

DAFTAR PUSTAKA

- Abotaleb, M., Samuel, S., Varghese, E., Varghese, S., Kubatka, P., Liskova, A., dkk., 2018. Flavonoids in Cancer and Apoptosis. *Cancers*, 11: 6.
- Afianti, H.P. dan Murrukmiyadi, M., 2015. Pengaruh Variasi Kadar Gelling Agent HPMC Terhadap Sifat Fisik dan Aktivitas Antibakteri Sediaan Gel Ekstrak Etanolik Daun Kemangi (*Ocimum basilicum* L. forma citratum Back.) 11: .
- Ali, S. dan Yosipovitch, G., 2013. Skin pH: From Basic Science to Basic Skin Care. *Acta Dermato Venereologica*, 93: 3.
- Allen, L., 2014. *Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems*. Lippincott Williams & Wilkins.
- Almohari, Y., 2022. Novel Hydrogels for Topical Applications: An Updated Comprehensive Review Based on Source. *Gels*, 8: 3.
- Balakrishnan, K.P. dan Narayanaswamy, N., 2011. Botanicals as sunscreens: Their role in the prevention of photoaging and skin cancer. *International Journal of Research in Cosmetic Science*, 1: 1–12.
- Balsam, M.S. dan Sagarin, E., 1972. *Cosmetics: Science and Technology*, 2nd ed. Interscience Publishers Inc, New York.
- Becker, L.C., Bergfeld, W.F., Belsito, D.V., Hill, R.A., Klaassen, C.D., Liebler, D.C., dkk., 2019. Safety Assessment of Glycerin as Used in Cosmetics. *International Journal of Toxicology*, 38: 6S-22S.
- Benson, H.A.E. (Editor), 2019. *Cosmetic Formulation: Principles and Practice*. CRC Press Taylor & Francis Group, Boca Raton, FL.
- Bhamare, V.S., Kulkarni, R.M., dan Parwaz Khan, A.A., 2021. Chapter 10 - Adsorptive removals of pollutants using aerogels and its composites, dalam: Khan, A.A.P., Ansari, M.O., Khan, A., dan Asiri, A.M. (Editor), *Advances in Aerogel Composites for Environmental Remediation*. Elsevier, hal. 171–199.
- Boo, Y.C., 2020. Emerging Strategies to Protect the Skin from Ultraviolet Rays Using Plant-Derived Materials. *Antioxidants*, 9: 637.
- Bose, S., Du, Y., Takhistov, P., dan Michniak-Kohn, B., 2013. Formulation optimization and topical delivery of quercetin from solid lipid based nanosystems. *International Journal of Pharmaceutics*, 441: 56–66.
- BPOM, 2019. *Peraturan Badan Pengawas Obat Dan Makanan, Nomor 23 Tahun 2019, Tentang Persyaratan Teknis Bahan Kosmetika*. Badan Pengawas Obat dan Makanan Republik Indonesia, Badan Pengawas Obat dan Makanan Republik Indonesia.
- Butkeviciute, A., Ramanauskiene, K., dan Janulis, V., 2022. Formulation of Gels and Emulgels with *Malus domestica* Borkh: Apple Extracts and Their Biopharmaceutical Evaluation In Vitro. *Antioxidants*, 11: 373.
- Cao, H., Saroglu, O., Karadag, A., Diaconeasa, Z., Zoccatelli, G., Conte-Junior, C.A., dkk., 2021. Available technologies on improving the stability of polyphenols in food processing. *Food Frontiers*, 2: 109–139.

- Carrer, V., Alonso, C., Pont, M., Zanuy, M., Córdoba, M., Espinosa, S., dkk., 2020. Effect of propylene glycol on the skin penetration of drugs. *Archives of Dermatological Research*, 312: .
- Chamcheu, J., Roy, T., Uddin, M., Banang-Mbeumi, S., Chamcheu, R.-C., Walker, A., dkk., 2019. Role and Therapeutic Targeting of the PI3K/Akt/mTOR Signaling Pathway in Skin Cancer: A Review of Current Status and Future Trends on Natural and Synthetic Agents Therapy. *Cells*, 8: 803.
- Chander, M., 2018. Anticancer Efficacy of Some Plant Phenolics - A Recent Scenario. *International Journal of Current Microbiology and Applied Sciences*, 7: 1746–1768.
- Chaudhari, K.D., Ande, S.N., Bakal, R.L., dan Malode, G.P., 2022. Gelling agents: Can they formulate a perfect emulgel? 10: 5.
- Chen, G., Hu, O., Lu, J., Gu, J., Chen, K., Huang, J., dkk., 2021. Highly flexible and adhesive poly(vinyl alcohol)/poly(acrylic amide-co-2-acrylamido-2-methylpropane sulfonic acid)/glycerin hydrogel electrolyte for stretchable and resumable supercapacitor. *Chemical Engineering Journal*, 425: 131505.
- Choi, K.-S., Kundu, J.K., Chun, K.-S., Na, H.-K., dan Surh, Y.-J., 2014. Rutin inhibits UVB radiation-induced expression of COX-2 and iNOS in hairless mouse skin: p38 MAP kinase and JNK as potential targets. *Archives of Biochemistry and Biophysics*, 559: 38–45.
- Choi, S.J., Lee, S.-N., Kim, K., Joo, D.H., Shin, S., Lee, J., dkk., 2016. Biological effects of rutin on skin aging. *International Journal of Molecular Medicine*, 38: 357–363.
- Cumpelik, M., 1972. Analytical Procedures and Evaluation of Sunscreens. *Journal of The Society of Cosmetic Chemist*, 333–344.
- de Oliveira, C.A., Peres, D.D., Rugno, C.M., Kojima, M., Pinto, C.A.S. de O., Consiglieri, V.O., dkk., 2015. Functional photostability and cutaneous compatibility of bioactive UVA sun care products. *Journal of Photochemistry and Photobiology B: Biology*, 148: 154–159.
- Deuschle, V.C.K.N., Deuschle, R.A.N., Bortoluzzi, M.R., dan Athayde, M.L., 2015. Physical chemistry evaluation of stability, spreadability, in vitro antioxidant, and photo-protective capacities of topical formulations containing *Calendula officinalis* L. leaf extract. *Brazilian Journal of Pharmaceutical Sciences*, 51: 69.
- Diaz, J.H. dan Nesbitt, L.T., 2013. Sun Exposure Behavior and Protection: Recommendations for Travelers. *Journal of Travel Medicine*, 20: 110.
- Dimitrovska Cvetkovska, A., Manfredini, S., Ziosi, P., Molesini, S., Dissette, V., Magri, I., dkk., 2017. Factors affecting SPF in vitro measurement and correlation with in vivo results. *International Journal of Cosmetic Science*, 39: 310–319.
- Dunaway, S., Odin, R., Zhou, L., Ji, L., Zhang, Y., dan Kadekaro, A.L., 2018. Natural Antioxidants: Multiple Mechanisms to Protect Skin From Solar Radiation. *Frontiers in Pharmacology*, 9: 392.
- Dutra, E.A., Oliveira, D.A.G. da C., Kedor-Hackmann, E.R.M., dan Santoro, M.I.R.M., 2004. Determination of sun protection factor (SPF) of sunscreens

- by ultraviolet spectrophotometry. *Revista Brasileira de Ciências Farmacêuticas*, 40: 381–385.
- Ermawati, D.E., Yugatama, A., dan Wulandari, W., 2020. Optimization of Olive Oil, Tween 80, and Propylene Glycol of Selfnanoemulsifying Drug Delivery System of Zinc Oxide by D-Optimal Method. *Journal of Pharmaceutical Sciences and Community*, 17: 92–101.
- European Medicines Agency, 2017. Propylene glycol used as an excipient. *European Medicines Agency Science Medicines Health*, 97.
- Fisher, G.J., Wang, Z., Datta, S.C., Varani, J., Kang, S., dan Voorhees, J.J., 1997. Pathophysiology of Premature Skin Aging Induced by Ultraviolet Light. *New England Journal of Medicine*, 337: 1419–1429.
- Fiume, M.M., Heldreth, B., Bergfeld, W.F., Belsito, D.V., Hill, R.A., Klaassen, C.D., dkk., 2013. Safety Assessment of Triethanolamine and Triethanolamine-Containing Ingredients as Used in Cosmetics. *International Journal of Toxicology*, 32: 59S-83S.
- Gabros, S., Nessel, T.A., dan Zito, P.M., 2022. Sunscreens And Photoprotection, dalam: *StatPearls*. StatPearls Publishing, Treasure Island (FL).
- Gęgotek, A., Rybałtowska-Kawałko, P., dan Skrzydlewska, E., 2017. Rutin as a Mediator of Lipid Metabolism and Cellular Signaling Pathways Interactions in Fibroblasts Altered by UVA and UVB Radiation. *Oxidative Medicine and Cellular Longevity*, 2017: 1–20.
- Geoffrey, K., Mwangi, A.N., dan Maru, S.M., 2019. Sunscreen products: Rationale for use, formulation development and regulatory considerations. *Saudi Pharmaceutical Journal*, 27: 1009–1018.
- Golonka, I., Wilk, S., dan Musiał, W., 2020. The Influence of UV Radiation on the Degradation of Pharmaceutical Formulations Containing Quercetin. *Molecules*, 25: 5454.
- Gonzalez, H., 2010. Percutaneous absorption with emphasis on sunscreens. *Photochemical & Photobiological Sciences*, 9: 482.
- Gunarti, N., Aisyah, I., dan Lia, F., 2021. Physical Stability Test Sunscreen Gel Extracts Blackberry Fruit (*rubus fruticosus* l.). *IOP Conference Series: Materials Science and Engineering*, 1071: 012011.
- Gunarti, N.S. dan Fikayuniar, L., 2020. Formulasi dan Uji Aktivitas Gel Tabir Surya dari Ekstrak Buah Blackberry (*Rubus Fruticosus*) Secara In Vitro dengan Spektrofotometri UV-Visibel. *Kartika : Jurnal Ilmiah Farmasi*, 7: 68.
- Haghighi, M. dan Rezaei, K., 2012. General Analytical Schemes for the Characterization of Pectin-Based Edible Gelled Systems. *The Scientific World Journal*, 2012: 1–12.
- Hajrin, W., Subaidah, W.A., Juliantoni, Y., dan Wirasisya, D.G., 2021. Application of Simplex Lattice Design Method on The Optimisation of Deodorant Roll-on Formula of Ashitaba (*Angelica keiskei*). *Jurnal Biologi Tropis*, 21: 506.
- Hidayat, I.R., Zuhrotun, A., dan Sopyan, I., 2020. Design-Expert Software sebagai Alat Optimasi Formulasi Sediaan Farmasi. *Majalah Farmasetika*, 6: 99–104.

- Huang, J., Peng, S., Gu, J., Chen, G., Gao, J., Zhang, J., dkk., 2020. Self-powered integrated system of a strain sensor and flexible all-solid-state supercapacitor by using a high performance ionic organohydrogel. *Materials Horizons*, 7: 2085–2096.
- Huichao, W., Shouying, D., Yang, L., Ying, L., dan Di, W., 2014. The application of biomedical polymer material hydroxy propyl methyl cellulose(HPMC) in pharmaceutical preparations 6.
- Hurler, J., Engesland, A., Poorahmary Kermamy, B., dan Škalko-Basnet, N., 2012. Improved texture analysis for hydrogel characterization: Gel cohesiveness, adhesiveness, and hardness. *Journal of Applied Polymer Science*, 125: 180–188.
- Ikasari, E.D., 2012. The Effect of Propylene Glycol Concentration on The Physical Characteristic and Release Rate Of Caffeine in Gel.
- Kajbafvala, A. dan Salabat, A., 2021. Microemulsion and microemulsion gel formulation for transdermal delivery of rutin: Optimization, in-vitro/ex-vivo evaluation and SPF determination. *Journal of Dispersion Science and Technology*, 1–9.
- Kamel, R. dan Mostafa, D.M., 2015. Rutin nanostructured lipid cosmeceutical preparation with sun protective potential. *Journal of Photochemistry and Photobiology B: Biology*, 153: 59–66.
- Kaur, A., Thatai, P., dan Sapra, B., 2014. Need of UV protection and evaluation of efficacy of sunscreens. *Journal of Cosmetic Science*, 65: 315–345.
- Kementerian Kesehatan, 2020. *Farmakope Indonesia*, VI. ed. Kementerian Kesehatan Republik Indonesia, Jakarta.
- Kovalchuk, N.M., Dunn, J., Davies, J., dan Simmons, M.J.H., 2019. Superspreading on Hydrophobic Substrates: Effect of Glycerol Additive. *Colloids and Interfaces*, 3: 51.
- Kozłowska, J., Pauter, K., dan Sionkowska, A., 2018. Carrageenan-based hydrogels: Effect of sorbitol and glycerin on the stability, swelling and mechanical properties. *Polymer Testing*, 67: .
- Kusuma, M.P. dan Sushmitha, C., 2021. Design, Formulation and Optimization of Rutin Trihydrate Emulgel by Response Surface Methodology. *International Journal of Pharmaceutical Sciences and Research*, 12: 1277–1282.
- Larrea-Wachtendorff, D., Di Nobile, G., dan Ferrari, G., 2020. Effects of processing conditions and glycerol concentration on rheological and texture properties of starch-based hydrogels produced by high pressure processing (HPP). *International Journal of Biological Macromolecules*, 159: .
- Latimer, G.W. (Editor), 2016. *Official Methods of Analysis of AOAC International*, 20th Edition. ed. AOAC International, Gaithersburg, Md.
- Luo, Y., Pan, K., dan Zhong, Q., 2015. Casein/pectin nanocomplexes as potential oral delivery vehicles. *International Journal of Pharmaceutics*, 486: 65.
- Mamontova, A.V., Bogdanov, A.M., dan Lukyanov, K.A., 2015. Influence of cell growth conditions and medium composition on EGFP photostability in live cells. *BioTechniques*, 58: 259.
- Manikrao Donglikar, M. dan Laxman Deore, S., 2016. Sunscreens: A review. *Pharmacognosy Journal*, 8: 171–179.

- Mansur, J. de S., Breder, M.N.R., Mansur, M.C. d'Ascensão, dan Azulay, R.D., 1986. Determinação do fator de proteção solar por espectrofotometria. *An. bras. dermatol*, 121–4.
- Martin, A.N., Sinko, P.J., dan Singh, Y. (Editor), 2011. *Martin's Physical Pharmacy and Pharmaceutical Sciences: Physical Chemical and Biopharmaceutical Principles in the Pharmaceutical Sciences*, 6th ed., 50th anniversary ed. ed. Lippincott Williams & Wilkins, Baltimore, MD.
- Mascaraque, C., Aranda, C., Ocón, B., Monte, M.J., Suárez, M.D., Zarzuelo, A., dkk., 2014. Rutin has intestinal antiinflammatory effects in the CD4+ CD62L+ T cell transfer model of colitis. *Pharmacological Research*, 90: 48–57.
- Maulana, R., Zulkarnain, A.K., dan Kuswahyuning, R., 2021. Evaluation of Novel 3,4-Dimethoxychalcone Activity as a Photoprotective Agent Against Ultraviolet A (UVA) In Vitro in Gel and Microemulgel Dosage Forms. *International Journal of Pharmaceutical Research*, 13: 1866.
- Maverakis, E., Miyamura, Y., Bowen, M.P., Correa, G., Ono, Y., dan Goodarzi, H., 2010. Light, including ultraviolet. *Journal of Autoimmunity*, 34: J247–J257.
- Mesa-Arango, A., Flórez-Muñoz, S., dan Sanclemente, G., 2017. Mechanisms of skin aging. *IATREIA*, 30: 160–170.
- Mita, N., Ardana, M., Arifuddin, M., Febrianie, N.L., dan Farida, S., 2020. Optimization of Gelling Agents and Emulsifiers in Emulgel Bases, and Physical Evaluation of Emulgel containing Sepabang (*Melastoma malabathricum* L.) Leaves Extract. *Journal of Tropical Pharmacy and Chemistry*, 5: 143–149.
- Mohamad Zen, N.I., Abd Gani, S.S., Shamsudin, R., dan Fard Masoumi, H.R., 2015. The Use of D-Optimal Mixture Design in Optimizing Development of Okara Tablet Formulation as a Dietary Supplement. *The Scientific World Journal*, 2015: 1–7.
- Mohania, D., Chandel, S., Kumar, P., Verma, V., Digvijay, K., Tripathi, D., dkk., 2017. Ultraviolet Radiations: Skin Defense-Damage Mechanism, dalam: Ahmad, S.I. (Editor), *Ultraviolet Light in Human Health, Diseases and Environment, Advances in Experimental Medicine and Biology*. Springer International Publishing, Cham, hal. 71–87.
- Nabi, S.A.A., Sheraz, M.A., Ahmed, S., Mustaan, N., dan Ahmad, I., 2016. Pharmaceutical Gels: A Review. *RADS-JPPS*, 4: 40–44.
- Narasagoudr, S.S., Hegde, V.G., Chougale, R.B., Masti, S.P., Vootla, S., dan Malabadi, R.B., 2020. Physico-chemical and functional properties of rutin induced chitosan/poly (vinyl alcohol) bioactive films for food packaging applications. *Food Hydrocolloids*, 109: 106096.
- National Center for Biotechnology Information, 2023. 'PubChem Compound Summary for CID 22947, 1,3-Bis(hydroxymethyl)-5,5-dimethylimidazolidine-2,4-dione', URL: <https://pubchem.ncbi.nlm.nih.gov/compound/22947> (diakses tanggal 28/6/2023).

- Negahdari, R., Bohlouli, S., Sharifi, S., Maleki Dizaj, S., Rahbar Saadat, Y., Khezri, K., dkk., 2021. Therapeutic benefits of rutin and its nanoformulations. *Phytotherapy Research*, 35: 1719–1738.
- Ngoc, Tran, Moon, Chae, Park, dan Lee, 2019. Recent Trends of Sunscreen Cosmetic: An Update Review. *Cosmetics*, 6: 64.
- Noval, N., Rosyifa, R., dan Annisa, A., 2020. 'Effect of HPMC Concentration Variation as Gelling Agent on Physical Stability of Formulation Gel Ethanol Extract Bundung Plants (*Actinuscirpus Grossus*)', , dalam: *Proceedings of the Proceedings of the First National Seminar Universitas Sari Mulia, NS-UNISM 2019, 23rd November 2019, Banjarmasin, South Kalimantan, Indonesia*. Dipresentasikan pada Proceedings of the First National Seminar Universitas Sari Mulia, NS-UNISM 2019, 23rd November 2019, Banjarmasin, South Kalimantan, Indonesia, EAI, Banjarmasin, Indonesia.
- Nunes, A.R., Vieira, Í.G.P., Queiroz, D.B., Leal, A.L.A.B., Maia Morais, S., Muniz, D.F., dkk., 2018. Use of Flavonoids and Cinnamates, the Main Photoprotectors with Natural Origin. *Advances in Pharmacological Sciences*, 2018: 1–9.
- Oliveira, C.A. de, Dario, M.F., Sarruf, F.D., Mariz, I.F.A., Velasco, M.V.R., Rosado, C., dkk., 2016. Safety and efficacy evaluation of gelatin-based nanoparticles associated with UV filters. *Colloids and Surfaces B: Biointerfaces*, 140: .
- Pande, V., Patel, S., Patil, V., dan Sonawane, R., 2014. Design Expert Assisted Formulation of Topical Bioadhesive Gel of Sertaconazole Nitrate. *Advanced Pharmaceutical Bulletin; eISSN 2251-7308*, .
- Patlolla, V.G.R., Holbrook, W.P., Gizurarson, S., dan Kristmundsdottir, P., 2020. Evaluation of in vitro mucoadhesiveness and texture profile analysis of doxycycline in situ hydrogels.
- Peres, D.A., de Oliveira, C.A., da Costa, M.S., Tokunaga, V.K., Mota, J.P., Rosado, C., dkk., 2016. Rutin increases critical wavelength of systems containing a single UV filter and with good skin compatibility. *Skin Research and Technology*, 22: 325–333.
- Pinzaru, I., Chioibas, R., Marcovici, I., Coricovac, D., Susan, R., Predut, D., dkk., 2021. Rutin Exerts Cytotoxic and Senescence-Inducing Properties in Human Melanoma Cells. *Toxics*, 9: 226.
- Pivec, Kargl, Maver, Bračić, Elschner, Žagar, dkk., 2019. Chemical Structure–Antioxidant Activity Relationship of Water–Based Enzymatic Polymerized Rutin and Its Wound Healing Potential. *Polymers*, 11: 1566.
- Proksch, E., 2018. pH in nature, humans and skin. *The Journal of Dermatology*, 45: 2.
- Puspitasari, A.D., Mulangsri, D.A.K., dan Herlina, H., 2018. Formulasi Krim Tabir Surya Ekstrak Etanol Daun Kersen (*Muntingia calabura L.*) untuk Kesehatan Kulit. *Media Penelitian dan Pengembangan Kesehatan*, 28: 263–270.
- Rasheed, A., Shama, S.N., Mohanalakshmi, S., dan Ravichandran, V., 2012. Formulation, characterization and in vitro evaluation of herbal sunscreen lotion. *Oriental Pharmacy and Experimental Medicine*, 12: 241–246.

- Rohmani, S. dan Kuncoro, M.A.A., 2019. Uji Stabilitas dan Aktivitas Gel andsanitizer Ekstrak Daun Kemangi. *JPSCR : Journal of Pharmaceutical Science and Clinical Research*, 4: 19.
- Satari, A., Ghasemi, S., Habtemariam, S., Asgharian, S., dan Lorigooini, Z., 2021. Rutin: A Flavonoid as an Effective Sensitizer for Anticancer Therapy; Insights into Multifaceted Mechanisms and Applicability for Combination Therapy. *Evidence-Based Complementary and Alternative Medicine*, 2021: 1–10.
- Sayuti, N.A., 2015. Formulasi dan Uji Stabilitas Fisik Sediaan Gel Ekstrak Daun Ketepeng Cina (*Cassia alata* L.). *Jurnal Kefarmasian Indonesia*, 5: 74–80.
- Sheskey, P.J., Cook, W.G., dan Cable, C.G. (Editor), 2017. *Handbook of Pharmaceutical Excipients*, 8th ed. ed. Pharmaceutical Press, London.
- Slominski, A.T., 2015. Ultraviolet radiation (UVR) activates central neuro-endocrine-immune system. *Photodermatology, Photoimmunology & Photomedicine*, 31: 121–123.
- Sudhahar, V. dan Balasubramanian, V., 2013. Sun production factor (SPF) determination of marketed sunscreen formulation by In-Vitro method using UV-VIS spectrophotometer 119–122.
- Swari Maharani, N.P.D., Cahyani, I.M., dan Hanhadyanaputri, E.S., 2022. Optimization of Polyvinyl Alcohol (PVA) and Glycerin in Kolang Kaling Peel-Off Gel Mask Formula (*Arenga pinnata*). *Journal of Food and Pharmaceutical Sciences*, 746–753.
- Tavakoli, S. dan Klar, A.S., 2020. Advanced Hydrogels as Wound Dressings. *Biomolecules*, 10: 1169.
- The United States Pharmacopeia : USP 29: The National Formulary : NF 24 : By Authority of the United States Pharmacopeial Convention, Meeting at Washington, D.C., March 9-13, 2005, 2006. . United States Pharmacopeial Convention Incorporated.*
- Tomazelli, L.C., de Assis Ramos, M.M., Sauce, R., Cândido, T.M., Sarruf, F.D., de Oliveira Pinto, C.A.S., dkk., 2018. SPF enhancement provided by rutin in a multifunctional sunscreen. *International Journal of Pharmaceutics*, 552: 401–406.
- Tsabitah, A.F., Zulkarnain, A.K., Wahyuningsih, M.S.H., dan Nugrahaningsih, D.A.A., 2020. Optimasi Carbomer, Propilen Glikol, dan Trietanolamin Dalam Formulasi Sediaan Gel Ekstrak Etanol Daun Kembang Bulan (*Tithonia diversifolia*). *Majalah Farmaseutik*, 16: 115.
- Tyrrell, R.M., 2012. Modulation of gene expression by the oxidative stress generated in human skin cells by UVA radiation and the restoration of redox homeostasis. *Photochem. Photobiol. Sci.*, 11: 135–147.
- Vckn, D., P, B., M, P., S, T., Ran, D., S, S., dkk., 2019. Deuschle VCKN, et al. Rutin Release of Gel Formulations Containing *Persea Americana* Mill. Extract in Vertical Difusion System in Vitro. *Journal of Cosmetology*, 2–8.
- Vu, H.T.H., Hook, S.M., Siqueira, S.D., Müllertz, A., Rades, T., dan McDowell, A., 2018. Are phytosomes a superior nanodelivery system for the antioxidant rutin? *International Journal of Pharmaceutics*, 548: 82–91.



- Won, H., Lee, J.H., Seok, J.-H., Jung, K., Yang, J.-Y., Jeong, J., dkk., 2021. Single- and repeated-dose 28-day oral toxicity study of MDM hydantoin in Sprague–Dawley rats. *Toxicological Research*, 37: 59–69.
- Xu, S.P., Song, W., Qin, X.F., Xie, Y.H., dan Hassan, M., 2015. Method for Solubilizing Rutin with Polyhydroxy Alkyl Alcohol. *International Application Published Under The Patent Cooperation Treaty (PCT), World Intellectual Property Organization*, .
- Yanti Eff, A.R., Rahayu, S.T., Saraswati, H., dan Munim, A., 2019. Formulation and Evaluation of Sunscreen Gels Containing Mangiferin Isolated from Phaleria macrocarpa Fruits. *International Journal of Pharmaceutical Investigation*, 9: 141–145.
- Yati, K., Jufri, M., Gozan, M., Mardiasuti⁴, dan Dwita, L.P., 2018. Pengaruh Variasi Konsentrasi Hidroxy Propyl Methyl Cellulose (HPMC) terhadap Stabilitas Fisik Gel Ekstrak Tembakau (*Nicotiana tabaccum* L.) dan Aktivitasnya terhadap *Streptococcus mutans*. *Pharmaceutical Sciences and Research*, 5: .
- Yousef, H., Alhaji, M., dan Sharma, S., 2022. Anatomy, Skin (Integument), Epidermis, dalam: *StatPearls*. StatPearls Publishing, Treasure Island (FL).
- Yuliani, S.H., 2010. Optimasi kombinasi campuran sorbitol, gliserol, dan propilenglikol dalam gel sunscreen ekstrak etanol Curcuma mangga 7.
- Zulkarnain, A.K., Wahyuono, S., dan Susidarti, R.A., 2015. Pengaruh Konsentrasi Mahkota Dewa Terhadap Stabilitas Lotion – Krim Serta Uji Tabir Surya Secara Spektrofotometri 11: 330.