

DAFTAR PUSTAKA

- [1] K. A. Cook, E. Martinez-Lozano, R. Sheridan, E. K. Rodriguez, A. Nazarian, and M. W. Grinstaff, “Hydrogels for the management of second-degree burns: currently available options and future promise,” *Burn. Trauma*, vol. 10, 2022, doi: 10.1093/burnst/tkac047.
- [2] A. A. W. Perkasa-hendropriyono and I. D. Saputro, “Contribution of SIRS and sepsis on the outcomes of patients with burn injuries in Dr . Soetomo Teaching Hospital,” vol. 14, no. 1, pp. 197–202, 2025, doi: 10.15562/bmj.v14i1.5406.
- [3] A. Wardhana and G. A. Winarno, “Epidemiology And Mortality Of Burn Injury In Ciptomangunkusumo Hospital, Jakarta: A 5 Year Retrospective Study,” *J. Plast. Rekonstruksi*, vol. 6, no. 1, pp. 234–242, 2020, doi: 10.14228/jpr.v6i1.270.
- [4] H. Wang *et al.*, “Antibacterial polysaccharide-based hydrogel dressing containing plant essential oil for burn wound healing,” *Burn. Trauma*, vol. 9, pp. 1–14, 2021, doi: 10.1093/burnst/tkab041.
- [5] W. Shu, Y. Wang, X. Zhang, C. Li, H. Le, and F. Chang, “Functional Hydrogel Dressings for Treatment of Burn Wounds,” *Front. Bioeng. Biotechnol.*, vol. 9, no. December, pp. 1–18, 2021, doi: 10.3389/fbioe.2021.788461.
- [6] J. Xiao, Y. Liang, T. Sun, M. Liu, and X. He, “A functional dual responsive CMC/OHA/SA/TOB hydrogel as wound dressing to enhance wound healing,” *Sci. Rep.*, vol. 14, no. 1, p. 26854, 2024, doi: 10.1038/s41598-024-78044-8.
- [7] A. Surowiecka, J. Strużyna, A. Winiarska, and T. Korzeniowski, “Hydrogels in Burn Wound Management—A Review,” *Gels*, vol. 8, no. 2, 2022, doi: 10.3390/gels8020122.
- [8] Y. Hong, Z. Lin, Y. Yang, T. Jiang, J. Shang, and Z. Luo, “Biocompatible Conductive Hydrogels: Applications in the Field of Biomedicine,” *Int. J. Mol. Sci.*, vol. 23, no. 9, 2022, doi: 10.3390/ijms23094578.

- [9] C. Xie *et al.*, “Synthesis and Properties of Injectable Hydrogel for Tissue Filling,” *Pharmaceutics*, vol. 16, no. 3, 2024, doi: 10.3390/pharmaceutics16030430.
- [10] H. Li *et al.*, “Injectable, self-healing, antibacterial, and hemostatic N,O-carboxymethyl chitosan/oxidized chondroitin sulfate composite hydrogel for wound dressing,” *Mater. Sci. Eng. C*, vol. 118, no. August 2020, p. 111324, 2021, doi: 10.1016/j.msec.2020.111324.
- [11] Y. C. Huang, K. Y. Huang, B. Y. Yang, C. H. Ko, and H. M. Huang, “Fabrication of Novel Hydrogel with Berberine-Enriched Carboxymethylcellulose and Hyaluronic Acid as an Anti-Inflammatory Barrier Membrane,” *Biomed Res. Int.*, vol. 2016, 2016, doi: 10.1155/2016/3640182.
- [12] W. Zhang, Y. Liu, Y. Xuan, and S. Zhang, “Synthesis and Applications of Carboxymethyl Cellulose Hydrogels,” *Gels*, vol. 8, no. 9, 2022, doi: 10.3390/gels8090529.
- [13] A. Song, “Exploring Hyaluronic Acid as a Potential Standard Dressing for Burn Wound,” *Int. J. Med. Sci. Clin. Res. Stud.*, vol. 02, no. 08, 2022, doi: 10.47191/ijmscrs/v2-i8-13.
- [14] A. W. Paramadini, P. Chinavinijkul, A. Meemai, P. Thongkam, A. Apasuthirat, and N. Nasongkla, “Fabrication and in vitro characterization of zinc oxide nanoparticles and hyaluronic acid-containing carboxymethylcellulose gel for wound healing application,” *Pharm. Dev. Technol.*, vol. 28, no. 1, pp. 95–108, 2023, doi: 10.1080/10837450.2022.2164304.
- [15] S. Deng, X. Li, W. Yang, K. He, and X. Ye, “Injectable in situ cross-linking hyaluronic acid/carboxymethyl cellulose based hydrogels for drug release,” *J. Biomater. Sci. Polym. Ed.*, vol. 29, no. 13, pp. 1643–1655, 2018, doi: 10.1080/09205063.2018.1481005.
- [16] D. M. Varma, G. T. Gold, P. J. Taub, and S. B. Nicoll, “Injectable carboxymethylcellulose hydrogels for soft tissue filler applications,” *Acta Biomater.*, vol. 10, no. 12, pp. 4996–5004, 2014, doi: 10.1016/j.actbio.2014.08.013.

- [17] 2020 Gopinathan Janarthanan, “Self-crosslinking hyaluronic acid-carboxymethylcellulose hydrogel enhances multilayered 3D printed construct shape integrity and mechanical stability for soft tissue engineering,” pp. 0–7, 2018.
- [18] M. Babaluei, *Injectable hydrogel based on silk fibroin/carboxymethyl cellulose/agarose containing polydopamine functionalized graphene oxide with conductivity, hemostasis, antibacterial, and anti-oxidant properties for full-thickness burn healing*. 2023.
- [19] T. Augmentation, “A Covalently Cross-Linked Hyaluronic Acid / Carboxymethyl Tissue Augmentation,” 2024.
- [20] D. Mubarak, “Perawatan Luka Dengan Modern Dressing,” pp. 1–23, 2016.
- [21] F. Fayyazbakhsh, M. J. Khayat, and M. C. Leu, “3D-Printed Gelatin-Alginate Hydrogel Dressings for Burn Wound Healing: A Comprehensive Study,” *Int. J. Bioprinting*, vol. 8, no. 4, pp. 274–291, 2022, doi: 10.18063/ijb.v8i4.618.
- [22] C. Xie, J. Hu, Y. Cheng, and Z. Yao, “Researches on cognitive sequelae of burn injury: Current status and advances,” *Front. Neurosci.*, vol. 16, no. November, pp. 1–14, 2022, doi: 10.3389/fnins.2022.1026152.
- [23] Y. Wang *et al.*, “Burn injury: Challenges and advances in burn wound healing, infection, pain and scarring,” *Adv. Drug Deliv. Rev.*, vol. 123, pp. 3–17, 2018, doi: 10.1016/j.addr.2017.09.018.
- [24] M. D. Peck, “Epidemiology of burns throughout the world. Part I: Distribution and risk factors,” *Burns*, vol. 37, no. 7, pp. 1087–1100, 2011, doi: 10.1016/j.burns.2011.06.005.
- [25] D. Saputra, “Tinjauan Komprehensif tentang Luka Bakar Dan Penanganannya,” *J. Sci. Univ. Andalas Padang*, pp. 207–218, 2023, [Online]. Available: <http://journal.scientic.id/index.php/sciena/issue/view/12>
- [26] A. K. Zusandy, Arwi Amiruddin, Andi Sastri Z, Lisa Yuniati, and Andi Miranti, “Gambaran dan Karakteristik Pasien Luka Bakar,” *Fakumi Med. J. J. Mhs. Kedokt.*, vol. 4, no. 5, pp. 412–422, 2024, doi: 10.33096/fmj.v4i5.455.

- [27] Y. R. S. Dewi, “Konsep Umum dan Investigasi Berbasis Klinis Luka Antemortem dan Postmortem,” *E-Jurnal Med. Udayana*, vol. 2, no. 3, pp. 1–11, 2013.
- [28] M. G. Jeschke, M. E. van Baar, M. A. Choudhry, K. K. Chung, N. S. Gibran, and S. Logsetty, “Burn injury,” *Nat. Rev. Dis. Prim.*, vol. 6, no. 1, 2020, doi: 10.1038/s41572-020-0145-5.
- [29] G.-E. Ja *et al.*, “Burns: Definition, Classification, Pathophysiology and Initial Approach,” no. June, 2020, doi: 10.4172/2327-5146.1000298.
- [30] H. M. Nguyen, T. T. Ngoc Le, A. T. Nguyen, H. N. Thien Le, and T. T. Pham, “Biomedical materials for wound dressing: recent advances and applications,” *RSC Adv.*, vol. 13, no. 8, pp. 5509–5528, 2023, doi: 10.1039/d2ra07673j.
- [31] R. C. Opt Veld, X. F. Walboomers, J. A. Jansen, and F. A. D. T. G. Wagener, “Design Considerations for Hydrogel Wound Dressings: Strategic and Molecular Advances,” *Tissue Eng. - Part B Rev.*, vol. 26, no. 3, pp. 230–248, 2020, doi: 10.1089/ten.teb.2019.0281.
- [32] V. Brumberg, T. Astrelina, T. Malivanova, and A. Samoilov, “Modern wound dressings: Hydrogel dressings,” *Biomedicines*, vol. 9, no. 9, 2021, doi: 10.3390/biomedicines9091235.
- [33] J. Fu and M. In Het Panhuis, “Hydrogel properties and applications,” *J. Mater. Chem. B*, vol. 7, no. 10, pp. 1523–1525, 2019, doi: 10.1039/c9tb90023c.
- [34] E. Rezvani Ghomi, S. Khalili, S. Nouri Khorasani, R. Esmaeely Neisiany, and S. Ramakrishna, “Wound dressings: Current advances and future directions,” *J. Appl. Polym. Sci.*, vol. 136, no. 27, pp. 1–12, 2019, doi: 10.1002/app.47738.
- [35] E. Caló and V. V. Khutoryanskiy, “Biomedical applications of hydrogels: A review of patents and commercial products,” *Eur. Polym. J.*, vol. 65, no. April, pp. 252–267, 2015, doi: 10.1016/j.eurpolymj.2014.11.024.
- [36] H. Haryanto, “Pengaruh Kitosan Terhadap Karakterisasi Hidrogel Film PVA Untuk Aplikasi Pembalut Luka,” *Techno (Jurnal Fak. Tek. Univ. Muhammadiyah Purwokerto)*, vol. 22, no. 2, p. 123, 2021, doi:

10.30595/techno.v22i2.11593.

- [37] E. M. Ahmed, "Hydrogel: Preparation, characterization, and applications: A review," *J. Adv. Res.*, vol. 6, no. 2, pp. 105–121, 2015, doi: 10.1016/j.jare.2013.07.006.
- [38] T. C. Ho *et al.*, "Hydrogels: Properties and Applications in Biomedicine," *Molecules*, vol. 27, no. 9, pp. 1–29, 2022, doi: 10.3390/molecules27092902.
- [39] Z. Ahmad *et al.*, "Versatility of Hydrogels: From Synthetic Strategies, Classification, and Properties to Biomedical Applications," *Gels*, vol. 8, no. 3, 2022, doi: 10.3390/gels8030167.
- [40] Y. M. T. Silaen, "Sintesis dan Karakterisasi Injectable Hydrogel Biokomposit Alginat/PVA/rGO Untuk Aplikasi Rekayasa Jaringan," *Tugas Akhir*, 2019.
- [41] J. M. Alonso, J. A. Del Olmo, R. P. Gonzalez, and V. Saez-martinez, "Injectable hydrogels: From laboratory to industrialization," *Polymers (Basel)*, vol. 13, no. 4, pp. 1–24, 2021, doi: 10.3390/polym13040650.
- [42] R. NURLAILA, "Pemanfaatan Jerami Padi (*Oryza Sativa* L.) Sebagai Bahan Baku Dalam Pembuatan CMC (Carboximetil Cellulose)," *J. Rekayasa Proses*, vol. 15, no. 2, p. 194, 2021, doi: 10.22146/jrekpros.69569.
- [43] M. Vivi Purwandari, Mahyuni Harahap¹, Liver Imam Putra Zai¹ and A. Mubarakh¹, "Jurnal Kimia Saintek dan Pendidikan," *J. Kim. Saintek dan Pendidik.*, vol. 7, no. 1, pp. 72–78, 2023.
- [44] V. Kanikireddy, K. Varaprasad, T. Jayaramudu, C. Karthikeyan, and R. Sadiku, "Carboxymethyl cellulose-based materials for infection control and wound healing: A review," *Int. J. Biol. Macromol.*, vol. 164, pp. 963–975, 2020, doi: 10.1016/j.ijbiomac.2020.07.160.
- [45] I. Widia, M. Abdassah, A. Y. Chaerunisaa, T. Rusdiana, F. Farmasi, and U. Padjadjaran, "Farmaka Farmaka," *Farmaka*, vol. 15, no. 1, pp. 37–46, 2018.
- [46] M. S. Rahman *et al.*, "Recent developments of carboxymethyl cellulose," *Polymers (Basel)*, vol. 13, no. 8, 2021, doi: 10.3390/polym13081345.
- [47] T. I. Sari, P. Susmanto, M. H. Dahlan, N. I. Kamega, and A. Pratiwi, "Jurnal Integrasi Proses Website: <http://jurnal.untirta.ac.id/index.php/jip> Pembuatan Hidrogel Berbasis Polivinil Alkohol (PVA)/Karboksimetil Selulosa

- (CMC)/Minyak Asiri Serai menggunakan Metode Chemical Crosslinked,” *J. Integr. Proses*, vol. 13, no. 1, pp. 43–51, 2024, [Online]. Available: <http://jurnal.untirta.ac.id/index.php/jip>
- [48] M. G. Neuman, R. M. Nanau, L. Oruña-Sanchez, and G. Coto, “Hyaluronic acid and wound healing,” *J. Pharm. Pharm. Sci.*, vol. 18, no. 1, pp. 53–60, 2015, doi: 10.18433/j3k89d.
- [49] O. Dereure, M. Czubek, and P. Combemale, “Efficacy and safety of hyaluronic acid in treatment of leg ulcers: A double-blind RCT,” *J. Wound Care*, vol. 21, no. 3, pp. 131–139, 2012, doi: 10.12968/jowc.2012.21.3.131.
- [50] X. Yang *et al.*, “Hyaluronic Acid-Based Injectable Hydrogels for Wound Dressing and Localized Tumor Therapy: A Review,” *Adv. NanoBiomed Res.*, vol. 2, no. 12, 2022, doi: 10.1002/anbr.202200124.
- [51] A. Yasin, Y. Ren, J. Li, Y. Sheng, C. Cao, and K. Zhang, “Advances in Hyaluronic Acid for Biomedical Applications,” *Front. Bioeng. Biotechnol.*, vol. 10, no. July, pp. 1–12, 2022, doi: 10.3389/fbioe.2022.910290.
- [52] Y. Dong *et al.*, “Conformable hyaluronic acid hydrogel delivers adipose-derived stem cells and promotes regeneration of burn injury,” *Acta Biomater.*, vol. 108, pp. 56–66, 2020, doi: 10.1016/j.actbio.2020.03.040.
- [53] M. M. Dalmedico, M. J. Meier, J. V. C. Felix, F. S. Pott, F. de F. C. Petz, and M. C. Santos, “Hyaluronic acid covers in burn treatment: A systematic review,” *Rev. da Esc. Enferm.*, vol. 50, no. 3, pp. 519–524, 2016, doi: 10.1590/S0080-623420160000400020.
- [54] M. Antoszewska, E. M. Sokolewicz, and W. Barańska-Rybak, “Wide Use of Hyaluronic Acid in the Process of Wound Healing—A Rapid Review,” *Sci. Pharm.*, vol. 92, no. 2, 2024, doi: 10.3390/scipharm92020023.
- [55] S. Pokhrel, “Uji Stabilitas Fisik Sediaan Emulgel Ekstrak Daun Ketepeng (*Cassia alata* L.) Berbasis Hidroxy Propyl Methyl Cellulose (HPMC) Sebagai Antiskabies,” *Ayaa*, vol. 15, no. 1, pp. 37–48, 2024
- [56] M. Khairati, “Pemurnian Gliserol,” *J. Jejaring Mat. dan Sains*, vol. 4, no. 2, pp. 35–40, 2022, [Online]. Available: <https://doi.org/10.36873/jjms.2022.v4.i2.706>
- [57] G. A. Wulandari, P. V. Y. Yamlean, and S. S. Abdullah, “Pengaruh Gliserin

- Terhadap Stabilitas Fisik Gel Ekstrak Etanol Sari Buah Tomat (*Solanum lycopersicum* L.),” *J. Kesehat. Tambusai*, vol. 4, no. 3, pp. 2383–2391, 2023, doi: 10.31004/jkt.v4i3.16601.
- [58] L. Widyaningsih, “Pengaruh Penambahan Kosolven Propilen Glikol Terhadap Kelarutan Asam Mefenamat,” *Univ. Muhammadiyah Surakarta*, p. 1, 2009.
- [59] S. Pokhrel, “Uji Stabilitas Fisik Sediaan Emulgel Ekstrak Daun Ketepeng (*Cassia alata* L.) Berbasis Hidroxy Propyl Methyl Cellulose (HPMC) Sebagai Antiskabies,” *Ayan*, vol. 15, no. 1, pp. 37–48, 2024.
- [60] A. F. Tsabitah, A. K. Zulkarnain, M. S. H. Wahyuningsih, and D. A. A. Nugrahaningsih, “Optimasi Carbomer, Propilen Glikol, dan Trietanolamin Dalam Formulasi Sediaan Gel Ekstrak Etanol Daun Kembang Bulan (*Tithonia diversifolia*),” *Maj. Farm.*, vol. 16, no. 2, p. 111, 2020, doi: 10.22146/farmaseutik.v16i2.45666.
- [61] E. M. Idzati, A. B. Yudhistira, and F. Kurniawansyah, “Pra Desain Pabrik Propilen Glikol melalui,” *J. Fundam. Appl. Chem. Eng.*, vol. 1, no. 2, pp. 25–28, 2020.
- [62] A. D. Djajanti, I. N. P. Sumule, Firmansyah, and Rusli, “Formulation And Physical Stability Test Of Celery Leaf Extract Gel (*Apium graveolens* L.) With Variations Concentration Of *Hydroxy Propyl Methyl Cellulose* And Carbopol,” *3rd Int. Conf. Urban Heal. Covid-19 Pandemic amd Urban Heal. Issues*, vol. 3, no. 1, pp. 54–63, 2021.
- [63] W. Wulandari, D. E. Ermawati, and A. Yugatama, “Optimization SNEDDS (Self-Nano Emulsifying Drug Delivery System) of ZnO that dispersed into Hydrogel Matrix as UV-Protective,” *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 578, no. 1, 2019, doi: 10.1088/1757-899X/578/1/012058.
- [64] Raharjo and Mugi, “Panduan Pengukuran Viskositas Fluida Menggunakan Viscometer Brookfield,” *Lab. Ind.*, p. 9, 2019.
- [65] A. Aliyah, W. W. Oktaviana, K. S. Dwipayanti, A. P. Erdiana, R. N. Utami, and A. D. Permana, “Enhanced skin localization of doxycycline using microparticles and hydrogel: Effect of oleic acid as penetration enhancer,” *Pharmaciana*, vol. 11, no. 2, p. 239, 2021, doi:

- 10.12928/pharmaciana.v11i2.21044.
- [66] A. K. Umar, M. Butarbutar, S. Sriwidodo, and N. Wathoni, “Film-forming sprays for topical drug delivery,” *Drug Des. Devel. Ther.*, vol. 14, pp. 2909–2925, 2020, doi: 10.2147/DDDT.S256666.
 - [67] S. Url, C. Press, T. J. Archive, and T. J. Archive, *Encyclopedia of Geoarcheology*, vol. 23, no. 1998. 2007.
 - [68] “(Characterization) 88550_BS EN13726-1 2002 (002).”
 - [69] J. Grip *et al.*, “Development of a novel beta-glucan supplemented hydrogel spray formulation and wound healing efficacy in a db/db diabetic mouse model,” *Eur. J. Pharm. Biopharm.*, vol. 169, no. October, pp. 280–291, 2021, doi: 10.1016/j.ejpb.2021.10.013.
 - [70] J. K. Indonesia and N. A. Sayuti, “Artikel Riset Formulasi dan Uji Stabilitas Fisik Sediaan Gel Ekstrak Daun Ketepeng Cina (*Cassia alata* L .) Formulation and Physical Stability of *Cassia alata* L . Leaf Extract Gel penyakit yang menyerang pada permu- *Malassezia furfur* . Penyakit yang diseb,” vol. 5, no. 2, pp. 74–82, 2015.
 - [71] A. Indalifiany, M. Hajrul Malaka, A. Fristiohady, R. Andriani, and M. Harul Malaka, “Jurnal Farmasi Sains dan Praktis Formulasi dan Uji Stabilitas Fisik Nanoemulgel Ekstrak Etanol Spons *Petrosia* Sp. Formulation and Physical Stability Test of Nanoemulgel Containing *Petrosia* Sp. Ethanolic Extract,” *Jfsp*, vol. 7, no. 3, pp. 2579–4558, 2021, [Online]. Available: <http://journal.ummg.ac.id/index.php/pharmacy>
 - [72] T. Imanto, R. Prasetiawan, and E. R. Wikantyasning, “Formulasi dan Karakterisasi Sediaan Nanoemulgel Serbuk Lidah Buaya (*Aloe Vera* L.),” *Pharmacon J. Farm. Indones.*, vol. 16, no. 1, pp. 28–37, 2019, doi: 10.23917/pharmacon.v16i1.8114.
 - [73] Yenny Harliantika and Noval, “Formulasi dan Evaluasi Hidrogel Ekstrak Etanol Daun Gaharu (*Aquilaria malacensis* Lamk.) dengan Kombinasi Basis Karbopol 940 dan HPMC K4M,” *J. Pharm. Sci.*, vol. 6, no. 1, pp. 37–46, 2021, doi: 10.53342/pharmasci.v6i1.208.
 - [74] B. Szulc-Musioł, W. Siemiradzka, and B. Dolińska, “Formulation and Evaluation of Hydrogels Based on Sodium Alginate and Cellulose

- Derivatives with Quercetin for Topical Application,” *Appl. Sci.*, vol. 13, no. 13, 2023, doi: 10.3390/app13137826.
- [75] M. Diki Wahyudi *et al.*, “Formulasi dan Uji Stabilitas Fisik Gel Ekstrak Batang Pisang Mauli (*Musa acuminata*),” *Dentin J. Kedokt. Gigi*, vol. 2022, no. 3, pp. 161–165, 2022.
- [76] NA Sayuti, “Formulasi dan Uji Stabilitas Fisik Sediaan Gel Ekstrak Daun Ketepeng Cina (*Cassia alata* L.),” *J. Kefarmasian Indones.*, vol. 5, no. 2, pp. 74–82, 2015.
- [77] H. M. Wijaya and R. N. Lina, “Formulasi Dan Evaluasi Fisik Sediaan Suspensi Kombinasi Ekstrak Biji Pepaya (*Carica Papaya* L.) Dan Umbi Rumput Teki (*Cyperus Rotundus* L.) Dengan Variasi Konsentrasi Suspending Agent Pga (Pulvis Gummi Arabici) Dan Cmc-Na (Carboxymethylcellulosum Natrium),” *Cendekia J. Pharm.*, vol. 5, no. 2, pp. 166–175, 2021, doi: 10.31596/cjp.v5i2.160.
- [78] M. S. Ågren, “An amorphous hydrogel enhances epithelialisation of wounds,” *Acta Derm. Venereol.*, vol. 78, no. 2, pp. 119–122, 1998, doi: 10.1080/000155598433449.
- [79] D. Dominica, Y. Harianti, R. Versita, and F. Shufyani, “Original Article Effect of palm leaf extract (*Elaeis Guineensis* Jacq .) addition on the viscosity of anti-acne sunscreen cream Pengaruh penambahan ekstrak kental daun kelapa sawit (*Elaeis Guineensis* Jacq .) terhadap viskositas krim tabir surya antijera,” vol. 1, pp. 181–186, 2025.
- [80] A. Widyasanti, M. Indriyani, S. H. Putri, and F. Fillianty, “Kajian Stabilitas Losion Berbasis Minyak Kelapa dengan Kombinasi Surfaktan Tween 80 dan Setil Alkohol,” *Teknotan*, vol. 17, no. 1, p. 33, 2023, doi: 10.24198/jt.vol17n1.5.
- [81] D. Chandra, “Uji Fisikokimia Sediaan Emulsi, Gel, Emulgel Ekstrak Etanol Goji Berry,” *Jayapangus Press*, vol. 11, no. 2, pp. 219–228, 2022.