E., Korlaeci, F., GÜrsoy, G., Karabag, Y., Yildiz, M., Erdogdu, H.I., Kivrak, Y. 2017. The Possible Effect of Vitamin D on Uric Acid Levels in Diabetic Patients. *World Clinical Journal of Medical Science*. 1(2):77–83.
- Badr, K. and Ichikawa, I. 1989. Prerenal failure: A deletrious shift from renal compensation to decompensation. *The New England Journal of Medicine*. 321(19): 1306–1311.

- Baldree, L.A. and Stapleton, F.B. 1990. Uric acid metabolism in children. *Pediatric Clinics of North America*. 37(2):391–418.
- Barreto, D.V., Barreto F.C., Laibeuf, S., Temmar, M., Boitte, F., Choukroun, G., Fournier, A., Massy, Z.A. 2009. Vitamin D affects survival independently of vascular calcification in chronic kidney disease. *Clinical Journal of the American Society of Nephrology*. 4(6):1128–1135.
- Basile, D.P., Donohoe, D., Roethe, K., Osborn, J.L. 2001. Renal ischemic injury results in permanent damage to peritubular capillaries and influences long-term function. *American Journal of Physiology - Renal Physiology*. 281(5 50-5): 887–899.
- Basile, D.P., Anderson, M.D. and Sutton, T.A. 2012. Pathophysiology of acute kidney injury. *Comprehensive Physiology*. 2(2):1303–1353.
- Berger, L. and Yu, T. 1975. Renal Function in Gout . IV . An Analysis of 524 Gouty Subjects Including Long-Term. *The American Journal of Medicine*, 59(November):605–613.
- Bi, J., Watanabe, H., Fujimura, R., Nishida, K., Nakamura, R., Oshiro, S., Imafuku, T., Komori, H., Miyahisa, M., Tanaka, M., Matsushita, K., Maruyama, T. 2018. A downstream molecule of 1,25-dihydroxyvitamin D<sub>3</sub>, alpha-1-acid glycoprotein, protects against mouse model of renal fibrosis. *Scientific Reports*. 8(1):1–9.
- Bonventre, J. V and Weinberg, J. M. 2003. Recent advances in the pathophysiology of ischemic acute renal failure. *Journal of American Society of Nephrology*. 11:2199–2210.
- Bonventre, J. V and Yang, L. 2011. Cellular pathophysiology of ischemic acute kidney injury. *Journal of Clinical Investigation*. 121(11)
- Böttinger, E.P. 2007. TGF- $\beta$  in renal injury and disease. *Seminars in Nephrology*, 27(3):309–320.
- Boutet, A., DeFrutos C.A., Maxwell, P.H., Mayol, M.J., Romero, J., Nieto, M.A. 2006. Snail activation disrupts tissue homeostasis and induces fibrosis in the adult kidney. *The EMBO Journal*. 25(23):5603–5613.
- Braga, T.T. Forni, M.F., Correa-Costa, M., Ramos, R.N., Barbuto, J.A., et al. 2017. Soluble Uric Acid Activates the NLRP3 Inflammasome. *Nature Scientific Reports*. 7(September 2016):1–14.
- Braga, T. T., Agudelo, J. S. H. and Camara, N. 2015. Macrophages During the Fibrotic Process: M2 as Friend and Foe. *Frontiers in Immunology*. 6.
- Brodsky, S.V., Yamamoto, Tada, T., Kim, B., Chen, J., Kajiya, F., Goligorsky, M.S 2002. Endothelial dysfunction in ischemic acute renal failure : rescue by transplanted endothelial cells. *American Journal of Physiology Renal Physiology*. 282(10595):F1140-49.
- Brown, R.D., Ambler, K., Mitchell, D., Long, C.S. 2005. The cardiac fibroblast: Therapeutic target in myocardial remodeling and failure. *Annual Review of Pharmacology and Toxicology*. 45(1):657–687.
- Chang, H.Y., Chi, J.T., Dudoit, S., Bondre, C., Rijn, M., Botstein, Brown., P.O. 2002. Diversity, topographic differentiation, and positional memory in human fibroblasts. *Proceedings of the National Academy of Sciences of the*

*United States of America*. 99(20):12877–12882.

- Chao, H. Liu, J., Lin, J., Chen, C., Wu, C., Cheng, T. 2008. Uric acid stimulates endothelin-1 gene expression associated with NADPH oxidase in human aortic smooth muscle cells. *Acta Pharmacology Sinica*. 29(11):1301–1312.
- 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):58–66.
- Chawla, L.S. and Kimmel, P.L. 2012. Acute kidney injury and chronic kidney disease: An integrated clinical syndrome. *Kidney International*. 82(5):516–524.
- Chen, W. Roncal-Jimenez, C., Lanaspa, M., Smits, G., Chonchol, M., Johnson, R., Jalal, D. 2014. Uric acid suppresses 1 alpha hydroxylase in vitro and in vivo', *Metabolism*. 63(1):1–19.
- Chen, Y., Zhang, J., Ge, X., Du, J., Deb, D.K., Li, C.Y. 2013. Vitamin D receptor inhibits Nuclear Factor  $\kappa$ B activation by interacting with I $\kappa$ B Kinase. *The Journal of Biological Chemistry*. 288(27): 19450–19458.
- Cheng, T., Lin, J., Chap, H., Chen, Y., Chen, C., Chan, P., Liu, J. 2010. Uric acid activates extracellular signal-regulated kinases and thereafter endothelin-1 expression in rat cardiac fibroblasts. *International Journal of Cardiology*. 139(1):42–49.
- Chowdry, A.M., Azad, H., Najar, M.S., Mir, I. 2017. Acute kidney injury due to overcorrection of hypovitaminosis D: A tertiary center experience in the Kashmir Valley of India. *Saudi journal of kidney diseases and transplantation*. 28(6):1321–1329.
- Chung, S., Kim, S., Kim, M., Koh, E.S. Shin, S.J., Park, C.W., Chang, Y.S., Kim, H. 2017. Treatment combining aliskiren with paricalcitol is effective against progressive renal tubulointerstitial fibrosis via dual blockade of intrarenal renin. *PLoS ONE*. 12(7):1–19.
- Le Clef, N., Verhulst, A., D;Haese, P.C., Vervaet, B.A. 2016. Unilateral renal ischemia-reperfusion as a robust model for acute to chronic kidney injury in mice. *PLoS ONE*. 11(3)
- Conger, J.D. and Falk, S.A. 1977. Intrarenal dynamics in the pathogenesis and prevention of acute urate nephropathy. *The Journal of clinical investigation*. 59: 786–793.
- Dagher, P.C.m Hato, T., Mang, H.E., Plotkin, Z., Richardson, Q.V., Massad, M., Mai, E., Kuehl, S.E., Graham, P., Kumar, R., Sutton, T.A. 2016. Inhibition of Toll-Like Receptor 4 signaling mitigates microvascular loss but not fibrosis in a model of ischemic acute kidney injury. *International Journal of Molecular Sciences*. 17:647.
- Darabian, S., Rattanasompattikul, M., Hatamizadeh, P., Bunnapradist, S., Budoff, M.J., Csaba, P.K., Kalantar-Zadeh, K. 2012. Cardiorenal syndrome and vitamin D receptor activation in chronic kidney disease. *Kidney Research and Clinical Practice*. 31(1):12–25.
- Deb, D.K., Sun, T., Wong, K.E., Shi, H., Chang, A., Li, Y.C. 2010. Combined vitamin D analog and AT1 receptor antagonist synergistically block the development of kidney disease in a model of type 2 diabetes. *Kidney*

- International*. Elsevier Masson SAS, 77(11), pp. 1000–1009. doi: 10.1038/ki.2010.22.
- Desmoulière, A., Darby, I. A. and Gabbiani, G. 2003. Normal and pathologic soft tissue remodeling: role of the myofibroblast, with special emphasis on liver and kidney fibrosis. *Laboratory Investigation*. 83(12):1689–1707.
- Donnahoo, K.K., Meng, X., Ayala, A., Cain, M.P., harken, A.H., Meldrum, D.R. 1999. Early kidney TNF- $\alpha$  expression mediates neutrophil infiltration and injury after renal ischemia-reperfusion. *American Physiological Society*. (30):R922–R929.
- Du, J., Jiang, S., Hu, Z., Tang, S., Sun, Y., He, J., Li, Z., Yin, B., Wang, J., Zhang, H., Li, Y.C. 2019. Vitamin D receptor activation protects against lipopolysaccharide-induced acute kidney injury through suppression of tubular cell apoptosis. *American Journal of Physiology-Renal Physiology*. 316(5):F1068–F1077.
- Dusso, A. S. *et al.* 2005. Vitamin D', *Am J Physiol Renal Physiol*. 289(289):F8–F28.
- Dusso, A. S. and Tokumoto, M. 2011. Defective renal maintenance of the vitamin D endocrine system impairs vitamin D renoprotection: A downward spiral in kidney disease', *Kidney International*. 79(7):715–729.
- Eddy, A. 2000. Molecular basis of renal fibrosis. *Pediatric Nephrology*. 15(3–4):290–301.
- Eddy, A.A. and Neilson, E.G. 2006. Chronic kidney disease progression. *Journal of the American Society of Nephrology*. 17(11):2964–2966.
- Edwards, N.L. 2009. Febuxostat: A new treatment for hyperuricaemia in gout', *Rheumatology*, 48(SUPPL. 2):1–6.
- El, R. and Tallima, H. 2017. Physiological functions and pathogenic potential of uric acid : A review', *Journal of Advanced Research*. 8(5):487–493.
- Eleftheriadis, T., Antoniadi, G., Liakopoulos, V., Nikolaos, A., Stefanidis, I., Galaktidou, G. 2010. Vitamin D receptor activators and response to injury in kidney diseases. *J Nephrol*. 23(5):514–524.
- Fathallah-Shaykh, S.A. and Cramer, M.T. 2014. Uric acid and the kidney. *Pediatric Nephrology*. 29(6):999–1008.
- Feig, D.I., Kang, D.H. and Johnson, R.J. 2009. Uric Acid and Cardiovascular Risk. *New England Journal of Medicine*. 359(17):1811–1821.
- Festing, M.F.W. and Altman, D.G. 2002. Guidelines for the design and statistical analysis of experiments using laboratory animals. *ILAR Journal*. 43(4):244–257.
- Finch, J.L., Suarez, E.B., Husain, K., Ferder, L., Cardema, M.C., Glenn, D.J., Gardner, D.G., Liapus, H., Slatopolsky, E. 2012. Effect of combining an ACE inhibitor and a VDR activator on glomerulosclerosis, proteinuria, and renal oxidative stress in uremic rats. *American Journal of Physiology Renal Physiology*. 302:F141–F149.
- Fragiadaki, M., Mason, R.M. and Mason, R.M. 2011. Epithelial-mesenchymal transition in renal fibrosis – evidence for and against. *International Journal of Experimental Pathology*. 1:143–150.
- Francois, H. and Jacquet, A. 2011. Emerging strategies to preserve renal function.

*Journal of Nephrology*. 24(2):131–141.

- Freundlich, M., 2008. Suppression of renin-angiotensin gene expression in the kidney by paricalcitol. *Kidney International*. 74(11):1394–1402.
- Fujii, T., Kurata, H., Takaoka, M., Muraoka, T., Fujisawa, Y., Shokoji, T., Nishiyama, A., Abe, Y., Matsumura, Y. 2003. The role of renal sympathetic nervous system in the pathogenesis of ischemic acute renal failure. *European Journal of Pharmacology*. 481(2–3):241–248.
- Garsen, M., Sonneveld, R., Rops, A.L.W.M.M., Huntink, S., Kuppevelt, T.H.V., Rabelink, T.J., Hoenderop, J.G.J., Berden, J.H.M., Nijenhuis, T., Vlag, J.V.D. 2015. Vitamin D attenuates proteinuria by inhibition of heparanase expression in the podocyte. *Journal of Pathology*. 237(4):472–481.
- Gasse, P., Riteau, N., Petrelli, V., Tschopp, J., Lagente, V., Quesniaux, V.F.J., Ryffel, B., Couillin, I. 2009. Uric acid is a danger signal activating NALP3 inflammasome in lung injury inflammation and fibrosis. *American Journal of Respiratory and Critical Care Medicine*. 179(10):903–913.
- Gelse, K., Pöschl, E. and Aigner, T. 2003. Collagens - structure, function, and biosynthesis. *Advanced Drug Delivery Reviews*. 55(12): 1531–1546.
- Ginhoux, F. and Jung, S. 2014. Monocytes and macrophages: developmental pathways and tissue homeostasis. *Nature Reviews Immunology*. 14(6):392–404.
- Goddard, J., Eckhart, C., Johnston, N.R., Cumming, A.D., Rankin, A.J., Webb, D.J. 2004. Endothelin A receptor antagonism and angiotensin- converting enzyme inhibition are synergistic via an endothelin b receptor – mediated and nitric oxide – dependent mechanism. *Journal of American Society Nephrology*. 15:2601–2610.
- Goldberg, R. and Dennen, P. 2008. Long-term outcomes of acute kidney injury. *Advances in Chronic Kidney Disease*. 15(3):297–307.
- Goncalves, G., Braganca, A.C.D., Canale, D., Shimizu, M.H.H., Sanches, T.R., Moyses, R.M.A., Andrade, L., Seguro, A.C., Volpini, R.A. 2014. Vitamin D deficiency aggravates chronic kidney disease progression after ischemic acute kidney injury. *PLoS ONE*. 9(9):1–13.
- Gosling, A.L., Matisoo-Smith, E. and Merriman, T.R. 2014. Hyperuricaemia in the pacific: Why the elevated serum urate levels?. *Rheumatology International*. 34(6):743–757.
- Gren, A. 2013. Effects of Vitamin E, C, and D supplementation on inflammation and oxidative stress in streptozotocin-induced diabetic mice. *International Journal of Vitamine and Nutrition Research*. 83(3):9831.
- Guan, Z. and Inscho, E.W. 2015. Endothelin and the Renal Vasculature. *Seminars in Nephrology*. 35(2):145–155.
- Hahn, K., Kanbay, M., Lanaspas, M.A., Johnson, R.J., Ejaz, A.A. 2017. Serum uric acid and acute kidney injury: A mini review', *Journal of Advanced Research*. 8(5):529–536.
- Hamden, K., Carreau, S., Jamoussi, K., Ayadi, F., Garmazi, F., Mesgenni, N., Elfeki, A. 2008. Inhibitory effects of 1 $\alpha$ , 25dihydroxyvitamin D<sub>3</sub> and Ajuga iva extract on oxidative stress, toxicity, and hypo-fertility in diabetic rat testes. *Journal of Physiology Biochemistry*. 64(3):231–240.



- Han, D.C., Isono, M., Hoffman, B.B., Ziyadeh, F.N. 1999. High glucose stimulates proliferation and collagen type I synthesis in renal cortical fibroblasts: Mediation by autocrine activation of TGF- $\beta$ . *Journal of the American Society of Nephrology*. 10(9):1891–1899.
- Haryono, A, Nugrahaningsih, D.A.A., Sari, D.C.R., Romi M.M., Arfian N. Reduction of serum uric acid associated with attenuation of renal injury, inflammation and macrophages M1/M2 ratio in hyperuricemic mice model. *Kobe Journal of Medical Sciences* 2018;64(3):E107.
- He, W., Kang, Y.S., Dai, C., Liu, Y. 2011. Blockade of Wnt/  $\beta$ -Catenin signaling by paricalcitol ameliorates proteinuria and kidney injury. *Journal of the American Society of Nephrology*. 22(1):90–103.
- Heaf, J. G., Joffe, P. and Marckmann, P. 2012. Vitamin D and stage 5 chronic kidney disease: A new paradigm?. *Seminars in Dialysis*. 25(1):50–58.
- Hediger, M., Johnson, R.J., Miyazaki, H., Endou, H. 2005. Molecular physiology of urate transport. *Physiology*. 20:125–133.
- Hegarty, N.J., Young, L.S. Kirwan, C.N., O'Neill. A.J., Bouchier-Hayes, D.M., Sweeny, P., Watson, R.W., Fitzpatrick, J.M. 2001. Nitric oxide in unilateral ureteral obstruction: Effect on regional renal blood flow. *Kidney International*. 59(3):1059–1065.
- Hellberg, P.O.A., Kallskog, O.T., Ojteg, G., Wolgast, M. 1990. Peritubular capillary permeability and intravascular RBC aggregation after ischemia: effects of neutrophils. *American Journal of Physiology - Renal Fluid and Electrolyte Physiology*. 258(4):27-4.
- Hill, N.R., Fatoba, S.T., Oke, J.L., Hirst, J.A., O'Callaghan, C.A., Lasserson, D.S., Hobbs, R. 2013. Global prevalence of chronic kidney disease – a systematic review and meta-analysis. *Indian Journal of Medical Sciences*. 67(5):103–116.
- Hinz, B. 2007. Formation and function of the myofibroblast during tissue repair', *Journal of Investigative Dermatology*. 127(3):526–537.
- Holick, M.F. 2007. Vitamin D Deficiency. *New England Journal of Medicine*. 357(3):266–281.
- Holick, M.F. 2016. Biological effects of sunlight, ultraviolet radiation, visible light, infrared radiation and Vitamin D for health. *Anticancer Research*. 36(3):1345–1356.
- Holick, M. F. 2017. The vitamin D deficiency pandemic: Approaches for diagnosis, treatment and prevention. *Reviews in Endocrine and Metabolic Disorders*. 18(2):153–165.
- Hosseini-Nezhad, A. and Holick, M.F. 2013. Vitamin D for health: A global perspective. *Mayo Clinic Proceedings*. 88(7):720–755.
- Hovater, M.B. and Sanders, P.W. 2012. Effect of dietary salt on regulation of TGF- $\beta$  in the kidney. *Seminars in Nephrology*. 32(3):269–276.
- Hu, H., Xu, S., Hu, S., Gao, Y., Shui, H. 2016. Effect of 1,25(OH)<sub>2</sub>D<sub>3</sub> on transdifferentiation of rat renal tubular epithelial cells induced by high glucose. *Biomedical Reports*. 5(6):699–704.
- Humphreys, B.D. 2018. Mechanisms of renal fibrosis. *Annual Review of Physiology*. 80(October 2017):1–18.

- Imanishi, Y., Inaba, M., Nakatsuka, K., Nagasue, K., Okuno, S., Yoshihara, A., Miura, M., Miyauchi, A., Kobayashi, K., Miki, T., Shoji, T., Ishimura, E., Nishizawa, Y. 2004. FGF-23 in patients with end-stage renal disease on hemodialysis. *Kidney International*. 65(5):1943–1946.
- Inazaki, K., Kanamaru, Y., Kojima, Y., Sueyoshi, N., Okumura, K., Kaneko, K., Yamashiro, Y., Ogawa, H., Nakao, A. 2004. Smad3 deficiency attenuates renal fibrosis, inflammation, and apoptosis after unilateral ureteral obstruction. *Kidney International*. 66:597–604.
- Incho, E.W., Imig, J., Cook, K.A., Pollock, D.M. 2005. ET<sub>A</sub> and ET<sub>B</sub> receptors differentially modulate afferent and efferent arteriolar responses to endothelin. *British Journal of Pharmacology*. 146(7):1019–1026.
- Iseki, K., Oshiro, S. and Tozawa, M. 2001. Significance of hyperuricemia on the early detection of renal failure in a cohort of screened subjects. *Hypertension Research*, 24(6):691–697.
- Ito, I., Waku, T., Aoki, M., Abe, R., Nagai, Y., Watanabe, T., Nakajima, Y., Ohdiko, I., Yokoyama, K., Miyachi, H., Shimizu, T., Murayama, A., Kishimoto, H., Nagasawa, K., Yanagisawa, J. 2013. A nonclassical vitamin D receptor pathway suppresses renal fibrosis. *Journal of Clinical Investigation*. 123(11):4579–4594.
- Jin, M., Yang, F., Yang, I., Yin, Y., Luo, J.J., Wang, H., Yang, X. 2012. Uric acid, hyperuricemia and vascular diseases. *Frontiers in Bioscience*. 17(2):656–669.
- Kaballo, M.A., Elsayed, M.E. and Stack, A.G. 2017. Linking acute kidney injury to chronic kidney disease: the missing links. *Journal of Nephrology*. 30(4):461–475.
- Kalluri, R. and Neilson, E.G. 2003. Epithelial-mesenchymal transition and its implications for fibrosis. *Journal of Clinical Investigation*. 112(12):1776–1784.
- Kang, D., Nakagawa, T., Feng, L., Harris, R., Johnson, R.J. 2002. A role for uric acid in the progression of renal disease. *American Journal of Nephrology*. (9):2888–2897.
- Kang, D. and Ha, S. 2014. Uric acid puzzle : dual role as anti-oxidant and pro-oxidant. *Korean Society of Electrolyte Metabolism*. 5997:1–6.
- Kementerian Kesehatan Republik Indonesia. 2017. *INFODATIN-PUSATDATA DAN INFORMASI*.
- Kheterpal, S., Tremper, K.K., Heung, M., Rosenverg, A.L., Englesbe, M., SHanks, A.M., Campbell, D.A. 2009. Development and validation of an acute kidney injury risk index for patients undergoing general surgery: Results from a national data set. *Anesthesiology*. 110(3):505–515.
- Kienreich, K., Grubler, M., Tomaschitz, A., Schmid, J., Verhyen, N., Dekker, J., Pilz, S. 2013. Vitamin D, arterial hypertension & cerebrovascular disease. *Indian Journal of Medical Research*. Apr;137(4):69–79.
- Kilkenny, C., Browne, W.J., Cuthill, I.C., Emerson, M., Altman, D. 2010. Improving bioscience research reporting: The arrive guidelines for reporting animal research. *PLoS Biology*. 8(6):6–10.
- Kono, K., Fujii, H., Nakai, K., Goto, S., Kitazawa, R., Kitazawa, S., Shinohara,

- M., Hirata, M., Fukagawa, M., Nishi, S. 2013. Anti-oxidative effect of Vitamin D analog on incipient vascular lesion in non-obese type 2 diabetic rats. *American Journal of Nephrology*. 37:167–174.
- Kosugi, T., Heinig, M., Nakayama, T., Matsuo, S., Nakagawa, T. 2010. eNOS knockout mice with advanced diabetic nephropathy have less benefit from Renin-Angiotensin blockade than from aldosterone receptor antagonists. *The American Journal of Pathology*. 176(2):619–629.
- Kumar, R., Goyal, A., Singh, P., Bhardwaj, A., Mittal, A., Yadav, S.S. 2017. Knowledge attitude and perception of sex education among school going adolescents in ambala district Haryana, India : A Cross-Sectional Study. *Journal of Clinical and Diagnostic Research*. 11(3):LC01-LC04.
- Kuro-o, M. 2011. Klotho and the aging process. *Korean Journal of Internal Medicine*. 26(2):113–122.
- Kwon, O., Phillips, C.L. and Molitoris, B.A. 2002. Ischemia induces alterations in actin filaments in renal vascular smooth muscle cells. *American Journal of Physiology - Renal Physiology*. 282(651-6):1012–1019.
- Labudzynski, D., Latyshko, N. and Gudkova, O. 2015. Vitamin D(3) contribution to the regulation of oxidative metabolism in the liver of diabetic mice. *Ukraina Biochemistry Journal*. 87(3):75–90.
- Larsson, T., Nisbeth, U., Ljunggren, O., Juppner, H., Jonsson, K.B. 2003. Circulating concentration of FGF-23 increases as renal function declines in patients with chronic kidney disease, but does not change in response to variation in phosphate intake in healthy volunteers. *Kidney International*. 64(6):2272–2279.
- Laske, B. and Razzaque, M.S. 2007. Vitamin D and aging: old concepts and new insights. *Journal of Nutrient Biochemistry*. 18(2):771–777.
- Li, Y., Spataro, B.C., Yang, J., Dai, C., Liu, Y. 2005. 1,25-dihydroxyvitamin D3 inhibits renal interstitial myofibroblast activation by inducing hepatocyte growth factor expression. *Kidney International*. 68:1500–1510.
- Li, Y.C., Kong, J., Wei, M.m Chen, Z., Liu, S.Q., Cao, L. 2002. 1,25-Dihydroxyvitamin D3 is a negative endocrine regulator of the renin-angiotensin system. *Journal of Clinical Investigation*. 110(2):229–238.
- Li, Y. C. 2010. Renoprotective effects of vitamin D analogs. *Kidney International*. 78(2), pp. 134–139.
- Liu, B., Wang, T, Zhao, H.N., Yue, W.W., Yu, H.P., Liu, C.X., Yin, J., Jia, R.Y., Nie, H.W. 2011. The prevalence of hyperuricemia in China : a meta-analysis. *BMC Public Health*. 11(832):1-10.
- Lucisano, S., Buemi, M., Passantino, A., Aloisi, C., Cernaro, V., Santoro, D. 2013. New Insights on the role of vitamin D in the progression of renal damage. *Kidney and Blood Pressure Research*. 37(6):667–678.
- Mansouri, A., Gattoliat, C. and Asselah, T. 2018. Mitochondrial dysfunction and signaling in chronic liver diseases. *Gastroenterology*. 155(3):629–647.
- Marckmann, P., Agerskov, H., Thineskumar, S., Bladbejerg, E., Sidelman, J.J., Jespersen J., Nybo, M., Rasmussen, L.M., Hansen, D., Scholze, A. 2012. Randomized controlled trial of cholecalciferol supplementation in chronic kidney disease patients with hypovitaminosis D. *Nephrology Dialysis*



*Transplantation*. 27(9):3523–3531.

- Marina, S., Hirai, Y., Navre, M., Werb, Z., Lochter, A., Bissell, M.J. 2001. The interplay of matrix metalloproteinases, morphogens and growth factors is necessary for branching of mammary epithelial cells. *Development*. 128(16):3117–3131.
- Martinez-Miguel, P., Valdivielso, J.M., Medrano-Andres, D., Roman-Garcia, P., Cano-Penalver, J.L., Rodriguez-Puyol, M., Rodriguez-Puyol, D., Lopez-Ongil, S. 2014. The active form of vitamin D, calcitriol, induces a complex dual upregulation of endothelin and nitric oxide in cultured endothelial cells. *AJP: Endocrinology and Metabolism*. 307(12):E1085–E1096.
- Massague, J. 1998. TGF- $\beta$  signal transduction. *Annual Review Biochemistry*. 67:753–791.
- Meng, P., Tang, J., Li, J. 2015. Macrophage phenotype in kidney injury and repair. *Kidney Diseases*. 1(2):138–146.
- Meng, X.M., Nikolic-Paterson, D.J. and Lan, H.Y. 2014. Inflammatory processes in renal fibrosis, *Nature Reviews Nephrology*. 10(9):493–503.
- Mirkovic, K., Born, J.V.D., Navis, G., deBorst, M.H. 2011. Vitamin D in chronic kidney disease: new potential for intervention. *Current Drug Targets*. 12(1):42–53.
- Molinari, C., Uberti, F., Grossini, E., Vacca, G., Carda, S., Invernizzi, M., Cisari, C. 2011. 1 $\alpha$ ,25-Dihydroxycholecalciferol induces nitric oxide production in cultured endothelial cells. *Cell Physiology Biochemistry*. 27:661–668.
- Mollitoris, B. and Finn, W. 2002. Acute renal failure: a companion to brenner and rector's the kidney. *American Journal of Kidney Diseases*. 39(5):1123.
- Monamy, V. 2009. *Animal Experimentation A Guide to the Issue*. 2nd. Cambridge University Press.
- Murray, P.J. and Wynn, T.A. 2011. Protective and pathogenic functions of macrophage subsets. *Nature Reviews Immunology*. 11(11):723–737.
- Negri, A.L. 2006. Proximal tubule endocytic apparatus as the specific renal uptake mechanism for vitamin D-binding protein/25-(OH)D<sub>3</sub> complex. *Nephrology*. 11(6):510–515.
- Nony, P.A. and Schnellmann, R.G. 2003. Mechanisms of renal cell repair and regeneration after acute renal failure. *Journal of Pharmacology and Experimental Therapeutics*. 304(3):905–912.
- Okada, H., Danoff, T.M., Kalluri, R., Neilson, E.G. 1997. Early role of Fsp1 in epithelial-mesenchymal transformation. *American Journal of Physiology - Renal Physiology*. 273(4):42–4.
- Park, J.K., Jeong, J.W., Kang, M.Y., Baek, J.C., Shin, J.K., Lee, S.A., Choi, W.S., Lee, J.H., Paik, W.Y. 2010. Inhibition of the PI3K-Akt pathway suppresses sFLT1 expression in human placental hypoxia models in vitro. *Placenta*. 31(7):621–629.
- Park, J.S., Choi, H.I., Bae, E.H., Ma, S.K., Ki, S.W. 2019. Paricalcitol attenuates indoxyl sulfate-induced apoptosis through the inhibition of MAPK, Akt, and NF- $\kappa$ B activation in HK2 cells. *Korean Journal of Internal Medicine*. 34(1):146–155.
- Patel, T. and Singh, A.K. 2010. Role of Vitamin D in Chronic Kidney Disease.

*Seminars in Nephrology*. 29(2):113–121.

- Pedraza-Chaverri, J., Sanchez-Lozada, L.G., Osorio-Alonso, H., Tapia, E., Scholze, A. 2016. New pathogenic concepts and therapeutic approaches to oxidative stress in chronic kidney disease. *Oxidative Medicine and Cellular Longevity*. 2016.
- Piechota, M., Banach, M., Irmanski, R., Barylski, M., Piechota-Urbanska, M., Kowalski, J., Pawlicki, L. 2007. Plasma endothelin-1 levels in septic patients. *Journal of Intensive Care Medicine*. 22(4):232–239.
- Pisano, A., Cernaro, V. and Bolignano, D. 2017. Xanthine oxidase inhibitors for improving renal function in chronic kidney disease patients: an updated systematic review and meta-analysis. *International journal of Molecular Sciences*. 18(2283):1–19.
- Rabb, H., O'Meara, Y.M., Maderna, P., Coleman, P., Brady, H.R. 1997. Leukocytes, cell adhesion molecules and ischemic acute renal failure. *Kidney International*. 51(5):1463–1468.
- Ricotti, R. Genoni, G., Giglione, E., Monzani, A., Nugnes, M., Zanetta, S., Castagno, M., Marolda, A., Bellomo, G., Bona, G., Bellone, S., Prodam, F. 2018. High-normal estimated glomerular filtration rate and hyperuricemia positively correlate with metabolic impairment in pediatric obese patients. *Plos One*. pp. 1–17.
- Roberts, A.B., Heine, U.I., Flanders, K.C., Sporn, M.B. 1990. Transforming Growth Factor- $\beta$ : major role in regulation of extracellular matrix. *Annals of the New York Academy of Sciences*. 580(1):225–232.
- Rodenbach, K.E., Schneiderr, M.F., Furth, S.L., Moxey-Mims, M., Mitsneces, M.M., Weaver, D.J. Warady, B.A., Schwartz, G.J. 2016. Hyperuricemia and progression of CKD in children and adolescents: the chronic kidney disease in children (CKD) cohort study. *American Journal Kidney Disease*. 66(6):984–992.
- Romi, M.M., Arfian, N., Tranggono, U., Setyaningsih, W.A.W., Sari, D.C.R. 2017. Uric acid causes kidney injury through inducing fibroblast expansion, Endothelin-1 expression, and inflammation. *BMC Nephrology*. 18(1):1–8.
- Röszer, T. 2015. Understanding the mysterious M2 macrophage through activation markers and effector mechanisms. *Mediators of Inflammation*. 2015:1–16.
- Ryu, E., Kim, M.J., Shin, H., Jang, Y., Choi, H., Jo, I., Johnson, R.J., Kang, D. 2013. Chronic kidney disease and fibrosis uric acid-induced phenotypic transition of renal tubular cells as a novel mechanism of chronic kidney disease. *American Journal of Physiology Renal Physiology*. pp. 471–480.
- Sanchez-Nino, M.D., Bozic, M., Cordoba-Lanus, E., Valcheva, P., Gracia, O., Ibarz, M., Fernandez, E., Navarro-Gonzalze, J.F., Ortiz, A., Valdivielso, M. 2012 Beyond proteinuria: VDR activation reduces renal inflammation in experimental diabetic nephropathy. *American Journal Physiology Renal Physiology*. 302:F647-F657
- Sanchez-Lozada, L.G. Tapia, E., Santamaria, J., Avila-Casado, C., Soto, V., Nepomuceno, T., Rodriguez-Iturbe, B., Johnson, Ri., Herrera-Acosta, J. 2005. Mild hyperuricemia induces vasoconstriction and maintains

- glomerular hypertension in normal and remnant kidney rats. *Kidney International*. 67:237–247.
- Sánchez-Lozada, L.G., Lanaspá, M., Cristóbal-García, M., García-Arroyo, F., Soto, V., Cruz-Robles, D., Nakagawa, T., Yu, M., Kang, D., Johnson, R. 2013. Uric acid-induced endothelial dysfunction is associated with mitochondrial alterations and decreased intracellular ATP concentrations. *Nephron Experimental Nephrology*. 121(0):1–13.
- Sari, D.C.R., Putri, M.W., Leksono, T.P., Chairunnisa, N., Reynaldi, G.N., Simanjuntak, B.C., Debora, J., Yunus, J., and Arfian, N. 2019. Calcitriol ameliorates kidney injury through reducing podocytopathy, tubular injury, inflammation and fibrosis in 5/6 Subtotal Nephrectomy model in rats. *Kobe Journal Medical Sciences*. 65(5):E153-E163
- Schwartz, J.H., Shih, T. and Menza, S.A. 1999. ATP depletion increases tyrosine phosphorylation of  $\beta$ -catenin and plakoglobin in renal tubular cells. *Journal of American Society Nephrology*. 10:2297–2305.
- Seibert, E., Helne, G.H., Ulrich, C., Seiler, S., Kohler, H., Girndit, M. 2013. Influence of cholecalciferol supplementation in hemodialysis patients on monocyte subsets: A randomized, double-blind, placebo-controlled clinical trial. *Nephron-Clinical Practice*. 123(3–4):209–219.
- Seiler, S., Heine, G.H. and Fliser, D. 2009. Clinical relevance of FGF-23 in chronic kidney disease', *Kidney International*. 76(SUPPL. 114):S34–S42.
- Setyaningsih, W.A.W., Arfian, N., Suryadi, E., Romi, M.M., Tranggono, U., Sari, D.C.R. 2018. Hyperuricemia induces Wnt5a/Ror2 gene expression, Epithelial – Mesenchymal Transition (EMT), and kidney tubular injury in mice. *Iranian Journal of Medical Sciences*. 43(2):1–10.
- Sharaf El Din, U.A.A., Salem, M.M. and Abdulazim, D.O. 2017. Uric acid in the pathogenesis of metabolic, renal, and cardiovascular diseases: A review. *Journal of Advanced Research*. 8(5):537–548.
- Simoyi, M.F., Van Dyke, K. and Klandorf, H. 2002. Manipulation of plasma uric acid in broiler chicks and its effect on leukocyte oxidative activity. *American Journal of Physiology - Regulatory Integrative and Comparative Physiology*. 282(351-3):791–796.
- So A & Thorens B. 2010. Uric Acid Transport and Disease. *Journal of Clinical Investigation*. 120(6):1791–1798.
- Song, P., Wang, H., Xia, W., Chang, X., Wang, M., An, L. 2018. Prevalence and correlates of hyperuricemia in the middle-aged and older adults in China. *Scientific Reports*. 8(4314):1–9.
- Song, Z., Guo, Y., Zhou, M., Zhang, X. 2014. The PI3K/p-Akt signaling pathway participates in calcitriol ameliorating podocyte injury in DN rats. *Metabolism: Clinical and Experimental*. 63(10):1324–1333.
- Spencer, H., Lesniak, M., Gatzka, C.A., Osis, D.C., Lender, M. 1980. Magnesium absorption and metabolism in patients with chronic renal failure and in patients with normal renal function. *Gastroenterology*. 79(1):26–34.
- Spurgeon, K.R., Donohoe, D.L. and Basile, D.P. 2005. Transforming growth factor- $\beta$  in acute renal failure: Receptor expression, effects on proliferation, cellularity, and vascularization after recovery from injury. *American Journal*

- of Physiology - Renal Physiology*. 288(357):568–577.
- Star, R.A. 1998. Treatment of acute renal failure. *Kidney International*. 54(6):1817–1831.
- Strait, K.A., Stricklett, P.K., Kohan, R.M., Kohan, D.E. 2010. Identification of two Nuclear Factor of Activated T-cells (NFAT) response elements in the 5-upstream regulatory region of the ET-1 promoter. *The Journal of Biological Chemistry*. 285(37):28520–28528.
- Strutz, F. and Zeisberg, M. 2006. Renal fibroblasts and myofibroblasts in chronic kidney disease. *Journal of the American Society of Nephrology*. 17(11):2992–2998.
- Su, H. Y., Yang, C., Liang, D., Liu, H.F. 2020. Research advances in the mechanisms of hyperuricemia-induced renal injury. *BioMed Research International*. 2020.
- Sutton, T.A., Fisher, C.J. and Molitoris, B.A. 2002. Microvascular endothelial injury and dysfunction during ischemic acute renal failure. *Kidney International*. 62:1539–1549.
- Tan, X., Li, Y. and Liu, Y. 2006. Paricalcitol attenuates renal interstitial fibrosis in obstructive nephropathy. *Journal of the American Society of Nephrology*. 17(12):3382–3393.
- Tan, X., Wen, X. and Liu, Y. 2008. Paricalcitol inhibits renal inflammation by promoting vitamin D receptor-mediated sequestration of NFκB signaling. *Journal of the American Society of Nephrology*. 19(9):1741–1752.
- Taniguchi, C.M., Emanuelli, B. and Kahn, C.R. 2006. Critical nodes in signalling pathways : insights into insulin action. *Journal of the American Society of Nephrology*. 7(February):85–96.
- Thadhani, R., Pascual, M. and Bonventre, J. 1980. Acute renal failure. *British Medical Journal*. 281(6232):60.
- Thakkinthian, A., Anothaisintawee, T., Chailurkit, L., Ratanachaiwong, W., Yamwong, S., Sritara, P., Ongphiphadhanakul, B. 2015. Potential causal associations between Vitamin D and uric acid: Bidirectional mediation analysis. *Scientific Reports*. Nature Publishing Group. 5:1–8.
- Tomasek, J.J., Gobbiani, G., Hinz, B., Chaponnier, C., Brown, R.A. 2002. Myofibroblasts and mechano: Regulation of connective tissue remodelling. *Nature Reviews Molecular Cell Biology*. 3(5):349–363.
- Tortora, G.J. and Derrickson, B. 2013. *Principles of anatomy and physiology*, *Journal of Chemical Information and Modeling*.
- Valle, M., Martos, R., Canete, M.D., Valle, R., Donkelaar, E.L.V., Bermudo, F., Canete, R. 2015. Association of serum uric acid levels to inflammation biomarkers and endothelial dysfunction in obese prepubertal children. *Pediatric of Diabetes*. 16(6):441–447.
- Venkatachalam, M.A., Griffin, K.A., Lan, R., Geng, H., Saikumar, P., Bidani, A.K. 2010. Acute kidney injury: A springboard for progression in chronic kidney disease. *American Journal of Physiology - Renal Physiology*. 298(5):078–1094.
- Verrecchia, F., Tachcheu, C., Wagner, E., Mauviel, A. 2003. A central role for the JNK pathway in mediating the antagonistic activity of pro-inflammatory

- cytokines against transforming growth factor- $\beta$ -driven SMAD3/4-specific gene expression. *Journal of Biological Chemistry*. 278(3):1585–1593.
- Verzola, D., Ratto, E., Villaggio, B., Parodi, E.L., Pontremoli, R., Garibotto, G., Viazzi, F. 2014. Uric Acid Promotes Apoptosis in Human Proximal Tubule Cells by Oxidative Stress and the Activation of NADPH Oxidase NOX 4. *Plos One*. 1–19.
- Wada, T. *et al.* (2007). Fibrocytes: A new insight into kidney fibrosis. *Kidney International*. 72(3):269–273.
- Wang, Y., Gu, Y., Lyod, S., Jia, X., Groome, L.J. 2015. Increased urinary levels of podocyte glycoproteins, matrix metalloproteinases, inflammatory cytokines, and kidney injury biomarkers in women with preeclampsia. *Journal of American Society Nephrology*. 1009–1017.
- Wang, Y. and Harris, D.C.H. 2011. Macrophages in Renal Disease. *Journal of the American Society of Nephrology*. 22(1):21–27.
- Weiner, D.E., Tighiouart, H., Elsayed, E.F., Griffith, J.L., Salem, D.N., Levey, A.S. 2008. Uric acid and incident kidney disease in the community. *Journal of American Society Nephrology*. 19:1204–1211.
- Willnow, T. E. and Nykjaer, A. 2002. Pathways for kidney-specific uptake of the steroid hormone 25-hydroxyvitamin D<sub>3</sub>. *Current Opinion in Lipidology*. 13(3):255–260.
- Wonnacott, A., Meran, S., Amphlett, B., Talabani, B., Phillips, A. 2014. Epidemiology and outcomes in community-acquired versus hospital-acquired. *Clinical Journal of the American Society of Nephrology*. 9(6):1007–1014.
- Wynn, T.A., Chawla, A. and Pollard, J.W. 2013. Macrophage biology in development, homeostasis and disease. *Nature*. 496(7446):445–455.
- Xiao, J., Zhang, X.L., Fu, C., Han, R., Chen, W., Lu, Y., Ye., Z. 2015. Soluble uric acid increases NALP3 inflammasome and interleukin-1 $\beta$  expression in human primary renal proximal tubule epithelial cells through the Toll-like receptor 4-mediated pathway. *International Journal of Molecular Medicine*. 35:1347–1354.
- Yamamoto, T., Takabatake, Y., Takahashi, A., Kimura, T., Namba, T., Matsuda, J., Minami, S., Kaimori, J.Y., Matsui, I., Matsusaka, T., Niimura, F., Yanagita, M., Isakan, Y. 2018. Effect of uric acid control on serum creatinine. *Journal of Clinical Rheumatology*. 00(00):1–5.
- Yang, Z., Xiaohua, W., Lei, J., Rouyun, T., Mingxia, X., Wichun, H., Li, F., Ping, W., Junwei, Y. 2010. Uric acid increases fibronectin synthesis through upregulation of lysyl oxidase expression in rat renal tubular epithelial cells. *American Journal of Physiology Renal Physiology*. 299:299:336–346.
- Yuan, W., Pan, W., Kong, J., Zheng, W., Szeto, F.L., Wong, K.E., Cohen, R., Klopot, A., Zhang, Z., Li, Y.C. 2007. 1,25-Dihydroxyvitamin D<sub>3</sub> Suppresses renin gene transcription by blocking the activity of the Cyclic AMP response element in the renin gene promoter. *Journal of Biological Chemistry*. 282(41):29821–29830.
- Zhang, X.L., Guo, F.Y., Song, Z., Zhou, M. 2014. Vitamin D prevents podocyte injury via regulation of macrophage M1/M2 phenotype in diabetic



- nephropathy rats. *Endocrinology*, 155(12):4939–4950
- Zhang, Y., Deb, D., Kong, J., Ning, G., Wang, Y., Li, G. 2009. Long-term therapeutic effect of vitamin D analog doxercalciferol on diabetic nephropathy: Strong synergism with AT1 receptor antagonist. *American Journal of Physiology - Renal Physiology*. 297(3).
- Zhong, W., Gu, B., Gu, Y., Groome, L., Sun, J., Wang, Y. 2015. Activation of vitamin D receptor promotes VEGF and CuZn-SOD expression in endothelial cells. *J Steroid Biochemical and Molecular Biology*. 5379(318):56–62.
- Zhou, G. and Groth, T. 2018. Host responses to biomaterials and anti-inflammatory design: a brief review. *Anti-Inflammation*. 1800112:1–15.
- Zhou, Y., Fang, L., Jiang, L., Wen, P., Cao, H., He, W., Dai, C., Yang, J. 2012. Uric acid induces renal inflammation via activating tubular nf- k b signaling pathway. *PLoS ONE*, 7(6):1–10.
- Zhu, L., Li, N., Cowley Jr., A.W. 2011. Activation of RhoA in Podocytes Induces Focal Segmental Glomerulosclerosis. *Journal of the American Society of Nephrology*. 22:1621–1630.
- Zou, A., Li, N. and Cowley, A. W. 2001. Production and actions of superoxide in the renal medulla. *Hypertension*. 2:547–553.