

DAFTAR PUSTAKA

- Abbas AK., Lichtman AH., Pillai S., 2016. *Imunologi dasar abbas : Fungsi dan kelainan sistem imun*. Edisi Indonesia kelima. Elsevier (Singapore) Pte Ltd. Singapore.
- Aggarwal S., Gupta S., 1998. Increased apoptosis of T cell subset in aging humans: altered expression of Fas (CD95), Fas ligand, Bcl-2, and Bax. *J Immunol.* 160:1627-1637.
- Akbar AN., Salmon M., 1997. Cellular environments and apoptosis: tissue microenvironments contro activated T-cell death. *Immunol Today.* 18:72-76.
- Andrew D., Aspinall R., 2001. IL-7 and not stem cell factor reverses both the increase in apoptosis and the decline in thymopoiesis seen in aged mice. *J Immunol.* 166:1524-1530.
- Atilasoy E., Holt PR., 1993. Gastrointestinal proliferation and aging. *J Gerontol B Psychol Sci Soc Sci.* 48:43-49.
- Baker GTIII., Sprott RL., 1988. Biomarkers of aging. *Exp Gerontol.* 23:223-239.
- Barrett KE., Borman SM., Boitano S., Brooks HL., 2012. *Review of medical physiology*. 24th edition. Lange.
- Bernik TR., Friedman SG., Ochani M., DiRaimo R., Susarla S., *et al.*, 2002. Cholinergic antiinflammatory pathway inhibition of tumor necrosis factor during ischemia reperfusion. *J Vasc Surg.* 36:1231-1236.
- Bjelakovic G., Glud C., 2007. Surviving antioxidant supplements. *J Natl Cancer Inst.* 99:742-743.
- Brocklehurst JC., Allen SC., 1987. Theory on the nature of aging. In: *Geriatric medicine for student*, 3rd ed. Churchill Livingstone London New York. 3-12.
- Bronner MP., Hoggitt RC., 1993. The polyp-cancer sequence: do all colorectal cancers arise from benign adenomas? *Gastrointest Endosc Clin North American.* 3:611-622.
- Brooks G., White T., 1978. Determination of metabolic and heart rate responses of rats do treadmill exercise. *J Appl Physiol.* 45:323-332.
- Brunsgard H., Bjerregaard E., Schroll M., Pedersen BK., 2004. Muscle strength after resistance training is inversely correlated with baseline levels of soluble tumor necrosis factor receptors in the oldest old. *J Am Geriatr Soc.* 52:237-241.
- Brunsgard H., Pedersen BK., 2003. Age-related inflammatory cytokines and disease. *Immunol. Allergy clin North America.* 23:15-39.
- Budiharjo SM., Romi M., Prakosa D., 2004. Pengaruh latihan fisik intensitas sedang terhadap persentase lemak badan wanita lanjut usia. 36:195-200.
- Buchala R., Cerami A., 1992. Advanced glycosilation: chemistry, biology, and implification for diabetes and aging. *Adv Pharmacol.* 23:1-34.

- Campbell PT., Campbell KL., Wener MH., Wood BL., Potter JD., *et al.*, 2009. A yearlong exercise intervention decreases CRP among obese postmenopausal women. *Med Sci Sports Exerc.* 41:1533-1539.
- Caspersen CJ., Powell KE., Christenson GM., 1985. Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. *Public Health Rep.* 100:126-131.
- Charan J., Khantaria ND., 2013. How to calculate sample size in animal studies? *J Pharmacol Pharmacother.* 4:303-306.
- Chatterjee PK., Al-Abed Y., Sherry B., Metz CN., 2009. Cholinergic agonists regulate JAK2/STAT3 signaling to suppress endothelial cell activation. *Am J Physiol., Cell Physiol.* 297:294-306
- Chaurasia's BD., 2004. Human anatomy: Regional and applied dissection and clinical. 14th edition. CBS Publisher & Distributors. New Delhi, Bangalore. 2.
- Chen CF., Lang SY., Zuo PP., Yang N., Wang XQ., *et al.*, 2006. Effects of D-galactose on the expression of hippocampal peripheral type benzodiazepine receptor and spatial memory performance in rats. *Psychoneuroendocrinology.* 31:805-811.
- Chung HY., Cesari M., Anton S., Marzetti E., Giovannini, S., *et al.*, 2009. Molecular inflammation: underpinnings of aging and age-related diseases. *Aging Res. Rev.* 8:18-30.
- Coggan AR., Spina RJ., King DS., Rogers MA., Brown M., *et al.*, 1992. Skeletal muscle adaptations to endurance training in 60- to 70-yr-old men and women. *J Appl Physiol.* 72:1780-1786.
- Compston JE., 2002. Bone marrow and bone : a functional unit. *J Endocrinol.* 173:387-394.
- Costanzo LS., 2015. Broad review series: Physiology. 6th edition. Wolters Kluwer Health.
- Cox HG., 1988. Later life. The reality of aging. 2nd edition. Prentice-Hall, Englewood Cliffs New Jersey. 1-21.
- Cui X., Wang L., Zuo P., Han Z., Fang Z., *et al.*, 2004. D-galactose caused life shortening in *Drosophila melanogaster* and *Musca domestica* is associated with oxidative stress. *Biogerontology.* 5:317-325.
- Cunha N., Ilha J., Centenaro L., Lovatel G., Balbinot L., *et al.*, 2011. The effect of treadmill training on young and mature rats after traumatic peripheral nerve lesion. *Neurosci Lett.* 501:15-19.
- Daniels IR., Allum WH., 2005. The anatomy and physiology of the stomach. Upper Gastrointestinal Surgery. 17-37.
- Date Y., Murakami N., Toshinai K., Matsukura S., Nijima A., *et al.*, 2002. The role of gastric afferent vagal nerve in ghrelin-induced feeding and growth hormone secretion in rats. *Gastroenterology.* 123:1120-1128.
- Djaja S., 2012. Analisis penyebab kematian dan tantangan yang dihadapi penduduk lanjut usia di Indonesia menurut Riset Kesehatan Dasar 2007. *Buletin Penelitian Sistem Kesehatan.* 15:323-330.

- Djam'an Q., 2008. Pengaruh air perasan daun *Cyclea barbata miers* (cincau hijau) terhadap konsentrasi HCl lambung dan gambaran histopatologik lambung tikus galur wistar yang diinduksi *Acetylsalicylic acid*. Universitas Diponegoro, Semarang, Indonesia.
- Dorricott Nj., Fiddian-Green RG., Silen W., 1975. Mechanisms of acid disposal in canine duodenum. *Am J Physiol.* 228:269-275.
- Drouet M., Lauthier F., Charmes JP., Sauvage P., Ratinauh MH., 1999. Aged-associated changes in mitochondrial parameters on peripheral human lymphocytes. *Exp Gerontol.* 34:843-852.
- D'Souza AL., 2007. Ageing and the gut. Ageing Series. *Postgrad Med J.* 83:44-53.
- Edeas M., Attaf D., Mailfert AS., Nasu M., Joubet R., 2010. Maillard reaction, mitochondria and oxidative stress: potential role of antioxidants. *Pathol Biol (Paris).* 58:220-225.
- Finkel T., Holbrook NJ., 2000. Oxidants, oxidative stress and the biology of ageing. *Nature.* 408:239-247.
- Flemstrom G., 1986. Gastroduodenal mucosal secretion of bicarbonate and mucus. *Am J Med.* 81:18-22.
- Flemstrom G., Garner A., 1982. Gastroduodenal HCO₃⁻ transport: characteristics and proposed role in acidity regulation and mucosal protection. *Am J Physiol.* 242:G183-G193.
- Flemstrom G., Kivilaakso E., 1983. Demonstration of a pH gradient at the luminal surface of rat duodenum in vivo and its dependence on mucosal alkaline secretion. *Gastroenterology.* 84:787-794.
- Flemstrom G., Turnberg LA., 1984. Gastroduodenal defence mechanisms. *Clin Gastroenterol.* 13:327-354.
- Fleshner M., Goehler LE., Schwartz BA., McGorry M., Martin D., *et al.*, 1998. Thermogenic and corticosterone responses to intravenous cytokines (IL-1beta and TNF-alpha) are attenuated by subdiaphragmatic vagotomy. *J Neuroimmunol.* 86:134-141.
- Freidel D., Krevsky B., 2000. Irritable bowel syndrome in the elderly. *Clin Geriatr.* 8:36-47.
- Fried SK., Bunkin DA., Greenberg AS., 1998. Omental and subcutaneous adipose tissues of obese subjects release interleukin-6: depot difference and regulation by glucocorticoid. *J Clin Endocrinol Metab.* 83:847-850.
- Gaykema RP., Dijkstra I., Tilders FJ., 1995. Subdiaphragmatic vagotomy suppresses endotoxin-induced activation of hypothalamic corticotropin-releasing hormone neurons and ACTH secretion. *Endocrinology.* 136:4717-4720.
- Giam K., Teh, KC., 1992. Ilmu kedokteran olahraga. Binarupa Aksara. Grogol, Jakarta Barat, Indonesia.

- Gil P., Farinas F., Casado A & Lopez-Fernandez E. 2002. Malondialdehyde: a possible marker of ageing. *Gerontology*. 48:209-214.
- Gill R., Tsung A., Billiar T., 2010. Linking oxidative stress to inflammation: Tpl1-like receptors. *Free Radic Biol Med*. 48:1121–1132.
- Goberdhan DC., Wilson C., 2003. PTEN: tumor suppressor, multifunctional growth regulator and more. *Hum Mol Genet*. 2:239-248.
- Goh H., Bourne R., 2002. Non-steroidal anti-inflammatory drugs and perforated diverticular disease: a case-control study. *Ann Rev Coll Surg Engl*. 84:93-96.
- Gong GQ., Xu FB., 1991. Study of aging model in mice. *J China Pharm Univ*. 22:101–103.
- Grenbeck JE., Lacy ER., 1995. Role of gastric blood flow in impaired defense and repair on aged rat stomachs. *Am J Physiol*. 269:737-744.
- Gruver AL., Hudson LL., Sempowski GD., 2007. Immunosenescence of aging. *J Pathol*. 211:144-156.
- Gwee KA., Leong YL., Graham C., *et al.*, 1999. the role of psychological and biological factors in post-infectious gut dysfunction. *Gut*. 44:400-406.
- Haarala A., Kahonen M., Eklund C., Jylhava J., Koskinen T., *et al.*, 2011. Heart rate variability is independently associated with C-reactive protein but not with Serum amyloid A. The cardiovascular risk in Young Fians study. *Eur J Clin Invest*. 41:951-957.
- Habib NA., 2017. Pengaruh latihan fisik terhadap fibrosis hepar pada tikus jantan Wistar model penuaan dengan induksi D-galaktosa (kajian terhadap kadar SGPT dan rasio M1 & M2) [tesis]. Universitas Gadjah Mada. Yogyakarta. Indonesia.
- Haider S., Liaquat L., Shahzad S., Sadir S., Madiha S., *et al.* 2015. A high dose of shortterm exogenous D-galactose administration in young male rats produces symptoms simulating the natural aging process. *Life Sci*.124:110-119.
- Harmon JW., Woods M., Gurll NJ., 1978. Different mechanisms of hydrogen ion removal in stomach and duodenum. *Am J Physiol*. 235:692-698.
- Health MUSH, 2017. Stomach and duodenum. Medical University of South Carolina. Digestive Diseases Center.
- Hengartner MO., 2000. The biochemistry of apoptosis. *Nature*. 407:770-776.
- Hlobilkova A., Knillova J., Bartek J., Lukas J., Kolar Z., 2003. The mechanism of action of the tumour suppressor gene PTEN. *Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub*. 147:19-25.
- Ho SC., Liu JH., Wu RY., 2003. Establishment of the memetic aging effect in mice caused by D-galactose. *Biogerontology*. 4:15–18.
- Hollenberg M., Yang J., Haight TJ., Tager IB., 2006. Longitudinal changes in aerobic capacity: implications for concepts of aging. *J Gerontol A Biol Sci Med Sci*. 61:851-858.

- Holloszy JO, 1967. Biochemical adaptations in muscle. Effects of exercise on mitochondrial oxygen uptake and respiratory enzyme activity in skeletal muscle. *J Biol Chem.* 242:2278-2282.
- Holt PR., Yeh KY., 1988. Colonic proliferation is increased in senescent rats. *Gastroenterology.* 95:1556-1563.
- Holt PR., Yeh KY., 1989. Small intestinal crypt cell proliferation rates are increased in senescent rats. *J Gerontol B Psychol Sci Soc Sci.* 44:9-14.
- Hood DA., 2001. Invited Reviewer: Contractile activity-induced mitochondrial biogenesis in skeletal muscle. *J Appl Physiol.* 90:1137-1157.
- Hotamisligil GS., 2006. Inflammation and metabolic disorders. *Nature.* 444:860-867.
- Huang J., Kontos CD., 2002. PTEN modulates vascular endothelial growth factor-mediated signaling and angiogenic effects. *J Biol Chem.* 277:10760-10766.
- Hurley JV., 1972. Acute inflammation. Edinburgh, London: Curchill Livingstone.
- Huston JM., Tracey KJ., 2011. The pulse of inflammation: Heart rate variability, the cholinergic anti-inflammatory pathway, and implications for therapy. *J Intern Med.* 269:45-53.
- Ihsani A., 2017. Pengaruh latihan fisik terhadap cedera tubulus ginjal, disfungsi endotelial, dan glomerulosklerosis pada tikus *Wistar* jantan model penuaan dengan induksi D-galaktosa [tesis]. Universitas Gadjah Mada. Yogyakarta. Indonesia.
- Isenberg JI., Smedfors B., Johansson C., 1985. Effect of graded doses of intraluminal H₂, prostaglandin E₂, and inhibition of endogenous prostaglandin synthesis on proximal duodenal bicarbonate secretion in unanesthetized rat. *Gastroenterology.* 88:303-307.
- Jenkinson DH., Morton IKM., 1967. The role of alpha and beta-adrenergic receptors in some actions of catecholamines on intestinal smooth muscle. *J Appl Physiol.* 188:387-402.
- Jin HO., Lee KY., Chang TM., Chey WY., Dubois A., 1994. Secretin, a physiological regulator of gastric emptying and acid output in dogs. *Am J Physiol.* 267:702-708.
- Jin K., 2010. Modern biological theories of aging. *Aging Dis.* 1:72-74.
- Johnson TE., 2006. Recent results: biomarkers of aging. *Exp Gerontol.* 41:1243-1246.
- Joseph A-M., Adhietty PJ., Leeuwenburgh C., 2016. Beneficial effects of exercise on age-related mitochondrial dysfunction and oxidative stress in skeletal muscle. *J Physiol.* 594:5105-5123.
- Joyner MJ., 2011. Why physiology matters in medicine. *Physiology (Bethesda).* 26:72-75.
- Kahn SE., Hull, RL., Utzschneider, KM., 2006. Mechanisms linking obesity to insulin resistance and type 2 diabetes. *Nature.* 444:840-846.
- Kaleem A., Khurshid A., Ahmad I., Nasir EW., Khan S., *et al.*, 2008. Terminal galactose as cancer recognition marker: Computing analysis with implication of vicinal sugars, linkage and anomery. *Pakistan J Zool.* 40:135-143.

- Kane RL., Ouslander JG., Abras IB., 1989. Essentials of clinical geriatrics, 2nd ed. McGraw-Hill New York Hamburg Paris Tokyo. 3-17.
- Karima N., 2017. Pengaruh pemberian Alfa-galaktosa dosis tinggi selama 4 minggu terhadap *insulin-like growth factor-1* (igf-1) dan *brain derived neurotrophin factor* (BDNF) serta aktivitas motorik tikus *Wistar* jantan [tesis]. Universitas Gadjah Mada. Yogyakarta. Indonesia.
- Khalil T., Singh P., Fujimura M., Townsend CM., Greeley GH., *et al.*, 1988. Effect of aging on gastric acid secretion, serum gastrin, and antral gastrin content in rats. *Digest Dis Sci.* 33:1544-1548.
- Kim SW., Parekh D., Townsend CM., Thompson JC., 1990. Effects of aging on duodenal bicarbonate secretion. Department of Surgery, The University of Texas. Medical Branch, Galveston, Texas.
- Kohut ML., McCann DA., Russell DW., Konopka DN., Cunnick JE., *et al.*, 2006. Aerobic exercise, but not flexibility/resistance exercise, reduces serum IL-18, CRP, and IL-6 independent of beta-blockers, BMI, and psychosocial factors in older adults. *Brain Behav Immun.* 20:201-209.
- Kirkwood T., 2007. Ageaction 'Changing expectations of life', Vol. 1, 1st edition (Newcastle, UK: The Institute for Ageing and Health).
- Krabbe KS., Bruunsgaard H., Hansen CM., Moller K., Fonsmark L., *et al.*, 2001. Ageing is Associated with a prolonged fever response in human endotoxemia. *Clin Diagn Lab Immunol.* 8:333-338.
- Kramer AM., Schrier RW., 1990. Demographic, social, and economic issues. In: Schrier, RW ed geriatric medicine. W. B. Saunders Company. Philadelphia London Toronto. 1-10.
- Krammer PH., 2000. CD95's deadly mission in the immune system. *Nature.* 407:789-795.
- Kroemer G., Reed JC., 2000. Mitochondrial control of cell death. *Nature Med.* 6:513-519.
- Laine L., Takeuchi K., Tarnawski A., 2008. Gastric mucosal defense and cytoprotection: bench to bedside. *Gastroenterology.* 135:41-60.
- Lamberts SW., van den Beld AW., van der Lely AJ., 1997. The endocrinology of aging. *Science.* 273:419-424.
- Lampert L., Bremmer JD., Su S., Miller A., Lee F., *et al.*, 2008. Decreased heart rate variability is associated with higher levels of inflammation in middle-aged men. *Am. Heart J.* 156:7591-7597.
- Lee IM., Shiroma EJ., Lobelo F., Puska P., Blair SN., Katzmarzyk PT., 2012. Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy, *Lancet.* 380:219-229.
- Lee M., 1996. Age-related changes in gastric blood flow in rats. *Gerontology.* 42:289-293.
- Lee M., 1996. Age-related changes in gastric mucosal bicarbonate secretion in rats. *Age.* 19:55-58.

- Lee M., Feldman M., 1993. Age-related changes in gastric mucosal glycoprotein synthesis in rats basally and in response to acute aspirin exposure. *Gastroenterology*. 104:131.
- Lee M., Feldman M., 1994. Age-related reductions in gastric mucosal prostaglandin levels increase susceptibility to aspirin-induced injury in rats. *Gastroenterology*. 107:1746-1750.
- Lei M., Hua X., Xiao M., Ding J., Han Q., *et al.*, 2008. Impairments of astrocytes are involved in the D-galactose-induced brain aging. *Biochem Biophys Res Commun*. 369:1082-1087.
- Li YM., Dicks D., 1997. Enhanced binding of advanced glycation endproducts by Apo E4 isotype links mechanisms of plaque deposition in Alzheimer's disease. *Neurosc Lett*. 226:155-158.
- Li YM., Tan AX., Vlassara H., 1995. Antibacterial activity of lysozyme and lactoferrin is inhibited by binding of advanced glycation-modified proteins to a conserved motif. *Nat Med*. 1:1057-1061.
- Lu J., Zheng YL., Luo L., Wu DM., Sun DX., *et al.*, 2006. Quercetin reverses D-galactose induced neurotoxicity in mouse brain. *Behav Brain Res*. 171:251-260.
- Mao GX., Deng HB., Yuan LG., Li DD., Li YY., *et al.*, 2010. Protective role of salidroside against aging in mouse model induced by D-galactose. *Biomed Environ Sci*. 23:161-166.
- Majumdar APN., Jasti S., Hatfield JS., Tureaud J., Fligel SEG., 1990. Morphological and biochemical changes in gastric mucosa of aging rats. *Digest Dis Sci*. 35:1364-1370.
- Matsumono M., Inoue R., Tsukahara T., Ushida K., Chiji H., *et al.*, 2008. Voluntary running exercise alters microbiota composition and increases n-Butyrate concentration in the rat cecum. *Biosci Biotechnol Biochem*. 72:572-576.
- McElhaney JE., Meneilly GS., Beattie BL., Helgason CD., Lee SF., *et al.*, 1992. The effect of influenza vaccination on IL2 production in healthy elderly: implications for current vaccination practices. *J Gerontol*. 47:3-8.
- McLeod JD., 2000. Apoptotic capability in ageing T cells. *Mech Ageing Dev*. 121:151-159.
- Melov S., Tarnopolsky MA., Beckman K., Felkey K., Hubbard A., 2007. Resistance exercise reverse aging in human skeletal muscle. *PLoS ONE*. 2:465.
- Merkel IS., Locher J., Burgio K., *et al.* 1993. Physiological and psychological characteristics of an elderly population with chronic constipation. *Am J Gastroenterol*. 88:1854-1859.
- Miller, RA., 1994. The biology of aging and longevity, In: Hazzard, WR., Bierman, EL., Blass, JP., Ettinger Jr, WH., Halter, JB (eds). Principle of geriatric medicine and gerontology, 3rd ed. McGraw-Hill Inc. New York. 3-18.

- Moningka NC., Sindler AL., Muller-Delp JM., Baylis C., 2011. Twelve weeks of treadmill exercise does not alter age-dependent chronic kidney disease in the Fisher 344 male rat. *J Physiol.* 589:6129-6138.
- Moss C., Dhillon WS., Frost G., Hickson M., 2012. Gastrointestinal hormones: the regulation of appetite and the anorexia of ageing. *J Human Nutr Diet: Off J British Dietetic Association.* 25:3-15.
- Mutlu-Türkoğlu Ü., İlhan E., Öztezcan S., Kuru A., Aykac-Toker G., *et al.*, 2003. Age-related increases in plasma malondialdehyde and protein carbonyl levels and lymphocyte DNA damage in elderly subjects. *Clin Biochem.* 36:397-400.
- Nam SM., Kim JW., Yoo DY., Yim HS., Kim DW., *et al.*, 2014. Physical exercise ameliorates the reduction of neural stem cell, cell proliferation and neuroblast differentiation in senescent mice induced by D-galactose. *BMC Neurosci.* 15:116.
- Ogra PL., 2010. Ageing and its possible impact on mucosal immune responses. *Ageing Res Rev.* 9:101-106.
- Osiris S., Karbohidrat. <http://lordbroken.w.com/category/ilmu-dan-teknologi-pangan/senyawa-pangan/>. Download tanggal 12 Maret 2017.
- Park S., Kim CS., Lee J., Suk KJ., Kim J., 2003. Effect of regular exercise on the histochemical changes of D-galactose-induced oxidative renal injury in high-fed rats. *Acta Histochem Cytochem.* 46:111-119.
- Pescatello L., Arena R., Riebe D., Thompson PD., 2014. ACMS's Guidelines for Exercise Testing and Prescription Ninth Edition. Lippincott William & Wilkins.
- Peters HP., De Vries WR., Vanberge-Henegouwen GP., Akkermans LM., 2001. Potential benefits and hazards of physical activity and exercise on the gastrointestinal tract. *Gut.* 48:435-439.
- Porges SW, 2009. Reciprocal influences between body and brain in the perception and expression of affect. In: the healing power of emotion. Eds: Diana Fosha, Daniel J. Siegel, Marion Solomon. 27-54.
- Powers DC., 1992. Immunological principles and emerging strategies of vaccination for the elderly. *J Am Geriatr Soc.* 40:81-94.
- Powers DC., Belshe RB., 1993. Effect of age on cytotoxic T lymphocyte memory as well as serum and local antibody responses elicited by inactivated influenza virus vaccine. *J Infect Dis.* 167:584-592.
- Puigserver P., Spiegelman BM., 2003. Peroxisome proliferator-activated receptor- γ coactivator 1 α (PGC-1 α): transcriptional coactivator and metabolic regulator. *Endocr Rev.* 24:78-90.
- Punchard, NA., Whelan, CJ., Adcock, I., 2004. The journal of inflammation. *J Inflamm.* 1:1.
- Pusat Data dan Informasi Kementerian Kesehatan RI, 2016. Situasi lanjut usia (Lansia) di Indonesia.

- Rao SSC., Beaty J., Chamberlain M., Lambert PG., Gisolfi C., 1999. Effects of acute graded exercise on human colonic motility. *Am Physiol Soc.* 99:0193–1857.
- Redwine L., Snow S., Mills P., Irwin M., 2003. Acute psychological stress: effects on chemotaxis and cellular adhesion molecule expression. *Psychosom Med.* 65: 598-603.
- Relan NK., Fligiel SE., Dutta S., Tureaud J., Chauhan DP., *et al.*, 1995. Induction of EGF-receptor tyrosine kinase during early reparative phase of gastric mucosa and effects of aging. *Lab Invest.* 73:717-726.
- Rochmah W., Aswin S., 2001. Tua dan proses menua. *Berkala Ilmu Kedokteran.* 33:4.
- Rowell LB., 1974. Human cardiovascular adjustments to exercise and thermal stress. *Physiol Rev.* 54:75-159.
- Saaed RW., Varma S., Peng-Nemeroff T., Sherry B., Balakhaneh D., *et al.*, 2005. Cholinergic stimulation blocks endothelial cell activation and leukocyte recruitment during inflammation. *J Exp Med.* 201:1113-1123.
- Safdar A., Bourgeois JM., Ogborn DI., Little JP., Hettinga BP., *et al.*, 2011. Endurance exercise rescues progeroid aging and induces systemic mitochondrial rejuvenation in mtDNA mutator mice. *Proc Natl Acad Sci USA.* 108:4135-4140.
- Saffrey MJ., 2014. Aging of the mammalian gastrointestinal tract: a complex organ system. *AGE.* 36:1019-1032.
- Salikunna NA., 2017. Pengaruh latihan fisik teratur dan teratur pada ventrikel kiri jantung tikus *Wistar (rattus novergicus)* jantan model penuaan (kajian terhadap sel fibroblas, kadar periostin, dan ketebalan dinding ventrikel) [tesis]. Universitas Gadjah Mada. Yogyakarta. Indonesia.
- Saltzman RL., Peterson PK., 1987. Immunodeficiency of the elderly. *Rev Infect Dis.* 9:1127-1139.
- Schadewaldt P., Hammen HW., Loganathan K., Bodner-Leidecker A., Wendel U., 2000. Analysis of concentration and (13)C enrichment of D-galactose in human plasma. *Clin Chem.* 46:612–619.
- Schuster MM., 1976. Disorders of the Aging GI System. *Hosp Prac Sept.* 95-103.
- Schwartz GJ., McHugh PR., Moran TH., 1991. Integration of vagal afferent responses to gastric loads and cholecystokinin in rats. *Am J Physiol.* 261:R64-R69.
- Schwartz GJ., Tougas G., Moran TH., 1995. Integration of vagal afferent responses to duodenal loads and exogenous CCK in rats. *Peptides.* 16:707-711.
- Semba RD., Nicklett EJ., Ferrucci L., 2010. Does accumulation of advanced endproducts contribute to the aging phenotype? *J Gerontol A Biol Sci Med Sci.* 65:963-975.
- Shearer GM., 1997. Th1/Th2 changes in aging. *Mech Aging Dev.* 94:1-5.
- Shephard RJ., 2009. Maximal oxygen intake and independence in old age. *Br J Sports Med.* 43:342-346.

- Short KR., Vittone JL., Bigelow ML., Proctor DN., Rizza RA., *et al.*, 2003. Impact of aerobic exercise training on age-related changes in insulin sensitivity and muscle oxidative capacity. *Diabetes*. 52:1888-1896.
- Simm A., Nass N., Bartling B., Hofmann B., Silber R-E., *et al.*, 2008. Potential biomarkers of ageing. *Biol Chem*. 389:257-265.
- Simson JNL., Merhav A., Silen W., 1981. Alkaline secretion by amphibian duodenum. I. General characteristics. *Am J Physiol*. 240:401-408.
- Song X., Bao M., Li D., Li YM., 1999. Advanced glycation in D-galactose induced mouse aging model. *Mech Ageing Dev*. 108:239-251.
- Spector WG., Willoughby DA., 1963. The inflammatory response. *Bacteriol Rev*. 27:117-149.
- Stambolic V., Suzuki A., de la Pompa JL., Brothers GM., Mirtsos C., *et al.*, 1998. Negative regulation of PKB/Akt-dependent cell survival by the tumor suppressor PTEN. *Cell*. 95:29-39.
- Taddei S., Virdis A., Mattei P., Ghiadoni L., Gennari A., *et al.*, 1995. Aging and endothelial function in normotensive subjects and patients with essential hypertension. *Circulation*. 91:1981-1987.
- Tarnawski AS., Ahluwalia A., Jones MK., 2012. The mechanisms of gastric mucosal injury: focus on microvascular endothelium as a key target. *Curr Med Chem*. 19:4-15.
- Tarnawski A., Pai R., Deng X., Ahluwalia A., Khomenko T., *et al.*, 2007. Aging gastropathy-novel mechanisms: hypoxia, up-regulation of multifunctional phosphatase PTEN, and proapoptotic factors. *Gastroenterology*. 133:1938-1947.
- Taylor L., Schneider E., Smith J., Polgar P., 1981. Prostaglandin production and cellular aging. *Mech Ageing Dev*. 16:311-317.
- Tortora GJ., Derrickson, B. 2014. Principles of anatomy & physiology. 14th edition. Wiley.
- Tracey KJ., 2007. Physiology and immunology of the cholinergic antiinflammatory pathway. *J Clin Investig*. 117:289-296.
- Tracey KJ., 2009. Reflex control of immunity. *Nat Rev Immunol*. 9:418-428.
- Truelove SC., 1996. Movements of the large intestine. *Physiology Rev*. 46:457-512.
- Tsukimi Y., Okabe S., 1995. Changes in gastric function and healing of chronic gastric ulcers in aged rats. *Jpn J Pharmacol*. 68:103-110.
- Tureaud J., Sarkar FH., Fligel SE., Kulkarni S., Jaszewski R., *et al.*, 1997. Increased expression of EGFR in gastric mucosa of aged rats. *Am J Physiol Gastrointest Liver Physiol*. 273:389-398.
- Utami KP., Efek latihan fisik terhadap osteoblastus dan osteoklastus pada tikus *Wistar* jantan model penuaan yang diinduksi D-galaktosa [tesis]. Universitas Gadjah Mada. Yogyakarta. Indonesia.
- Van Praag H., Shubert T., Zhao C., Gage FH., 2005. Exercise enhances learning and hippocampal neurogenesis in aged mice. *J Neurosci*. 25:8680-8685.

- Vieira VJ., Valentine RJ., McAuley E., Evans E., Woods JA., 2007. Independent relationship between heart rate recovery and C-reactive protein in older adults. *J Am Geriatr Soc.* 55:747-751.
- Viswanathan K., Dhabhar FS., 2005. Stress-induced enhancement of leukocyte trafficking into sites of surgery or immune activation. *Proc Natl Acad Sci USA.* 102:5808-5813.
- Vlassara H., Striker LJ., Teichberg S., Fuh H., Li YM., *et al.*, 1994. Advanced glycation endproducts induce glomerular sclerosis and albuminuria in normal rats. *Proc Natl Acad Sci. USA.* 91:11704-11708.
- Vogiagis D., Glare EM., Misajon A., Brown W., O'Brien PE., 2000. Cyclooxygenase-1 and an alternatively spliced mRNA in the rat stomach: effects of aging and ulcers. *Am J Physiol Gastrointest Liver Physiol.* 278:820-827.
- Wang CQ., Udupa KB., Xiao H., Lipschitz DA., 1995. Effect of age on marrow macrophage number and function. *Aging (Milano).* 7:379-384.
- WebMD, 2017. About inflammation. <http://www.webmd.com/arthritis/about-inflammation?print=true>. Download tanggal 28 Maret 2017.
- WHO, 1985. Diabetes mellitus, report of a WHO study group, WHO technical report series 727.
- WHO, 2010. Global recommendations on physical activity for health. Geneva, Switzerland: WHO Library Cataloguing-in-Publication Data.
- WHO, 2016. Health statistics and information system. Global Health Estimates 2015 summary tables: Global deaths by cause, age and sex, 2000-2015. Geneva, Switzerland.
- Woods JA., Wilund KR., Martin SA., Kistler BM., 2011. Exercise, inflammation and aging. *Aging Dis.* 3:130-140.
- Xu H., Barnes GT., Yang Q., Tan G., Yang D., *et al.*, 2003. Chronic inflammation in fat plays a crucial role in the development of obesity-related insulin resistance. *J Clin Invest.* 112:1821-1830.