

## DAFTAR PUSTAKA

- Alberti, K. G. M. M., Eckel, R. H., Grundy, S. M., Zimmet, P. Z., Cleeman, J. I., Donato, K. A., *et al.* 2009. Harmonizing the Metabolic Syndrome International Atherosclerosis Society; and International Association for the Study of Obesity. *J. Am. Heart Assoc.* :1640–1645. doi: 10.1161/circulationaha.109.192644.
- Anonim 2008. *Waist circumference and waist-hip ratio report of a WHO expert consultation.* Geneva. Tersedia pada: <http://www.who.int>.
- Anonim 2013. Manual procedure of DRG Insulin ELISA (EIA-2935). USA. Tersedia pada: [www.drg-international.com](http://www.drg-international.com).
- Anonim 2016a. Manual procedure of Glucose-HK, Triglyceride, Total Cholesterol-Gen2 and HDL-Precipitant Gen 4. Germany. Tersedia pada: <https://diagnostics.roche.com/>.
- Anonim 2016b. *Peraturan Menteri Kesehatan Republik Indonesia Nomor 25 Tahun 2016 Tentang Rencana Aksi Nasional Kesehatan Lanjut Usia Tahun 2016-2019.* Jakarta. Tersedia pada: [http://hukor.kemkes.go.id/uploads/produk\\_hukum/PMK\\_No.\\_25\\_ttg\\_Rencana\\_Aksi\\_Nasional\\_Kesehatan\\_Lanjut\\_Usia\\_Tahun\\_2016-2019\\_.pdf](http://hukor.kemkes.go.id/uploads/produk_hukum/PMK_No._25_ttg_Rencana_Aksi_Nasional_Kesehatan_Lanjut_Usia_Tahun_2016-2019_.pdf).
- Anonim 2018. *Hasil Utama Riset Kesehatan Dasar Tahun 2018 Kementerian Kesehatan Republik Indonesia.* Jakarta. Tersedia pada: <http://www.depkes.go.id/resources/download/info-terkini/hasil-riskesdas-2018.pdf>.
- Anonim 2020. *Manual procedure of genomic DNA extraction blood DNA mini/midi/maxi.* Tersedia pada: [http://www.favorgen.com/products/nucleic\\_genomic\\_dna\\_extraction/blood\\_dna.html](http://www.favorgen.com/products/nucleic_genomic_dna_extraction/blood_dna.html).
- Anonim 2021a. *HNF1A Hepatocyte Nuclear Factor 1 Homeobox A (homo sapiens/human).* Tersedia pada: [https://www.ncbi.nlm.nih.gov/genome/gdv/browser/genome/?id=GCF\\_000001405.39](https://www.ncbi.nlm.nih.gov/genome/gdv/browser/genome/?id=GCF_000001405.39).
- Anonim 2021b. *Variant information gene hepatocyte nuclear factor 1-alpha p.A98V.* Tersedia pada: [https://web.expasy.org/variant\\_pages/VAR\\_010540.html#](https://web.expasy.org/variant_pages/VAR_010540.html#).
- Anuradha, S., Radha, V., Deepa, R., Hansen, T., Carstensen, B., Pedersen, O., *et al.* 2005. A prevalent amino acid polymorphism at codon 98 (Ala98Val) of the hepatocyte nuclear factor-1 $\alpha$  is associated with maturity-onset diabetes of the young and younger age at onset of type 2 diabetes in Asian Indians. *Diabetes Care* 28(10):2430–2435.

- Armendariz, A. D. dan Krauss, R. M. 2009. Hepatic nuclear factor 1- a : inflammation , genetics , and atherosclerosis. *Genet. Mol. Biol.* 20:106–111. doi: 10.1097/MOL.0b013e3283295ee9.
- Au, W., Lu, L., Yeung, C., Liu, C., Wong, O. G., Lai, L., *et al.* 2008. Hepatocyte nuclear factor 1 binding element within the promoter of microsomal triglyceride transfer protein ( MTTP ) gene is crucial for MTTP basal expression and insulin responsiveness. *J. Mol. Endocrinology* 41:229–238. doi: 10.1677/JME-08-0080.
- Awa, W. L., Thon, A., Raile, K., Grulich-Henn, J., Meissner, T., Schober, E., *et al.* 2011. Genetic and clinical characteristics of patients with HNF1A gene variations from the German-Austrian DPV database. *Eur. J. Endocrinol.* 164(4):513–520. doi: 10.1530/EJE-10-0842.
- Babaya, N., Ikegami, H., Fujisawa, T., Nojima, K., Itoi-babaya, M., Inou, K., *et al.* 2003. Association of I27L Polymorphism of Hepatocyte Nuclear. *J. Clin. Endocrinol. Metab.* 88(6):2548–2551. doi: 10.1210/jc.2002-021891.
- Belanne-Chantelot, C., Carette, C., Riveline, J., Larger, E., Reznik, Y., Ducluzeau, P., *et al.* 2008. The Type and the Position of HNF1A Mutation Modulate. *Diabetes* 57(February):503–508. doi: 10.2337/db07-0859.Additional.
- Bermudez, V., Rojos, J., Salazar, J., Calvo, M. J., Morillo, J., Torres, W., *et al.* 2014. The Maracaibo city metabolic syndrome prevalence study: primary results and agreement level of 3 diagnostic criteria. *Rev. Latinoam. Hipertens.* 9(4):94–107.
- Beysel, S., Eyerci, N., Pinarli, F. A., Kizilgul, M., Ozcelik, O., Caliskan, M., *et al.* 2019. HNF1A gene p.I27L is associated with early-onset, maturity-onset diabetes of the young-like diabetes in Turkey. *BMC Endocr. Disord.* 19(1):1–7. doi: 10.1186/s12902-019-0375-2.
- Beysel, S., Pinarli, F. A., Eyerci, N., Kizilgul, M., Hepsen, S., Alhan, A., *et al.* 2020. HNF1A gene p . I27L is associated with co-existing preeclampsia in gestational diabetes mellitus Selvihan Beysel , Ferda Alparslan Pinarli , Nilnur Eyerci , Muhammed Kizilgul . *Gynecol. Endocrinol.* 0(0):1–5. doi: 10.1080/09513590.2019.1698023.
- Bilici, S., Akbulut, G., Tek, N. A., Yildiran, H., Koksall, E., Gezmen, M., *et al.* 2011. Prevalence of metabolic syndrome using NCEP-ATPIII and international dietetics federation ( IDF ) definitions : A cross- sectional study in Turkish adults. *African J. Biotechnol.* 10(66):14977–14983. doi: 10.5897/AJB11.3291.

- Chi, Y., Frantz, J. D., Oh, B., Hansen, L., Dhe-paganon, S. dan Shoelson, S. E. 2002. Diabetes Mutations Delineate an Atypical POU Domain in HNF1A. *Mol. Cell* 10:1129–1137.
- Chiu, K. C., Chuang, L. M., Ryu, J. M., Tsai, G. P. dan Saad, M. F. 2000. The I27L amino acid polymorphism of hepatic nuclear factor-1 $\alpha$  is associated with insulin resistance. *J. Clin. Endocrinol. Metab.* 85(6):2178–2183. doi: 10.1210/jc.85.6.2178.
- Chiu, K. C., Chuang, L., Ryu, J. M., Tsai, G. P. dan Saad, M. F. 2000. The I27L Amino Acid Polymorphism of Hepatic Nuclear Factor-1  $\alpha$  Is Associated with Insulin Resistance \*. *J. Clin. Endocrinol. Metab.* 85(6):2178–2183.
- D'Angelo, A., Bluteau, O., Garcia-gonzalez, M. A., Gresh, L., Doyen, A., Garby, S., *et al.* 2010. Hepatocyte nuclear factor 1 a and b control terminal differentiation and cell fate commitment in the gut epithelium. *Co. Biol. Ltd* 137(May 2014):1573–1582. doi: 10.1242/dev.044420.
- Fenwick, P. H., Jeejeebhoy, K., Dhaliwal, R., Royall, D., Brauer, P., Tremblay, A., *et al.* 2019. Lifestyle genomics and the metabolic syndrome: A review of genetic variants that influence response to diet and exercise interventions. *Crit. Rev. Food Sci. Nutr.* 59(13):2028–2039. doi: 10.1080/10408398.2018.1437022.
- Frayling, T. M., Evans, J. C., Bulman, M. P., Pearson, E., Allen, L., Owen, K., *et al.* 2001. GLUTS and diabetes. *Diabetes* 50(1):94–100. doi: 10.1016/0140-6736(91)93203-L.
- Fu, Z., Gilbert, E. R. dan Liu, D. 2013. Regulation of Insulin Synthesis and Secretion and Pancreatic Beta-Cell Dysfunction in Diabetes. *Curr. Diabetes Rev.* 9:25–53.
- Garg, M. K., Dutta, M. K. dan Mahalle, N. 2011. Original Article Study of beta-cell function ( by HOMA model ) in metabolic syndrome. *Indian J. Endocrinol. Metab.* 15:44–49. doi: 10.4103/2230-8210.83059.
- Giuffrida, F. M. A., Furuzawa, G. K., Kasamatsu, T. S., Oliveira, M. M., Reis, A. F. dan Dib, S. A. 2009. HNF1A gene polymorphisms and cardiovascular risk factors in individuals with late-onset autosomal dominant diabetes : a cross-sectional study. *Biomed Cent.* 9(8:9):1–9. doi: 10.1186/1475-2840-8-28.
- Herningtyas, E. H. dan Ng, T. S. 2019. Prevalence and distribution of metabolic syndrome and its components among provinces and ethnic groups in Indonesia. *BMC Public Health* 19(1):1–12. doi: 10.1186/s12889-019-6711-

7.

- Holmkvist, J., Cervin, C., Lyssenko, V., Winckler, W., Anevski, D., Cilio, C., *et al.* 2006. Common variants in HNF-1  $\alpha$  and risk of type 2 diabetes. *Diabetologia* 49:2882–2891. doi: 10.1007/s00125-006-0450-x.
- Hou, X., Liu, Jinbo, Song, J., Wang, C., Liang, K., Sun, Y., *et al.* 2016. Relationship of Hemoglobin A1c with ?? Cell Function and Insulin Resistance in Newly Diagnosed and Drug Naive Type 2 Diabetes Patients. *Hindawi* 2016. doi: <http://dx.doi.org/10.1155/2016/8797316>.
- Huang, T., Wang, T., Heianza, Y., Sun, D., Ivey, K., Durst, R., *et al.* 2018. HNF1A variant, energy-reduced diets and insulin resistance improvement during weight loss: the POUNDS Lost and DIRECT trials. *Diabetes Metab.* 20(2):2–31. doi: 10.1111/dom.13250.
- Imai, Y., Kuba, K., Ohto-nakanishi, T. dan Penninger, J. M. 2010. Angiotensin-Converting Enzyme 2 (ACE2) in Disease Pathogenesis. *Japan Circ. Soc.* 74(March):405–410. doi: 10.1253/circj.CJ-10-0045.
- Kaur, J. 2014. A comprehensive review on metabolic syndrome. *Cardiol. Res. Pract.* 2014. doi: 10.1155/2014/943162.
- Lau, H. H., Ng, N. H. J., Loo, L. S. W., Jasmen, J. B. dan Teo, A. K. K. 2017. The molecular functions of hepatocyte nuclear factors – In and beyond the liver. *J. Hepatol.* 68(5):1033–1048. doi: 10.1016/j.jhep.2017.11.026.
- Lemeshow, S. dan David, W. H. . 1997. *Besar sampel dalam penelitian kesehatan (terjemhan)*. Gajahmada University press.
- Low, B. S. J., Lim, C. S., Ding, S. S. L., Tan, Y. S., Ng, N. H. J., Krishnan, V. G., *et al.* 2021. Decreased GLUT2 and glucose uptake contribute to insulin secretion defects in MODY3/HNF1A hiPSC-derived mutant  $\hat{I}^2$  cells. *Nat. Commun.* 12(3133):1–20. doi: 10.1038/s41467-021-22843-4.
- Luni, C., Marth, J. D. dan Doyle, F. J. 2012. Computational Modeling of Glucose Transport in Pancreatic  $\beta$  -Cells Identifies Metabolic Thresholds and Therapeutic Targets in Diabetes. *Plosone* 7(12):1–8. doi: 10.1371/journal.pone.0053130.
- Maharani, C. 2019. *Hubungan Variasi Genetik RS1421085 pada Gen Fat Mass and Obesity-Associated (FTO) dengan Profil lemak Tubuh pada Penderita Obesitas Populasi Etnis Jawa UGM*. Yogyakarta.

- Mahjoub, S. dan Roudsari, J. M. 2014. of metabolic syndrome. *Casp. J. Intern. Med.* 3(1):386–396.
- Mohammadi, A., Eskandari, A., Sarmadi, A., Rahimi, M., Iraj, B., Hashemipour, M., *et al.* 2019. Genetic Study of Hepatocyte Nuclear Factor 1 Alpha Variants in Development of Early - Onset Diabetes Type 2 and Maturity - Onset Diabetes of the Young 3 in Iran. *Adv. Biomed. Res.* doi: 10.4103/abr.abr\_54\_19.
- Morita, K., Saruwatari, J., Tanaka, T., Oniki, K., Kajiwaru, A., Otake, K., *et al.* 2015. Associations between the common HNF1A gene variant p.I27L (rs1169288) and risk of type 2 diabetes mellitus are influenced by weight. *Diabetes Metab.* 41(1):91–94. doi: 10.1016/j.diabet.2014.04.009.
- Morjane, I., Kefi, R., Charoute, H., Lakbakbi el Yaagoubi, F., Hechmi, M., Saile, R., *et al.* 2017. Association study of HNF1A polymorphisms with metabolic syndrome in the Moroccan population. *Diabetes Metab. Syndr. Clin. Res. Rev.* 11(142410):S853–S857. doi: 10.1016/j.dsx.2017.07.005.
- Moy, F. M. dan Bulgiba, A. 2010. The modified NCEP ATP III criteria maybe better than the IDF criteria in diagnosing Metabolic Syndrome among Malays in Kuala Lumpur. *BMC Public Health* 10(1):678. doi: 10.1186/1471-2458-10-678.
- Murphy, R., Carroll, R. W. dan Krebs, J. D. 2013. Pathogenesis of the Metabolic Syndrome: Insights from Monogenic Disorders. *Hindawi* 2013. doi: <http://dx.doi.org/10.1155/2013/920214>.
- Najmi, L. A., Aukrust, I., Flannick, J., Molnes, J., Burt, N., Molven, A., *et al.* 2017. Functional Investigations of HNF1A Identify Rare Variants as Risk Factors for Type 2 Diabetes in the General Population The Harvard community has made this Functional Investigations of HNF1A Identify Rare Variants as Risk Factors for Type 2 Diabetes in th. *Diabetes* 66:335–346. doi: 10.2337/db16-0460.
- Nuli, R., Azati, J., Shawuti, Z., Shan, J., Kadeer, A., Abudukerimu, A., *et al.* 2018. The relationship between HNF1A variations and type 2 diabetes mellitus risk factors in the Uyghur population in Urumqi. *Int. J. Clin. Exp. Med.* 11(2):957–965.
- Oda, E. 2012. Metabolic syndrome: its history, mechanisms, and limitations. *Acta Diabetol* 49:89–95. doi: 10.1007/s00592-011-0309-6.
- Ogedengbe, O. S. dan Ezeani, I. U. 2014. Metabolic syndrome: Performance of five

- different diagnostic criterias. *Indian J. Endocrinol. Metab.* 18(4):496–501. doi: 10.4103/2230-8210.137494.
- Osman, A. A., Altayeb, H. N., Hamid, M. M. dan Yousif, G. M. 2018. Identification of (Ala98Val) and (Ile27Leu) mutation in exon 1 of HNF1- $\alpha$  (MODY 3) And their Association with early-onset Diabetes in Sudanese families. *J. Nat. Med. Sci.* 19(1):67–78.
- Pavić, T., Juszczak, A., Medvidović, E. P., Burrows, C., Šekerija, M., Bennett, A. J., *et al.* 2018. Maturity onset diabetes of the young due to HNF1A variants in Croatia. *Biochem Med* 28(2 Special Issue):1–11. doi: 10.11613/BM.2018.020703.
- Pedersen, K. B., Chhabra, K. H., Nguyen, V. K., Xia, H. dan Lazartigues, E. 2013. Biochimica et Biophysica Acta The transcription factor HNF1  $\alpha$  induces expression of angiotensin-converting enzyme 2 ( ACE2 ) in pancreatic islets from evolutionarily conserved promoter motifs. *BBA - Gene Regul. Mech.* 1829(11):1225–1235. doi: 10.1016/j.bbagr.2013.09.007.
- Pokharel, D. R., Khadka, D., Sigdel, M., Yadav, N. K., Acharya, S., Kafle, R. C., *et al.* 2014. Prevalence of metabolic syndrome in Nepalese type 2 diabetic patients according to WHO , NCEP ATP III , IDF and Harmonized criteria. *J. Diabetes Metab. Disord.* 13(104):1–13. doi: 10.1186/s40200-014-0104-3.
- Puspasari, A. 2019. *Peran Variasi Genetik Gen Nicotinamide Phosphoryl Transferase (NAMPT) pada Penderita Sindroma Metabolik Etnis Jawa di Yogyakarta UGM.* Yogyakarta.
- Ranade, S. S., Deobagkar, D. . dan Deobagkar, D. . 2010. Identification of I27L polymorphism in the HNF-1  $\alpha$  gene in Western Indian population with late-onset of diabetes. *Int. J. Diabetes Dev. Ctries.* (May 2014). doi: 10.4103/0973-3930.70864.
- Ranasinghe, P., Mathangasinghe, Y., Jayawardena, R., Hills, A. P. dan Misra, A. 2017. Prevalence and trends of metabolic syndrome among adults in the Asia-Pacific region: A systematic review. *BMC Public Health* 17(1):1–9. doi: 10.1186/s12889-017-4041-1.
- Rebak, D., Suliga, E., Grabowska, U. dan Gluszek, S. 2018. THE PREVELANCE OF METABOLIC SYNDROME ON THE SAMPLE OF PARAMEDICS. *Int. J. Occup. Med. Enviramental Heal.* 31(6):741–751. doi: <https://doi.org/10.13075/ijomeh.1896.01212> THE.
- Roberts, S. B. dan Rosenberg, I. 2006. Nutrition and Aging : Changes in the



Regulation of Energy Metabolism With Aging OF ENERGY INTAKE. *Am. J. Physiol. - Regul. Integr. Comp. Physiol.* 86(34):651–667. doi: 10.1152/physrev.00019.2005.

Sahu, R. P., Aggarwal, A., Zaidi, G., Shah, A., Modi, K., Kongara, S., *et al.* 2007. Etiology of early-onset type 2 diabetes in indians: Islet autoimmunity and mutations in hepatocyte nuclear factor 1 $\alpha$  and mitochondrial gene. *J. Clin. Endocrinol. Metab.* 92(7):2462–2467. doi: 10.1210/jc.2006-2467.

Sakinah, E. N. 2017. Peran Cholecalciferol Terhadap Perbaikan Resistensi Insulin Pada Mencit Model Diabetes. *J. Agromedicine Med. Sci.* 3(3):24–29.

Saklayen, M. G. 2018. The Global Epidemic of the Metabolic Syndrome. *Curr. Hypertens. Rep.* 20(12):8. doi: <https://doi.org/10.1007/s11906-018-0812-z>.

Shakya, P., Aryal, S., Aryal, R., Mazgaen, L. dan Shah, A. 2014. Occurrence of Amino Acid Mutation (Ala98Val) Of HNF1 $\alpha$  in Association with Type II Diabetes. *J. Nepal Health Res. Counc.*

Shi, T., Yang, F., Liu, C., Cao, X., Lu, J. dan Zhang, X. 2018. Biochemical and Biophysical Research Communications Angiotensin-converting enzyme 2 regulates mitochondrial function in pancreatic  $\beta$ -cells. *Biochem. Biophys. Res. Commun.* 495(1):860–866. doi: 10.1016/j.bbrc.2017.11.055.

Shih, D. Q., Bussen, M., Sehayek, E., Ananthanarayanan, M., Shneider, B. L., Suchy, F. J., *et al.* 2001. Hepatocyte nuclear factor-1  $\alpha$  is an essential regulator of bile acid and plasma. *Nat. Publ. Grup* 27(april):375–382. Tersedia pada: <http://genetics.nature.com>.

Sneha, P., Thirumal, K. D., George, P. D. C., Siva, R. dan Zayed, H. 2017. Determining the role of missense mutations in the POU domain of HNF1A that reduce the DNA-binding affinity: A computational approach. *PLoS One* 12(4):1–24. doi: 10.1371/journal.pone.0174953.

Stride, A., Ellard, S., Clark, P., Shakespeare, L., Salzmman, M., Shepherd, M., *et al.* 2005.  $\beta$ -Cell dysfunction, insulin sensitivity, and glycosuria precede diabetes in hepatocyte nuclear factor-1 $\alpha$  mutation carriers. *Diabetes Care* 28(7):1751–1756.

Tan, J., Xu, J., Wei, G., Zhang, L., Sun, L. dan Wang, G. 2019. HNF1  $\alpha$  Controls Liver Lipid Metabolism and Insulin Resistance via Negatively Regulating the SOCS-3-STAT3 Signaling Pathway. *J. Diabetes Research* 2019. doi: <https://doi.org/10.1155/2019/5483946>.

- Teran-Garcia, M. dan Bouchard, C. 2007. `SE REVIEW / SYNTHE. *NRC Res. Press* 32:89–114. doi: 10.1139/H06-102.
- Urhammer, S. A., Møller, A. M., Nyholm, B., Ekstrøm, C. T., Eiberg, H., Clausen, J. O., *et al.* 1998. The effect of two frequent amino acid variants of the hepatocyte nuclear factor-1 $\alpha$  gene on estimates of the pancreatic  $\beta$ -cell function in Caucasian glucosetolerant first-degree relatives of type 2 diabetic patients. *J. Clin. Endocrinol. Metab.* 83(11):3992–3995. doi: 10.1210/jcem.83.11.5228.
- Valkovicova, T., Skopkova, M., Stanik, J. dan Gasperikova, D. 2019. Novel insights into genetics and clinics of the HNF1A-MODY. *Endocr. Regul.* 53(2):110–134. doi: 10.2478/enr-2019-0013.
- Varghese, M., Song, J. dan Singer, K. 2021. Age and Sex : Impact on adipose tissue metabolism and inflammation. *Mech. Ageing Dev.* 199(111563):1–15. doi: 10.1016/j.mad.2021.111563.
- Vincent, H. K. dan Taylor, A. G. 2006. Biomarkers and potential mechanisms of obesity-induced oxidant stress in humans. *Int. J. Obes.* 30:400–418. doi: 10.1038/sj.ijo.0803177.
- Vinuella, A., Brown, A. A., Buil, A., Tsai, P., Davies, M. N., Bell, J. T., *et al.* 2018. Age-dependent changes in mean and variance of gene expression across tissues in a twin cohort. *Hum. Mol. Genet.* 27(4):732–741. doi: 10.1093/hmg/ddx424.
- Wang, X., Wu, H., Yu, W., Liu, J., Peng, J., Liao, N., *et al.* 2017. Hepatocyte nuclear factor 1b is a novel negative regulator of white adipocyte differentiation. *Nat. Publ. Gr.* 24(9):1588–1597. doi: 10.1038/cdd.2017.85.
- Yermakhanova, G., Vochshenkova, T., Benberin, V., Akhetov, A., Shanazarov, N., Seidalin, N., *et al.* 2018. Study of association of some gene polymorphisms with metabolic syndrome and its components in Kazakh population. in *5th Int. Conf. Hum. Genet. Genet. Dis. 11th Int. Conf. Genomics Pharmacogenomics*. Philadelphia USA: Journal of Molecular and Genetic Medicine :68. doi: 10.4172/1747-0862-C3-031.
- Yoon, H. 2020. Relationship between Metabolic Syndrome , Metabolic Syndrome Score , Insulin Resistance and Beta Cell Function in Korean Adults with Obesity. *Korean J. Clin. Lab. Sci.* 52(4):327–334. doi: <https://doi.org/10.15324/kjcls.2020.52.4.327> Korean.
- Zhou, Y.-J., Yin, R.-X., Hong, S.-C., Yang, Q., Cao, X.-L. dan Chen, W.-X. 2016.



Association of the HNF1A polymorphisms and serum lipid traits , the risk of coronary artery disease and ischemic stroke. *J. Gene Med. Publ.* (October 2016):1–9. doi: 10.1002/jgm.2941.

Ziki, M. D. A. dan Mani, A. 2016. Metabolic syndrome: genetic insights into disease pathogenesis. *Curr. Opin. Lipidol.* 27(2):162–171. doi: 10.1097/MOL.0000000000000276.