



DAFTAR PUSTAKA

- Al-Goblan, A.S., Al-Alfi, M.A., dan Khan, M.Z., 2014. Mechanism linking diabetes mellitus and obesity. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy*, **7**: 587–591.
- American Diabetes Association, 2015. Classification and Diagnosis of Diabetes. *Diabetes Care*, **38**: S8–S16.
- Armoni, M., Kritz, N., Harel, C., Bar-Yoseph, F., Chen, H., Quon, M.J., dkk., 2003. Peroxisome proliferator-activated receptor- γ represses GLUT4 promoter activity in primary adipocytes, and rosiglitazone alleviates this effect. *Journal of Biological Chemistry*, **278**: 30614–30623.
- Arneth, B., Arneth, R., dan Shams, M., 2019. Metabolomics of Type 1 and Type 2 Diabetes. *International Journal of Molecular Sciences*, **20**: 2467.
- Augustine, A.W., Narasimhan, A., Vishwanathan, M., dan Karundevi, B., 2014. Evaluation of antidiabetic property of *Andrographis paniculata* powder in high fat and sucrose-induced type-2 diabetic adult male rat. *Asian Pacific Journal of Tropical Disease*, **4**: S140–S147.
- Benton, C.R., Koonen, D.P.Y., Calles-Escandon, J., Tandon, N.N., Glatz, J.F.C., Luiken, J.J.F.P., dkk., 2006. Differential effects of contraction and PPAR agonists on the expression of fatty acid transporters in rat skeletal muscle. *Journal of Physiology*, **573**: 199–210.
- Biomol, I., Biomed, Sivananthan, M., dan Manoharan, E., 2013. Medicinal and pharmacological properties of *Andrographis paniculata* 1–12.
- Borai, A., Livingstone, C., dan Ferns, G.A.A., 2007. The biochemical assessment of insulin resistance. *Annals of Clinical Biochemistry: International Journal of Laboratory Medicine*, **44**: 324–342.
- BPOM RI, 2011. *Acuan Sediaan Herbal*, 1st ed. Direktorat Obat Asli Indonesia.
- Cao, Z., Umek, R.M., dan McKnight, S.L., 1991. Regulated expression of three C/EBP isoforms during adipose conversion of 3T3-L1 cells. *Genes & Development*, **5**: 1538–1552.
- Chao, W.-W. dan Lin, B.-F., 2010. Isolation and identification of bioactive compounds in *Andrographis paniculata* (Chuanxinlian). *Chinese Medicine*, **5**: 17.



- Chinetti, G., Fruchart, J.C., dan Staels, B., 2000. Peroxisome proliferator-activated receptors (PPARs): nuclear receptors at the crossroads between lipid metabolism and inflammation. *Inflammation Research: Official Journal of the European Histamine Research Society ... [et Al.]*, **49**: 497–505.
- 'Classification of diabetes mellitus', n.d. URL: <https://www.who.int/publications-detail-redirect/classification-of-diabetes-mellitus> (diakses tanggal 4/4/2021).
- Clément, K., Viguerie, N., Poitou, C., Carette, C., Pelloux, V., Curat, C.A., dkk., 2004. Weight loss regulates inflammation-related genes in white adipose tissue of obese subjects. *FASEB journal: official publication of the Federation of American Societies for Experimental Biology*, **18**: 1657–1669.
- DeFronzo, R.A., 2009. From the Triumvirate to the Ominous Octet: A New Paradigm for the Treatment of Type 2 Diabetes Mellitus. *Diabetes*, **58**: 773–795.
- Després, J.P. dan Lemieux, I., 2006. Abdominal obesity and metabolic syndrome. *Nature*, .
- Dexa Medica, 2019. 'Inlacin' Dexa Medica. URL: <https://www.dexamedica.com/OriginalResearch/Inlacin> (diakses tanggal 7/7/2020).
- Dif, N., Euthine, V., Gonnet, E., Laville, M., Vidal, H., dan Lefai, E., 2006. Insulin activates human sterol-regulatory-element-binding protein-1c (SREBP-1c) promoter through SRE motifs. *Biochemical Journal*, **400**: 179–188.
- Du, G.-H., 2018. *Natural Small Molecule Drugs from Plants*, 1st ed. 2018. ed. Springer Singapore : Imprint: Springer, Singapore.
- Eggleton, J.S. dan Jialal, I., 2021. Thiazolidinediones, dalam: *StatPearls*. StatPearls Publishing, Treasure Island (FL).
- El Akoum, S., 2014. PPAR Gamma at the Crossroads of Health and Disease: A Masterchef in Metabolic Homeostasis. *Endocrinology & Metabolic Syndrome*, **03**: .
- Fajas, L., 2009. Adipogenesis: a cross-talk between cell proliferation and cell differentiation.
- Farmer, S.R., 2006. Transcriptional control of adipocyte formation. *Cell Metabolism*, **4**: 263–273.



- Fasshauer, M., Klein, J., Ueki, K., Kriauciunas, K.M., Benito, M., White, M.F., dkk., 2000. Essential role of insulin receptor substrate-2 in insulin stimulation of Glut4 translocation and glucose uptake in brown adipocytes. *Journal of Biological Chemistry*, **275**: 25494–25501.
- Ferré, P., 2004. 'The Biology of Peroxisome Proliferator-Activated Receptors: Relationship with Lipid Metabolism and Insulin Sensitivity', dalam: *Diabetes*. American Diabetes Association Inc., hal. S43–S50.
- Fitrawan, L.O.M., Ariastuti, R., Tjandrawinata, R., Nugroho, A., dan Pramono, S., 2018. Antidiabetic effect of combination of fractionated-extracts of *Andrographis paniculata* and *Centella asiatica*: In vitro study. *Asian Pacific Journal of Tropical Biomedicine*, **8**: 527–532.
- Fu, Y., Luo, N., Klein, R.L., dan Timothy Garvey, W., 2005. Adiponectin promotes adipocyte differentiation, insulin sensitivity, and lipid accumulation. *Journal of Lipid Research*, **46**: 1369–1379.
- Gbaguidi, F.G., Chinetti, G., Milosavljevic, D., Teissier, E., Chapman, J., Olivecrona, G., dkk., 2002. Peroxisome proliferator-activated receptor (PPAR) agonists decrease lipoprotein lipase secretion and glycated LDL uptake by human macrophages. *FEBS Letters*, **512**: 85–90.
- Ghosh, B., Datta, A., Mandal, A., Dubey, P., dan Halder, S., 2012. An overview on *Andrographis paniculata* (Burm. F.) Nees. *International Journal of Research in Ayurveda & Pharmacy*, **3**: 752–760.
- González, E.L.M., Johansson, S., Wallander, M.-A., dan Rodríguez, L.A.G., 2009. Trends in the prevalence and incidence of diabetes in the UK: 1996–2005. *Journal of Epidemiology and Community Health*, **63**: 332–336.
- Goodpaster, B.H., Theriault, R., Watkins, S.C., dan Kelley, D.E., 2000. Intramuscular lipid content is increased in obesity and decreased by weight loss. *Metabolism: Clinical and Experimental*, **49**: 467–472.
- Gregoire, F.M., Smas, C.M., dan Sul, H.S., 1998. Understanding adipocyte differentiation. *Physiological Reviews*, **78**: 783–809.
- Hausman, D.B., DiGirolamo, M., Bartness, T.J., Hausman, G.J., dan Martin, R.J., 2001. The biology of white adipocyte proliferation. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, **2**: 239–254.
- Hausman, G.J. dan Richardson, R.L., 2004. Adipose tissue angiogenesis. *Journal of Animal Science*, **82**: 925–934.



Hossain, M.A., Roy, B.K., Ahmed, K., Chowdhury, A.S., dan Rashid, M.A., 2007. Antidiabetic Activity of *Andrographis paniculata*. *Dhaka University Journal of Pharmaceutical Sciences*, **6**: 15–20.

'IDF Diabetes Atlas 9th edition 2019', n.d. URL: <https://www.diabetesatlas.org/en/> (diakses tanggal 22/5/2021).

Jin, L., Fang, W., Li, B., Shi, G., Li, X., Yang, Y., dkk., 2012. Inhibitory effect of Andrographolide in 3T3-L1 adipocytes differentiation through the PPAR γ pathway. *Molecular and Cellular Endocrinology*, **358**: 81–87.

Jin, L., Shi, G., Ning, G., Li, X., dan Zhang, Z., 2011. Andrographolide attenuates tumor necrosis factor-alpha-induced insulin resistance in 3T3-L1 adipocytes. *Molecular and Cellular Endocrinology*, **332**: 134–139.

Kido, Y., Nakae, J., dan Accili, D., 2001. The Insulin Receptor and Its Cellular Targets¹. *The Journal of Clinical Endocrinology & Metabolism*, **86**: 972–979.

Krentz, A.J., Clough, G., dan Byrne, C.D., 2007. Interactions between microvascular and macrovascular disease in diabetes: pathophysiology and therapeutic implications. *Diabetes, Obesity & Metabolism*, **9**: 781–791.

Lefterova, M.I. dan Lazar, M.A., 2009. New developments in adipogenesis. *Trends in endocrinology and metabolism: TEM*, **20**: 107–114.

Lehmann, J.M., Moore, L.B., Smith-Oliver, T.A., Wilkison, W.O., Willson, T.M., dan Kliewer, S.A., 1995. An Antidiabetic Thiazolidinedione Is a High Affinity Ligand for Peroxisome Proliferator-activated Receptor γ (PPAR γ). *Journal of Biological Chemistry*, **270**: 12953–12956.

Leonardini, A., Laviola, L., Perrini, S., Natalicchio, A., dan Giorgino, F., 2009. Cross-Talk between PPAR γ and Insulin Signaling and Modulation of Insulin Sensitivity. *PPAR Research*, **2009**: .

Lustig, M., Feng, Q., Payan, Y., Gefen, A., dan Benayahu, D., 2019. Noninvasive Continuous Monitoring of Adipocyte Differentiation: From Macro to Micro Scales. *Microscopy and Microanalysis*, **25**: 119–128.

Malik, Z., Parveen, R., Parveen, B., Zahiruddin, S., Aasif Khan, M., Khan, A., dkk., 2021. Anticancer potential of andrographolide from *Andrographis paniculata* (Burm.f.) Nees and its mechanisms of action. *Journal of Ethnopharmacology*, **272**: 113936.

Manaf, A., 2014. Insulin Resistance as a Predictor of Worsening of Glucose Tolerance in Type 2 Diabetes Mellitus, dalam: *Medicinus: Scientific Journal of Pharmaceutical Development and Medical Application*, 2. Dexa Medica, Tangerang, Indonesia.



- Matsuo, K., Bettaieb, A., Nagata, N., Matsuo, I., Keilhack, H., dan Haj, F.G., 2011. Regulation of Brown Fat Adipogenesis by Protein Tyrosine Phosphatase 1B. *PLoS ONE*, **6**: e16446.
- Matthaei, S., Stumvoll, M., Kellerer, M., dan Häring, H.U., 2000. Pathophysiology and pharmacological treatment of insulin resistance. *Endocrine Reviews*, **21**: 585–618.
- Misra, P., Pal, N.L., Guru, P.Y., Katiyar, J.C., Srivastava, V., dan Tandon, J.S., 1992. Antimalarial Activity of *Andrographis paniculata* (Kalmegh) against *Plasmodium berghei* NK 65 in *Mastomys natalensis*. *International Journal of Pharmacognosy*, **30**: 263–274.
- Monsalve, F.A., Pyarasani, R.D., Delgado-Lopez, F., dan Moore-Carrasco, R., 2013. Peroxisome Proliferator-Activated Receptor Targets for the Treatment of Metabolic Diseases. *Mediators of Inflammation*, **2013**: 1–18.
- Morgenweck, J., Abdel-aleem, O.S., McNamara, K.C., Donahue, R.R., Badr, M.Z., dan Taylor, B.K., 2010. Activation of peroxisome proliferator activated receptor γ in brain inhibits inflammatory pain, dorsal horn expression of Fos, and local edema. *Neuropharmacology*, **58**: 337.
- Munhoz, A.C.M. dan Frode, T.S., 2018. Isolated Compounds from Natural Products with Potential Antidiabetic Activity - A Systematic Review. *Current Diabetes Reviews*, **14**: 36–106.
- Nagalekshmi, R., Menon, A., Chandrasekharan, D.K., dan Nair, C.K.K., 2011. Hepatoprotective activity of *Andrographis Paniculata* and *Swertia Chirayita*. *Food and Chemical Toxicology*, **49**: 3367–3373.
- Niranjan, A., Tewari, S.K., dan Lehri, A., 2010. Biological activities of <i style="">Kalmegh</i> (*Andrographis paniculata* Nees). *IJNPR Vol.1(2)* [June 2010], .
- Novitasari, P.R., Astuti, N.T., Pramono, S., Tjandrawinata, R., dan Nugroho, A.E., 2020. A Simple Liquid-Liquid Fractionation (LLF) Method for Isolating Deoxyandrographolide dan Andrographolide from Herbs of *Andrographis paniculata* (Burm., f) Ness and Its Cytotoxic Activity on 3T3-L1 Preadipocyte Cells. *Journal of Food and Pharmaceutical Sciences*, **8**: 2–2.
- Nugroho, A.E., Andrie, M., Warditiani, N.K., Siswanto, E., Pramono, S., dan Lukitaningsih, E., 2012. Antidiabetic and antihyperlipidemic effect of *Andrographis paniculata* (Burm. f.) Nees and andrographolide in high-fructose-fat-fed rats. *Indian Journal of Pharmacology*, **44**: 377–381.



Nugroho, A.E., Rais, I.R., Setiawan, I., Pratiwi, P.Y., Hadibarata, T., Tegar, M., dkk., 2013. Pancreatic effect of andrographolide isolated from *Andrographis paniculata* (Burm. f.) Nees. *Pakistan Journal of Biological Sciences*, **17**: 22–31.

Nugroho, A.E., Rais, I.R., Setiawan, I., Pratiwi, P.Y., Hadibarata, T., Tegar, M., dkk., 2014. Pancreatic effect of andrographolide isolated from *Andrographis paniculata* (Burm. f.) Nees. *Pakistan journal of biological sciences: PJBS*, **17**: 22–31.

Ojha, S., Nandave, M., Kumari, S., dan Arya, D., 2009. Antioxidant Activity of *Andrographis paniculata* in Ischemic Myocardium of Rats. *Global J. Pharmacol.*, **3**:

Olefsky, J.M. dan Saltiel, A.R., 2000. PPAR gamma and the treatment of insulin resistance. *Trends in endocrinology and metabolism: TEM*, **11**: 362–368.

Patel, J. dan Javiya, V., 2006. The role of peroxisome proliferator-activated receptors in human disease. *Indian Journal of Pharmacology*, **38**: 243.

Prokesch, A., Hackl, H., Hakim-Weber, R., Bornstein, S.R., dan Trajanoski, Z., 2009. Novel insights into adipogenesis from omics data. *Current Medicinal Chemistry*, **16**: 2952–2964.

PubChem, n.d. 'Andrographolide'. URL:
<https://pubchem.ncbi.nlm.nih.gov/compound/5318517> (diakses tanggal 11/1/2022a).

PubChem, n.d. 'Pioglitazone hydrochloride'. URL:
<https://pubchem.ncbi.nlm.nih.gov/compound/60560> (diakses tanggal 11/1/2022b).

Qi, C. dan Pekala, P.H., 2008. Tumor Necrosis Factor- α -Induced Insulin Resistance in Adipocytes. *Proceedings of the Society for Experimental Biology and Medicine*, **223**: 128–135.

Rival, Y., Stennevin, A., Puech, L., Rouquette, A., Cathala, C., Lestienne, F., dkk., 2004. Human adipocyte fatty acid-binding protein (aP2) gene promoter-driven reporter assay discriminates nonlipogenic peroxisome proliferator-activated receptor γ ligands. *Journal of Pharmacology and Experimental Therapeutics*, **311**: 467–475.

Rizzatti, V., Boschi, F., Pedrotti, M., Zoico, E., Sbarbati, A., dan Zamboni, M., 2013. Lipid Droplets Characterization in Adipocyte Differentiated 3T3-L1 Cells: Size and Optical Density Distribution. *European Journal of Histochemistry : EJH*, **57**: e24.



Santa, I.G.P., 1996. STUDI TAKSONOMI SAMBILOTO ANDROGRAPHIS PANICULATA (BURM.F) NESS. *Warta Tumbuhan Obat Indonesia*, **3**: .

Sarjeant, K. dan Stephens, J.M., 2012. Adipogenesis. *Cold Spring Harbor Perspectives in Biology*, **4**: .

Shaw, J.E., Sicree, R.A., dan Zimmet, P.Z., 2010. Global estimates of the prevalence of diabetes for 2010 and 2030. *Diabetes Research and Clinical Practice*, **87**: 4–14.

Shoelson, S.E., Lee, J., dan Goldfine, A.B., 2006. Inflammation and insulin resistance. *Journal of Clinical Investigation*, .

Son, N.H., Park, T.S., Yamashita, H., Yokoyama, M., Huggins, L.A., Okajima, K., dkk., 2007. Cardiomyocyte expression of PPAR γ leads to cardiac dysfunction in mice. *Journal of Clinical Investigation*, **117**: 2791–2801.

Song, Y.-X., Liu, S.-P., Jin, Z., Qin, J.-F., dan Jiang, Z.-Y., 2013. Qualitative and quantitative analysis of *Andrographis paniculata* by rapid resolution liquid chromatography/time-of-flight mass spectrometry. *Molecules (Basel, Switzerland)*, **18**: 12192–12207.

Spiegelman, B. M., 1998. PPAR-gamma: adipogenic regulator and thiazolidinedione receptor. *Diabetes*, **47**: 507–514.

Steppan, C.M., Bailey, S.T., Bhat, S., Brown, E.J., Banerjee, R.R., Wright, C.M., dkk., 2001. The hormone resistin links obesity to diabetes. *Nature*, **409**: 307–312.

Stipanuk, M.H., 2000. *Biochemical and Physiological Aspects of Human Nutrition*, 1 edition. ed. Saunders, Philadelphia.

Stöckli, J. dan James, D., 2009. GLUT4. *AfCS-Nature Molecule Pages*, .

Suharmiati, S. dan Handayani, L., 2001. Isolasi dan Identifikasi Andrografolida dari Herba *Andrographis paniculata* Ness. *Media Penelitian dan Pengembangan Kesehatan*, **11**: .

Syukri, Y., Martien, R., Lukitaningsih, E., dan Nugroho, A.E., 2018. Quantification of Andrographolide Isolated from *Andrographis paniculata* Nees Obtained from Traditional Market in Yogyakarta Using Validated HPLC. *Indonesian Journal of Chemistry*, **16**: 190.

Tontonoz, P. dan Spiegelman, B.M., 2008. Fat and beyond: the diverse biology of PPARgamma. *Annual Review of Biochemistry*, **77**: 289–312.



- Tyagi, S., Sharma, S., Gupta, P., Saini, A., dan Kaushal, C., 2011. The peroxisome proliferator-activated receptor: A family of nuclear receptors role in various diseases. *Journal of Advanced Pharmaceutical Technology & Research*, **2**: 236.
- Tandrasasmita, O.M., Wulan, D.D., Nailufar, F., Sinambela, J., dan Tjandrawinata, R.R., 2011. Glucose-lowering effect of DLBS3233 is mediated through phosphorylation of tyrosine and upregulation of PPAR γ and GLUT4 expression. *International Journal of General Medicine*, **4**: 345–357.
- Thorens, B. dan Mueckler, M., 2010. Glucose transporters in the 21st Century. *American Journal of Physiology - Endocrinology and Metabolism*, **298**: E141–E145.
- Tjandrawinata, R., 2016. Patogenesis Diabetes Tipe 2: Resistensi Insulin dan Defisiensi Insulin. *A Working Review Paper*, .
- Tjandrawinata, R., Wulan, Nailufar, F., Sinambela, dan Tandrasasmita, O., 2011. Glucose-lowering effect of DLBS3233 is mediated through phosphorylation of tyrosine and upregulation of PPAR γ ; and GLUT4 expression. *International Journal of General Medicine*, 345.
- Tontonoz, P. dan Spiegelman, B.M., 2008. Fat and beyond: the diverse biology of PPAR γ . *Annual Review of Biochemistry*, **77**: 289–312.
- Trayhurn, P. dan Wood, I.S., 2005. Signalling role of adipose tissue: adipokines and inflammation in obesity. *Biochemical Society Transactions*, **33**: 1078–1081.
- Widyastuti, N. dan Giarni, R., 2015. Total Sugar Content in Healthy Drinks of Oyster Mushroom (*Pleurotus ostreatus*) as Beta-Glucan Resources 7.
- Widyawati, T., 2007. Aspek Farmakologi Sambiloto (*Andrographis paniculata* Nees) **40**: 7.
- Wilcox, G., 2005. Insulin and Insulin Resistance. *Clinical Biochemist Reviews*, **26**: 19–39.
- Williams Christine L., Hayman Laura L., Daniels Stephen R., Robinson Thomas N., Steinberger Julia, Paridon Stephen, dkk., 2002. Cardiovascular Health in Childhood. *Circulation*, **106**: 143–160.
- World Health Organization, 2019. 'Diabetes'. URL: <https://www.who.int/westernpacific/health-topics/diabetes> (diakses tanggal 28/6/2019).



- Yahia, R.B., Lichnovská, R., dan Brychta, T., 2005. The Metabolic Syndrome: Relationship Between Insulin Sensitivity And The Role Of Peroxisome Proliferator-Activated Receptors (PPARs) In Saccharide And Lipid Metabolism. *Biomedical Papers*, **149**: 237–241.
- Yeh, W.C., Cao, Z., Classon, M., dan McKnight, S.L., 1995. Cascade regulation of terminal adipocyte differentiation by three members of the C/EBP family of leucine zipper proteins. *Genes & Development*, **9**: 168–181.
- Youssef, J. dan Badr, M.Z., 2013. PPARs: history and advances. *Methods in Molecular Biology (Clifton, N.J.)*, **952**: 1–6.
- Zheng, Y., Ley, S.H., dan Hu, F.B., 2018. Global aetiology and epidemiology of type 2 diabetes mellitus and its complications. *Nature Reviews Endocrinology*, .