

## DAFTAR PUSTAKA

- Abbas, S., Hayat, K., Karangwa, E., Bashari, M., Zhang, X., 2013. An Overview of Ultrasound-Assisted Food-Grade Nanoemulsions. *Food Eng. Rev.* 5, 139–157. <https://doi.org/10.1007/s12393-013-9066-3>
- Abd, E., Yousuf, S., Pastore, M., Telaprolu, K., Mohammed, Y., Namjoshi, S., Grice, J., Roberts, M., 2016. Skin models for the testing of transdermal drugs. *Clin. Pharmacol. Adv. Appl.* Volume 8, 163–176. <https://doi.org/10.2147/CPAA.S64788>
- Abdelkader, H., Alani, A.W.G., Alany, R.G., 2014. Recent advances in non-ionic surfactant vesicles (niosomes): self-assembly, fabrication, characterization, drug delivery applications and limitations. *Drug Deliv.* 21, 87–100. <https://doi.org/10.3109/10717544.2013.838077>
- Aguilar-Pérez, K.M., Avilés-Castrillo, J.I., Medina, D.I., Parra-Saldivar, R., Iqbal, H.M.N., 2020. Insight Into Nanoliposomes as Smart Nanocarriers for Greening the Twenty-First Century Biomedical Settings. *Front. Bioeng. Biotechnol.* 8, 579536. <https://doi.org/10.3389/fbioe.2020.579536>
- Akagi, T., Sasaki, M., Mohri, S., Kato, K., Ichiki, T., 2011. Immobilization And Lysis Of Nanoliposomes In Microfluidics By Photopatterning Of Biocompatible Anchor For Membrane 3, 395-397.
- Akbarzadeh, A., Rezaei-Sadabady, R., Davaran, S., Joo, S.W., Zarghami, N., Hanifehpour, Y., Samiei, M., Kouhi, M., Nejati-Koshki, K., 2013. Liposome: classification, preparation, and applications. *Nanoscale Res. Lett.* 8, 102. <https://doi.org/10.1186/1556-276X-8-102>
- Akcicek, A., Bozkurt, F., Akgül, C., Karasu, S., 2021. Encapsulation of Olive Pomace Extract in Rocket Seed Gum and Chia Seed Gum Nanoparticles: Characterization, Antioxidant Activity and Oxidative Stability. *Foods* 10, 1735. <https://doi.org/10.3390/foods10081735>
- Akhtar, K., Khan, S.A., Khan, S.B., Asiri, A.M., 2018. Scanning Electron Microscopy: Principle and Applications in Nanomaterials Characterization, in: Sharma, S.K. (Ed.), *Handbook of Materials Characterization*. Springer International Publishing, Cham, pp. 113–145. [https://doi.org/10.1007/978-3-319-92955-2\\_4](https://doi.org/10.1007/978-3-319-92955-2_4)

- Alkilani, A., McCrudden, M.T., Donnelly, R., 2015. Transdermal Drug Delivery: Innovative Pharmaceutical Developments Based on Disruption of the Barrier Properties of the Stratum Corneum. *Pharmaceutics* 7, 438–470. <https://doi.org/10.3390/pharmaceutics7040438>
- Andrews, S.N., Jeong, E., Prausnitz, M.R., 2013. Transdermal Delivery of Molecules is Limited by Full Epidermis, Not Just Stratum Corneum. *Pharm. Res.* 30, 1099–1109. <https://doi.org/10.1007/s11095-012-0946-7>
- Anggraeni, E., Djamaluddin, A., Ratnasari, D., 2021. Pembuatan dan uji organoleptik serbuk instan mentimun (cucumis sativus l.) sebagai antihipertensi dan penambahan jeruk nipis sebagai rasa khas (Citrus aurantifolia). *J. Holist. Health Sci.* 4, 120–128. <https://doi.org/10.51873/jhhs.v4i2.67>
- Annisa, V., 2020. Review Artikel: Metode untuk Meningkatkan Absorpsi Obat Transdermal. *J. Islam. Pharm.* 5, 18. <https://doi.org/10.18860/jip.v5i1.9157>
- Anwekar, H., Patel, S., Singhai, A.K., 2011. Liposome- as drug carriers. *Life Sci* 2, 7. 945-951
- Aqil, F., Munagala, R., Jeyabalan, J., Vadhanam, M.V., 2013. Bioavailability of phytochemicals and its enhancement by drug delivery systems. *Cancer Lett.* 334, 133–141. <https://doi.org/10.1016/j.canlet.2013.02.032>
- Attwood, S., Choi, Y., Leonenko, Z., 2013. Preparation of DOPC and DPPC Supported Planar Lipid Bilayers for Atomic Force Microscopy and Atomic Force Spectroscopy. *Int. J. Mol. Sci.* 14, 3514–3539. <https://doi.org/10.3390/ijms14023514>
- Azizah, N., Sagita, E., Iskandarsyah, I., 2017. In Vitro Penetration Tests of Transethosome Gel Preparations Containing Capsaicin. *Int. J. Appl. Pharm.* 9, 116. [https://doi.org/10.22159/ijap.2017.v9s1.68\\_75](https://doi.org/10.22159/ijap.2017.v9s1.68_75)
- Azmi, N.A.N., Hasham, R., Ariffin, F.D., Elgharbawy, A.A.M., Salleh, H.M., 2020. Characterization, Stability Assessment, Antioxidant Evaluation and Cell Proliferation Activity of Virgin Coconut Oil-based Nanostructured Lipid Carrier Loaded with Ficus deltoidea Extract. *Cosmetics* 7, 83. <https://doi.org/10.3390/cosmetics7040083>
- Bajaj, S., Singla, D., Sakhuja, N., 2012. Stability Testing of Pharmaceutical Products. *J. Appl. Pharm. Sci.* 2, 129-138. <https://doi.org/10.7324/JAPS.2012.2322>
- Barba, A.A., Bochicchio, S., Lamberti, G., Dalmoro, A., 2014. Ultrasonic energy in liposome production: process modelling and size calculation. *Soft Matter* 10, 2574. <https://doi.org/10.1039/c3sm52879k>

- Barbero, A.M., Frasc, H.F., 2016. Effect of Frozen Human Epidermis Storage Duration and Cryoprotectant on Barrier Function Using Two Model Compounds. *Skin Pharmacol. Physiol.* 29, 31–40. <https://doi.org/10.1159/000441038>
- Baroni, A., Buommino, E., De Gregorio, V., Ruocco, E., Ruocco, V., Wolf, R., 2012. Structure and function of the epidermis related to barrier properties. *Clin. Dermatol.* 30, 257–262. <https://doi.org/10.1016/j.clindermatol.2011.08.007>
- Bätz, F.M., Klipper, W., Korting, H.C., Henkler, F., Landsiedel, R., Luch, A., von Fritschen, U., Weindl, G., Schäfer-Korting, M., 2013. Esterase activity in excised and reconstructed human skin – Biotransformation of prednicarbate and the model dye fluorescein diacetate. *Eur. J. Pharm. Biopharm.* 84, 374–385. <https://doi.org/10.1016/j.ejpb.2012.11.008>
- Benson, H.A.E., Grice, J.E., Mohammed, Y., Namjoshi, S., Roberts, M.S., 2019. Topical and Transdermal Drug Delivery: From Simple Potions to Smart Technologies. *Curr. Drug Deliv.* 16, 444–460. <https://doi.org/10.2174/1567201816666190201143457>
- Bhatia, A., Shard, P., Chopra, D., Mishra, T., 2011. Chitosan nanoparticles as Carrier of Immunorestoratory plant extract: synthesis, characterization and Immunorestoratory efficacy. *International Journal of Drug Delivery.* 1, 381–385. <https://dx.doi.org/10.5138/ijdd.v3i2.234>
- Binarjo, A., Nugroho, A.K., 2014. Permeasi Transdermal Losartan In Vitro dari Larutan dengan Variasi Kadar Losartan dan Propilen Glikol. *J. Kim. Val.* 4. <https://doi.org/10.15408/jkv.v4i1.1046>
- Bloor, S.R., Schutte, R., Hobson, A.R., 2021. Oral Iron Supplementation—Gastrointestinal Side Effects and the Impact on the Gut Microbiota. *Microbiol. Res.* 12, 491–502. <https://doi.org/10.3390/microbiolres12020033>
- Bochicchio, S., Dalmoro, A., Lamberti, G., Barba, A.A., 2020. Advances in Nanoliposomes Production for Ferrous Sulfate Delivery. *Pharmaceutics* 12, 445. <https://doi.org/10.3390/pharmaceutics12050445>
- Bozzuto, G., Molinari, A., 2015. Liposomes as nanomedical devices. *Int. J. Nanomedicine* 975. <https://doi.org/10.2147/IJN.S68861>
- Branquinho, R.T., Mosqueira, V.C.F., Kano, E.K., de Souza, J., Dorim, D.D.R., Saude-Guimaraes, D.A., de Lana, M., 2014. HPLC-DAD and UV-Spectrophotometry for the Determination of Lychnopholide in Nanocapsule Dosage Form: Validation and Application to Release Kinetic Study. *J. Chromatogr. Sci.* 52, 19–26. <https://doi.org/10.1093/chromsci/bms199>

- Bulbake, U., Doppalapudi, S., Kommineni, N., Khan, W., 2017. Liposomal Formulations in Clinical Use: An Updated Review. *Pharmaceutics* 9, 12. <https://doi.org/10.3390/pharmaceutics9020012>
- Cançado, R.D. and Muñoz, M., 2011. Intravenous iron therapy: how far have we come?. *Rev Bras Hematol Hemoter.* 33, 461-9. <https://doi.org/10.5581/1516-8484.20110123>
- Carneiro, H.C.F., Tonon, R.V., Grosso, C.R.F., Hubinger, M.D., 2013. Encapsulation efficiency and oxidative stability of flaxseed oil microencapsulated by spray drying using different combinations of wall materials. *J. Food Eng.* 115, 443–451. <https://doi.org/10.1016/j.jfoodeng.2012.03.033>
- Cereda, C.M.S., Franz-Montan, M., da Silva, C.M.G., Casadei, B.R., Domingues, C.C., Tofoli, G.R., de Araujo, D.R., de Paula, E., 2013. Transdermal delivery of butamben using elastic and conventional liposomes. *J. Liposome Res.* 23, 228–234. <https://doi.org/10.3109/08982104.2013.796975>
- Cevc, G., Vierl, U., 2010. Nanotechnology and the transdermal route A state of the art review and critical appraisal. *J. Controlled Release* 141, 277–299. <https://doi.org/10.1016/j.jconrel.2009.10.016>
- Chaparro, C.M., Suchdev, P.S., 2019. Anemia epidemiology, pathophysiology, and etiology in low- and middle-income countries. *Ann. N. Y. Acad. Sci. nyas.14092*. <https://doi.org/10.1111/nyas.14092>
- Cheng, J., Kenaan, A., Zhao, D., Qi, D., Song, J., 2020. Photo-polymerizable ferrous sulfate liposomes as vehicles for iron fortification of food. *Nanomedicine Nanotechnol. Biol. Med.* 30, 102286. <https://doi.org/10.1016/j.nano.2020.102286>
- Cherukuri, S., Batchu, U., Mandava, K., Cherukuri, V., Ganapuram, K., 2017. Formulation and evaluation of transdermal drug delivery of topiramate. *Int. J. Pharm. Investig.* 7, 10. [https://doi.org/10.4103/jphi.JPHI\\_35\\_16](https://doi.org/10.4103/jphi.JPHI_35_16)
- Chinnagounder Periyasamy, P., Leijten, J.C.H., Dijkstra, P.J., Karperien, M., Post, J.N., 2012. Nanomaterials for the Local and Targeted Delivery of Osteoarthritis Drugs. *J. Nanomater.* 2012, 1–13. <https://doi.org/10.1155/2012/673968>
- Choudhury, A., 2020. Liposome: a carrier for effective drug delivery. *J. Appl. Pharm. Res.* 8, 22–28. <https://doi.org/10.18231/j.joapr.2019.v.8.i.1.003>
- Clemente-Suárez, V.J., Ramos-Campo, D.J., Mielgo-Ayuso, J., Dalamitros, A.A., Nikolaidis, P.A., Hormeño-Holgado, A., Tornero-Aguilera, J.F., 2021.

- Nutrition in the Actual COVID-19 Pandemic. A Narrative Review. *Nutrients* 13, 1924. <https://doi.org/10.3390/nu13061924>
- Cohn, J., Kamili, A., Wat, E., Chung, R.W., Tandy, S., 2010. Dietary Phospholipids and Intestinal Cholesterol Absorption. *Nutrients* 2, 116–127. <https://doi.org/10.3390/nu2020116>
- Corrêa, A.C.N.T.F., Pereira, P.R., Paschoalin, V.M.F., 2019a. Preparation and Characterization of Nanoliposomes for the Entrapment of Bioactive Hydrophilic Globular Proteins. *J. Vis. Exp.* 59900. <https://doi.org/10.3791/59900>
- Corrêa, A.C.N.T.F., Pereira, P.R., Paschoalin, V.M.F., 2019b. Preparation and Characterization of Nanoliposomes for the Entrapment of Bioactive Hydrophilic Globular Proteins. *J. Vis. Exp.* 59900. <https://doi.org/10.3791/59900>
- Cuhadar, S., Koseoglu, M., Atay, A., Dirican, A., 2013. The effect of storage time and freeze-thaw cycles on the stability of serum samples. *Biochem. Medica* 70–77. <https://doi.org/10.11613/BM.2013.009>
- Danaei, M., Dehghankhold, M., Ataei, S., Hasanzadeh Davarani, F., Javanmard, R., Dokhani, A., Khorasani, S., Mozafari, M., 2018a. Impact of Particle Size and Polydispersity Index on the Clinical Applications of Lipidic Nanocarrier Systems. *Pharmaceutics* 10, 57. <https://doi.org/10.3390/pharmaceutics10020057>
- Danaei, M., Kalantari, M., Raji, M., Samareh Fekri, H., Saber, R., Asnani, G.P., Mortazavi, S.M., Mozafari, M.R., Rasti, B., Taheriazam, A., 2018b. Probing nanoliposomes using single particle analytical techniques: effect of excipients, solvents, phase transition and zeta potential. *Heliyon* 4, e01088. <https://doi.org/10.1016/j.heliyon.2018.e01088>
- Danhier, F., Ansorena, E., Silva, J.M., Coco, R., Le Breton, A., Préat, V., 2012. PLGA-based nanoparticles: An overview of biomedical applications. *J. Controlled Release* 161, 505–522. <https://doi.org/10.1016/j.jconrel.2012.01.043>
- Date, A.A., Desai, N., Dixit, R., Nagarsenker, M., 2010. Self-nanoemulsifying drug delivery systems: formulation insights, applications and advances. *Nanomed.* 5, 1595–1616. <https://doi.org/10.2217/nnm.10.126>
- Debeer, S., Le Luduec, J.-B., Kaiserlian, D., Laurent, P., Nicolas, J.-F., Dubois, B., Kanitakis, J., 2013. Comparative histology and immunohistochemistry of porcine versus human skin. *Eur. J. Dermatol.* 23, 456–466. <https://doi.org/10.1684/ejd.2013.2060>

- Derman, S., 2015. Caffeic Acid Phenethyl Ester Loaded PLGA Nanoparticles: Effect of Various Process Parameters on Reaction Yield, Encapsulation Efficiency, and Particle Size. *J. Nanomater.* 2015, 1–12. <https://doi.org/10.1155/2015/341848>
- Dimov, N., Kastner, E., Hussain, M., Perrie, Y., Szita, N., 2017. Formation and purification of tailored liposomes for drug delivery using a module-based micro continuous-flow system. *Sci. Rep.* 7, 12045. <https://doi.org/10.1038/s41598-017-11533-1>
- Dinarvand, R., Sepehri, nima, Manouchehri, Rouhani, Atyabi, F., 2011. Polylactide-co-glycolide nanoparticles for controlled delivery of anticancer agents. *Int. J. Nanomedicine* 877. <https://doi.org/10.2147/IJN.S18905>
- Doroszowski, A., 1999. The physical chemistry of dispersion, in: *Paint and Surface Coatings*. Elsevier, pp. 198–242. <https://doi.org/10.1533/9781855737006.198>
- Doskocz, J., Dalek, P., Przybyło, M., Trzebicka, B., Foryś, A., Kobyliukh, A., Iglič, A., Langner, M., 2021. The Elucidation of the Molecular Mechanism of the Extrusion Process. *Materials* 14, 4278. <https://doi.org/10.3390/ma14154278>
- Drescher, S., van Hoogevest, P., 2020. The Phospholipid Research Center: Current Research in Phospholipids and Their Use in Drug Delivery. *Pharmaceutics* 12, 1235. <https://doi.org/10.3390/pharmaceutics12121235>
- Falke, S., Betzel, C., 2019. Dynamic Light Scattering (DLS): Principles, Perspectives, Applications to Biological Samples, in: Pereira, A.S., Tavares, P., Limão-Vieira, P. (Eds.), *Radiation in Bioanalysis, Bioanalysis*. Springer International Publishing, Cham, pp. 173–193. [https://doi.org/10.1007/978-3-030-28247-9\\_6](https://doi.org/10.1007/978-3-030-28247-9_6)
- Fang, C.-L., Aljuffali, I.A., Li, Y.-C., Fang, J.-Y., 2014. Delivery and targeting of nanoparticles into hair follicles. *Ther. Deliv.* 5, 991–1006. <https://doi.org/10.4155/tde.14.61>
- Farkuh, L., Hennies, P.T., Nunes, C., Reis, S., Barreiros, L., Segundo, M.A., Oseliero Filho, P.L., Oliveira, C.L.P., Cassago, A., Portugal, R.V., Muramoto, R.A., Carretero, G.P.B., Schreier, S., Chaimovich, H., Cuccovia, I.M., 2019. Characterization of phospholipid vesicles containing lauric acid: physicochemical basis for process and product development. *Heliyon* 5, e02648. <https://doi.org/10.1016/j.heliyon.2019.e02648>
- Febriyenti, F., Putra, D.P., Wicaksanti, E.I., Hamami, C.D., 2018. Formulasi Liposom Ekstrak Terpurifikasi Centella asiatica Menggunakan



Fosfatidilkolin dan Kolesterol. *J. Sains Farm. Klin.* 5, 78.  
<https://doi.org/10.25077/jsfk.5.2.78-82.2018>

Franken, L.E., Grünewald, K., Boekema, E.J., Stuart, M.C.A., 2020. A Technical Introduction to Transmission Electron Microscopy for Soft-Matter: Imaging, Possibilities, Choices, and Technical Developments. *Small* 16, 1906198. <https://doi.org/10.1002/sml.201906198>

Friedman, N., Dagan, A., Elia, J., Merims, S., Benny, O., 2021. Physical properties of gold nanoparticles affect skin penetration via hair follicles. *Nanomedicine Nanotechnol. Biol. Med.* 36, 102414. <https://doi.org/10.1016/j.nano.2021.102414>

Fuqua, B.K., Vulpe, C.D., Anderson, G.J., 2012. Intestinal iron absorption. *J. Trace Elem. Med. Biol.* 26, 115–119. <https://doi.org/10.1016/j.jtemb.2012.03.015>

Gan, Y., Li, X., Chen, D., Le, C., Zhu, C., Hovgaard, L., Yang, M., 2011. Novel mucus-penetrating liposomes as a potential oral drug delivery system: preparation, in vitro characterization, and enhanced cellular uptake. *Int. J. Nanomedicine* 3151. <https://doi.org/10.2147/IJN.S25741>

Ganz, T., 2013. Systemic Iron Homeostasis. *Physiol. Rev.* 93, 1721–1741. <https://doi.org/10.1152/physrev.00008.2013>

Gaucher, S., Elie, C., Vérola, O., Jarraya, M., 2012. Viability of cryopreserved human skin allografts: effects of transport media and cryoprotectant. *Cell Tissue Bank.* 13, 147–155. <https://doi.org/10.1007/s10561-011-9239-3>

Geisser, P., Burckhardt, S., 2011. The Pharmacokinetics and Pharmacodynamics of Iron Preparations. *Pharmaceutics* 3, 12–33. <https://doi.org/10.3390/pharmaceutics3010012>

Gharib, A., Faezizadeh, Z., Godarzee, M., 2012. In vitro and in vivo activities of ticarcillin-loaded nanoliposomes with different surface charges against *Pseudomonas aeruginosa* (ATCC 29248). *DARU J. Pharm. Sci.* 20, 41. <https://doi.org/10.1186/2008-2231-20-41>

Gharib, R., Auezova, L., Charcosset, C., Greige-Gerges, H., 2017. Drug-in-cyclodextrin-in-liposomes as a carrier system for volatile essential oil components: Application to anethole. *Food Chem.* 218, 365–371. <https://doi.org/10.1016/j.foodchem.2016.09.110>

Giraldo, S., Alea-Reyes, M.E., Limón, D., González, A., Duch, M., Plaza, J.A., Ramos-López, D., de Lapuente, J., González-Campo, A., Pérez-García, L., 2020.  $\pi$ -Donor/ $\pi$ -Acceptor Interactions for the Encapsulation of Neurotransmitters on Functionalized Polysilicon-Based Microparticles. *Pharmaceutics* 12, 724. <https://doi.org/10.3390/pharmaceutics12080724>

- Giridhar Reddy, S., Thakur, A., 2019. Drug Entrapment Efficiency of Silver Nanocomposite Hydrogel. IOP Conf. Ser. Mater. Sci. Eng. 577, 012176. <https://doi.org/10.1088/1757-899X/577/1/012176>
- Giuliano, C.B., Cvjetan, N., Ayache, J., Walde, P., 2021. Multivesicular Vesicles: Preparation and Applications. ChemSystemsChem 3. <https://doi.org/10.1002/syst.202000049>
- Gómez-Rioja, R., Segovia Amaro, M., Diaz-Garzón, J., Bauçà, J.M., Martínez Espartosa, D., Fernández-Calle, P., 2019. A protocol for testing the stability of biochemical analytes. Technical document. Clin. Chem. Lab. Med. CCLM 57, 1829–1836. <https://doi.org/10.1515/cclm-2019-0586>
- Gonzalez Gomez, A., Hosseinidoust, Z., 2020. Liposomes for Antibiotic Encapsulation and Delivery. ACS Infect. Dis. 6, 896–908. <https://doi.org/10.1021/acsinfecdis.9b00357>
- Gooris, G.S., Kamran, M., Kros, A., Moore, D.J., Bouwstra, J.A., 2018. Interactions of dipalmitoylphosphatidylcholine with ceramide-based mixtures. Biochim. Biophys. Acta BBA - Biomembr. 1860, 1272–1281. <https://doi.org/10.1016/j.bbamem.2018.02.024>
- Gorzelanny, C., Mess, C., Schneider, S.W., Huck, V., Brandner, J.M., 2020. Skin Barriers in Dermal Drug Delivery: Which Barriers Have to Be Overcome and How Can We Measure Them? Pharmaceutics 12, 684. <https://doi.org/10.3390/pharmaceutics12070684>
- Gupta, S., Chavhan, S., Sawant, K.K., 2011a. Self-nanoemulsifying drug delivery system for adefovir dipivoxil: Design, characterization, in vitro and ex vivo evaluation. Colloids Surf. Physicochem. Eng. Asp. 392, 145–155. <https://doi.org/10.1016/j.colsurfa.2011.09.048>
- Gupta, S., Chavhan, S., Sawant, K.K., 2011b. Self-nanoemulsifying drug delivery system for adefovir dipivoxil: Design, characterization, in vitro and ex vivo evaluation. Colloids Surf. Physicochem. Eng. Asp. 392, 145–155. <https://doi.org/10.1016/j.colsurfa.2011.09.048>
- Haeri, A., Alinaghian, B., Daeihamed, M., Dadashzadeh, S., 2014. Preparation and Characterization of Stable Nanoliposomal Formulation of Fluoxetine as a Potential Adjuvant Therapy for Drug-Resistant Tumors 12. Iranian Journal of Pharmaceutical Research.13, 3-14
- Hammoud, Z., Gharib, R., Fourmentin, S., Elaissari, A., Greige-Gerges, H., 2020. Drug-in-hydroxypropyl- $\beta$ -cyclodextrin-in-lipid S100/cholesterol liposomes: Effect of the characteristics of essential oil components on their encapsulation and release. Int. J. Pharm. 579, 119151. <https://doi.org/10.1016/j.ijpharm.2020.119151>



- Haq, A., Goodyear, B., Ameen, D., Joshi, V., Michniak-Kohn, B., 2018. Strat-M® synthetic membrane: Permeability comparison to human cadaver skin. *Int. J. Pharm.* 547, 432–437. <https://doi.org/10.1016/j.ijpharm.2018.06.012>
- Haque, T., Talukder, M.M.U., 2018. Chemical Enhancer: A Simplistic Way to Modulate Barrier Function of the Stratum Corneum. *Adv. Pharm. Bull.* 8, 169–179. <https://doi.org/10.15171/apb.2018.021>
- Harrington, M., Hotz, C., Zeder, C., Polvo, G.O., Villalpando, S., Zimmermann, M.B., Walczyk, T., Rivera, J.A., Hurrell, R.F., 2011. A comparison of the bioavailability of ferrous fumarate and ferrous sulfate in non-anemic Mexican women and children consuming a sweetened maize and milk drink. *Eur. J. Clin. Nutr.* 65, 20–25. <https://doi.org/10.1038/ejcn.2010.185>
- He, H., Lu, Y., Qi, J., Zhu, Q., Chen, Z., Wu, W., 2019. Adapting liposomes for oral drug delivery. *Acta Pharm. Sin. B* 9, 36–48. <https://doi.org/10.1016/j.apsb.2018.06.005>
- Hoang, V.T., Stępniewski, G., Czarnecka, K.H., Kasztelanic, R., Long, V.C., Xuan, K.D., Shao, L., Śmietana, M., Buczyński, R., 2019. Optical Properties of Buffers and Cell Culture Media for Optofluidic and Sensing Applications. *Appl. Sci.* 9, 1145. <https://doi.org/10.3390/app9061145>
- Honary, S., Zahir, F., 2013. Effect of Zeta Potential on the Properties of Nano-Drug Delivery Systems - A Review (Part 1). *Trop. J. Pharm. Res.* 12, 255–264. <https://doi.org/10.4314/tjpr.v12i2.19>
- Hoogevest, P., Tiemessen, H., Metselaar, J.M., Drescher, S., Fahr, A., 2021. The Use of Phospholipids to Make Pharmaceutical Form Line Extensions. *Eur. J. Lipid Sci. Technol.* 123, 2000297. <https://doi.org/10.1002/ejlt.202000297>
- Hosny, K., Banjar, Z., Hariri, A., Hassan, A.H., 2015. Solid lipid nanoparticles loaded with iron to overcome barriers for treatment of iron deficiency anemia. *Drug Des. Devel. Ther.* 313. <https://doi.org/10.2147/DDDT.S77702>
- Hosta-Rigau, L., Zhang, Y., Teo, B.M., Postma, A., Städler, B., 2013. Cholesterol – a biological compound as a building block in bionanotechnology. *Nanoscale* 5, 89–109. <https://doi.org/10.1039/C2NR32923A>
- Hurler, J., Sørensen, K.K., Fallarero, A., Vuorela, P., Škalko-Basnet, N., 2013. Liposomes-in-Hydrogel Delivery System with Mupirocin: *In Vitro* Antibiofilm Studies and *In Vivo* Evaluation in Mice Burn Model. *BioMed Res. Int.* 2013, 1–8. <https://doi.org/10.1155/2013/498485>

- Husni, P. dan Puspitaningrum, K., 2017. Pengembangan Formula Nano-Fitosom Serbuk Liofilisasi. IJPST. 4, 100-111. <https://doi.org/10.15416/ijpst.v4i3.10916>
- Isalomboto Nkanga, C., Murhimalika Bapolisi, A., Ikemefuna Okafor, N., Werner Maçedo Krause, R., 2019. General Perception of Liposomes: Formation, Manufacturing and Applications, in: Catala, A. (Ed.), Liposomes - Advances and Perspectives. IntechOpen. <https://doi.org/10.5772/intechopen.84255>
- Ismet, R., Raeis, B.K., Sriwulan, S., 2022. Penetapan Kadar Fe Gluconate dengan Metode Fe Fumarate Secara Spektrofotometri UV-Vis. J. Ilm. Tek. Kim. 6, 39. <https://doi.org/10.32493/jitk.v6i1.15669>
- Jabbar, A.S.A., Ashour, S.M., 2021. Formulation And Evaluation Of Antiretroviral Drug Loaded Unsaturated Phospholipid Based Stealth Liposome. Syst. Rev. Pharm. 12, 7. <https://doi.org/10.31838srp.2021.1.124>
- Jain, D., Stark, A.Y., Niewiarowski, P.H., Miyoshi, T., Dhinojwala, A., 2015. NMR spectroscopy reveals the presence and association of lipids and keratin in adhesive gecko setae. Sci. Rep. 5, 9594. <https://doi.org/10.1038/srep09594>
- Jampilek, J., Kos, J., Kralova, K., 2019. Potential of Nanomaterial Applications in Dietary Supplements and Foods for Special Medical Purposes. Nanomaterials 9, 296. <https://doi.org/10.3390/nano9020296>
- Jayanudin, J., Rochmadi, R., 2017. Pengaruh Perbedaan Bahan Penyalut Terhadap Efisiensi Enkapsulasi Oleoresin Jahe Merah. Alchemy J. Penelit. Kim. 13. <https://doi.org/10.20961/alchemy.v13i2.5406>
- Juan, J., Marlen, I., Luisa, C., 2012. Chemical and Physical Enhancers for Transdermal Drug Delivery, in: Gallelli, L. (Ed.), Pharmacology. InTech. <https://doi.org/10.5772/33194>
- Jufri, M., Rachmadiva R, R., Gozan, M., Suyono, E.A., 2018. Formulation, Stability Test and in vitro Penetration Test of Emulgel from Tobacco Leaves Extract. J. Young Pharm. 10, S69-S72. <https://doi.org/10.5530/jyp.2018.2s.13>
- Kahraman, E., Güngör, S., Özsoy, Y., 2017. Potential enhancement and targeting strategies of polymeric and lipid-based nanocarriers in dermal drug delivery. Ther. Deliv. 8, 967-985. <https://doi.org/10.4155/tde-2017-0075>
- Karami, H., Papari-Zare, S., Shanbedi, M., Eshghi, H., Dashtbozorg, A., Akbari, A., Mohammadian, E., Heidari, M., Sahin, A.Z., Teng, C.B., 2019. The thermophysical properties and the stability of nanofluids containing carboxyl-functionalized graphene nano-platelets and multi-walled carbon

nanotubes. *Int. Commun. Heat Mass Transf.* 108, 104302.  
<https://doi.org/10.1016/j.icheatmasstransfer.2019.104302>

Karande, P., Mitragotri, S., 2009. Enhancement of transdermal drug delivery via synergistic action of chemicals. *Biochim. Biophys. Acta BBA - Biomembr.* 1788, 2362–2373. <https://doi.org/10.1016/j.bbamem.2009.08.015>

Khan, Ibrahim, Saeed, K., Khan, Idrees, 2019. Nanoparticles: Properties, applications and toxicities. *Arab. J. Chem.* 12, 908–931.  
<https://doi.org/10.1016/j.arabjc.2017.05.011>

Khater, D., Nsairat, H., Odeh, F., Saleh, M., Jaber, A., Alshaer, W., Al Bawab, A., Mubarak, M.S., 2021. Design, Preparation, and Characterization of Effective Dermal and Transdermal Lipid Nanoparticles: A Review. *Cosmetics* 8, 39. <https://doi.org/10.3390/cosmetics8020039>

Kondratowicz, A., Weiss, M., Juzwa, W., Majchrzycki, Ł., Lewandowicz, G., 2019. Characteristics of liposomes derived from egg yolk. *Open Chem.* 17, 763–778. <https://doi.org/10.1515/chem-2019-0070>

Kulkarni, N.S., Ranpise, N.S., Rathore, D.S., Dhole, S.N., 2019. Characterization of Self-Microemulsifying Dosage Form: Special Emphasis on Zeta Potential Measurement 10, 8.

Kumar Trivedi, M., 2015. Comparative Physicochemical Evaluation of Biofield Treated Phosphate Buffer Saline and Hanks Balanced Salt Medium. *Am. J. Biosci.* 3, 267. <https://doi.org/10.11648/j.ajbio.20150306.20>

Le, N.T.T., Cao, V.D., Nguyen, T.N.Q., Le, T.T.H., Tran, T.T., Hoang Thi, T.T., 2019. Soy Lecithin-Derived Liposomal Delivery Systems: Surface Modification and Current Applications. *Int. J. Mol. Sci.* 20, 4706. <https://doi.org/10.3390/ijms20194706>

Lee, J.-M., Lim, D.-S., Jeon, S.-H., Hur, D.H., 2020. Zeta Potentials of Magnetite Particles and Alloy 690 Surfaces in Alkaline Solutions. *Materials* 13, 3999. <https://doi.org/10.3390/ma13183999>

Leena, M., Srinivasan, S., 2015. Synthesis and ultrasonic investigations of titanium oxide nanofluids. *J. Mol. Liq.* 206, 103–109. <https://doi.org/10.1016/j.molliq.2015.02.001>

Liberal, Â., Pinela, J., Vívar-Quintana, A.M., Ferreira, I.C.F.R., Barros, L., 2020. Fighting Iron-Deficiency Anemia: Innovations in Food Fortificants and Biofortification Strategies. *Foods* 9, 1871. <https://doi.org/10.3390/foods9121871>

Liu, P., Chen, G., Zhang, J., 2022. A Review of Liposomes as a Drug Delivery System: Current Status of Approved Products, Regulatory Environments,

and Future Perspectives. *Molecules* 27, 1372.  
<https://doi.org/10.3390/molecules27041372>

Liu, Weilin, Ye, A., Liu, Wei, Liu, C., Han, J., Singh, H., 2015. Behaviour of liposomes loaded with bovine serum albumin during in vitro digestion. *Food Chem.* 175, 16–24. <https://doi.org/10.1016/j.foodchem.2014.11.108>

Liu, W.I., Malekahmadi, O., Bagherzadeh, S.A., Ghashang, M., Karimipour, A., Hasani, S., Tlili, I., Goodarzi, M., 2019. A novel comprehensive experimental study concerned graphene oxide nanoparticles dispersed in water: Synthesise, characterisation, thermal conductivity measurement and present a new approach of RLSF neural network. *Int. Commun. Heat Mass Transf.* 109, 104333.  
<https://doi.org/10.1016/j.icheatmasstransfer.2019.104333>

Lordan, R., Tsoupras, A., Zabetakis, I., 2017. Phospholipids of Animal and Marine Origin: Structure, Function, and Anti-Inflammatory Properties. *Molecules* 22, 1964. <https://doi.org/10.3390/molecules22111964>

Low, M.S.Y., Speedy, J., Styles, C.E., De-Regil, L.M., Pasricha, S.-R., 2016. Daily iron supplementation for improving anaemia, iron status and health in menstruating women. *Cochrane Database Syst. Rev.*  
<https://doi.org/10.1002/14651858.CD009747.pub2>

Lujan, H., Griffin, W.C., Taube, J.H., Sayes, C.M., 2019. Synthesis and characterization of nanometer-sized liposomes for encapsulation and microRNA transfer to breast cancer cells. *Int. J. Nanomedicine Volume 14*, 5159–5173. <https://doi.org/10.2147/IJN.S203330>

Luo, Q., 2018. Electron Microscopy and Spectroscopy in the Analysis of Friction and Wear Mechanisms. *Lubricants* 6, 58.  
<https://doi.org/10.3390/lubricants6030058>

Mady, M.M. and Elshemey, W.M., 2011. Interaction of dipalmitoyl phosphatidylcholine (DPPC) liposomes and insulin. *Molecular Physics.* 12, 1593–1598. <http://dx.doi.org/10.1080/00268976.2011.575408>

Maguire, C.M., Rösslein, M., Wick, P., Prina-Mello, A., 2018. Characterisation of particles in solution – a perspective on light scattering and comparative technologies. *Sci. Technol. Adv. Mater.* 19, 732–745.  
<https://doi.org/10.1080/14686996.2018.1517587>

Mahbubul, I.M., Saidur, R., Amalina, M.A., Niza, M.E., 2016. Influence of ultrasonication duration on rheological properties of nanofluid: An experimental study with alumina–water nanofluid. *Int. Commun. Heat Mass Transf.* 76, 33–40.  
<https://doi.org/10.1016/j.icheatmasstransfer.2016.05.014>

- Maione-Silva, L., de Castro, E.G., Nascimento, T.L., Cintra, E.R., Moreira, L.C., Cintra, B.A.S., Valadares, M.C., Lima, E.M., 2019. Ascorbic acid encapsulated into negatively charged liposomes exhibits increased skin permeation, retention and enhances collagen synthesis by fibroblasts. *Sci. Rep.* 9, 522. <https://doi.org/10.1038/s41598-018-36682-9>
- Markowski, T., Müller, S., Dobner, B., Meister, A., Blume, A., Drescher, S., 2017. An Asymmetrical Glycerol Diether Bolalipid with Protonable Phosphodimethylethanolamine Headgroup: The Impact of pH on Aggregation Behavior and Miscibility with DPPC 17.
- Martien, R., Adhyatmika., Irianto, I.D.K., Farida, V., Sari, P., 2012. Perkembangan Teknologi Nanopartikel Sebagai Sistem Penghantaran Obat. *Majalah Farmaseutik* 8, 133-144. <https://doi.org/10.22146/farmaseutik.v8i1.24067>
- Martin, G.L., Caraan, P.J.M., Chua, J.J.S., Crescini, J.A.L., Diokno, J.M.C., Javier, C.B.Dlr., Reyes, K.B.O., Soliven, R.Y., 2019. Effects of pH changes of stock normal saline solution on 5 percent red cell suspension. *Immunohematology* 30, 126–134. <https://doi.org/10.21307/immunohematology-2019-108>
- Mathes, S.H., Ruffner, H., Graf-Hausner, U., 2014. The use of skin models in drug development. *Adv. Drug Deliv. Rev.* 69–70, 81–102. <https://doi.org/10.1016/j.addr.2013.12.006>
- Mathur, V., Satrawala, Y., Rajput, M., 2010. Physical and chemical penetration enhancers in transdermal drug delivery system. *Asian J. Pharm.* 4, 173. <https://doi.org/10.4103/0973-8398.72115>
- McClements, D.J., Gumus, C.E., 2016. Natural emulsifiers — Biosurfactants, phospholipids, biopolymers, and colloidal particles: Molecular and physicochemical basis of functional performance. *Adv. Colloid Interface Sci.* 234, 3–26. <https://doi.org/10.1016/j.cis.2016.03.002>
- Melzak, K., Melzak, S., Gizeli, E., Toca-Herrera, J., 2012. Cholesterol Organization in Phosphatidylcholine Liposomes: A Surface Plasmon Resonance Study. *Materials* 5, 2306–2325. <https://doi.org/10.3390/ma5112306>
- Menon, M., Parmar, J., Singh, D., Hegde, D., Lohade, A., Soni, P., Samad, A., 2010. Development and evaluation of inhalational liposomal system of budesonide for better management of asthma. *Indian J. Pharm. Sci.* 72, 442. <https://doi.org/10.4103/0250-474X.73916>
- Metwaly, A.M., Ghoneim, M.M., Eissa, Ibrahim.H., Elsehemy, I.A., Mostafa, A.E., Hegazy, M.M., Afifi, W.M., Dou, D., 2021. Traditional ancient Egyptian medicine: A review. *Saudi J. Biol. Sci.* 28, 5823–5832. <https://doi.org/10.1016/j.sjbs.2021.06.044>

- Mishra, D., Pal, S., Krishnamurty, S., 2011. Understanding the molecular conformations of Na-dimyristoylphosphatidylglycerol (DMPG) using DFT-based method. *Mol. Simul.* 37, 953–963. <https://doi.org/10.1080/08927022.2011.582105>
- Mishra, H., Chauhan, V., Kumar, K., Teotia, D., 2018. A comprehensive review on Liposomes: a novel drug delivery system. *J. Drug Deliv. Ther.* 8, 400–404. <https://doi.org/10.22270/jddt.v8i6.2071>
- Mohammadi, M., Ghanbarzadeh, B., Hamishehkar, H., 2014. Formulation of Nanoliposomal Vitamin D3 for Potential Application in Beverage Fortification. *Adv. Pharm. Bull. EISSN* 2251-7308. <https://doi.org/10.5681/APB.2014.084>
- Monteiro, N., Martins, A., Reis, R.L., Neves, N.M., 2014. Liposomes in tissue engineering and regenerative medicine. *J. R. Soc. Interface* 11, 20140459. <https://doi.org/10.1098/rsif.2014.0459>
- Mouffok, M., Mesli, A., Abdelmalek, I., Gontier, E., 2016. Effect of the formulation parameters on the encapsulation efficiency and release behavior of p-aminobenzoic acid-loaded ethylcellulose microspheres. *J. Serbian Chem. Soc.* 81, 1183–1198. <https://doi.org/10.2298/JSC160308068M>
- Mozafari, M.R., 2010. Nanoliposomes: Preparation and Analysis, in: Weissig, V. (Ed.), *Liposomes, Methods in Molecular Biology*. Humana Press, Totowa, NJ, pp. 29–50. [https://doi.org/10.1007/978-1-60327-360-2\\_2](https://doi.org/10.1007/978-1-60327-360-2_2)
- Muchtar, H., Anova, I.T., Yeni, G., 2015. Pengaruh Kecepatan Pengadukan dan Kehalusan Gambir Serta Variasi Komposisi Terhadap Beberapa Sifat Fisika dalam Pembuatan Tinta Cetak. *J. Litbang Ind.* 5, 131. <https://doi.org/10.24960/jli.v5i2.674.131-139>
- Müller, S., Gruhle, K., Meister, A., Hause, G., Drescher, S., 2019. Bolalipid-Doped Liposomes: Can Bolalipids Increase the Integrity of Liposomes Exposed to Gastrointestinal Fluids? *Pharmaceutics* 11, 646. <https://doi.org/10.3390/pharmaceutics11120646>
- Muppidi, K., Pumerantz, A.S., Wang, J., Betageri, G., 2012. Development and Stability Studies of Novel Liposomal Vancomycin Formulations. *ISRN Pharm.* 2012, 1–8. <https://doi.org/10.5402/2012/636743>
- Nakhaei, P., Margiana, R., Bokov, D.O., Abdelbasset, W.K., Jadidi Kouhbanani, M.A., Varma, R.S., Marofi, F., Jarahian, M., Beheshtkhoo, N., 2021. Liposomes: Structure, Biomedical Applications, and Stability Parameters With Emphasis on Cholesterol. *Front. Bioeng. Biotechnol.* 9, 705886. <https://doi.org/10.3389/fbioe.2021.705886>



- Naveed, S., Basheer, S., 2016. Stability of a Dosage Form and Forced Degradation Studies. *J. Bioequivalence Bioavail.* 8. <https://doi.org/10.4172/jbb.1000292>
- Neupane, R., Boddu, S.H.S., Renukuntla, J., Babu, R.J., Tiwari, A.K., 2020. Alternatives to Biological Skin in Permeation Studies: Current Trends and Possibilities. *Pharmaceutics* 12, 152. <https://doi.org/10.3390/pharmaceutics12020152>
- Nikmatin, S., Purwanto, S., Maddu, A., Mandang, T., 2012. Analisis Struktur Selulosa Kulit Rotan Sebagai Filler Bionanokomposit Dengan Difraksi Sinar-X. *Indonesian Journal of Materials Science*. 13, 2. 97 - 102. <http://dx.doi.org/10.17146/jsmi.2012.13.2.4712>
- Nugroho, B.H., Ningrum, A.D.K., Pertiwi, D.A., Salsabila, T., Syukri, Y., 2020. Pemanfaatan Ekstrak Daun Tin (*Ficus carica* L.) Berbasis Nanoteknologi Liposom Sebagai Pengobatan Antihiperglikemia. *EKSAKTA J. Sci. Data Anal.* 216–229. <https://doi.org/10.20885/eksakta.vol19.iss2.art12>
- Nyerovwo, D.T., 2010. Effect of nanoliposomes on the stabilization of incorporated retinol. *African Journal of Biotechnology*. 9, 37. 6158-6161. <https://doi.org/10.5897/AJB10.917>
- Oliveira, M.C., Ferreira, D., Faria, S., Lopes, S., Teixeira, C., Malachias, Â., Magalhães-Paniago, R., Filho, J.D., Oliveira, B., Guimarães, A., Caravan, P., Ferreira, L., Alves, R., 2016. Development of a bone-targeted pH-sensitive liposomal formulation containing doxorubicin: physicochemical characterization, cytotoxicity, and biodistribution evaluation in a mouse model of bone metastasis. *Int. J. Nanomedicine* Volume 11, 3737–3751. <https://doi.org/10.2147/IJN.S109966>
- Ong, S., Chitneni, M., Lee, K., Ming, L., Yuen, K., 2016. Evaluation of Extrusion Technique for Nanosizing Liposomes. *Pharmaceutics* 8, 36. <https://doi.org/10.3390/pharmaceutics8040036>
- Otarola, J., Lista, A.G., Fernández Band, B., Garrido, M., 2015. Capillary electrophoresis to determine entrapment efficiency of a nanostructured lipid carrier loaded with piroxicam. *J. Pharm. Anal.* 5, 70–73. <https://doi.org/10.1016/j.jpha.2014.05.003>
- Paecharoenchai, O., Niyomtham, N., Apirakaramwong, A., Ngawhirunpat, T., Rojanarata, T., Yingyongnarongkul, B., Opanasopit, P., 2012. Structure Relationship of Cationic Lipids on Gene Transfection Mediated by Cationic Liposomes. *AAPS PharmSciTech* 13, 1302–1308. <https://doi.org/10.1208/s12249-012-9857-5>

- Palac, Z., Engesland, A., Flaten, G.E., Škalko-Basnet, N., Filipović-Grčić, J., Vanić, Ž., 2014. Liposomes for (trans)dermal drug delivery: the skin-PVPA as a novel *in vitro stratum corneum* model in formulation development. J. Liposome Res. 24, 313–322. <https://doi.org/10.3109/08982104.2014.899368>
- Pantopoulos, K., Porwal, S.K., Tartakoff, A., Devireddy, L., 2012. Mechanisms of Mammalian Iron Homeostasis. Biochemistry 51, 5705–5724. <https://doi.org/10.1021/bi300752r>
- Patel, D.J., Patel, S.M., Rathi, S.G., Shah, S.K., 2021. Formulation and Evaluation of Transdermal Patch of Blonanserine. Int. J. Pharm. Sci. Rev. Res. 69. <https://doi.org/10.47583/ijpsrr.2021.v69i02.011>
- Patel, P., 2020. Preformulation Studies: An Integral Part of Formulation Design, in: Ahmad, U., Akhtar, J. (Eds.), Pharmaceutical Formulation Design - Recent Practices. IntechOpen. <https://doi.org/10.5772/intechopen.82868>
- Patra, J.K., Das, G., Fraceto, L.F., Campos, E.V.R., Rodriguez-Torres, M. del P., Acosta-Torres, L.S., Diaz-Torres, L.A., Grillo, R., Swamy, M.K., Sharma, S., Habtemariam, S., Shin, H.-S., 2018. Nano based drug delivery systems: recent developments and future prospects. J. Nanobiotechnology 16, 71. <https://doi.org/10.1186/s12951-018-0392-8>
- Popovska, O., Simonovska, J., Kavrovski, Z., Rafajlovska, V., 2020. Preparation of Ketoconazole Liposomes with an Ultrasonic and an Injection Method Using Vegetable Oils. Indian J. Pharm. Educ. Res. 54, 946–953. <https://doi.org/10.5530/ijper.54.4.188>
- Popovska, O., Simonovska, J., Kavrovski, Z., Rafajlovska, V., 2013. An Overview: Methods for Preparation and Characterization of Liposomes as Drug Delivery Systems. Int. J. Pharm. Phytopharmacol. Res. 3, 3. 182–189
- Posner, J.D., 2009. Properties and electrokinetic behavior of non-dilute colloidal suspensions. Mech. Res. Commun. 36, 22–32. <https://doi.org/10.1016/j.mechrescom.2008.08.008>
- Prow, T.W., Grice, J.E., Lin, L.L., Faye, R., Butler, M., Becker, W., Wurm, E.M.T., Yoong, C., Robertson, T.A., Soyer, H.P., Roberts, M.S., 2011. Nanoparticles and microparticles for skin drug delivery. Adv. Drug Deliv. Rev. 63, 470–491. <https://doi.org/10.1016/j.addr.2011.01.012>
- Pulsoni, I., Lubda, M., Aiello, M., Fedi, A., Marzagalli, M., von Hagen, J., Scaglione, S., 2022. Comparison Between Franz Diffusion Cell and a novel Micro-physiological System for In Vitro Penetration Assay Using Different Skin Models. SLAS Technol. 27, 161–171. <https://doi.org/10.1016/j.slast.2021.12.006>

- Rades, S., Hodoroaba, V.-D., Salge, T., Wirth, T., Lobera, M.P., Labrador, R.H., Natte, K., Behnke, T., Gross, T., Unger, W.E.S., 2014. High-resolution imaging with SEM/T-SEM, EDX and SAM as a combined methodical approach for morphological and elemental analyses of single engineered nanoparticles. *RSC Adv* 4, 49577–49587. <https://doi.org/10.1039/C4RA05092D>
- Rahmatia, T.U., 2016. Metode SPE (Solid Phase Extraction) Sebagai Alternatif Terbaru Dalam Analisis dan Pemurnian Senyawa Obat. *Farmaka*. 14, 2. 151-170. <https://doi.org/10.24198/jf.v14i2.10822.g5156>
- Ranjan, A.P., Mukerjee, A., Helson, L., Vishwanatha, J.K., 2012. Scale up, optimization and stability analysis of Curcumin C3 complex-loaded nanoparticles for cancer therapy. *J. Nanobiotechnology* 10, 38. <https://doi.org/10.1186/1477-3155-10-38>
- Rasmussen, M.K., Pedersen, J.N., Marie, R., 2020. Size and surface charge characterization of nanoparticles with a salt gradient. *Nat. Commun.* 11, 2337. <https://doi.org/10.1038/s41467-020-15889-3>
- Rihhadatulaisy, S., Sriwidodo, S., Putriana, N.A., 2020. Stabilisasi Liposom dalam Sistem Penghantaran Obat. *Maj. Farmasetika* 5, 257. <https://doi.org/10.24198/mfarmasetika.v5i5.27456>
- Rismana, E., Kusumaningrum, S., Bunga, O., Nizar, N., Marhamah, M., 2014. Pengujian Aktivitas Antiacne Nanopartikel Kitosan – Ekstrak Kulit Buah Manggis (*Garcinia mangostana*). *Media Penelit. Dan Pengemb. Kesehat.* 24, 19–27. <https://doi.org/10.22435/mpk.v24i1.3483.19-27>
- Rizvi, S.A.A., Saleh, A.M., 2018. Applications of nanoparticle systems in drug delivery technology. *Saudi Pharm. J.* 26, 64–70. <https://doi.org/10.1016/j.jsps.2017.10.012>
- Ruiz-Tagle, S.A., Figueira, M.M., Vial, V., Espinoza-Benavides, L., Maria, M., 2018. Micronutrients in hair loss. *Our Dermatol. Online* 9, 320–328. <https://doi.org/10.7241/ourd.20183.25>
- Sabourian, P., Yazdani, G., Ashraf, S.S., Frounchi, M., Mashayekhan, S., Kiani, S., Kakkar, A., 2020. Effect of Physico-Chemical Properties of Nanoparticles on Their Intracellular Uptake. *Int. J. Mol. Sci.* 21, 8019. <https://doi.org/10.3390/ijms21218019>
- Salamanca, C., Barrera-Ocampo, A., Lasso, J., Camacho, N., Yarcce, C., 2018. Franz Diffusion Cell Approach for Pre-Formulation Characterisation of Ketoprofen Semi-Solid Dosage Forms. *Pharmaceutics* 10, 148. <https://doi.org/10.3390/pharmaceutics10030148>

- Salem, H.F., Kharshoum, R.M., Mahmoud, M., Azim, S.A., Ebeid, E.-Z.M., 2018. Development and characterization of a novel nano-liposomal formulation of Alendronate Sodium loaded with biodegradable polymer. *Ars Pharm.* 59, 9-20. <http://dx.doi.org/10.4321/S2340-98942018000100001>
- Sandhya, M., Ramasamy, D., Sudhakar, K., Kadirgama, K., Harun, W.S.W., 2021. Ultrasonication an intensifying tool for preparation of stable nanofluids and study the time influence on distinct properties of graphene nanofluids – A systematic overview. *Ultrason. Sonochem.* 73, 105479. <https://doi.org/10.1016/j.ultrasonch.2021.105479>
- Santiago, P., 2012. Ferrous versus Ferric Oral Iron Formulations for the Treatment of Iron Deficiency: A Clinical Overview. *Sci. World J.* 2012, 1–5. <https://doi.org/10.1100/2012/846824>
- Scott, H.L., Skinkle, A., Kelley, E.G., Waxham, M.N., Levental, I., Heberle, F.A., 2019. On the mechanism of bilayer separation by extrusion; or, why your large unilamellar vesicles are not really unilamellar (preprint). *Biophysics*. <https://doi.org/10.1101/764274>
- Sebaaly, C., Greige-Gerges, H., Stainmesse, S., Fessi, H., Charcosset, C., 2016. Effect of composition, hydrogenation of phospholipids and lyophilization on the characteristics of eugenol-loaded liposomes prepared by ethanol injection method. *Food Biosci.* 15, 1–10. <https://doi.org/10.1016/j.fbio.2016.04.005>
- Segale, L., Giovannelli, L., Mannina, P., Pattarino, F., 2016. Calcium Alginate and Calcium Alginate-Chitosan Beads Containing Celecoxib Solubilized in a Self-Emulsifying Phase. *Scientifica* 2016, 1–8. <https://doi.org/10.1155/2016/5062706>
- Semlin, L., Schäfer-Korting, M., Borelli, C., Korting, H.C., 2011. In vitro models for human skin disease. *Drug Discov. Today* 16, 132–139. <https://doi.org/10.1016/j.drudis.2010.12.001>
- Sezgin-Bayindir, Z., Losada-Barreiro, S., Bravo-Díaz, C., Sova, M., Kristl, J., Saso, L., 2021. Nanotechnology-Based Drug Delivery to Improve the Therapeutic Benefits of NRF2 Modulators in Cancer Therapy. *Antioxidants* 10, 685. <https://doi.org/10.3390/antiox10050685>
- Shah, P.P., Desai, P.R., Patel, A.R., Singh, M.S., 2012. Skin permeating nanogel for the cutaneous co-delivery of two anti-inflammatory drugs. *Biomaterials* 33, 1607–1617. <https://doi.org/10.1016/j.biomaterials.2011.11.011>
- Shashi, K., Satinder, K., Bharat, P., 2012. A Complete Review On: Liposom. *IRJP.* 3, 10-16.

- Shashidhar, G.M., Manohar, B., 2018. Nanocharacterization of liposomes for the encapsulation of water soluble compounds from *Cordyceps sinensis* CS1197 by a supercritical gas anti-solvent technique. RSC Adv. 8, 34634–34649. <https://doi.org/10.1039/C8RA07601D>
- Silfia, S., Failisnur, F., Sofyan, S., 2018. Analisis gugus fungsi, distribusi, dan ukuran partikel tinta stempel dari ekstrak gambir (*Uncaria gambir* Roxb) dengan senyawa pengomplek NaOH dan  $Al_2(SO_4)_3$ . J. Litbang Ind. 8, 31. <https://doi.org/10.24960/jli.v8i1.3886.31-38>
- Singh, I., Morris, A., 2011. Performance of transdermal therapeutic systems: Effects of biological factors. Int. J. Pharm. Investig. 1, 4. <https://doi.org/10.4103/2230-973X.76721>
- Skoglund, S., Hedberg, J., Yunda, E., Godymchuk, A., Blomberg, E., Odnevall Wallinder, I., 2017. Difficulties and flaws in performing accurate determinations of zeta potentials of metal nanoparticles in complex solutions—Four case studies. PLOS ONE 12, e0181735. <https://doi.org/10.1371/journal.pone.0181735>
- Skuban, S., Džomić, T., Kapor, A., Cvejić, Ž., Rakic, S., 2012. Dielectric and structural properties of iron- and sodium-fumarates. J. Res. Phys. 36, 21–29. <https://doi.org/10.2478/v10242-012-0010-2>
- Son, Y., No, Y., Kim, J., 2020. Geometric and operational optimization of 20-kHz probe-type sonoreactor for enhancing sonochemical activity. Ultrason. Sonochem. 65, 105065. <https://doi.org/10.1016/j.ultsonch.2020.105065>
- Souto, E.B., Fangueiro, J.F., Fernandes, A.R., Cano, A., Sanchez-Lopez, E., Garcia, M.L., Severino, P., Paganelli, M.O., Chaud, M.V., Silva, A.M., 2022. Physicochemical and biopharmaceutical aspects influencing skin permeation and role of SLN and NLC for skin drug delivery. Heliyon 8, e08938. <https://doi.org/10.1016/j.heliyon.2022.e08938>
- Jumaryatno, P., Chabib, L., Hayati, H., Awaluddin, R., 2018. Stability Study of Ipomoea reptans Extract Self-Nanoemulsifying Drug Delivery System (SNEDDS) as Anti-Diabetic Therapy. J. Appl. Pharm. Sci. 8, 11–14. <https://doi.org/10.7324/JAPS.2018.8903>
- Sudewi, S., Pontoh, J., 2018. Optimasi dan Validasi Metode Analisis Dalam Penentuan Kandungan Total Flavonoid Pada Ekstrak Daun Gedi Hijau (*abelmoscus manihot* L.) Yang Diukur Menggunakan Spektrofotometer UV-VIS 7, 10.
- Sugiyati, R., Djajadisastra, J., 2015. Formulasi dan Uji Penetrasi In Vitro Sediaan Gel Transfersom Mengandung Kofein sebagai Antiselulit 13, 6.

- Sujatno, A., Salam, R., Bandriyana, B., Dimiyati, A., 2017. Studi Scanning Electron Microscopy (SEM) Untuk Karakterisasi Proses Oksidasi Paduan Zirkonium. J. Forum Nukl. 9, 44. <https://doi.org/10.17146/jfn.2015.9.1.3563>
- Suliburska, J., Chmurzynska, A., Kocylowski, R., Skrypnik, K., Radziejewska, A., Baralkiewicz, D., 2021. Effect of Iron and Folic Acid Supplementation on the Level of Essential and Toxic Elements in Young Women. Int. J. Environ. Res. Public Health 18, 1360. <https://doi.org/10.3390/ijerph18031360>
- Sultana, K., 2010. Formulation of ferrous fumarate (combination) tablets by using a direct-compression method. Indian J. Sci. Technol. 3, 994–1000. <https://doi.org/10.17485/ijst/2010/v3i9.10>
- Sun, X., Zhang, Y., Chen, G., Gai, Z., 2017. Application of Nanoparticles in Enhanced Oil Recovery: A Critical Review of Recent Progress. Energies 10, 345. <https://doi.org/10.3390/en10030345>
- Syukri, Y., Kholidah, Z., Chabib, L., 2020. Fabrikasi dan Studi Stabilitas Self-Nano Emulsifying Propolis menggunakan Minyak Kesturi sebagai Pembawa. J. Sains Farm. Klin. 6, 265. <https://doi.org/10.25077/jsfk.6.3.265-273.2019>
- Tabatabaei Mirakabad, F.S., Nejati-Koshki, K., Akbarzadeh, A., Yamchi, M.R., Milani, M., Zarghami, N., Zeighamian, V., Rahimzadeh, A., Alimohammadi, S., Hanifehpour, Y., Joo, S.W., 2014. PLGA-Based Nanoparticles as Cancer Drug Delivery Systems. Asian Pac. J. Cancer Prev. 15, 517–535. <https://doi.org/10.7314/APJCP.2014.15.2.517>
- Tampucci, S., Paganini, V., Burgalassi, S., Chetoni, P., Monti, D., 2022. Nanostructured Drug Delivery Systems for Targeting 5- $\alpha$ -Reductase Inhibitors to the Hair Follicle. Pharmaceutics 14, 286. <https://doi.org/10.3390/pharmaceutics14020286>
- Theil, E.C., Chen, H., Miranda, C., Janser, H., Elsenhans, B., Núñez, M.T., Pizarro, F., Schümann, K., 2012. Absorption of Iron from Ferritin Is Independent of Heme Iron and Ferrous Salts in Women and Rat Intestinal Segments. J. Nutr. 142, 478–483. <https://doi.org/10.3945/jn.111.145854>
- Todo, H., 2017. Transdermal Permeation of Drugs in Various Animal Species. Pharmaceutics 9, 33. <https://doi.org/10.3390/pharmaceutics9030033>
- Tolkien, Z., Stecher, L., Mander, A.P., Pereira, D.I.A., Powell, J.J., 2015. Ferrous Sulfate Supplementation Causes Significant Gastrointestinal Side-Effects in Adults: A Systematic Review and Meta-Analysis. PLOS ONE 10, e0117383. <https://doi.org/10.1371/journal.pone.0117383>



- Tonnis, W.F., Kersten, G.F., Frijlink, H.W., Hinrichs, W.L.J., de Boer, A.H., Amorij, J.-P., 2012. Pulmonary Vaccine Delivery: A Realistic Approach? *J. Aerosol Med. Pulm. Drug Deliv.* 25, 249–260. <https://doi.org/10.1089/jamp.2011.0931>
- Trevisan, J.E., Cavalcanti, L.P., Oliveira, C.L.P., de La Torre, L.G., Santana, M.A.H., 2011. Technological Aspects of Scalable Processes for the Production of Functional Liposomes for Gene Therapy, in: Yuan, X. (Ed.), *Non-Viral Gene Therapy*. InTech. <https://doi.org/10.5772/17869>
- Uhm, Y.R., Lim, J.C., Choi, S.M., 2017. Analyses of Ferrous and Ferric State in Dynabi<sub>Tab</sub> Using Mössbauer Spectroscopy. *Int. J. Anal. Chem.* 2017, 1–4. <https://doi.org/10.1155/2017/9321896>
- Ural, N., 2021. The significance of scanning electron microscopy (SEM) analysis on the microstructure of improved clay: An overview. *Open Geosci.* 13, 197–218. <https://doi.org/10.1515/geo-2020-0145>
- van Hoogevest, P., 2017. Review – An update on the use of oral phospholipid excipients. *European Journal of Pharmaceutical Sciences.* 2017, 1-12. <http://dx.doi.org/10.1016/j.ejps.2017.07.008>
- van Hoogevest, P., Wendel, A., 2014. The use of natural and synthetic phospholipids as pharmaceutical excipients. *Eur. J. Lipid Sci. Technol.* 116, 1088–1107. <https://doi.org/10.1002/ejlt.201400219>
- van Smeden, J., Janssens, M., Gooris, G.S., Bouwstra, J.A., 2014. The important role of stratum corneum lipids for the cutaneous barrier function. *Biochim. Biophys. Acta BBA - Mol. Cell Biol. Lipids* 1841, 295–313. <https://doi.org/10.1016/j.bbalip.2013.11.006>
- Verawaty, V., Halim, A., Febriyenti, F., 2016. Efektivitas Sistem Penghantaran Liposom pada Katekin Sebagai Antioksidan. *J. Sains Farm. Klin.* 2, 176. <https://doi.org/10.29208/jsfk.2016.2.2.85>
- Waldvogel-Abramowski, S., Waeber, G., Gassner, C., Buser, A., Frey, B.M., Favrat, B., Tissot, J.-D., 2014. Physiology of Iron Metabolism. *Transfus. Med. Hemotherapy* 41, 213–221. <https://doi.org/10.1159/000362888>
- Wang, Q., Wang, G., Xie, S., Zhao, X., Zhang, Y., 2019. Comparison of high-performance liquid chromatography and ultraviolet-visible spectrophotometry to determine the best method to assess Levofloxacin released from mesoporous silica microspheres/nano-hydroxyapatite composite scaffolds. *Exp. Ther. Med.* <https://doi.org/10.3892/etm.2019.7238>

- Weng, J., Tong, H.H.Y., Chow, S.F., 2020. In Vitro Release Study of the Polymeric Drug Nanoparticles: Development and Validation of a Novel Method. *Pharmaceutics* 12, 732. <https://doi.org/10.3390/pharmaceutics12080732>
- Wu, W., Lu, Y., Qi, J., 2015. Oral delivery of liposomes. *Ther. Deliv.* 6, 1239–1241. <https://doi.org/10.4155/tde.15.69>
- Yang, R., Wei, T., Goldberg, H., Wang, W., Cullion, K., Kohane, D.S., 2017. Getting Drugs Across Biological Barriers. *Adv. Mater.* 29, 1606596. <https://doi.org/10.1002/adma.201606596>
- Yetisgin, A.A., Cetinel, S., Zuvun, M., Kosar, A., Kutlu, O., 2020. Therapeutic Nanoparticles and Their Targeted Delivery Applications. *Molecules* 25, 2193. <https://doi.org/10.3390/molecules25092193>
- Yiannikourides, A., Latunde-Dada, G., 2019. A Short Review of Iron Metabolism and Pathophysiology of Iron Disorders. *Medicines* 6, 85. <https://doi.org/10.3390/medicines6030085>
- Youngren-Ortiz, S.R., Gandhi, N.S., España-Serrano, L., Chougule, M.B., 2017. Aerosol Delivery of siRNA to the Lungs. Part 2: Nanocarrier-based Delivery Systems. *KONA Powder Part. J.* 34, 44–69. <https://doi.org/10.14356/kona.2017005>
- Yuan, W., Kuai, R., Dai, Z., Yuan, Y., Zheng, N., Jiang, W., Noble, C., Hayes, M., Szoka, F.C., Schwendeman, A., 2017. Development of a Flow-Through USP-4 Apparatus Drug Release Assay to Evaluate Doxorubicin Liposomes. *AAPS J.* 19, 150–160. <https://doi.org/10.1208/s12248-016-9958-2>
- Yücel, Ç., Şeker Karatoprak, G., Değim, İ.T., 2019. Anti-aging formulation of rosmarinic acid-loaded ethosomes and liposomes. *J. Microencapsul.* 36, 180–191. <https://doi.org/10.1080/02652048.2019.1617363>
- Zariwala, M.G., 2013. Comparison Study of Oral Iron Preparations Using a Human Intestinal Model. *Sci. Pharm.* 81, 1123–1139. <https://doi.org/10.3797/scipharm.1304-03>
- Zhang, Q., Lu, X.-M., Zhang, M., Yang, C.-Y., Lv, S.-Y., Li, S.-F., Zhong, C.-Y., Geng, S.-S., 2021. Adverse effects of iron deficiency anemia on pregnancy outcome and offspring development and intervention of three iron supplements. *Sci. Rep.* 11, 1347. <https://doi.org/10.1038/s41598-020-79971-y>
- Zizzari, A., Bianco, M., Carbone, L., Perrone, E., Amato, F., Maruccio, G., Rendina, F., Arima, V., 2017. Continuous-Flow Production of Injectable Liposomes via a Microfluidic Approach. *Materials* 10, 1411. <https://doi.org/10.3390/ma10121411>

Zothanpuui, F., Rajesh, R., Selvakumar, K., 2020. AReview on Stability Testing Guidelines of Pharmaceutical Products. Asian J. Pharm. Clin. Res. 3–9.  
<https://doi.org/10.22159/ajpcr.2020.v13i10.38848>

