

DAFTAR PUSTAKA

- Ahmed Saeed AL-Japairai, K., Mahmood, S., Hamed Almurisi, S., Reddy Venugopal, J., Rebhi Hilles, A., Azmana, M., & Raman, S. (2020). Current trends in polymer microneedle for transdermal drug delivery. *International Journal of Pharmaceutics*, 587(May), 119673.
<https://doi.org/10.1016/j.ijpharm.2020.119673>
- Aini, N. N., Wijayatri, R., & Pribadi, P. (2022). Nanoemulsion Characteristics Preparations Ethanol Leaf Extracts in Various Plants: Literature Review. *Jurnal Farmasi Sains Dan Praktis*, 8(3), 215–226.
<https://doi.org/10.31603/pharmacy.v8i3.4786>
- Alkilani, A. Z., McCrudden, M. T. C., & Donnelly, R. F. (2015). Transdermal drug delivery: Innovative pharmaceutical developments based on disruption of the barrier properties of the stratum corneum. *Pharmaceutics*, 7(4), 438–470.
<https://doi.org/10.3390/pharmaceutics7040438>
- Asita, N., Zubair, M. S., & Syukri, Y. (2023). Formulasi Self-Nanoemulsifying Drug Delivery System (SNEDDS) yang Memanfaatkan Tanaman Obat: Narrative Review. *Jurnal Sains Farmasi & Klinis*, 10(2), 184.
<https://doi.org/10.25077/jsfk.10.2.184-196.2023>
- Atun, S., Arianingrum, R., Cahyaningsih, L., Pratiwi, F. A., Kusumaningrum, R., & Khairuddean, M. (2020). Formulation and characterization of quercitrin nanoemulsion isolated from *dendrophoe falcata* and its antioxidant activity test. *Rasayan Journal of Chemistry*, 13(3), 1347–1356.
<https://doi.org/10.31788/RJC.2020.1335868>
- Balapadang, R. N., Sarie, A. D., Rosyidah, S., Zulqifli, I., Akifah, M. N., & Azkia, A. (2024). *Formulation and Evaluation of Transdermal Dissolving Microneedle Loaded with Ethanol Extract of Cocor Bebek Leaves (Kalanchoe pinnata)*. 11(3), 378–385. <https://doi.org/10.20473/jfiki.v11i32024.378-385>
- Castilla-Casadiago, D. A., Carlton, H., Gonzalez-Nino, D., Miranda-Muñoz, K. A., Daneshpour, R., Huitink, D., Prinz, G., Powell, J., Greenlee, L., & Almodovar, J. (2021). Design, characterization, and modeling of a chitosan microneedle patch for transdermal delivery of meloxicam as a pain management strategy for use in cattle. *Materials Science and Engineering C*, 118(August 2020),

111544. <https://doi.org/10.1016/j.msec.2020.111544>

Chaiwarit, T., Chanabodeechalermrung, B., Jantrawut, P., Ruksiriwanich, W., & Sainakham, M. (2024). Fabrication and Characterization of Dissolving Microneedles Containing *Oryza sativa* L. Extract Complex for Enhancement of Transfollicular Delivery. *Polymers*, 16(16).

<https://doi.org/10.3390/polym16162377>

Chellathurai, M. S., Ling, V. W. T., & Palanirajan, V. K. (2021). Fabrication and evaluation of transdermal microneedles for a recombinant human keratinocyte growth factor. *Turkish Journal of Pharmaceutical Sciences*, 18(1), 96–103.

<https://doi.org/10.4274/tjps.galenos.2020.21033>

Chen, S., Wu, D., Liu, Y., Huang, Y., Xu, H., Gao, W., Zhang, J., Sun, J., & Zhuang, J. (2020). Optimal scaling analysis of polymeric microneedle length and its effect on transdermal insulin delivery. *Journal of Drug Delivery Science and Technology*, 56(July 2019), 101547.

<https://doi.org/10.1016/j.jddst.2020.101547>

Choerunnisa, C., Pujiastuti, R. S. E., & Kusmiyati, Y. (2024). Effectiveness of Basil Leaf Nanoparticle Supplementation on Stress Levels and Breast Milk Adequacy in Postpartum. *Amalee: Indonesian Journal of Community Research and Engagement*, 5(1), 503–517.

<https://doi.org/10.37680/amalee.v5i1.3154>

Choironi, N. A., Pudyastuti, B., Gumelar, G., Fareza, M. S., Wijaya, T. H., & Setyono, J. (2022). Optimasi Formula Self-Nanoemulsifying Drug Delivery System (SNEDDS) Etil-p-metoksisinamat (EPMS). *ALCHEMY Jurnal Penelitian Kimia*, 18(2), 205.

<https://doi.org/10.20961/alchemy.18.2.56847.205-213>

Deswita, W., Manalu, K., & Tambunan, E. P. S. (2021). Uji Efektivitas Antibakteri Ekstrak Umbi Lobak Putih (*Raphanus Sativus* L) Terhadap Pertumbuhan Bakteri *Propionibacterium Acnes* Dan *Staphylococcus Epidermidis*. *Klorofil: Jurnal Ilmu Biologi Dan Terapan*, 5(2), 111.

<https://doi.org/10.30821/kfl:jibt.v5i2.10032>

Dyah Ayu Nurismawati, & Sani Ega Priani. (2021). Kajian Formulasi dan Karakterisasi Self-nanoemulsifying Drug Delivery System (SNEDDS)

- sebagai Penghantar Agen Antihiperlipidemia Oral. *Jurnal Riset Farmasi*, 1(2), 114–123. <https://doi.org/10.29313/jrf.v1i2.455>
- Gorle, A., Ahire, K., & Shende, R. (2022). Design, Development and Characterization of Nanoemulsion developed by High Pressure Homogenization (HPH) method Containing Antifungal Drug. *Journal of Drug Delivery and Therapeutics*, 12(2), 24–32. <https://doi.org/10.22270/jddt.v12i2.5245>
- Griffin, S., Masood, M. I., Nasim, M. J., Sarfraz, M., Ebokaiwe, A. P., Schäfer, K. H., Keck, C. M., & Jacob, C. (2018). Natural nanoparticles: A particular matter inspired by nature. *Antioxidants*, 7(1). <https://doi.org/10.3390/antiox7010003>
- Hainil, S., Sammulia, S. F., & Adella, A. (2022). Aktivitas Antibakteri *Staphylococcus aureus* dan *Salmonella thypi* Ekstrak Metanol Anggur Laut (*Caulerpa racemosa*). *Jurnal Surya Medika*, 7(2), 86–95. <https://doi.org/10.33084/jsm.v7i2.3210>
- Hajrin, W., Subaidah, W. A., & Juliantoni, Y. (2024). Formulation And Characterization of Nanoemulsion from *Brucea javanica* Seed Extract. *Indonesian Journal of Pharmaceutical Science and Technology Journal Homepage*, 11(1), 117–125. <http://jurnal.unpad.ac.id/ijpst/>
- Hayati, R., Sari, A., & Chairunnisa, C. (2019). Formulasi Spray Gel Ekstrak Etil Asetat Bunga Melati (*Jasminum sambac* (L.) Ait.) Sebagai Antijerawat. *Indonesian Journal of Pharmacy and Natural Product*, 2(2), 59–64. <https://doi.org/10.35473/ijpnp.v2i2.256>
- Her, C., Venier-Julienne, M.-C., & Roger, E. (2018). Improvement of Curcumin Bioavailability for Medical Applications. *Medicinal & Aromatic Plants*, 07(06). <https://doi.org/10.4172/2167-0412.1000326>
- Hoseini, B., Jaafari, M. R., Golabpour, A., Momtazi-Borojeni, A. A., Karimi, M., & Eslami, S. (2023). Application of ensemble machine learning approach to assess the factors affecting size and polydispersity index of liposomal nanoparticles. *Scientific Reports*, 13(1), 1–11. <https://doi.org/10.1038/s41598-023-43689-4>
- Iwani, N., Ar, P., Yuniarti, R., Lubis, M. S., & Nasution, M. A. (2024). Uji Aktivitas Antibakteri Ekstrak Etanol Daun Sirih Merah (*Piper ornatum* *Staphylococcus*

- epidermidis . Antibacterial Activity Test of Ethanolic Extract from Red Betel Leaves (*Pepper ornatum* N . E . Br) against *Propionibacterium acne* , *Staphylococcus aur*. *Pharmauho: Jurnal Farmasi, Sains, Dan Kesehatan*, 10(1). <https://doi.org/10.33772/pharmauho.V10i1.92>
- Kalangi, S. J. R. (2014). Histofisiologi Kulit. *Jurnal Biomedik (Jbm)*, 5(3), 12–20. <https://doi.org/10.35790/jbm.5.3.2013.4344>
- Kang, H., Zuo, Z., Lin, R., Yao, M., Han, Y., & Han, J. (2022). The most promising microneedle device: present and future of hyaluronic acid microneedle patch. *Drug Delivery*, 29(1), 3087–3110. <https://doi.org/10.1080/10717544.2022.2125600>
- Khanifah, F., Vokasi, F., Khanifah, F., & Vokasi, F. (2022). Uji Flavonoid Kunyit Putih (*Curcuma zedoria*) dan Kunyit Kuning (*Curcuma longa*) Sebagai Senyawa Antibakteri *Stahylococcus aureus*. *Prosiding Seminar Nasional Kimia*, 1–7.
- Kumar, B., Aggarwal, R., Prakash, U., & Sahoo, P. K. (2023). Emerging therapeutic potential of curcumin in the management of dermatological diseases: an extensive review of drug and pharmacological activities. *Future Journal of Pharmaceutical Sciences*, 9(1), 1–10. <https://doi.org/10.1186/s43094-023-00493-1>
- Kusumawati, M., Sedyadi, E., & Nugraha, I. (2018). Pengaruh Penambahan Ekstrak Kunyit Pada Edible Film Umbi Ganyong Dan Lidah Buaya (*Aloe Vera L*) Terhadap Kualitas Buah Tomat. *Integrated Lab Journal*, 06(01), 13–20.
- Mahdi, L., Sudibyo, R. S., & Martien, R. (2020). Self-nano emulsifying drug delivery system (SNEDDS) of curcuma mangga Val. essential oil and the stability study. *Indonesian Journal of Pharmacy*, 31(4), 238–243. <https://doi.org/10.22146/ijp.584>
- Malahayati, S., Nastiti, K., Audina, M., & Noval, N. (2024). Formulasi Nanoemulsi Ekstrak Bunga Melati (*Jasmine sambac L.*) dengan Teknik Self Nano Emulsifying Drug Delivery System (SNEDDS) Sebagai Anti Jerawat. *Jurnal Surya Medika*, 10(1), 325–333. <https://doi.org/10.33084/jsm.v10i1.7236>
- Malek-Khatabi, A., Faraji Rad, Z., Rad-Malekshahi, M., & Akbarijavar, H. (2023). Development of dissolvable microneedle patches by CNC machining and

- micromolding for drug delivery. *Materials Letters*, 330, 133328. <https://doi.org/https://doi.org/10.1016/j.matlet.2022.133328>
- Mayasari, U. (2022). Uji Aktivitas Antibakteri ekstrak Batang Muda Rotan Manau (*Calamus manan*) terhadap pertumbuhan bakteri *Klebsiella pneumonia*. *KLOROFIL: Jurnal Ilmu Biologi Dan Terapan*, 6(1), 9. <https://doi.org/10.30821/kfl:jibt.v6i1.11762>
- Mendes, T. F., Reis, A. S., Silva, A. C., & Barrozo, M. A. S. (2024). Analysis of the Effect of Surfactants on the Performance of Apatite Column Flotation. *Minerals*, 14(8), 1–15. <https://doi.org/10.3390/min14080840>
- Miura, S., Yamagishi, R., Ando, M., Hachikubo, Y., Ibrahim, N. A., Fadilah, N. I. M., Maarof, M., Oshima, M., Goo, S. L., Hayashi, H., Morita, M., Fauzi, M. B., & Takei, S. (2025). Fabrication and Evaluation of Dissolving Hyaluronic Acid Microneedle Patches for Minimally Invasive Transdermal Drug Delivery by Nanoimprinting. *Gels*, 11(2), 1–17. <https://doi.org/10.3390/gels11020089>
- Nasiri, M. I., Vora, L. K., Ershaid, J. A., Peng, K., Tekko, I. A., & Donnelly, R. F. (2022). Nanoemulsion-based dissolving microneedle arrays for enhanced intradermal and transdermal delivery. *Drug Delivery and Translational Research*, 12(4), 881–896. <https://doi.org/10.1007/s13346-021-01107-0>
- Pariury, J. A., Juan Paul Christian Herman, Tiffany Rebecca, Elvina Veronica, & I Gusti Kamasan Nyoman Arijana. (2021). Potensi Kulit Jeruk Bali (*Citrus Maxima Merr*) Sebagai Antibakteri *Propionibacterium acne* Penyebab Jerawat. *Hang Tuah Medical Journal*, 19(1), 119–131. <https://doi.org/10.30649/htmj.v19i1.65>
- Permana, A. D., Mir, M., Utomo, E., & Donnelly, R. F. (2020). Bacterially sensitive nanoparticle-based dissolving microneedles of doxycycline for enhanced treatment of bacterial biofilm skin infection: A proof of concept study. *International Journal of Pharmaceutics*, X, 2(March), 100047. <https://doi.org/10.1016/j.ijpx.2020.100047>
- Prihantini, M., & Fayakun, F. L. (2023). Optimasi Konsentrasi Surfaktan Cremophor RH 40 dalam Nanoemulsi Kompleks Molekular Asam Glikolat-Kitosan Menggunakan Metode Multilevel Categorical-One Factor. *Jurnal Ilmu Farmasi Dan Farmasi Klinik*, 20(2), 167.

<https://doi.org/10.31942/jiffk.v20i2.9858>

- Prihantini, M., Wibowo, D. N., Azizah, N., & Setya, N. F. (2021). Formulasi Dan Uji Stabilitas Antioksidan Krim Nanopartikel Kitosan-Ekstrak Etanol Daun Sirsak (*Annona Muricata* L.) Menggunakan Metode Cycling Test. *Cendekia Eksakta*, 6(2), 88–93. <https://doi.org/10.31942/ce.v6i2.5525>
- Pulsoni, I., Lubda, M., Aiello, M., Fedi, A., Marzagalli, M., Hagen, J. von, & Scaglione, S. (2022). Comparison Between Franz Diffusion Cell and a novel Micro-physiological System for In Vitro Penetration Assay Using Different Skin Models. *SLAS Technology*, 27(3), 161–171. <https://doi.org/10.1016/j.slant.2021.12.006>
- Quesada-v, S., Moreno, R. C., & Badia, A. Della. (2024). *Promising Phytogetic Feed Additives Used as Anti-Mycotoxin Solutions in Animal Nutrition*.
- Ramadon, D., Ulayya, F., Qur'ani, A. S., Iskandarsyah, I., Harahap, Y., Anjani, Q. K., Aileen, V., Hartrianti, P., & Donnelly, R. F. (2023). Combination of Dissolving Microneedles with Nanosuspension and Co-Grinding for Transdermal Delivery of Ketoprofen. *Pharmaceuticals*, 16(3). <https://doi.org/10.3390/ph16030378>
- Ramelia Hudaya, I., Luthfiana Hasna, V., Hasanah, F. F., Hermawan, K. A., & Mierza, V. (2023). Standardization Methods for the Determination of Curcumin in Turmeric and Its Anticancer Activities : A Review. *Jurnal Eduhealth*, 14(01), 2023. <http://ejournal.seaninstitute.or.id/index.php/health>
- Rosalina, A., & Wicaksono, I. A. (2018). Article Review: Formulasi dan Evaluasi Microneedle dengan Berbagai Macam Polimer Sebagai Zat Pembawa Obat. *Jurnal Farmaka*, 16(3), 292–303.
- Rusdi, M. (2017). Karakteristik Ukuran Partikel dan Indeks Polidispersitas Formulasi Nanoemulsi Pewarna Alam Ekstrak Kayu Secang (*Caesalpinia Sappan* Linn). *Jurnal Pertanian Terpadu*, 5(2), 114–127. <https://doi.org/10.36084/jpt..v5i2.132>
- Rusminingsih, E., Susanto, H., Afifah, D. N., Martien, R., & Anas, Y. (2023). Peningkatan Performa Self Nanoemulsifying Drug Delivery System Daun Kelor (*Moringa oleifera* Lam) Menggunakan Metode Emulsifikasi Ultrasonic Improved Performance of Self Nanoemulsifying Drug Delivery System

- (*Moringa oleifera* Lam) Using Ultrasonic Emulsific. *Pharmaceutical Journal of Indonesia*, 20(02), 123–129.
- Ryu, S., Han, H. M., Song, P. I., Armstrong, C. A., & Park, Y. (2015). Suppression of propionibacterium acnes infection and the associated inflammatory response by the antimicrobial peptide P5 in Mice. *PLoS ONE*, 10(7), 1–18. <https://doi.org/10.1371/journal.pone.0132619>
- Saha, I., & Rai, V. K. (2021). Hyaluronic acid based microneedle array: Recent applications in drug delivery and cosmetology. *Carbohydrate Polymers*, 267(January), 118168. <https://doi.org/10.1016/j.carbpol.2021.118168>
- Salim, W. P., Hutahae, Y. O., & Sitohang, F. A. (2024). Efektivitas Antibakteri Senyawa Kurkumin terhadap Foodborne Bacteria: Tinjauan Curcuma longa untuk Mengatasi Resistensi Antibiotik. *Jurnal Sains Dan Kesehatan*, 3(1), 242–247.
- Santika, I. G. A., Tantontos, E. Y., Khusumua, A., Inayati, N., & Gede, L. S. (2023). Analisis Hasil Pemeriksaan Gas Darah Pada Pasien Positif Covid-19. *Journal of Indonesia Laboratory Technology of Student (JILTS)*, 2(1), 55–61.
- Saragih, D. F., Opod, H., & Pali, C. (2016). Hubungan tingkat kepercayaan diri dan jerawat (*Acne vulgaris*) pada siswa-siswi kelas XII di SMA Negeri 1 Manado. *Jurnal E-Biomedik*, 4(1), 0–7. <https://doi.org/10.35790/ebm.4.1.2016.12137>
- Sartawi, Z., Blackshields, C., & Faisal, W. (2022). Dissolving microneedles: Applications and growing therapeutic potential. *Journal of Controlled Release*, 348(May), 186–205. <https://doi.org/10.1016/j.jconrel.2022.05.045>
- Shu, C., Ge, L., Li, Z., Chen, B., Liao, S., Lu, L., Wu, Q., Jiang, X., An, Y., Wang, Z., & Qu, M. (2024). Antibacterial activity of cinnamon essential oil and its main component of cinnamaldehyde and the underlying mechanism. *Frontiers in Pharmacology*, 15(March), 1–14. <https://doi.org/10.3389/fphar.2024.1378434>
- Sifatullah, N., & Zulkarnain. (2021). Jerawat (*Acne vulgaris*): Review Penyakit Infeksi Pada Kulit. *Prosiding Biologi Achieving the Sustainable Development Goals*, November, 19–23. <http://journal.uin-alaudhin.ac.id/index.php/psb>
- Singh, D. (2021). Self-nanoemulsifying Drug Delivery System: A Versatile Carrier for Lipophilic Drugs. *Pharmaceutical Nanotechnology*, 9(3), 166–176.

<https://doi.org/10.2174/2211738509666210422124023>

Snetkov, P., Rogacheva, E., Kremleva, A., Morozkina, S., Uspenskaya, M., & Kraeva, L. (2022). In-Vitro Antibacterial Activity of Curcumin-Loaded Nanofibers Based on Hyaluronic Acid against Multidrug-Resistant ESKAPE Pathogens. *Pharmaceutics*, 14(6).

<https://doi.org/10.3390/pharmaceutics14061186>

Sudjarwo, S., Bobsaid, J., Windianto, F. R., Rizkyah, C., Shaffiq, N., Putra, A. S., Jaelani, M. I., Zulfah, Y., Nareswari, A. B., Fridayanti S, S. I., Devitri, N. A., Yakub, N., Putri, Y. B. P., & Widyowati, R. (2023). Improving the Bioavailability of Curcumin in Curcuma heyneana by Preparing Solid Dispersion. *Berkala Ilmiah Kimia Farmasi*, 10(1), 23–27.

<https://doi.org/10.20473/bikfar.v10i1.44546>

Teow, S. Y., Liew, K., Ali, S. A., Khoo, A. S. B., & Peh, S. C. (2016). Antibacterial Action of Curcumin against Staphylococcus aureus: A Brief Review. *Journal of Tropical Medicine*, 2016. <https://doi.org/10.1155/2016/2853045>

Thantaviriya, S., Kamanamool, N., Sansureerungsikul, T., Udompataikul, M., Wanichwecharungruang, S., & Rojhirunsakool, S. (2023). Efficacy and Safety of Detachable Microneedle Patch Containing Triamcinolone Acetonide in the Treatment of Inflammatory Acne. *Clinical, Cosmetic and Investigational Dermatology*, 16(June), 1431–1441. <https://doi.org/10.2147/CCID.S411378>

Tuloli, T. S., Asriastuti, A. N., Dwifrila, D., Gubali, R., Rombe, N. T., Kartika, P., Kahar, A., & Tolulu, S. N. (2024). Gambaran Frekuensi Penggunaan Antimikroba Oral Pada Tatalaksana Terapi Pasien Acne Vulgaris Di Rsud Toto Kabila. 19(1), 25–35.

Wang, C. Y., Yen, C. C., Hsu, M. C., & Wu, Y. T. (2020). SELF-nanoemulsifying drug delivery systems for enhancing solubility, permeability, and bioavailability of sesamin. *Molecules*, 25(14).

<https://doi.org/10.3390/molecules25143119>

Widasari, N. P. A., Arsyastuti, A. A. S., & Sunyamurthi, I Gde Nengah, A. (2024). Hubungan Derajat Acne Vulgaris dengan Tingkat Ansietas pada Mahasiswa Fakultas Kedokteran dan Ilmu Kesehatan Universitas Warmadewa. *Aesculapius Medical Journal*, 4(2), 252–260.

- Windy, Y. M., Dilla, K. N., Claudia, J., Noval, N., & Hakim, A. R. (2022). Karakterisasi dan Formulasi Nanopartikel Ekstrak Tanaman Bundung (*Actinoscirpus grossus*) dengan Variasi Konsentrasi Basis Kitosan dan Na-TPP Menggunakan Metode Gelasi Ionik. *Jurnal Surya Medika*, 8(3), 25–29. <https://doi.org/10.33084/jsm.v8i3.4495>
- Zhang, X., Chen, G., Yu, Y., Sun, L., & Zhao, Y. (2020). Bioinspired Adhesive and Antibacterial Microneedles for Versatile Transdermal Drug Delivery. *Research*, 2020. <https://doi.org/10.34133/2020/3672120>
- Zheng, D., Huang, C., Huang, H., Zhao, Y., Khan, M. R. U., Zhao, H., & Huang, L. (2020). Antibacterial Mechanism of Curcumin: A Review. *Chemistry and Biodiversity*, 17(8). <https://doi.org/10.1002/cbdv.202000171>