

DAFTAR PUSTAKA

- Ahmadi, H., Heydari, M., Abdouss, M., Jamalpoor, Z., Fathi-karkan, S., Rahdar, A., & Pandey, S. (2024). Metronidazole delivery strategies: Optimizing cancer therapy through novel approaches for enhanced delivery, cytotoxicity, and side effect reduction. *European Journal of Medicinal Chemistry Reports*, 12, 100202. <https://doi.org/https://doi.org/10.1016/j.ejmcr.2024.100202>
- Alavi, S. E., Alavi, S. Z., Nisa, M. un, Koohi, M., Raza, A., & Ebrahimi Shahmabadi, H. (2024). Revolutionizing Wound Healing: Exploring Scarless Solutions through Drug Delivery Innovations. *Molecular Pharmaceutics*, 21(3), 1056–1076. <https://doi.org/https://doi.org/10.1021/acs.molpharmaceut.3c01072>
- Aldakheel, F. M., Wickramasinghe, R., Thamaraiselvan, C., Sayed, M. M. E., Fagir, M. H., Dein, D. K. E., & Mohsen, D. (2025). Green silver nanoparticle-embedded chitosan-alginate hydrogel: A novel antibacterial approach for potential wound healing. *Polymers and Polymer Composites*, 33, 1–14. <https://doi.org/10.1177/09673911251320463>
- Almeida, A. C., Pacheco, D., Mateus, A., Montesi, M., Panzeri, S., Alves, N., Sprio, S., & Fernandes Patrício, T. M. (2025). Magnetic-responsive materials tailored to enhance the cascade of bone regeneration and immune response. *Materials & Design*, 113645. <https://doi.org/https://doi.org/10.1016/j.matdes.2025.113645>
- Alves, C., Ribeiro, A., Pinto, E., Santos, J., & Soares, G. (2022). Exploring Z-Tyr-Phe-OH-based hydrogels loaded with curcumin for the development of dressings for wound healing. *Journal of Drug Delivery Science and Technology*, 73(May). <https://doi.org/10.1016/j.jddst.2022.103484>
- Aykaç, A., Ok, I., Bakay, E., & Topaloğlu, N. (2024). Chitosan-based hydrogel incorporating mesoporous silica/zinc oxide nanoparticles with controlled swelling and potent antibacterial activity. *International Journal of Polymeric Materials and Polymeric Biomaterials*, 74, 465–473. <https://doi.org/10.1080/00914037.2024.2344602>
- Baek, K., Woo, M. R., Choi, Y., Kang, M., Kim, J. O., Choi, H.-G., & Jin, S. G. (2024). Engineering sodium alginate microparticles with different crystallinities for niclosamide repositioning and solubilization to improve solubility and oral bioavailability in rats. *International Journal of Biological Macromolecules*, 137471. <https://doi.org/10.1016/j.ijbiomac.2024.137471>
- Benali, F., Boukoussa, B., Issam, I., Iqbal, J., Mokhtar, A., Hachemaoui, M., Habeche, F., Hacini, S., & Abboud, M. (2023). Zinc nanoparticles encapsulated in porous biopolymer beads for reduction of water pollutants and antimicrobial activity. *International Journal of Biological Macromolecules*, 248(March), 125832. <https://doi.org/10.1016/j.ijbiomac.2023.125832>
- Bhat, M. P., Lee, J.-H., Kurkuri, M., Chen, T., Kim, C. S., & Lee, K.-H. (2025). Diatom contained alginate-chitosan hydrogel beads with enhanced hydrogen bonds and ionic interactions for extended release of gibberellic acid. *International Journal of Biological Macromolecules*, 291, 138906. <https://doi.org/https://doi.org/10.1016/j.ijbiomac.2024.138906>

- Bramhe, P., Rarokar, N., Kumbhalkar, R., Saoji, S., & Khedekar, P. (2024). Natural and synthetic polymeric hydrogel: A bioink for 3D bioprinting of tissue models. *Journal of Drug Delivery Science and Technology*, 101, 106204. <https://doi.org/https://doi.org/10.1016/j.jddst.2024.106204>
- Chalitagkoon, J., Ronte, A., Sintoppun, T., Manapradit, N., & Monvisade, P. (2025). Dual Cross-Linked Chitosan-Based Films with pH-Sensitive Coloration and Drug Release Kinetics for Smart Wound Dressings. *ACS Omega*, 10(8), 7770–7782. <https://doi.org/10.1021/acsomega.4c08089>
- Dey, P., Mandal, S., & Brahma, R. K. (2025). Chapter 20 - Cellulose-based hydrogels: Biocompatibility, environmental impact, and sustainable management (K. Deshmukh, S. Barua, S. Baruah, & C. B. T.-C.-B. H. Mustansar Hussain (eds.); pp. 439–458). Elsevier. <https://doi.org/https://doi.org/10.1016/B978-0-443-22049-4.00007-2>
- Dinh, L., Machamasi, R., Kim, C. J., Lee, J.-J., Choi, Y., Kim, H., Mahon, L., Grabenbauer, A., Yan, B., & Hwang, S.-J. (2024). 3D-printed chitosan-pectin-sodium alginate scaffolds for post-surgical peritoneal wound dressing and sustained delivery of oxaliplatin. *Journal of Pharmaceutical Investigation*. <https://doi.org/10.1007/s40005-024-00704-8>
- Feyissa, Z., Edossa, G. D., Gupta, N. K., & Negera, D. (2023). Development of double crosslinked sodium alginate/chitosan based hydrogels for controlled release of metronidazole and its antibacterial activity. *Heliyon*, 9(9), e20144. <https://doi.org/10.1016/j.heliyon.2023.e20144>
- Ghauri, Z. H., Islam, A., Qadir, M. A., Ghaffar, A., Gull, N., Azam, M., Mehmood, A., Ghauri, A. A., & Khan, R. U. (2022). Novel pH-responsive chitosan/sodium alginate/PEG based hydrogels for release of sodium ceftriaxone. *Materials Chemistry and Physics*, 277(November 2021), 125456. <https://doi.org/10.1016/j.matchemphys.2021.125456>
- Jakovija, A., & Chtanova, T. (2023). Skin immunity in wound healing and cancer. *Frontiers in Immunology*, 14(June), 1–10. <https://doi.org/10.3389/fimmu.2023.1060258>
- Jallab, M., Ghaheri, M., Javan, B., Erfani-Moghadam, V., Ghaffari, M., & Goudarzi, A. (2024). Synthesis and Comprehensive Characterization of PVA/Chitosan/Cu Nanowires Wound Dressing Hydrogel for Effective In Vitro Wound Healing. *Journal of Industrial and Engineering Chemistry*. <https://doi.org/https://doi.org/10.1016/j.jiec.2024.11.029>
- Khan, M. U. A., Iqbal, I., Ansari, M. N. M., Razak, S. I. A., Raza, M. A., Sajjad, A., Jabeen, F., Mohamad, M. R., & Jusoh, N. (2021). Development of antibacterial, degradable and ph-responsive chitosan/guar gum/polyvinyl alcohol blended hydrogels for wound dressing. *Molecules*, 26(19). <https://doi.org/10.3390/molecules26195937>
- Krstić, J., Radosavljević, A., Spasojević, J., Nikolić, N., Jovanović, U., Abazović, N., & Kačarević-Popović, Z. (2022). Improvement of antibacterial activity of Ag-poly(vinyl-alcohol)/chitosan hydrogel by optimizing the procedure of radiolytic synthesis. *Radiation Physics and Chemistry*, 194(January). <https://doi.org/10.1016/j.radphyschem.2022.110045>

- Li, S., Zhang, H., Chen, K., Jin, M., Vu, S. H., Jung, S., He, N., Zheng, Z., & Lee, M.-S. (2022). Application of chitosan/alginate nanoparticle in oral drug delivery systems: prospects and challenges. *Drug Delivery*, 29(1), 1142–1149. <https://doi.org/10.1080/10717544.2022.2058646>
- Manohar, D., Babu, R. S., Vijaya, B., Nallakumar, S., Gobi, R., Anand, S., Nishanth, D. S., Anupama, A., & Rani, M. U. (2024). A review on exploring the potential of PVA and chitosan in biomedical applications: A focus on tissue engineering, drug delivery and biomedical sensors. *International Journal of Biological Macromolecules*, 283, 137318. <https://doi.org/10.1016/j.ijbiomac.2024.137318>
- Naghib, S. M., Matini, A., Amiri, S., Ahmadi, B., & Mozafari, M. R. (2024). Exploring the potential of polysaccharides-based injectable self-healing hydrogels for wound healing applications: A review. *International Journal of Biological Macromolecules*, 282, 137209. <https://doi.org/10.1016/j.ijbiomac.2024.137209>
- Nawaz, A., Ullah, S., Alnuwaiser, M. A., Rehman, F. U., & Selim, S. (2022). *Formulation and Evaluation of Chitosan-Gelatin Thermosensitive*. 4.
- Oliveira, M. X., Canafistula, F. V. C., Ferreira, C. R. N., Fernandes, L. V. O., de Araújo, A. R., Ribeiro, F. O. S., Souza, J. M. T., Lima, I. C., Assreuy, A. M. S., Silva, D. A., Filho, J. D. B. M., Araújo, A. J., Maciel, J. S., & Feitosa, J. P. A. (2023). Hydrogels dressings based on guar gum and chitosan: Inherent action against resistant bacteria and fast wound closure. *International Journal of Biological Macromolecules*, 253(October), 127281. <https://doi.org/10.1016/j.ijbiomac.2023.127281>
- Omer, A. M., Abd El-Monaem, E. M., Eltaweil, A. S., Tamer, T. M., Mohy Eldin, M. S., Ouyang, X., & Heydari, A. (2024). Advances in stimuli-responsive polymeric hydrogels for anticancer drug delivery: A review. *Journal of Drug Delivery Science and Technology*, 102, 106394. <https://doi.org/10.1016/j.jddst.2024.106394>
- Ouyang, Y., Su, X., Zheng, X., Zhang, L., Chen, Z., Yan, Q., Qian, Q., Zhao, J., Li, P., & Wang, S. (2024). Mussel-inspired “all-in-one” sodium alginate/carboxymethyl chitosan hydrogel patch promotes healing of infected wound. *International Journal of Biological Macromolecules*, 261(P2), 129828. <https://doi.org/10.1016/j.ijbiomac.2024.129828>
- Pablos, J. L., Lozano, D., Manzano, M., & Vallet-Regí, M. (2024). Regenerative medicine: Hydrogels and mesoporous silica nanoparticles. *Materials Today Bio*, 29, 101342. <https://doi.org/10.1016/j.mtbio.2024.101342>
- Podgorbunskikh, E., Kuskov, T., Rychkov, D., Lomovskii, O., & Bychkov, A. (2022). Mechanical Amorphization of Chitosan with Different Molecular Weights. *Polymers*, 14. <https://doi.org/10.3390/polym14204438>
- Qureshi, M. A. U. R., Arshad, N., Rasool, A., Rizwan, M., Fahmi Fawy, K., & Rasheed, T. (2024). pH-responsive chitosan dendrimer hydrogels enabling controlled cefixime release. *European Polymer Journal*, 219(June), 113377. <https://doi.org/10.1016/j.eurpolymj.2024.113377>
- Rehman, S., Jamil, Q. A., Noreen, S., Ashraf, M. A., Madni, A., Mahmood, H., Shoukat,

- H., & Raza, M. R. (2024). Preparation and Evaluation of pH-Sensitive Chitosan/Alginate Nanohybrid Mucoadhesive Hydrogel Beads: An Effective Approach to a Gastro-Retentive Drug Delivery System. *Pharmaceutics*, 16(11). <https://doi.org/10.3390/pharmaceutics16111451>
- Ristić, I., Nikolić, L., Cakić, S., Nikolić, V., Tanasić, J., Zvezdanović, J., & Krstić, M. (2024). Eco-Friendly Microwave Synthesis of Sodium Alginate-Chitosan Hydrogels for Effective Curcumin Delivery and Controlled Release. *Gels*, 10(10). <https://doi.org/10.3390/gels10100637>
- Saberian, M., Safari Roudsari, R., Haghshenas, N., Rousta, A., & Alizadeh, S. (2024). How the combination of alginate and chitosan can fabricate a hydrogel with favorable properties for wound healing. *Heliyon*, 10(11), e32040. <https://doi.org/10.1016/j.heliyon.2024.e32040>
- Sanchez, M. F., Luciani-Giacobbe, L. C., Barbieri, F., & Olivera, M. E. (2024). Defining critical quality attributes and composition parameters for burn wound dressings: Antibiotic-anesthetic films as a model. *Heliyon*, 10(22), e39766. <https://doi.org/https://doi.org/10.1016/j.heliyon.2024.e39766>
- Sanyal, A., Roy, S., Ghosh, A., Chakraborty, M., Ghosh, A., & Mandal, D. (2024). The next frontier in hemorrhagic management: A comprehensive review on development of natural polymer-based injectable hydrogels as promising hemostatic dressings. *Chemical Engineering Journal*, 497, 155033. <https://doi.org/https://doi.org/10.1016/j.cej.2024.155033>
- Shashikumar, U., Saraswat, A., Deshmukh, K., Hussain, C. M., Chandra, P., Tsai, P.-C., Huang, P.-C., Chen, Y.-H., Ke, L.-Y., Lin, Y.-C., Chawla, S., & Ponnusamy, V. K. (2024). Innovative technologies for the fabrication of 3D/4D smart hydrogels and its biomedical applications - A comprehensive review. *Advances in Colloid and Interface Science*, 328, 103163. <https://doi.org/https://doi.org/10.1016/j.cis.2024.103163>
- Shi, K., Nokhodchi, A., & Ghafourian, T. (2025). Magnetic microscale polymeric nanocomposites in drug delivery: advances and challenges. *Drug Discovery Today*, 30(1), 104276. <https://doi.org/https://doi.org/10.1016/j.drudis.2024.104276>
- Shi, X., Xu, S., Xu, J., & He, J. (2023). Preparation and properties of a multi-crosslinked chitosan/sodium alginate composite hydrogel. *Materials Letters*. <https://doi.org/10.1016/j.matlet.2023.135414>
- Silva, L. dos S., Vila Nova, B. G., Sousa, C. E. M. de, Silva, R. G., Carvalho, L. R. de S., Silva, I. S. S., Moreira, P. H. de A., Cardenas, A. F. M., Monteiro, C. de A., Tofanello, A., Garcia, W., Teixeira, C. S., & Nascimento da Silva, L. C. (2024). Fabrication and characterization of physically crosslinked alginate/chitosan-based hydrogel loaded with neomycin for the treatment of skin infections caused by *Staphylococcus aureus*. *International Journal of Biological Macromolecules*, 271(December 2023). <https://doi.org/10.1016/j.ijbiomac.2024.132577>
- Sun, S., Wang, N., Ali, E., Qiao, L., Guo, Q., & Lu, L. (2025). Glucose-responsive carboxymethyl chitosan/ sodium alginate film protects against mechanical wound on postharvest blueberry. *Food Hydrocolloids*, 159(July 2024), 110648. <https://doi.org/10.1016/j.foodhyd.2024.110648>

- Talebi, M., Ghale, R. A., Asl, R. M., & Tabandeh, F. (2025). Advancements in Characterization and Preclinical Applications of Hyaluronic Acid-Based Biomaterials for Wound Healing: A Review. *Carbohydrate Polymer Technologies and Applications*, 100706. <https://doi.org/https://doi.org/10.1016/j.carpta.2025.100706>
- Tang, N. F. R., Arminah, B., & Tahir, D. (2024). Structural and optical properties of alginate-based antibacterial dressing with calcium phosphate and zinc oxide for biodegradable wound painting applications. *International Journal of Biological Macromolecules*, 276(P2), 133996. <https://doi.org/10.1016/j.ijbiomac.2024.133996>
- Venkata Prathyusha, E., Gomte, S. S., Ahmed, H., Prabakaran, A., Agrawal, M., Chella, N., & Alexander, A. (2025). Nanostructured polymer composites for bone and tissue regeneration. *International Journal of Biological Macromolecules*, 284, 137834. <https://doi.org/https://doi.org/10.1016/j.ijbiomac.2024.137834>
- Westlake, J. R., Laabei, M., Jiang, Y., Yew, W. C., Smith, D. L., Burrows, A. D., & Xie, M. (2023). Vanillin Cross-Linked Chitosan Film with Controlled Release of Green Tea Polyphenols for Active Food Packaging. *ACS Food Science & Technology*, 3(10), 1680–1693. <https://doi.org/10.1021/acsfoodscitech.3c00222>
- Wu, P., Cui, Y., Sun, Z., Cao, M., Liu, Y., Fu, K., & Zhou, Y. (2022). Sodium alginate coupled with organosilane quaternary ammonium salt for the antibacterial application. *Cellulose*, 30, 449–462. <https://doi.org/10.1007/s10570-022-04911-0>
- Wu, X., Wang, Y., Liu, X., Ding, Q., Zhang, S., Wang, Y., Chai, G., Tang, Y., Yang, J., Yu, T., Liu, W., & Ding, C. (2025). Carboxymethyl chitosan and sodium alginate oxide pH-sensitive dual-release hydrogel for diabetes wound healing: The combination of astilbin liposomes and diclofenac sodium. *Carbohydrate Polymers*, 349, 122960. <https://doi.org/https://doi.org/10.1016/j.carbpol.2024.122960>
- Yerlan, G. Y., Shen, M., Tyussypova, B. B., Tazhibayeva, S. M., Musabekov, K., & Takhistov, P. (2024). Insulin Conformation Changes in Hybrid Alginate–Gelatin Hydrogel Particles. *Molecules*, 29(6). <https://doi.org/10.3390/molecules29061254>
- Zamani, S., Salehi, M., Abbaszadeh-Goudarzi, G., Cheraghali, D., Ehterami, A., Esmaili, S., & Kolarijani, N. R. (2024). Evaluation effect of alginate hydrogel containing losartan on wound healing and gene expression. *Journal of Biomaterials Applications*, 39, 762–788. <https://doi.org/10.1177/08853282241292144>
- Zhang, X., Liang, Y., Huang, S., & Guo, B. (2024). Chitosan-based self-healing hydrogel dressing for wound healing. *Advances in Colloid and Interface Science*, 332(June), 103267. <https://doi.org/10.1016/j.cis.2024.103267>
- Zhu, F., Hu, Y., Meng, L., Li, W., Xie, B., Zhou, Z., Cui, S., Wang, M., Wang, Y., Chen, Z., & Wu, Q. (2024). Photo-crosslinking methacrylated-amylopectin/polyacrylamide hydrogels loading curcumin for applications as degradable, injectable, and antibacterial wound dressings. *International Journal of Biological Macromolecules*, 278, 134692. <https://doi.org/https://doi.org/10.1016/j.ijbiomac.2024.134692>
- Zivari-Ghader, T., Rashidi, M.-R., & Mehrali, M. (2024). Biological macromolecule-based hydrogels with antibacterial and antioxidant activities for wound dressing: A review. *International Journal of Biological Macromolecules*, 279, 134578.

<https://doi.org/https://doi.org/10.1016/j.ijbiomac.2024.134578>