

DAFTAR PUSTAKA

1. Tortora GJ, Derrickson Bryan. Principles of Anatomy and Physiology. 12th ed. USA: John Wiley & Sons. USA: Wiley; 2009.
2. Perdanakusuma DS. Anatomi Fisiologi Kulit. In: Anatomi Fisiologi Kulit Dan Penyembuhan Luka. Surabaya: Dipublikasikan dalam Seminar "From Caring to Curing Before You Use Gauze"; 2007. 1–8.
3. Sari AN. Antioksidan Alternatif Untuk Menangkal Bahaya Radikal Bebas Pada Kulit. *Elkawnie: Journal of Islamic Science and Technology*. 2015;1(1):63–68.
4. Fitraneti E, Rizal Y, Riska Nafiah S, Primawati I, Ayu Hamama D. Pengaruh Paparan Sinar Ultraviolet terhadap Kesehatan Kulit dan Upaya Pencegahannya : Tinjauan Literatur. *Scientific Journal*. 2024;3(3):185–194.
5. Marta Lisnawati Zalukhu. Proses Menua, Stres oksidatif, dan peran antioksidan. *Cermin dunia kedokteran* 245. *Cermin Dunia Kedokteran*. 2018;43(10):733–735.
6. Schöttker B, Brenner H, Jansen EHJM, Gardiner J, Peasey A, Kubínová R, et al. Evidence for the free radical/oxidative stress theory of ageing from the Chances consortium: A meta-analysis of individual participant data. *BMC Med*. 2015;13(300):1–15.
7. Bahashwan E. Awareness and knowledge of sun exposure and use of sunscreen among adults in Aseer region, Saudi Arabia. *Saudi Pharmaceutical Journal*. 2024;32(102019):1–10.
8. Chou Y, Khairani AF. Progress in the Development of Stem Cell-Derived Cell-Free Therapies for Skin Aging. 2023.
9. Dirja BT, Kusuma DR. Prospek Media Sel Punca Jaringan Adiposa Terkondisi sebagai Anti-Aging. 2021;10(2):464–467.
10. Jha KA, Rasiyah PK, Gentry J, A. NDM, Kumar R, Adebisi A, et al. Mesenchymal Stem Cell Secretome Protects Against Oxidative Stress-Induced Ocular Blast Visual Pathologies. *Exp Eye Res*. 2022;215(1):108-120.
11. Hartono B. Sel Punca : Karakteristik, Potensi dan Apoptosis. *Jurnal Kedokteran Meditek*. 2016;22(60):72–75.
12. Bhattarai E. Stem Cells And Their Potential Applications In Dermatology. *Journal of Stem Cells Research, Development & Therapy*. 2020;6(43):1–6.
13. Halim D, Murti H, Sandra F, Boediono A, Djuwantono T, Setiawan B. Stem Cell : Dasar Teori & Aplikasi Klinis. Rina Asrikawati, editor. Jakarta: Erlangga; 2010.

14. Santi. Peranan Sel Punca dalam Penyembuhan Luka. *Cermin Dunia Kedokteran*. 2018;45(5):374–379.
15. Thomson JA, Itskovitz-Eldor J, Shapiro SS, Waknitz MA, Swiergiel JJ, Marshall VS, et al. Embryonic Stem Cell Lines Derived from Human Blastocysts. *Science*. 1998 Nov;282(5391):145–147.
16. Yolanda MM, Maria AV, Amaia FG, Marcos PB, Silvia PL, Dolores E, et al. Adult Stem Cell Therapy in Chronic Wound Healing. *J Stem Cell Res Ther*. 2014;4(1):1-10.
17. Freshney RI, Stacey GN, Auerbach JM, editors. *Culture of Human Stem*. Canada: John Wiley & Sons, Inc., Hoboken, New Jersey; 2007.
18. Peraturan Menteri Kesehatan Republik Indonesia Nomor 32 Tahun 2018 Tentang Penyelenggaraan Pelayanan Sel Punca Dan/Atau Sel. In Kementerian Kesehatan Republik Indonesia; 2018.
19. Kirby GTS, Mills SJ, Cowin AJ, Smith LE. Stem cells for Cutaneous Wound Healing. *Biomed Res Int*. 2015;11(1):1-12.
20. Foo JB, Looi QH, Chong PP, Hassan NH, Yeo GEC, Ng CY, et al. Comparing the Therapeutic Potential of Stem Cells and their Secretory Products in Regenerative Medicine. *Stem Cells Int*. 2021;10(1):1–30.
21. Putri WE, Endaryanto A. Mesenchymal Stem Cells-Conditioned Medium (SECRETOME) in Skin Aging : A Systematic Review. *International Journal for Pharmaceutical Research Scholar*. 2021;13(2):613–635.
22. Widhiastuti SS. Aplikasi Media Terkondisi Sel Punca Mesensimal dalam Terapi Penyakit Degeneratif dan Penyembuhan Luka. *Biota : Jurnal Ilmiah Ilmu-Ilmu Hayati*. 2020;5(1):48–60.
23. Kim HO, Choi SM, Kim HS. Mesenchymal stem cell-derived secretome and microvesicles as a cell-free therapeutics for neurodegenerative disorders. *Tissue Eng Regen Med*. 2013;10(3):93–101.
24. Chen J, Xie S, Qiu D, Xie M, Wu M, Li X, et al. The NLRP3 molecule influences the therapeutic effects of mesenchymal stem cells through Glut1-mediated energy metabolic reprogramming. *J Adv Res*. 2024;1(1):1-5.
25. Eleuteri S, Fierabracci A. Insights into the secretome of mesenchymal stem cells and its potential applications. *International Journal of Molecular Sciences*. MDPI AG; 2019;20(1):1-9.
26. Bari E, Perteghella S, Di Silvestre D, Sorlini M, Catenacci L, Sorrenti M, et al. Pilot production of mesenchymal stem/stromal freeze-dried secretome for cell-free regenerative nanomedicine: A validated GMP-compliant process. *Cells*. 2018;1(7):11-15.

27. Ghasemi M, Roshandel E, Mohammadian M, Farhadhosseinabadi B, Akbarzadehlaleh P, Shamsasenjan K. Mesenchymal stromal cell-derived secretome-based therapy for neurodegenerative diseases: overview of clinical trials. *Stem Cell Research and Therapy*. BioMed Central Ltd; 2023;14(1):1-7.
28. Kalangi SJR. Histofisiologi Kulit. *Jurnal Biomedik*. 2014;5(3):12–20.
29. Siregar R. Atlas Berwarna Saripati Penyakit Kulit. Notes and Queries. Jakarta: Kedokteran EGC; 2005.
30. Gilchrest BA, Krutmann J. Skin aging. Jakarta; 2006.
31. Damayanti. Skin Aging and Basic Skin Care in Elderly. *Berkala ilmu kesehatan dan kelamin*. 2017;29(1):73–80.
32. Zargarani D, Zoller F, Zargarani A, Weyrich T, Mosahebi A. Facial skin ageing: Key concepts and overview of processes. *Int J Cosmet Sci*. 2022;44(1):414–420.
33. Ngoc LTN, Tran V Van, Moon JY, Chae M, Park D, Lee YC. Recent trends of sunscreen cosmetic: An update review. *Cosmetics*. 2019;6(64):1–14.
34. Osterwalder U, Herzog B. Sun protection factors: world wide confusion. *Br J Dermatol*. 2009;161(3):13–24.
35. Husni P, Hisprastin Y, Januarti M. Formulasi dan Uji Stabilitas Fisik Sediaan Emulsi Minyak Ikan Lemuru (*Sardinella lemuru*). *Jurnal Ilmiah As-Syifaa*. 2019;11(2):137–46.
36. Hisprasitin Y, Fajri NR. Perbedaan Emulsi Dan Mikroemulsi Pada Minyak Nabati. *Farmaka*. 2018;16(1):133–40.
37. Sheibat-Othman N, Bourgeat-Lami E. Use of Silica Particles for the Formation of Organic-Inorganic Particles by Surfactant-Free Emulsion Polymerization. *Langmuir*. 2009;25(10):21–33.
38. Mollet H, Grubenmann A. *Formulation Technology : Emulsions, Suspensions, Solid Forms*. 1st ed. Wiley-VCH. Weinheim, Germany; 2004.
39. Felix M, Guerrero A, Carrera-s C. Optimization of Multiple W1/O/W2 Emulsions Processing for Suitable Stability and Encapsulation Efficiency. *Foods*. 2022;11(1367):1-10.
40. Jo YJ, Karbstein HP, Van Der Schaaf US. Collagen peptide-loaded W1/O single emulsions and W1/O/W2 double emulsions: Influence of collagen peptide and salt concentration, dispersed phase fraction and type of hydrophilic emulsifier on droplet stability and encapsulation efficiency. *Food Funct*. 2019;10(6):12–23.
41. Rowe RC, Shelskey PJ, Quinn ME, editors. *Handbook of Pharmaceutical Excipients*. 6th ed. the Pharmaceutical Press; 2023.

42. Putra AM, Syarifuddin A, Dirpan A. Characterization pH, stability of emulsion, and viscosity canola oil (*Brassica napus L.*) emulsion (O/W). *Earth and Environmental Science*. 2020;575(1):1-10.
43. Sumaiyah S, Meyliana. Formulation and Evaluation of Skin Anti-aging Nanocream Containing Canola (*Brassica napus L.*) Oil. *Indonesian Journal of Pharmaceutical and Clinical Research*. 2021;4(1):47–58.
44. Ariem F, Yamlean PVY, Lebang JS. Formulations and Antioxidant Efficacy The Cream Leaf Extract Of The Belimbing Wuluh (*Averrhoa bilimbi L.*) Dengan Menggunakan Metode DPPH (1,1-diphenyl-2-picrylhydrazyl). *Pharmacon*. 2020;9(4):501–511.
45. Panova IG, Tatikolov AS. Endogenous and Exogenous Antioxidants as Agents Preventing the Negative Effects of Contrast Media (Contrast-Induced Nephropathy). *Pharmaceuticals*. 2023;16(1077):1-8.
46. Serlahwaty D, Sevian AN. Uji Aktivitas Antioksidan Ekstrak Etanol 96% Kombinasi Buah Strawberry dan Tomat dengan Metode ABTS. In: *Seminar Nasional Tumbuhan Obat Indonesia Ke-50*. Samarinda; 2016.
47. Munteanu IG, Apetrei C. Analytical methods used in determining antioxidant activity: A review. *International Journal Molecule Sci*. 2021;22(3380):1-12.
48. Lung JKS, Destiani DP. Uji Aktivitas Antioksidan Vitamin A, C, E dengan Metode DPPH. *Farmaka*. 2017;15(1):53–62.
49. Pradifta R, Marlina, Lucida H, Sudji IR, Salsabila HN, Elida N, et al. Formulation of Mesenchymal Stem Cell Secretome As Antiaging Cream. *International Journal of Applied Pharmaceutics*. 2023;15(1):45–50.
50. Freshney R. *Animal Cell Culture Guide*. Vol. 39, ATCC (American Type Culture Collection). Manassas: University Boulevard; 2014.
51. Sharopova FS, Winka M, William N, Setzer. Radical Scavenging and Antioxidant Activities of Essential Oil Components – An Experimental and Computational Investigation. 2015;10(1):153–156.
52. Puspita RE. *Formulasi Emulsi Ganda Mengandung Sekretom Mesenchymal Stem Cell sebagai Tabir Surya*. Universitas Andalas; 2024.
53. Wedana JS, Leliqia NPE, C.I.S A. Optimasi Komposisi Span® 60 dan Tween® 80 sebagai Emulgator terhadap Stabilitas Fisik dalam Formulasi Cold Cream Ekstrak Kulit Buah Manggis (*Garcinia mangostana L.*). *Jurnal Farmasi Udayana*. 2013;8:91–95.
54. Anonim. *More Solutions To Sticky Problems : A Guide to Getting More From Your Brookfield Viscometer & Rheometer*. Ametek Brookfield; 2024.

55. Saputra SA, Lailiyah M, Erivina A. Formulasi Dan Uji Aktivitas Anti Bakteri Masker Gel Peel-Off Ekstrak Daun Pacar Air (*Impatiens balsamina linn.*) Dengan Kombinasi Basis PVA dan HPMC. *Jurnal Riset Kefarmasian Indonesia*. 2019;1(2):114–122.
56. Kale SN, Deore SL. Solubility enhancement of Nebivolol by micro emulsion technique. *Journal of Young Pharmacists*. 2016;8(4):356–367.
57. Wikantyasning ER, Indianie N. Optimisasi Tween 80 dan Span 80 Sebagai Emulgator dalam Formula Krim Tabir Surya Kombinasi Ekstrak Etanol Daun Alpukat (*Persea americana M.*) dan Nanopartikel Seng Oksida Dengan Metode Simplex Lattice Design. *Cerata Jurnal Ilmu Farmasi*. 2021;12(1):1–28.
58. Chen S, He Z, Xu J. Application of adipose-derived stem cells in photoaging: basic science and literature review. *Stem Cell Res Ther*. 2020;11(491):1–15.
59. Noviantari A, Febrianti T. Kajian: Alternatif Pengganti Trypsin pada Kultur Sel Punca Mesenkim. In: *Seminar Nasional Riset Kedokteran (SENSORIK II)*. Jakarta: 1Puslitbang Biomedis dan Teknologi Dasar Kesehatan; 2021;1(1):1-73.
60. Hunt CJ. Technical Considerations in the Freezing, Low-Temperature Storage and Thawing of Stem Cells for Cellular Therapies. *Transfusion Medicine and Hemotherapy*. S. Karger AG; 2019.46(1):134–149.
61. Linkova DD, Rubtsova YP, Egorikhina MN. Cryostorage of Mesenchymal Stem Cells and Biomedical Cell-Based Products. *Cells*. MDPI; 2022;11(1):1-8.
62. HiMedia. Dulbecco's Modified Eagle Medium (DMEM) Product Information. 2011.
63. Pilgrim CR, McCahill KA, Rops JG, Dufour JM, Russell KA, Koch TG. A Review of Fetal Bovine Serum in the Culture of Mesenchymal Stromal Cells and Potential Alternatives for Veterinary Medicine. Vol. 9, *Frontiers in Veterinary Science*. Frontiers Media S.A. 2022;1(1):1–11.
64. Ryu AH, Eckalbar WL, Kreimer A, Yosef N, Ahituv N. Use antibiotics in cell culture with caution: Genome-wide identification of antibiotic-induced changes in gene expression and regulation. *Sci Rep*. 2017;7(1):1–9.
65. Budi HS, Setyawati MC, Anitasari S, Shen YK, Ramadan DE. Cell Detachment Rates and Confluence of Fibroblast and Osteoblast Cell Culture Using Different Washing Solutions. *Brazilian Journal of Biology*. 2024; 84(1):1–8.
66. Mótyán J, Tóth F, Tózsér J. Research Applications of Proteolytic Enzymes in Molecular Biology. *Biomolecules*. 2013;3(4):923–942.
67. Phelps J, Sanati-Nezhad A, Ungrin M, Duncan NA, Sen A. Bioprocessing of mesenchymal stem cells and their derivatives: Toward cell-free therapeutics. *Stem Cells International*. Hindawi Limited; 2018.

68. Yasarah Hisprastin, Rina Fajri Nuwarda. Perbedaan Emulsi Dan Mikroemulsi Pada Minyak Nabati. *Farmaka*. 2018;16(1):133–40.
69. Badan Standardisasi Nasional. Standar Nasional Indonesia: Sediaan Tabir Surya SNI 16-4399-1996. Vol. 16. Jakarta: Badan Standardisasi Nasional; 1996. 1–3.
70. Brooks SG, Mahmoud RH, Lin RR, Fluhr JW, Yosipovitch G. The Skin Acid Mantle: An Update on Skin pH. *Journal of Investigative Dermatology*. 2025;145(3):509–521.
71. Hardani, Ajeng Dian, Fajar Agung, dkk. Buku Ajar Farmasi Fisika. Mataram: Samudra Biru (Anggota IKAPI); 2021.
72. Prior RL, Wu X, Schaich K. Standardized Methods for the Determination of Antioxidant Capacity and Phenolics in Foods and Dietary Supplements. *J Agric Food Chem*. 2005;53(10):290–302.
73. Faria J, Calcat-i-Cervera S, Skovronova R, Broeksma BC, Berends AJ, Zaal EA, et al. Mesenchymal stromal cells secretome restores bioenergetic and redox homeostasis in human proximal tubule cells after ischemic injury. *Stem Cell Res Ther*. 2023;14(1).
74. Ok-Hee Kim, Ha-Eun Hong, Haeyeon Seo, Bong Jun Kwak, Ho Joong Choi, Kee-Hwan Kim, et al. Generation of induced secretome from adipose-derived stem cells specialized for disease-specific treatment: An experimental mouse model. *Worlds Journal of Stem Cells*. 2020;26(1):70–86.
75. Bellei Barbara, Papaccio F, Filoni A, Caputo S, Lopez G, Migliano E, et al. Extracellular fraction of adipose tissue as an innovative regenerative approach for vitiligo treatment. *Dermatol*. 2019;28:695–703.
76. Azzahra F, Fauziah V, Nurfajriah W, Emmanuel SW. Daun Kelor (*Moringa oleifera*): Aktivitas Tabir Surya Ekstrak dan Formulasi Sediaan Lotion. *Majalah Farmasetika*. 2023;8(2):133.
77. Qamarul Huda, Firdaus S, Ulfiana Utari A, Yulianti Alifah D, Jumardin W. Penentuan Nilai SPF (Sun Protection Factor) Krim Ekstrak Etanol Daun Belimbing Wuluh (*Averrhoa bilimbi L.*) Menggunakan Metode Spektrofotometri. *Jurnal Kesehatan*. 2024;12(2):67–77.
78. Li L, Ngo HTT, Hwang E, Wei X, Liu Y, Liu J, et al. Conditioned Medium from Human Adipose-Derived Mesenchymal StemCell Culture Prevents UVB-Induced Skin Aging in Human Keratinocytes and Dermal Fibroblasts. *Int J Mol Sci*. 2020;21(49):1-8.
79. Burón M, Palomares T, Garrido-Pascual P, Herrero de la Parte B, García-Alonso I, Alonso-Varona A. Conditioned Medium from H2O2-Preconditioned Human

- Adipose-Derived Stem Cells Ameliorates UVB-Induced Damage to Human Dermal Fibroblasts. *Antioxidants*. 2022;11(10):1-9.
80. Bhowmick M, Sengodan T. Mechanisms, Kinetics and Mathematical Modelling of Transdermal Permeation-an updated review. 2013;4(6):1-4.
81. Zhao AG, Shah K, Cromer B, Sumer H. Mesenchymal Stem Cell-Derived Extracellular Vesicles and Their Therapeutic Potential. *Stem Cells Int*. 2020;1:1.
82. zhang M, Fan L, Liu Y, Huang S, Li J. Effects of Proteins on Emulsion Stability: The Role of Proteins at the Oil-Water Interface. *Food Chem*. 2022;397:133-226.
83. Chevalier RC, Gomes A, Cunha RL. Tailoring W/O emulsions for application as inner phase of W/O/W emulsions: Modulation of the aqueous phase composition. *Journal Food Eng*. 2021;297(1):1-10.
84. Leister N, Götz V, Jan Bachmann S, Nachtigall S, Hosseinpour S, Peukert W, et al. A Comprehensive Methodology to Study Double Emulsion Stability. *J Colloid Interface Sci*. 2023;630(1):534-548.

