

DAFTAR PUSTAKA

- Aldawood, F. K., Andar, A., & Desai, S. (2021). A Comprehensive Review of Microneedles: Types, Materials, Processes, Characterizations and Applications. *Polymers*, 13(16), 1–34. <https://doi.org/10.3390/polym13162815>
- Al-Japairai, K. A. S., Mahmood, S., Almurisi, S. H., Venugopal, J. R., Hilles, A. R., Azmana, M., & Raman, S. (2020). Current trends in polymer microneedle for transdermal drug delivery. *International Journal of Pharmaceutics*, 587. <https://doi.org/10.1016/j.ijpharm.2020.119673>
- 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>
- Bai, Y., Liu, C.-P., Chen, D., Liu, C.-F., Zhuo, L.-H., Li, H., Wang, C., Bu, H.-T., & Tian, W. (2020). β -Cyclodextrin-modified hyaluronic acid-based supramolecular self-assemblies for pH-and esterase-dual-responsive drug delivery. *Carbohydrate Polymers*, 246. <https://doi.org/10.1016/j.carbpol.2020.116654>
- Bolger, G. T., Pucaj, K., Minta, Y. O., & Sordillo, P. (2022). Relationship between the in vitro efficacy, pharmacokinetics and in vivo efficacy of curcumin. *Biochemical Pharmacology*, 205. <https://doi.org/10.1016/j.bcp.2022.111.5251>
- Dave, R., Shinde, S., Kalayil, N., & Budar, A. (2024). Engineering Microscopic Delivery Systems: A review of Dissolving Microneedle Design, Fabrication, and Function. *Micro and Nano Systems Letters*, 12(1), 1–11. <https://doi.org/10.1186/s40486-024-00204-2>
- DS, A., Julietraja, K., Jaganathan, B., & Alsinai, A. (2024). Curcumin-Conjugated PAMAM Dendrimers of Two Generations: Comparative Analysis of Physiochemical Properties Using Adriatic Topological Indices. *ACS Omega*, 9(12), 14558–14579. <https://doi.org/10.1021/acsomega.4c00686>
- Erenoğlu Sarı, Ö., Donat, R., & Çelik, S. Ş. (2025). Micromolding-Based Fabrication of Dissolvable Microneedles: An Economical and Scalable

- Approach for Transdermal Drug Delivery. *International Journal of Polymer Science*, 2025(1), 1–13. <https://doi.org/10.1155/ijps/2261987>
- Fatima, N., Khalid, S. H., Liaqat, K., Zulfiqar, A., & Munir, R. (2023). Beta-cyclodextrin: A Cyclodextrin Derivative and its Various Applications. *Polymer Science: Peer Review Journal*, 4(5), 1–4. <https://doi.org/10.31031/PSPRJ.2023.04.000597>
- Gaikwad, S. S., Zanje, A. L., & Somwanshi, J. D. (2024). Advancements in Transdermal Drug Delivery: A Comprehensive Review of Physical Penetration Enhancement Techniques. *International Journal of Pharmaceutics*, 652. <https://doi.org/10.1016/J.IJPHARM.2024.123856>
- Guo, J., Chen, Z., Huang, R., Tang, D., Wang, Y., Song, P., Mei, L., Hou, S., Peng, W., & He, L. (2024). Development and Optimization of the Glabridin-Loaded Dissolving Microneedle for Enhanced Treatment of Keloid. *International Journal of Pharmaceutics: X*, 8. <https://doi.org/10.1016/j.ijpx.2024.100267>
- Hamadani, C. M., Mahdi, F., Merrell, A., Flanders, J., Cao, R., Vashisth, P., Dasanayake, G. S., Darlington, D. S., Singh, G., & Pride, M. C. (2024). Ionic liquid coating-driven nanoparticle delivery to the brain: Applications for NeuroHIV. *Advanced Science*, 11(23). <https://doi.org/10.1002/advs.202305484>
- Han, Y., Jia, F., Bai, S., Xiao, Y., Meng, X., & Jiang, L. (2022). Effect of Operating Conditions on Size of Catechin/ β -Cyclodextrin Nanoparticles Prepared by Nanoprecipitation and Characterization of their Physicochemical Properties. *LWT - Food Science Technology*, 153. <https://doi.org/10.1016/j.lwt.2021.112447>
- Her, C., Venier-Julienne, M. C., & Roger, E. (2018). Improvement of Curcumin Bioavailability for Medical Applications. *Med. Aromat. Plants*, 7(326), 2167–2412. <https://doi.org/10.41722167-0412-1000326>
- Jiang, L., Xia, N., Wang, F., Xie, C., Ye, R., Tang, H., Zhang, H., & Liu, Y. (2022). Preparation and Characterization of Curcumin/ β -Cyclodextrin Nanoparticles by Nanoprecipitation to Improve the Stability and Bioavailability of Curcumin. *Lwt*, 171. <https://doi.org/10.1016/j.lwt.2022.114149>

- Kfoury, M., Landy, D., & Fourmentin, S. (2018). Characterization of Cyclodextrin/Volatile Inclusion Complexes: A Review. *Molecules*, 23(5). <https://doi.org/10.3390/molecules23051204>
- Khalbas, A. H., Albayati, T. M., Ali, N. S., & Salih, I. K. (2024). Drug Loading Methods and Kinetic Release Models Using of Mesoporous Silica Nanoparticles as a Drug Delivery System: A Review. *South African Journal of Chemical Engineering*, 50(1), 261–280. <https://doi.org/10.1016/J.SAJCE.2024.08.013>
- Kolay, S., Apohan, N. K., Babu, E., & Gün, G. (2025). Investigation of Curcumin- β -Cyclodextrin Complex Release in Injectable Hyaluronic Acid/Quince Seed Gum Hydrogel. *AAPS PharmSciTech*, 26(4). <https://doi.org/10.1208/s12249-025-03095-7>
- Kuddushi, M., Kanike, C., Xu, B. Bin, & Zhang, X. (2025). Recent Advances in Nanoprecipitation: From Mechanistic Insights to Applications in Nanomaterial Synthesis. *Soft Matter*, 21(15), 2759–2781. <https://doi.org/10.1039/d5sm00006h>
- Kusumawati, M., Sedyadi, E., Nugraha, I., & Karmanto, K. (2018). Pengaruh Penambahan Ekstrak Kunyit Pada Edible Film Umbi Ganyong dan Lidah Buaya (Aloe vera L) terhadap Kualitas Buah Tomat. *Integrated Lab Journal*, 6(1), 13–20.
- Li, J., Xu, F., Dai, Y., Zhang, J., Shi, Y., Lai, D., Sriboonvorakul, N., & Hu, J. (2022). A Review of Cyclodextrin Encapsulation and Intelligent Response for the Release of Curcumin. *Polymers*, 14(24). <https://doi.org/10.3390/polym14245421>
- Li, S., Chen, Q., Zhang, Y., Wang, D., Hu, H., Li, J., Zhang, C., & Zhang, J. (2024). Hyaluronic Acid Dissolving Microneedle Patch-Assisted Acupoint Transdermal Delivery of Triptolide for Effective Rheumatoid Arthritis Treatment. *Scientific Reports*, 14(1). <https://doi.org/10.1038/s41598-024-76341-w>
- Low, Z. X., Teo, M. Y. M., Nordin, F. J., Dewi, F. R. P., Palanirajan, V. K., & In, L. L. A. (2022). Biophysical Evaluation of Water-Soluble Curcumin Encapsulated in β -Cyclodextrins on Colorectal Cancer Cells. *International*

- Journal of Molecular Sciences*, 23(21).
<https://doi.org/10.3390/ijms232112866>
- Lu, Y., Yue, Z., Xie, J., Wang, W., Zhu, H., Zhang, E., & Cao, Z. (2018). Micelles with Ultralow Critical Micelle Concentration as Carriers for Drug Delivery. *Nature Biomedical Engineering*, 2(5), 318–325.
<https://doi.org/10.1038/s41551-018-0234-x>.
- Ma, Z., Wang, N., He, H., & Tang, X. (2019). Pharmaceutical Strategies of Improving Oral Systemic Bioavailability of Curcumin for Clinical Application. *Journal of Controlled Release*, 316, 359–380.
<https://doi.org/10.1016/j.jconrel.2019.10.053>
- Mashaqbeh, H., Obaidat, R., & Al-Shar'i, N. (2021). Evaluation and Characterization of Curcumin- β -Cyclodextrin and Cyclodextrin-Based Nanosponge Inclusion Complexation. *Polymers*, 13(23).
<https://doi.org/10.3390/polym13234073>
- Miura, S., Yamagishi, R., Ando, M., Hachikubo, Y., Ibrahim, N. A., Fadilah, N. I. M., Maarof, M., Oshima, M., Goo, S. L., & Hayashi, H. (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>
- Nagarkar, R., Singh, M., Nguyen, H. X., & Jonnalagadda, S. (2020). A Review of Recent Advances in Microneedle Technology for Transdermal Drug Delivery. *Journal of Drug Delivery Science and Technology*, 59.
<https://doi.org/10.1016/j.jddst.2020.101923>
- 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>
- Purpura, M., Lowery, R. P., Wilson, J. M., Mannan, H., Münch, G., & Razmovski-Naumovski, V. (2018). Analysis of Different Innovative Formulations of Curcumin for Improved Relative Oral Bioavailability in Human Subjects. *European Journal of Nutrition*, 57(3), 929–938.
<https://doi.org/10.1007/s00394-016-1376-9>

- Ramadon, D., McCrudden, M. T. C., Courtenay, A. J., & Donnelly, R. F. (2022). Enhancement Strategies for Transdermal Drug Delivery Systems: Current Trends and Applications. *Drug Delivery and Translational Research*, 12(4), 758–791. <https://doi.org/10.1007/s13346-021-00909-6>
- Rinalkhar, Sabale, P., & Kadam, P. (2021). A Review on Synthesis and Biological Activity of Curcumin and Curcumin Derivatives. *Asian Journal of Chemical Sciences*, 10(4), 7–23. <https://doi.org/10.9734/AJOCS/2021/v10i419099>
- Rosalina, A., & Wicaksono, I. A. (2018). Article review: Formulasi dan Evaluasi Microneedle dengan Berbagai Macam Polimer Sebagai Zat Pembawa Obat. *Farmaka*, 16(3), 292–303.
- Sabrina, N. K., Wulandari, W. T., & Wardana, G. A. (2024). Pembuatan Film Kitosan-PVA Untuk Meningkatkan Penghantaran Zat Aktif Kurkumin. *Bakti Tunas Husada Conference Series*, 4, 244–253.
- Saha, I., & Rai, V. K. (2021). Hyaluronic Acid Based Microneedle Array: Recent Applications in Drug Delivery and Cosmetology. *Carbohydrate Polymers*, 267. <https://doi.org/10.1016/j.carbpol.2021.118168>
- Sartawi, Z., Blackshields, C., & Faisal, W. (2022). Dissolving Microneedles: Applications and Growing Therapeutic Potential. *Journal of Controlled Release*, 348, 186–205. <https://doi.org/10.1016/j.conrel.2022.05.045>
- 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*, 1431–1441. <https://doi.org/10.2147/CCID.S411378>
- Wulandari, W. T., Ledyastuti, M., Tan, M. I., & Arcana, I. M. (2025). Fabrication and Evaluation of Polymeric Microneedles Containing a Chitosan-Coated Curcumin Nanoemulsion: Structural Characterization and Transdermal Performance. *New Journal of Chemistry*, 50(1). <https://doi.org/10.1039/d5nj03627e>
- Zaibudeen, A. W. (2025). Recent Advances in Different Nanoprecipitation Methods for Efficient Drug Loading and Controlled Release. *Journal of*

Nanotechnology and Nanomaterials, 6(1), 12–25.
<https://doi.org/10.33696/Nanotechnol.6.059>

Zheng, D., Huang, C., Huang, H., Zhao, Y., Khan, M. R. U., Zhao, H., & Huang, L. (2020). Antibacterial Mechanism of Curcumin: A Review. *Chemistry & Biodiversity*, 17(8). <https://doi.org/10.1002/CBDV202000171>

Zia, A., Farkhondeh, T., Pourbagher-Shahri, A. M., & Samarghandian, S. (2021). The Role of Curcumin in Aging and Senescence: Molecular Mechanisms. *Biomedicine & Pharmacotherapy*, 134. <https://doi.org/10.1016/j.biopha.2020.111119>