



DAFTAR PUSTAKA

- Al-Ghazzewi, F.H. dan Tester, R.F., 2010. Effect of konjac glucomannan hydrolysates and probiotics on the growth of the skin bacterium *Propionibacterium acnes* in vitro. *International Journal of Cosmetic Science*, **32**: 139–142.
- Alestas, T., Ganceviciene, R., Fimmel, S., Müller-Decker, K., dan Zouboulis, C.C., 2006. Enzymes involved in the biosynthesis of leukotriene B 4 and prostaglandin E 2 are active in sebaceous glands. *Journal of Molecular Medicine*, **84**: 75–87.
- Anonim. 2018. *BioFense*. ProTec Ingredia. Dapat diakses melalui: <https://protecingredia.com/products/barnet/biofense.html>. Diakses pada: 3 Maret 2021.
- Anonim. 2018. *ProRenew Complex CLR™*. Chemisches Laboratorium Dr. Kurt Richter GmbH: Jerman. Dapat diakses di: <https://www.clr-berlin.com/products/prorenew-complex-clr/>. Diakses pada: 3 Maret 2021.
- Anonim. 2020. *Serums, Ampoules, Emulsions and Essences: Is There Really a Difference?* skincare.com by L'Oréal. Dapat diakses di: <https://www.skincare.com/article/korean-skin-care-the-difference-between-serums-emulsions-and-essence#>. Diakses pada 8 Desember 2020.
- Barland, C.O., Zettersten, E., Brown, B.S., Ye, J., Elias, P.M., dan Ghadially, R., 2004. Imiquimod-Induced Interleukin-1 α Stimulation Improves Barrier Homeostasis in Aged Murine Epidermis. *Journal of Investigative Dermatology*, **122**: 330–336.
- Berkers, T., Boiten, W.A., Absalah, S., van Smeden, J., Lavrijsen, A.P.M., dan Bouwstra, J.A., 2019. Compromising human skin in vivo and ex vivo to study skin barrier repair. *Biochimica et Biophysica Acta - Molecular and Cell Biology of Lipids*, **1864**: 1103–1108.
- Bhatt, V.S., 2018. Quorum sensing mechanisms in gram positive bacteria. *Implication of Quorum Sensing System in Biofilm Formation and Virulence*, 297–311.
- Bielecka, M., 2006. Probiotics in food. *Chemical and Functional Properties of Food Components, Third Edition*, 413–426.
- Böhm, M., Schiller, M., Ständer, S., Seltmann, H., Li, Z., Brzoska, T., Metze, D., Schiöth, H. B., Skottner, A., Seiffert, K., Zouboulis, C. C., dan Luger, T. A., 2002. Evidence for expression of melanocortin-1 receptor in human sebocytes in vitro and in situ. *Journal of Investigative Dermatology*, **118**: 533–539.
- Bowe, W.P., Filip, J.C., DiRienzo, J.M., Volgina, A., dan Margolis, D.J., 2006. Inhibition of *propionibacterium acnes* by bacteriocin-like inhibitory substances (BLIS) produced by *Streptococcus salivarius*. *Journal of drugs in dermatology : JDD*, **5**: 868–870.
- BPOM. 2017. Peraturan Kepala Badan Pengawas Obat dan Makanan Republik Indonesia Nomor 14 Tahun 2017 Tentang Pedoman Dokumen Informasi Produk. Badan Pengawas Obat dan Makanan Republik Indonesia.
- BPOM. 2019. Peraturan Kepala Badan Pengawas Obat dan Makanan Republik Indonesia Nomor 12 Tahun 2019 tentang Cemaran dalam Kosmetika. Badan



Pengawas Obat dan Makanan Republik Indonesia

- Burkhart, C.G. dan Burkhart, C.N., 2007. Expanding the microcomedone theory and acne therapeutics: Propionibacterium acnes biofilm produces biological glue that holds corneocytes together to form plug. *Journal of the American Academy of Dermatology*, **57**: 722–724.
- Cha, H.M., Kim, S.K., Kook, M.C., dan Yi, T.H., 2020. Lactobacillus paraplanitarum THG-G10 as a potential anti-acne agent with anti-bacterial and anti-inflammatory activities. *Anaerobe*, **64**.
- Chaurasia, G. 2016 A Review on Pharmaceutical Preformulation Studies in Formulation and Development of new Drug Molecules. *Int J Pharm Sci Res*; **7**(6): 2313-20.doi: 10.13040/IJPSR.0975-8232.7(6).2313-20.
- Chen, X., 2018. Current and future technological advances in transdermal gene delivery. *Advanced Drug Delivery Reviews*, **127**: 85–105.
- Chen, Z., Lv, Y., Qi, J., Zhu, Q., Lu, Y., dan Wu, W., 2018. Overcoming or circumventing the stratum corneum barrier for efficient transcutaneous immunization. *Drug Discovery Today*, **23**: 181–186.
- Chew, C.H., Wu, C.C., dan Chen, C.C., 2016. A novel electrospun Microtube Array Membrane (MTAM) based low cost conceptual tubular Microbial Fuel Cell (MFC). *European Polymer Journal*, **83**: 138–147.
- Choi, J.J., Park, M.Y., Lee, H.J., Yoon, D. young, Lim, Y., Hyun, J.W., Zouboulis, C. C., & Jin, M., 2012. TNF- α increases lipogenesis via JNK and PI3K/Akt pathways in SZ95 human sebocytes. *Journal of Dermatological Science*, **65**: 179–188.
- Christensen, G.J.M., Scholz, C.F.P., Enghild, J., Rohde, H., Kilian, M., Thürmer, A., Brzuszkiewicz, E., Lomholt, H. B., dan Brüggemann, H., 2016. Antagonism between *Staphylococcus epidermidis* and *Propionibacterium acnes* and its genomic basis. *BMC Genomics*, **17**: 1–14.
- Coenye, T., Honraet, K., Rossel, B., dan Nelis, H., 2008. Biofilms in Skin Infections: *Propionibacterium acnes* and *Acne Vulgaris*. *Infectious Disorders - Drug Targets*, **8**: 156–159.
- Cooper, A.J. dan Harris, V.R., 2017. Modern management of acne. *Medical Journal of Australia*, **206**: 41–45.
- Cosseau, C., Devine, D.A., Dullaghan, E., Gardy, J.L., Chikatamarla, A., Gellatly, S., Yu, L. L., Pistolic, J., Falsafi, R., Tagg, J., & Hancock, R. E. W., 2008. The commensal *Streptococcus salivarius* K12 downregulates the innate immune responses of human epithelial cells and promotes host-microbe homeostasis. *Infection and Immunity*, **76**: 4163–4175.
- Dahal, R.H., Shim, D.S., dan Kim, J., 2017. Development of actinobacterial resources for functional cosmetics. *Journal of Cosmetic Dermatology*, **16**: 243–252.
- Degitz, K., Placzek, M., Borelli, C., dan Plewig, G., 2007. Pathophysiology of acne. *JDDG - Journal of the German Society of Dermatology*, **5**: 316–323.
- Deidda, F., Amoruso, A., Nicola, S., Graziano, T., Pane, M., dan Mogna, L., 2018. New Approach in Acne Therapy A Specific Bacteriocin Activity and a Targeted Anti IL-8 Property in Just 1 Probiotic Strain, the *L. salivarius* LS03. *Journal of Clinical Gastroenterology*, **52**: S78–S81.



- Del Rosso, J.Q., Kircik, L., dan Tanghetti, E., 2018. Management of Truncal Acne Vulgaris with Topical Dapsone 7.5% Gel. *JCAD Journal of Clinical and Aesthetic Dermatology*, **11**: 45–50.
- Dessinioti, C. dan Katsambas, A.D., 2010. The role of *Propionibacterium acnes* in acne pathogenesis: facts and controversies. *Clinics in Dermatology*, **28**: 2–7.
- Di Marzio, L., Centi, C., Cinque, B., Masci, S., Giuliani, M., Arcieri, A., Zicari, L., De Simone, C., & Cifone, M. G., 2003. Effect of the lactic acid bacterium *Streptococcus thermophilus* on stratum corneum ceramide levels and signs and symptoms of atopic dermatitis patients. *Experimental Dermatology*, **12**: 615–620.
- Di Marzio, L., Cinque, B., Cupelli, F., De Simone, C., Cifone, M.G., dan Giuliani, M., 2008. Increase of skin-ceramide levels in aged subjects following a short-term topical application of bacterial sphingomyelinase from *Streptococcus thermophilus*. *International Journal of Immunopathology and Pharmacology*, **21**: 137–143.
- Dréno, B., Poli, F., Pawin, H., Beylot, C., Faure, M., Chivot, M., Auffret, N., Moyse, D., Ballanger, F., & Revuz, J., 2011. Development and evaluation of a Global Acne Severity Scale (GEA Scale) suitable for France and Europe. *Journal of the European Academy of Dermatology and Venereology*, **25**: 43–48.
- Erdo, F., Hashimoto, N., Karvaly, G., Nakamichi, N., dan Kato, Y., 2016. Critical evaluation and methodological positioning of the transdermal microdialysis technique. A review. *Journal of Controlled Release*, **233**: 147–161.
- Falk, N.A., 2019. Surfactants as Antimicrobials: A Brief Overview of Microbial Interfacial Chemistry and Surfactant Antimicrobial Activity. *Journal of Surfactants and Detergents*, **22**: 1119–1127.
- Feingold, K.R. dan Elias, P.M., 2014. Role of lipids in the formation and maintenance of the cutaneous permeability barrier. *Biochimica et Biophysica Acta - Molecular and Cell Biology of Lipids*, **1841**: 280–294.
- Fierer, N., Ferrenberg, S., Flores, G.E., González, A., Kueneman, J., Legg, T., Lynch, R. C., McDonald, D., Mihaljevic, J. R., O'Neill, S. P., Rhodes, M. E., Song, S. J., & Walters, W. A., 2012. From animalcules to an ecosystem: Application of ecological concepts to the human microbiome. *Annual Review of Ecology, Evolution, and Systematics*, **43**: 137–155.
- Fisher, M. 2018. *Facial Toner: What It Is & Why Your Arsenal Should Never Be Without It*. skincare.com by L'Oréal . Dapat diakses di: <https://www.skincare.com/article/best-facial-toner>. Diakses pada 8 Desember 2020.
- Fitz-Gibbon, S., Tomida, S., Chiu, B.H., Nguyen, L., Du, C., Liu, M., Elashoff, D., Erfe, M. C., Loncaric, A., Kim, J., Modlin, R. L., Miller, J. F., Sodergren, E., Craft, N., Weinstock, G. M., & Li, H., 2013. *Propionibacterium acnes* strain populations in the human skin microbiome associated with acne. *Journal of Investigative Dermatology*, **133**: 2152–2160.
- Friedlander, S.F., Eichenfield, L.F., Fowler, J.F., Fried, R.G., Levy, M.L., dan Webster, G.F., 2010. Acne epidemiology and pathophysiology. *Seminars in cutaneous medicine and surgery*, **29**: 2–4.



- Fuchs-Tarlovsky, V., Marquez-Barba, M.F., dan Sriram, K., 2016. Probiotics in dermatologic practice. *Nutrition*, **32**: 289–295.
- Ghodsi, S.Z., Orawa, H., dan Zouboulis, C.C., 2009. Prevalence, severity, and severity risk factors of acne in high school pupils: A community-based study. *Journal of Investigative Dermatology*, **129**: 2136–2141.
- Giacomoni, P.U., Mammone, T., dan Teri, M., 2009. Gender-linked differences in human skin. *Journal of Dermatological Science*, **55**: 144–149.
- Gollnick, H.P., Bettoli, V., Lambert, J., Araviiskaia, E., Binic, I., Dessinioti, C., Galadari, I., Ganceviciene, R., Ilter, N., Kaegi, M., Kemeny, L., López-Estebaranz, J. L., Massa, A., Oprica, C., Sinclair, W., Szepietowski, J. C., & Dréno, B., 2016. A consensus-based practical and daily guide for the treatment of acne patients. *Journal of the European Academy of Dermatology and Venereology*, **30**: 1480–1490.
- Gollnick, H.P.M. dan Krautheim, A., 2003. Topical treatment in acne: Current status and future aspects. *Dermatology*, **206**: 29–36.
- Goodarzi, A., Mozafarpoor, S., Bodaghbadi, M., dan Mohamadi, M., 2020. The potential of probiotics for treating acne vulgaris: A review of literature on acne and microbiota. *Dermatologic Therapy*, **33**: .
- Grice, E.A., Kong, H.H., Conlan, S., Deming, C.B., Davis, J., Young, A.C., Bouffard, G. G., Blakesley, R. W., Murray, P. R., Green, E. D., Turner, M. L., & Segre, J. A., 2009. Topographical and temporal diversity of the human skin microbiome. *Science*, **324**: 1190–2.
- Grice, E.A. dan Segre, J.A., 2011. The skin microbiome. *Nature Reviews Microbiology*, **9**: 244–253.
- Hay, R.J., Johns, N.E., Williams, H.C., Bolliger, I.W., Dellavalle, R.P., Margolis, D.J., Marks, R., Naldi, L., Weinstock, M. A., Wulf, S. K., Michaud, C., J.I. Murray, C., & Naghavi, M., 2014. The global burden of skin disease in 2010: An analysis of the prevalence and impact of skin conditions. *Journal of Investigative Dermatology*, **134**: 1527–1534.
- Heffernan, M.P., Nelson, M.M., dan Anadkat, M.J., 2007. A pilot study of the safety and efficacy of picolinic acid gel in the treatment of acne vulgaris. *British Journal of Dermatology*, **156**: 548–552.
- van der Hoeven, H. 2014. Probiotic health food for the skin. *Personal Care: CLR Berlin*, Jerman.
- Hsiao, K.H., Huang, C.M., dan Lee, Y.H., 2018. Development of Rifampicin-Indocyanine green-loaded perfluorocarbon nanodroplets for photo-chemo-probiotic antimicrobial therapy. *Frontiers in Pharmacology*, **9**: 1–12.
- Hsiao, K.H., Huang, C.M., dan Lee, Y.H., 2020. Novel rifampicin and indocyanine green co-loaded perfluorocarbon nanodroplets provide effective in vivo photo–chemo–probiotic antimicrobility against pathogen of acne vulgaris Cutibacterium acnes. *Nanomaterials*, **10**: .
- Htwe, M.M., Teanpaisan, R., Khongkow, P., dan Amnuakit, T., 2019. Liposomes of probiotic's lyophilized cell free supernatant; A potential cosmeceutical product. *Pharmazie*, **74**: 462–466.
- Isard, O., Knol, A.C., Ariès, M.F., Nguyen, J.M., Khammari, A., Castex-Rizzi, N., dan Dréno, B., 2011. Propionibacterium acnes activates the IGF-1/IGF-1R



- system in the epidermis and induces keratinocyte proliferation. *Journal of Investigative Dermatology*, **131**: 59–66.
- Jasson, F., Nagy, I., Knol, A.C., Zuliani, T., Khammari, A., dan Dréno, B., 2013. Different strains of *Propionibacterium acnes* modulate differently the cutaneous innate immunity. *Experimental Dermatology*, **22**: 587–592.
- Jiang, M., Deng, Kan, Jiang, C., Fu, M., Guo, C., Wang, X., Wang, X., Meng, F., Yang, S., Deng, K., Chen, T., dan Xin, H., 2016. Evaluation of the Antioxidative, Antibacterial, and Anti-Inflammatory Effects of the Aloe Fermentation Supernatant Containing *Lactobacillus plantarum* HM218749.1. *Mediators of Inflammation*, **2016**: .
- Kang, B.S., Seo, J.G., Lee, G.S., Kim, J.H., Kim, S.Y., Han, Y.W., Kang, H., Kim, H. O., Rhee, J. H., Chung, M. J., & Park, Y. M., 2009. Antimicrobial activity of enterocins from *Enterococcus faecalis* SL-5 against *Propionibacterium acnes*, the causative agent in acne vulgaris, and its therapeutic effect. *Journal of Microbiology*, **47**: 101–109.
- Kang, M.S., Oh, J.S., Lee, S.W., Lim, H.S., Choi, N.K., dan Kim, S.M., 2012. Effect of *Lactobacillus reuteri* on the proliferation of *Propionibacterium acnes* and *Staphylococcus epidermidis*. *Journal of Microbiology*, **50**: 137–142.
- Kang, S., Cho, S., Chung, J.H., Hammerberg, C., Fisher, G.J., dan Voorhees, J.J., 2005. Inflammation and extracellular matrix degradation mediated by activated transcription factors nuclear factor- κ B and activator protein-1 in inflammatory acne lesions in vivo. *American Journal of Pathology*, **166**: 1691–1699.
- Kaur, S. dan Kaur, R., 2019. Biosurfactant from *Lactobacillus* sp. as an antibiofilm agent. *Biotechnologia*, **100**: 335–343.
- Kemenkes RI. 1995. *Farmakope Indonesia, Edisi IV*. Jakarta: Kementerian Kesehatan Republik Indonesia.
- Kemenkes RI. 2014. *Farmakope Indonesia, Edisi V*. Jakarta: Kementerian Kesehatan Republik Indonesia.
- Khmaladze, I., Butler, É., Fabre, S., dan Gillbro, J.M., 2019. *Lactobacillus reuteri* DSM 17938—A comparative study on the effect of probiotics and lysates on human skin. *Experimental Dermatology*, **28**: 822–828.
- Kim, S.H., Han, S.Y., Azam, T., Yoon, D.Y., dan Dinarello, C.A., 2005. Interleukin-32: A cytokine and inducer of TNF α . *Immunity*, **22**: 131–142.
- Kistowska, M., Gehrke, S., Jankovic, D., Kerl, K., Fettelschoss, A., Feldmeyer, L., Fenini, G., Kolios, A., Navarini, A., Ganceviciene, R., Schuber, J., Contassot, E., & French, L. E., 2014. IL-1 β drives inflammatory responses to *propionibacterium acnes* in vitro and in vivo. *Journal of Investigative Dermatology*, **134**: 677–685.
- Kober, M.M. dan Bowe, W.P., 2015. The effect of probiotics on immune regulation, acne, and photoaging. *International Journal of Women's Dermatology*, **1**: 85–89.
- Krutmann, J., 2012. Pre- and probiotics for human skin. *Clinics in Plastic Surgery*, **39**: 59–64.
- Kurokawa, I., Danby, F.W., Ju, Q., Wang, X., Xiang, L.F., Xia, L., Chen, W. C.,



- Nagy, I., Picardo, M., Suh, D. H., Ganceviciene, R., Schagen, S., Tsatsou, F., & Zouboulis, C. C., 2009. New developments in our understanding of acne pathogenesis and treatment. *Experimental Dermatology*, **18**: 821–832.
- Lee, D.K., Kim, M.J., Ham, J.W., An, H.M., Cha, M.K., Lee, S.W., Park, C. I., Shin, S. H., Lee, K. O., Kim, K. J., dan Ha, N. J., 2012. In vitro evaluation of antibacterial activities and anti-inflammatory effects of bifidobacterium spp. Addressing acne vulgaris. *Archives of Pharmacal Research*, **35**: 1065–1071.
- Lee, S.Y., Lee, E., Park, Y.M., dan Hong, S.J., 2018. Microbiome in the gut-skin axis in atopic dermatitis. *Allergy, Asthma and Immunology Research*, **10**: 354–362.
- Lew, L.C. dan Liang, M.T., 2013. Bioactives from probiotics for dermal health: Functions and benefits. *Journal of Applied Microbiology*, **114**: 1241–1253.
- Lopes, E.G., Moreira, D.A., Gullón, P., Gullón, B., Cardelle-Cobas, A., dan Tavaria, F.K., 2016. Topical application of probiotics in skin: adhesion, antimicrobial and antibiofilm in vitro assays. *Journal of Applied Microbiology*, **122**: 450–461.
- Lwin, S.M., Kimber, I., dan McFadden, J.P., 2014. Acne, quorum sensing and danger. *Clinical and Experimental Dermatology*, **39**: 162–167.
- Marchesi, J.R. dan Ravel, J., 2015. The vocabulary of microbiome research: a proposal. *Microbiome*, **3**: 1–3.
- Marito, S., Keshari, S., dan Huang, C.M., 2020. Peg-8 laurate fermentation of staphylococcus epidermidis reduces the required dose of clindamycin against cutibacterium acnes. *International Journal of Molecular Sciences*, **21**: 1–11.
- Marson, J.W. dan Baldwin, H.E., 2019. New Concepts, Concerns, and Creations in Acne. *Dermatologic Clinics*, **37**: 1–9.
- Mehdi-Alamdarloo, S., Ameri, A., Moghimipour, E., Gholipour, S., dan Saadatzadeh, A., 2016. Formulation development of a topical probiotic gel for antidermatophytosis effect. *Jundishapur Journal of Natural Pharmaceutical Products*, **11**: .
- Meidan, V.M., Bonner, M.C., dan Michniak, B.B., 2005. Transfollicular drug delivery - Is it a reality? *International Journal of Pharmaceutics*, **306**: 1–14.
- Miller, M.B. dan Bassler, B.L., 2001. Quorum Sensing in Bacteria. *Annu. Rev. Microbiol.*, **55**: 165–199.
- Mills, P.C., Magnusson, B.M., dan Cross, S.E., 2006. The effects of vehicle and region of application on in vitro penetration of testosterone through canine skin. *Veterinary Journal*, **171**: 276–280.
- Mizutani, Y., Mitsutake, S., Tsuji, K., Kihara, A., dan Igarashi, Y., 2009. Ceramide biosynthesis in keratinocyte and its role in skin function. *Biochimie*, **91**: 784–790.
- Mottin, V.H.M. dan Suyenaga, E.S., 2018. An approach on the potential use of probiotics in the treatment of skin conditions: acne and atopic dermatitis. *International Journal of Dermatology*, **57**: 1425–1432.
- Muizzuddin N, Maher W, Sullivan M, Schnittger S, Mammone T. 2012. Physiological effect of a probiotic on skin. *J Cosmet Sci*, **63**(6):385-95. PMID: 23286870.
- Murtini, G. (2016). *Farmasetika Dasar*. Kementerian Kesehatan Republik



Indonesia.

- Nast, A., Dréno, B., Bettoli, V., Bukvic Mokos, Z., Degitz, K., Dressler, C., Finlay, A. Y., Haedersdal, M., Lambert, J., Layton, A., Lomholt, H. B., López-Estebaranz, J. L., Ochsendorf, F., Oprica, C., Rosumeck, S., Simonart, T., Werner, R. N., dan Gollnick, H., 2016. European evidence-based (S3) guideline for the treatment of acne – update 2016 – short version. *Journal of the European Academy of Dermatology and Venereology*, **30**: 1261–1268.
- Neufang, G., Fürstenberger, G., Heidt, M., Marks, F., dan Müller-Decker, K., 2001. Abnormal differentiation of epidermis in transgenic mice constitutively expressing cyclooxygenase-2 in skin. *Proceedings of the National Academy of Sciences of the United States of America*, **98**: 7629–7634.
- Niemann, C. dan Horsley, V., 2012. Development and homeostasis of the sebaceous gland. *Seminars in Cell and Developmental Biology*, **23**: 928–936.
- Nole, K.L.B., Mph, E.Y., dan Keri, J.E., 2014. Probiotics and prebiotics in dermatology. *Journal of American Dermatology*, 1–8.
- O'Neill, A.M., Nakatsuji, T., Hayachi, A., Williams, M.R., Mills, R.H., Gonzalez, D.J., dan Gallo, R. L., 2020. Identification of a Human Skin Commensal Bacterium that Selectively Kills *Cutibacterium acnes*. *Journal of Investigative Dermatology*, **140**: 1619–1628.e2.
- Oh, S., Kim, S.H., Ko, Y., Sim, J.H., Kim, K.S., Lee, S.H., Park, S., dan Kim, Y. J., 2006. Effect of bacteriocin produced by *Lactococcus* sp. HY 449 on skin-inflamatory bacteria. *Food and Chemical Toxicology*, **44**: 1184–1190.
- Ottaviani, M., Camera, E., dan Picardo, M., 2010. Lipid mediators in acne. *Mediators of Inflammation*, **2010**: .
- Paetzold, B., Willis, J.R., Pereira De Lima, J., Knöldlseder, N., Brüggemann, H., Quist, S.R., Gabaldón, T., dan Güell, M., 2019. Skin microbiome modulation induced by probiotic solutions. *Microbiome*, **7**: 1–9.
- Papenfort, K. dan Bassler, B., 2016. Quorum-Sensing Signal-Response Systems in Gram-Negative Bacteria **14**: 576–588.
- Patel, P., 2019. Preformulation Studies: An Integral Part of Formulation Design. *Pharmaceutical Formulation Design - Recent Practices*, 1–19.
- Pavicic, T., Wollenweber, U., Farwick, M., dan Korting, H.C., 2007. Anti-microbial and -inflammatory activity and efficacy of phytosphingosine: An in vitro and in vivo study addressing acne vulgaris. *International Journal of Cosmetic Science*, **29**: 181–190.
- Picardo, M., Eichenfield, L. F., dan Tan, J. 2017. Acne and Rosacea. *Dermatology and Therapy*, **7**(s1), 43–52. <https://doi.org/10.1007/s13555-016-0168-8>
- Piqué, N., Berlanga, M., dan Miñana-Galbis, D., 2019. Health benefits of heat-killed (Tyndallized) probiotics: An overview. *International Journal of Molecular Sciences*, **20**: 1–30.
- Rathi, S. K. 2011. Acne vulgaris treatment : the current scenario. *Indian journal of dermatology*, (1), 7–13. <https://doi.org/10.4103/0019-5154.77543>.
- Ryu, S., Park, Y., Kim, B., Cho, S.-M., Lee, J., Lee, H.-H., Gurley, C., Song, K., Johnson, A., Armstrong, C. A., dan Song, P. I., 2014. Inhibitory and anti-inflammatory effects of *Helicobacter pylori*-derived antimicrobial peptide



- HPA3NT3 against Propionibacterium acnes in the skin. *British Journal of Dermatology*, **171**: 1358–1367.
- Schmitt, T., Gupta, R., Lange, S., Sonnenberger, S., Dobner, B., Hauß, T., Rai, B., & Neubert, R. H. H., 2018. Impact of the ceramide subspecies on the nanostructure of stratum corneum lipids using neutron scattering and molecular dynamics simulations. Part I: impact of CER[NS]. *Chemistry and Physics of Lipids*, **214**: 58–68.
- Silva, A.K.S., Silva, T.R.N., Nicoli, J.R., Vasquez-Pinto, L.M.C., dan Martins, F.S., 2018. In vitro evaluation of antagonism, modulation of cytokines and extracellular matrix proteins by Bifidobacterium strains. *Letters in Applied Microbiology*, **67**: 497–505.
- Silva, P., 2014. The right skin preparation technique: A literature review. *Journal of Perioperative Practice*, **24**: 283–285.
- Silverberg, J.I. dan Silverberg, N.B., 2014. Epidemiology and extracutaneous comorbidities of severe acne in adolescence: A US population-based study. *British Journal of Dermatology*, **170(5)**: 1136–1142.
- Slominski, A., Zbytek, B., Nikolakis, G., Manna, P.R., Skobowiat, C., Zmijewski, M., Li, W., Janjetovic, Z., Postlethwaite, A., Zouboulis, C. C., & Tuckey, R. C., 2013. *Steroidogenesis in the Skin: Implications for Local Immune Functions*, Journal of Steroid Biochemistry and Molecular Biology. Elsevier Ltd.
- Slominski, A.T., Manna, P.R., dan Tuckey, R.C., 2015. On the role of skin in the regulation of local and systemic steroidogenic activities. *Steroids*, **103**: 72–88.
- Tagliolatto, S., França, P.F., dan dos Santos, K.M.P., 2020. Use of topical tyndallized probiotic bacteria in the treatment of acne vulgaris. *Surgical and Cosmetic Dermatology*, **12**: 148–155.
- Tan, J.K.L. dan Bhate, K., 2015. A global perspective on the epidemiology of acne. *British Journal of Dermatology*, **172**: 3–12.
- Tayupanta, T. de los A.M. dan Ocana, V.S.P., 2019. In vivo Evaluation of the Antagonistic Effect of Lactobacillus acidophilus against Propionobacterium acnes in the Treatment of Acne. *Journal of Pure and Applied Microbiology*, **13**: 1317–1324.
- Teneva, D., Denkova, R., Goranov, B., Denkova, Z., dan Kostov, G., 2017. Antimicrobial activity of Lactobacillus plantarum strains against Salmonella pathogens. *Ukrainian Food Journal*, **6**: 125–133.
- Thiboutot, D., Gollnick, H., Bettoli, V., Dréno, B., Kang, S., Leyden, J.J., Shalita, A. R., Lozada, V. T., Berson, D., Finlay, A., Goh, C. L., Herane, M. I., Kaminsky, A., Kubba, R., Layton, A., Miyachi, Y., Perez, M., Martin, J. P., Ramos-e-Silva, M., See, J. A., Shear, N., Wolf, J., 2009. New insights into the management of acne: An update from the Global Alliance to Improve Outcomes in Acne Group. *Journal of the American Academy of Dermatology*, **60**: .
- Thiboutot, D.M., Dréno, B., Abanmi, A., Alexis, A.F., Araviiskaia, E., Barona Cabal, M.I., Bettoli, V., Casintahan, F., Chow, S., da Costa, A., El Ouazzani, T., Goh, C. L., Gollnick, H. P. M., Gomez, M., Hayashi, N., Herane, M. I.,



- Honeyman, J., Kang, S., Kemeny, L., Kubba, R., Lambert, J., Layton, A. M., Leyden, J. J., López-Estebaranz, J. L., Noppakun, N., Ochsendorf, F., Oprica, C., Orozco, B., Perez, M., Piquero-Martin, J., See, J. A., Suh, D. H., Tan, J., Lozada, V. T., Troielli, P., Xiang, L. F., 2018. Practical management of acne for clinicians: An international consensus from the Global Alliance to Improve Outcomes in Acne. *Journal of the American Academy of Dermatology*, **78**: S1-S23.e1.
- Trivedi, N.R., Gilliland, K.L., Zhao, W., Liu, W., dan Thiboutot, D.M., 2006. Gene array expression profiling in acne lesions reveals marked upregulation of genes involved in inflammation and matrix remodeling. *Journal of Investigative Dermatology*, **126**: 1071–1079.
- Tuchayi, S., Makrantonaki, E., Ganceviciene, R., Dessinioti, C., Feldman, S.R., dan Zouboulis, C.C., 2015. Acne vulgaris. *Nature reviews. Disease primers*, **1**: 15029.
- Uche, L.E., Gooris, G.S., Beddoes, C.M., dan Bouwstra, J.A., 2019. New insight into phase behavior and permeability of skin lipid models based on sphingosine and phytosphingosine ceramides. *Biochimica et Biophysica Acta - Biomembranes*, **1861**: 1317–1328.
- Venus, M., Waterman, J., dan McNab, I., 2011. Basic physiology of the skin. *Surgery*, **29**: 471–474.
- Vora, S., Ovhal, A., Jerajani, H., Nair, N., dan Chakrabortty, A., 2008. Correlation of facial sebum to serum insulin-like growth factor-1 in patients with acne. *British Journal of Dermatology*, **159**: 990–991.
- Wang, Y., Kao, M.S., Yu, J., Huang, S., Marito, S., Gallo, R.L., dan Huang, C. M., 2016. A precision microbiome approach using sucrose for selective augmentation of *Staphylococcus epidermidis* fermentation against *Propionibacterium acnes*. *International Journal of Molecular Sciences*, **17**: 1–12.
- Wang, Y., Kuo, S., Shu, M., Yu, J., Huang, S., Dai, A., Two, A., Gallo, R. L., & Huang, C. M., 2014. *Staphylococcus epidermidis* in the human skin microbiome mediates fermentation to inhibit the growth of *Propionibacterium acnes*: Implications of probiotics in acne vulgaris. *Applied Microbiology and Biotechnology*, **98**: 411–424.
- Wang, Y., Wang, L., Wen, X., Hao, D., Zhang, N., He, G., dan Jiang, X., 2019. NF-κB signaling in skin aging. *Mechanisms of Ageing and Development*, **184**: .
- Williams, H.C., Dellavalle, R.P., dan Garner, S., 2012. Acne vulgaris. *The Lancet*, **379**: 361–372.
- Wohlrab, J., 2016. Topika und deren Einsatz in der Dermatologie. *JDDG - Journal of the German Society of Dermatology*, **14**: 1061–1071.
- Worret, W.I. dan Fluhr, J.W., 2006. Topische therapie mit benzoylperoxid, antibiotika und azelainsäure bei der akne. *JDDG - Journal of the German Society of Dermatology*, **4**: 293–300.
- Xia, X., Li, Z., Liu, K., Wu, Y., Jiang, D., dan Lai, Y., 2016. Staphylococcal LTA-Induced miR-143 Inhibits *Propionibacterium acnes*-Mediated Inflammatory Response in Skin. *Journal of Investigative Dermatology*, **136**:



621–630.

- Xu, H. dan Li, H., 2019. Acne, the Skin Microbiome, and Antibiotic Treatment. *American Journal of Clinical Dermatology*, **20**: 335–344.
- Yang, A.J., Marito, S., Yang, J.J., Keshari, S., Chew, C.H., Chen, C.C., Huang, C. M., 2019. A microtube array membrane (MTAM) encapsulated live fermenting staphylococcus epidermidis as a skin probiotic patch against cutibacterium acnes. *International Journal of Molecular Sciences*, **20**: .
- Yosipovitch, G., Tang, M., Dawn, A.G., Chen, M., Goh, C.L., Chan, Y.H., Seng, L. F., 2007. Study of psychological stress, sebum production and acne vulgaris in adolescents. *Acta Dermato-Venereologica*, **87**: 135–139.
- Zhang, X., Du, J., Wang, Yu, Chen, S., dan Wang, Y., 2017. Escherichia coli GutM4 produces 2,5-diketopiperazines and inhibits human pathogens in vitro. *Electronic Journal of Biotechnology*, **28**: 35–40.
- Zhang, Y., Hu, P., Lou, L., Zhan, J., Fan, M., Li, D., dan Liao, Q., 2017. Antioxidant Activities of Lactic Acid Bacteria for Quality Improvement of Fermented Sausage. *Journal of Food Science*, **82**: 2960–2967.
- Zouboulis, C.C., 2009. Propionibacterium acnes and sebaceous lipogenesis: A love-hate relationship? *Journal of Investigative Dermatology*, **129**: 2093–2096.