DAFTAR PUSTAKA

Aashaq, S., Batool, A., Mir, S. A., Beigh, M. A., Andrabi, K. I., & Shah, Z. A. (2022). TGF-β signaling: A recap of SMAD-independent and SMAD-dependent pathways. *Journal of Cellular Physiology*, *237*(1), 59–85. https://doi.org/10.1002/jcp.30529

Adams, G. (2020). A beginner's guide to RT-PCR, qPCR and RT-qPCR. *The Biochemist*, *42*(3), 48–53. https://doi.org/10.1042/BIO20200034

Adtani, P., Narasimhan, M., Ranganathan, K., Punnoose, A., Prasad, P., & Natarajan, P. (2019). Characterization of oral fibroblasts: An in vitro model for oral fibrosis. *Journal of Oral and Maxillofacial Pathology*, *23*(2), 198. https://doi.org/10.4103/jomfp.JOMFP_28_19

Ahmad, Z. (2018). *Penuaan Kulit: Patofisiologi dan Manifestasi Klinis (Skin Aging: Pathophysiology and Clinical Manifestation)*.

Aisyah, R., & Jatmiko, S. W. (2019). Jalur Sinyal TGF-β Berperan Dalam Self Renewal, Diferensiasi, Dan Proliferasi Stem Cell. *Saintika Medika*, *15*(1), 50. https://doi.org/10.22219/sm.Vol15.SMUMM1.8002

Alafiatayo, A. A., Lai, K.-S., Ahmad, S., Mahmood, M., & Shaharuddin, N. A. (2020). RNA-Seq analysis revealed genes associated with UV-induced cell necrosis through MAPK/TNF-α pathways in human dermal fibroblast cells as an inducer of premature photoaging. *Genomics*, *112*(1), 484–493. https://doi.org/10.1016/j.ygeno.2019.03.011

Bakhshipour, F., Zibaei, M., Rokni, M. B., Miahipour, A., Firoozeh, F., Beheshti, M., Beikzadeh, L., Alizadeh, G., Aryaeipour, M., & Raissi, V. (2024). Comparative evaluation of real-time PCR and ELISA for the detection of human fascioliasis. *Scientific Reports*, *14*(1), 3865. https://doi.org/10.1038/s41598-024-54602-y

Barnes, P. W., Williamson, C. E., Lucas, R. M., Robinson, S. A., Madronich, S., Paul, N. D., Bornman, J. F., Bais, A. F., Sulzberger, B., Wilson, S. R., Andrady, A. L., McKenzie, R. L., Neale, P. J., Austin, A. T., Bernhard, G. H., Solomon, K. R., Neale, R. E., Young, P. J., Norval, M., … Zepp, R. G. (2019). Ozone depletion, ultraviolet radiation, climate change and prospects for a sustainable future. *Nature Sustainability*, *2*(7), 569–579. https://doi.org/10.1038/s41893-019-0314-2

Brister, M. M., & Crespo-Hernández, C. E. (2019). Excited-State Dynamics in the RNA Nucleotide Uridine 5′-Monophosphate Investigated Using Femtosecond Broadband Transient Absorption Spectroscopy. *The Journal of Physical Chemistry Letters*, *10*(9), 2156–2161. https://doi.org/10.1021/acs.jpclett.9b00492

Britannica, T. E. of E. (2024, Februari 20). *ultraviolet radiation*. Ecyclopedia Britannica . https://www.britannica.com/science/ultraviolet-radiation

Calvo, M. J., Navarro, C., Durán, P., Galan-Freyle, N. J., Parra Hernández, L. A., Pacheco-Londoño, L. C., Castelanich, D., Bermúdez, V., & Chacin, M. (2024). Antioxidants in Photoaging: From Molecular Insights to Clinical Applications. *International Journal of Molecular Sciences*, *25*(4), 2403. https://doi.org/10.3390/ijms25042403

Chen, H.-Y., Chou, H.-C., Ho, Y.-J., Chang, S.-J., Liao, E.-C., Wei, Y.-S., Lin, M.-W., Wang, Y.-S., Chien, Y.-A., Yu, X.-R., Kung, H.-Y., Yang, C.-C., Chen, J.-Y., Chan, H.-L., & Ko, M.-L. (2021). Characterization of TGF-β by Induced Oxidative Stress in Human Trabecular Meshwork Cells. *Antioxidants*, *10*(1), 107. https://doi.org/10.3390/antiox10010107

Chen, P.-Y., Qin, L., & Simons, M. (2023). TGFβ signaling pathways in human health and disease. *Frontiers in Molecular Biosciences*, *10*. https://doi.org/10.3389/fmolb.2023.1113061

Chheda, U., Pradeepan, S., Esposito, E., Strezsak, S., Fernandez-Delgado, O., & Kranz, J. (2024). Factors Affecting Stability of RNA – Temperature, Length, Concentration, pH, and Buffering Species. *Journal of Pharmaceutical Sciences*, *113*(2), 377–385. https://doi.org/10.1016/j.xphs.2023.11.023

Chia, Z.-J., Cao, Y., Little, P. J., & Kamato, D. (2024). Transforming growth factor-β receptors: versatile mechanisms of ligand activation. *Acta Pharmacologica Sinica*, *45*(7), 1337–1348. https://doi.org/10.1038/s41401-024-01235-6

Chong, G. Oh., Han, H. S., Lee, S. D., & Lee, Y. H. (2020). Improvement in RNA quantity and quality in cervico-vaginal cytology. *Virology Journal*, *17*(1), 8. https://doi.org/10.1186/s12985-020-1282-x

Chung, J., Huda, M. N., Shin, Y., Han, S., Akter, S., Kang, I., Ha, J., Choe, W., Choi, T. G., & Kim, S. S. (2021). Correlation between Oxidative Stress and Transforming Growth Factor-Beta in Cancers. *International Journal of Molecular Sciences*, *22*(24), 13181. https://doi.org/10.3390/ijms222413181

Ciążyńska, M., Bednarski, I. A., Wódz, K., Narbutt, J., Sobjanek, M., Woźniacka, A., & Lesiak, A. (2018a). Impact of Ultraviolet Radiation on Expression of Transforming Growth Factor β, Smad2, Metalloproteinases-1, -3, -8, -9, Cathepsin K and Progerin. *Photochemistry and Photobiology*, *94*(2), 362–369. https://doi.org/10.1111/php.12866

Ciążyńska, M., Bednarski, I. A., Wódz, K., Narbutt, J., Sobjanek, M., Woźniacka, A., & Lesiak, A. (2018b). Impact of Ultraviolet Radiation on Expression of Transforming Growth Factor β, Smad2, Metalloproteinases-1, -3, -8, -9, Cathepsin K and Progerin. *Photochemistry and Photobiology*, *94*(2), 362–369. https://doi.org/10.1111/php.12866

Deng, Z., Fan, T., Xiao, C., Tian, H., Zheng, Y., Li, C., & He, J. (2024). TGF-β signaling in health, disease, and therapeutics. *Signal Transduction and Targeted Therapy*, *9*(1), 61. https://doi.org/10.1038/s41392-024-01764-w

Derynck, R., & Budi, E. H. (2019). Specificity, versatility, and control of TGF-β family signaling. *Science Signaling*, *12*(570). https://doi.org/10.1126/scisignal.aav5183

Dewanata, P. A., & Mushlih, M. (2021). Differences in DNA Purity Test Using UV-Vis Spectrophotometer and Nanodrop Spectrophotometer in Type 2 Diabetes Mellitus Patients. *Indonesian Journal of Innovation Studies*, *15*. https://doi.org/10.21070/ijins.v15i.553

Dick, M. K., Miao, J. H., & Limaiem, F. (2023, Mei 1). *Histology, Fibroblast.* StatPearls Publishing . ncbi.nlm.nih.gov/books/NBK541065/

Fernandez-Flores, A., & Saeb-Lima, M. (2019). Histopathology of Cutaneous Aging. *The American Journal of Dermatopathology*, *41*(7), 469–479. https://doi.org/10.1097/DAD.0000000000001260

Gauthier, V., Kyriazi, M., Nefla, M., Pucino, V., Raza, K., Buckley, C. D., & Alsaleh, G. (2023). Fibroblast heterogeneity: Keystone of tissue homeostasis and pathology in inflammation and ageing. *Frontiers in Immunology*, *14*. https://doi.org/10.3389/fimmu.2023.1137659

Ge, G., Wang, Y., Xu, Y., Pu, W., Tan, Y., Liu, P., Ding, H., Lu, Y.-M., Wang, J., Liu, W., & Ma, Y. (2023). Induced skin aging by blue-light irradiation in human skin fibroblasts via TGF-β, JNK and EGFR pathways. *Journal of Dermatological Science*, *111*(2), 52–59. https://doi.org/10.1016/j.jdermsci.2023.06.007

Giri Putra, L. A., Yonathan, C. J., Niedhatrata, N. I., Rizka Firdaus, M. H., & Yoewono, J. R. (2020). A review of the development of Polymerase Chain Reaction technique and its uses in Scientific field. *Stannum : Jurnal Sains dan Terapan Kimia*, *2*(1), 14–30. https://doi.org/10.33019/jstk.v2i1.1619

Green, M. R., & Sambrook, J. (2020). Quantifying and Storing RNA. *Cold Spring Harbor Protocols*, *2020*(3), pdb.top101709. https://doi.org/10.1101/pdb.top101709

Grenier, A., Morissette, M. C., Rochette, P. J., & Pouliot, R. (2023). The combination of cigarette smoke and solar rays causes effects similar to skin aging in a bilayer skin model. *Scientific Reports*, *13*(1), 17969. https://doi.org/10.1038/s41598-023-44868-z

Gunin, A. G., & Golubtzova, N. N. (2019). Transforming Growth Factor-β (TGF-β) in Human Skin during Aging. *Advances in Gerontology*, *9*(3), 267–273. https://doi.org/10.1134/S2079057019030068

Guo, Y., Pan, W., Liu, S., Shen, Z., Xu, Y., & Hu, L. (2020). ERK/MAPK signalling pathway and tumorigenesis (Review). *Experimental and Therapeutic Medicine*. https://doi.org/10.3892/etm.2020.8454

Hanna, A., & Frangogiannis, N. G. (2019). The Role of the TGF-β Superfamily in Myocardial Infarction. *Frontiers in Cardiovascular Medicine*, *6*. https://doi.org/10.3389/fcvm.2019.00140

Hariyanto, N. I., Yo, E. C., & Wanandi, S. I. (2021). Regulation and Signaling of TGF-β Autoinduction. *International journal of molecular and cellular medicine*, *10*(4), 234–247. https://doi.org/10.22088/IJMCM.BUMS.10.4.234

He, A., Zheng, S., Luan, W., Wang, L., Qian, L., Qi, F., & Feng, Z. (2023). Antiphotoaging Effect of Micronized Fat in Ultraviolet B–Induced Human Dermal Fibroblasts. *Plastic & Reconstructive Surgery*, *152*(5), 1023–1033. https://doi.org/10.1097/PRS.0000000000010458

He, T., Quan, T., & Fisher, G. J. (2014). Ultraviolet irradiation represses <scp>TGF</scp> -β type II receptor transcription through a 38-bp sequence in the proximal promoter in human skin fibroblasts. *Experimental Dermatology*, *23*(s1), 2–6. https://doi.org/10.1111/exd.12389

Hsiao, Y., Lee, J.-J., Yang, I.-H., Wu, P.-C., Ke, M.-C., & Lo, J. (2023). Ultraviolet A at levels experienced outdoors suppresses transforming growth factor-beta signaling and collagen production in human scleral fibroblasts. *Biochemical and Biophysical Research Communications*, *641*, 10–17. https://doi.org/10.1016/j.bbrc.2022.12.009

Hu, Y., He, J., He, L., Xu, B., & Wang, Q. (2021). Expression and function of Smad7 in autoimmune and inflammatory diseases. *Journal of molecular medicine (Berlin, Germany)*, *99*(9), 1209–1220. https://doi.org/10.1007/s00109-021-02083-1

Kapoor, M., & Chinnathambi, S. (2023). TGF-β1 signalling in Alzheimer's pathology and cytoskeletal reorganization: a specialized Tau perspective. *Journal of Neuroinflammation*, *20*(1), 72. https://doi.org/10.1186/s12974-023-02751-8

Karolczak, K., & Watala, C. (2021). Blood Platelets as an Important but Underrated Circulating Source of TGFβ. *International Journal of Molecular Sciences*, *22*(9), 4492. https://doi.org/10.3390/ijms22094492

Ke, Y., & Wang, X. J. (2021). TGFβ Signaling in Photoaging and UV-Induced Skin Cancer. Dalam *Journal of Investigative Dermatology* (Vol. 141, Nomor 4). https://doi.org/10.1016/j.jid.2020.11.007

Kim, J.-M., Chung, K.-S., Yoon, Y.-S., Jang, S.-Y., Heo, S.-W., Park, G., Jang, Y.-P., Ahn, H.-S., Shin, Y.-K., Lee, S.-H., & Lee, K.-T. (2022). Dieckol Isolated from Eisenia bicyclis Ameliorates Wrinkling and Improves Skin Hydration via MAPK/AP-1 and TGF-β/Smad Signaling Pathways in UVB-Irradiated Hairless Mice. *Marine Drugs*, *20*(12), 779. https://doi.org/10.3390/md20120779

Kim, K.-H., Kim, H.-J., & Lee, T. R. (2017). Epidermal long non-coding RNAs are regulated by ultraviolet irradiation. *Gene*, *637*, 196–202. https://doi.org/10.1016/j.gene.2017.09.043

Krutmann, J., Schikowski, T., Morita, A., & Berneburg, M. (2021). Environmentally-Induced (Extrinsic) Skin Aging: Exposomal Factors and Underlying Mechanisms. *Journal of Investigative Dermatology*, *141*(4), 1096–1103. https://doi.org/10.1016/j.jid.2020.12.011

Lee, L.-Y., & Liu, S.-X. (2020). Pathogenesis of Photoaging in Human Dermal Fibroblasts. *International Journal of Dermatology and Venereology*, *3*(1), 37–42. https://doi.org/10.1097/JD9.0000000000000068

Liarte, S., Bernabé-García, Á., & Nicolás, F. J. (2020). Role of TGF-β in Skin Chronic Wounds: A Keratinocyte Perspective. *Cells*, *9*(2), 306. https://doi.org/10.3390/cells9020306

Louault, K., Blavier, L., Lee, M.-H., Kennedy, R. J., Fernandez, G. E., Pawel, B. R., Asgharzadeh, S., & DeClerck, Y. A. (2024). Nuclear factor-κB activation by transforming growth factor-β1 drives tumour microenvironment-mediated drug resistance in neuroblastoma. *British Journal of Cancer*, *131*(1), 90–100. https://doi.org/10.1038/s41416-024-02686-8

Mah, W., Jiang, G., Olver, D., Gallant-Behm, C., Wiebe, C., Hart, D. A., Koivisto, L., Larjava, H., & Häkkinen, L. (2017). Elevated CD26 Expression by Skin Fibroblasts Distinguishes a Profibrotic Phenotype Involved in Scar Formation Compared to Gingival Fibroblasts. *The American Journal of Pathology*, *187*(8), 1717–1735. https://doi.org/10.1016/j.ajpath.2017.04.017

Mainkar, P., Jayaswal, D., Kumar, D., Jayaswall, K., Jaiswal, S., Singh, A. N., Kumar, S., & Kansal, R. (2023). Development of modified CTAB and Trizol protocols to isolate high molecular weight (HMW) RNA from polyphenol and polysaccharides rich pigeonpea (Cajanuscajan (L.) Millsp. *PLOS ONE*, *18*(12), e0291949. https://doi.org/10.1371/journal.pone.0291949

Maltoni, R., Ravaioli, S., Bronte, G., Mazza, M., Cerchione, C., Massa, I., Balzi, W., Cortesi, M., Zanoni, M., & Bravaccini, S. (2022). Chronological age or biological age: What drives the choice of adjuvant treatment in elderly breast cancer patients? *Translational Oncology*, *15*(1), 101300. https://doi.org/10.1016/j.tranon.2021.101300

Massagué, J., & Sheppard, D. (2023). TGF-β signaling in health and disease. *Cell*, *186*(19), 4007–4037. https://doi.org/10.1016/j.cell.2023.07.036

Mayangsari, E., Mustika, A., Nurdiana, N., & Samad, N. (2024). Comparison of UVA vs UVB Photoaging Rat Models in Short-term Exposure. *Medical Archives*, *78*(2), 88. https://doi.org/10.5455/medarh.2024.78.88-91

Nandi Jui, B., Sarsenbayeva, A., Jernow, H., Hetty, S., & Pereira, M. J. (2022). Evaluation of RNA Isolation Methods in Human Adipose Tissue. *Laboratory Medicine*, *53*(5), e129–e133. https://doi.org/10.1093/labmed/lmab126

Nugroho, A. A., Mazfufah, N. F., Karina, K., & Priyadi, P. S. (2023). Effect of Secretome of Mesenchymal Stem Cells from Adipose Tissue in Old and Young Donors on Fibroblast Cells Induced by UV-B [Universitas Indonesiia]. Dalam *Online Journal of Biological Science*. https://lib.ui.ac.id/detail?id=9999920540111&lokasi=lokal

Nuryana, C. T., Agustin, T. P., Haryana, S. M., Wirohadidjojo, Y. W., & Arfian, N. (2023). Achatina fulica Mucus Ameliorates UVB-induced Human Dermal Fibroblast Photoaging via the TGF-β/Smad Pathway. *The Indonesian Biomedical Journal*, *15*(6), 375–382. https://doi.org/10.18585/inabj.v15i6.2580

Omer, S. A. E., Badi, R. M., Garelnabi, M. E. M., Altayeb, O. A., Hussein, M. O., Fadul, E. A., & Saeed, A. M. (2019). Effects of acute and chronic exposure to natural sunlight and UVB on CD4/CD8 ratio and circulating pro-inflammatory and anti-inflammatory cytokine levels in mice. *Scientific African*, *4*, e00102. https://doi.org/10.1016/j.sciaf.2019.e00102

Parker, J. B., Valencia, C., Akras, D., DiIorio, S. E., Griffin, M. F., Longaker, M. T., & Wan, D. C. (2023). Understanding Fibroblast Heterogeneity in Form and Function. *Biomedicines*, *11*(8), 2264. https://doi.org/10.3390/biomedicines11082264

Peng, D., Fu, M., Wang, M., Wei, Y., & Wei, X. (2022). Targeting TGF-β signal transduction for fibrosis and cancer therapy. *Molecular Cancer*, *21*(1), 104. https://doi.org/10.1186/s12943-022-01569-x

Remelia, M., Bela, B., Widyaningtyas, S. T., Antarianto, R. D., Mazfufah, N. F., & Pawitan, J. A. (2023). The Use of Cell-penetrating Peptide for Delivery of Recombinant Transcription Factor DNA into Primary Human Fibroblast. *Molecular and Cellular Biomedical Sciences*, *7*(1), 28. https://doi.org/10.21705/mcbs.v7i1.279

Saha, R., & Chen, I. A. (2019). Effect of UV Radiation on Fluorescent RNA Aptamers' Functional and Templating Ability. *ChemBioChem*, *20*(20), 2609–2617. https://doi.org/10.1002/cbic.201900261

Sanjabi, S., Oh, S. A., & Li, M. O. (2017). Regulation of the Immune Response by TGF-β: From Conception to Autoimmunity and Infection. *Cold Spring Harbor Perspectives in Biology*, *9*(6), a022236. https://doi.org/10.1101/cshperspect.a022236

Shin, J.-W., Kwon, S.-H., Choi, J.-Y., Na, J.-I., Huh, C.-H., Choi, H.-R., & Park, K.-C. (2019). Molecular Mechanisms of Dermal Aging and Antiaging Approaches. *International Journal of Molecular Sciences*, *20*(9), 2126. https://doi.org/10.3390/ijms20092126

Tominaga, K., & Suzuki, H. I. (2019). TGF-β Signaling in Cellular Senescence and Aging-Related Pathology. *International Journal of Molecular Sciences*, *20*(20), 5002. https://doi.org/10.3390/ijms20205002

Tzavlaki, K., & Moustakas, A. (2020). TGF-β Signaling. *Biomolecules*, *10*(3), 487. https://doi.org/10.3390/biom10030487

Vakrou, S., Liu, Y., Zhu, L., Greenland, G. V., Simsek, B., Hebl, V. B., Guan, Y., Woldemichael, K., Talbot, C. C., Aon, M. A., Fukunaga, R., & Abraham, M. R. (2021). Differences in molecular phenotype in mouse and human hypertrophic cardiomyopathy. *Scientific Reports*, *11*(1), 13163. https://doi.org/10.1038/s41598-021-89451-6

Vijayashree, R. J., & Sivapathasundharam, B. (2022). The diverse role of oral fibroblasts in normal and disease. *Journal of oral and maxillofacial pathology : JOMFP*, *26*(1), 6–13. https://doi.org/10.4103/jomfp.jomfp_48_22

Violita, V., Achyar, A., Zulyusri, Z., Atifah, Y., Putri, D. H., & Nabilah, R. (2024). Primer Design and Optimization of Annealing Temperature for Gene Amplification GSTL2 on Rice. *Al-Kauniyah: Jurnal Biologi*, *17*(2), 377–386. https://doi.org/10.15408/kauniyah.v17i2.32859

Wang, D., & Farhana, A. (2024, Juli 29). *Biochemistry, RNA Structure.* StatPearls Publishing . ncbi.nlm.nih.gov/books/NBK558999/

Wei, M., He, X., Liu, N., & Deng, H. (2024). Role of reactive oxygen species in ultraviolet-induced photodamage of the skin. *Cell Division*, *19*(1), 1. https://doi.org/10.1186/s13008-024-00107-z

Worrede, A., Douglass, S. M., & Weeraratna, A. T. (2021). The dark side of daylight: photoaging and the tumor microenvironment in melanoma progression. *Journal of Clinical Investigation*, *131*(6). https://doi.org/10.1172/JCI143763

Wu, M., Cronin, K., & Crane, S. (2024, Januari). *Biochemistry, Collagen Synthesis*. StatPearls Publishing . https://www.ncbi.nlm.nih.gov/books/NBK507709/

Xue, S., Zang, Y., Chen, J., Shang, S., Gao, L., & Tang, X. (2022). Ultraviolet-B radiation stress triggers reactive oxygen species and regulates the antioxidant defense and photosynthesis systems of intertidal red algae Neoporphyra haitanensis. *Frontiers in Marine Science*, *9*. https://doi.org/10.3389/fmars.2022.1043462

Zhang, M., Zhang, Y. Y., Chen, Y., Wang, J., Wang, Q., & Lu, H. (2021). TGF-β Signaling and Resistance to Cancer Therapy. *Frontiers in Cell and Developmental Biology*, *9*. https://doi.org/10.3389/fcell.2021.786728