

## DAFTAR PUSTAKA

- Abood, R. M. *et al.* (2013) ‘Microemulsion as a tool for the transdermal delivery of ondansetron for the treatment of chemotherapy induced nausea and vomiting’, *Colloids and Surfaces B: Biointerfaces*. Elsevier B.V., 101, pp. 143–151. doi: 10.1016/j.colsurfb.2012.06.015.
- Alkilani, A. Z., Mccrudden, M. T. C. and Donnelly, R. F. (2015) ‘Transdermal Drug Delivery: Innovative Pharmaceutical Developments Based on Disruption of the Barrier Properties of the stratum corneum’, *Pharmaceutics*, 7, pp. 438–470. doi: 10.3390/pharmaceutics7040438.
- Annisa, R., Hendradi, E. and Melani, D. (2016) ‘Pengembangan Sistem Nanostructured Lipid Carriers (NLC) Meloxicam Dengan Lipid Monostearin Dan Miglyol 808 Menggunakan Metode Emulsifikasi’, *Journal Of Tropical Pharmacy And Chemistry*, 3(3), pp. 156–169. doi: 10.25026/jtpc.v3i3.102.
- Atmaja, T. C. J. (2019) Studi Perbandingan Stabilitas Fisik dan Penetrasi APMS dalam Sistem Penghantaran NLC SLN, dan Nanoemulsi. *Skripsi*. Universitas Airlangga.
- Attama, A. A., Schicke, B. C. and Mu, C. C. (2006) ‘Further characterization of theobroma oil – beeswax admixtures as lipid matrices for improved drug delivery systems’, *European Journal of Pharmaceutics and Biopharmaceutics*, 64, pp. 294–306. doi: 10.1016/j.ejpb.2006.06.010.
- Bajaj, S., Singla, D. and Sakhuja, N. (2012) ‘Stability testing of pharmaceutical products’, *Journal of Applied Pharmaceutical Science*, 2(3), pp. 129–138. doi: 10.7324/JAPS.2012.2322.
- Bank, G., Kagan, D. and Madhavi, D. (2014) ‘Coenzyme Q10: Clinical Update and Bioavailability Coenzyme Q 10: Clinical Update and Bioavailability’, *Journal of Evidence-Based Complementary & Alternative Medicine*, 16(2), pp. 129–138. doi: 10.1177/2156587211399438.
- Bentinger, M., Tekle, M. and Dallner, G. (2010) ‘Coenzyme Q - Biosynthesis and functions’, *Biochemical and Biophysical Research Communications*. Elsevier Inc., 396(1), pp. 74–79. doi: 10.1016/j.bbrc.2010.02.147.

- Chen, J. *et al.* (2015) 'Potential of Essential Oils as Penetration Enhancers for Transdermal Administration of Ibuprofen to Treat Dysmenorrhoea', *Molecules*, 20, pp. 18219–18236. doi: 10.3390/molecules201018219.
- Derawi, D., Azman, N. A. Z. and Jumadi, M. F. (2017) 'Malaysian Journal Of Analytical Sciences Preliminary Study on Production Of Monoacylglycerol and Diacylglycerol of Virgin Coconut Oil Via Enzymatic Glycerolysis Using Lipase *Candida antarctica* (Novozyme 435) (Kajian Awal Penghasilan Monoasilgliserol dan D', *Malaysian Journal of Analytical Sciences*, 21(1), pp. 37–45. doi: 10.17576/mjas-2017-2101-05.
- Dubey, A., Prabhu, P. and Kamath, J. V. (2012) 'Nano structured lipid carriers: A novel topical drug delivery system', *International Journal of PharmTech Research*, 4(2), pp. 705–714. doi: 10.20902/CT.
- Erawati, T. *et al.* (2019) 'Characteristics and stability of nanostructured lipid carrier (Nlc) aleurites moluccana seed oil (ams oil) using various combinations of beeswax and oleum cacao', *International Journal of Drug Delivery Technology*, 9(1), pp. 94–97. doi: 10.25258/ijddt.9.1.15.
- Erawati, T. *et al.* (2019) 'The Anti-inflammatory Activity of p-methoxycinnamic acid ( PMCA ) in the Nanostructured lipid carrier ( NLC ) system using combinations of solid lipid , beeswax-oleum cacao and liquid lipid , Virgin Coconut oil ( VCO )', *Research Journal of Pharmacy and Technology*, 12(8), pp. 3619–3625. doi: 10.5958/0974-360X.2019.00617.6.
- Fahy, E. *et al.* (2009) 'Update of the LIPID MAPS comprehensive classification system for lipids', *Journal of Lipid Research*, 50(SUPPL.), pp. 9–14. doi: 10.1194/jlr.R800095-JLR200.
- Gao Z. S., Wang L., & Zhang M. (2012) 'Effects of Penetration Enhancers on Curcumin Transdermal Drug Delivery', *Zhong Yao Cai*, 35(1), pp. 141-144.
- Ghodrati, M., Farahpour, M. R. and Hamishehkar, H. (2019) 'Encapsulation of Peppermint essential oil in nanostructured lipid carriers: In-vitro antibacterial activity and accelerative effect on infected wound healing', *Colloids and Surfaces A: Physicochemical and Engineering Aspects*. Elsevier B.V., 564, pp. 161–169. doi: 10.1016/j.colsurfa.2018.12.043.
- Guimarães K.L., Ré M.I. (2011) Lipid Nanoparticles as Carriers for Cosmetic Ingredients: The First (SLN) and the Second Generation (NLC). In: Beck R., Guterres S., Pohlmann A. (eds) *Nanocosmetics and*

*Nanomedicines*. Springer, Berlin, Heidelberg.  
[https://doi.org/10.1007/978-3-642-19792-5\\_5](https://doi.org/10.1007/978-3-642-19792-5_5)

- Hao, J. *et al.* (2011) 'Development and optimization of solid lipid nanoparticle formulation for ophthalmic delivery of chloramphenicol using a Box-Behnken design', *International journal of nanomedicine*, 6, pp. 683–692. doi: 10.2147/ijn.s17386.
- Herman, A. and Herman, A. P. (2015) 'Essential oils and their constituents as skin penetration enhancer for transdermal drug delivery: A review', *Journal of Pharmacy and Pharmacology*, 67(4), pp. 473–485. doi: 10.1111/jphp.12334.
- How, C. W., Abdullah, R. and Abbasalipourkabir, R. (2011) 'Physicochemical properties of nanostructured lipid carriers as colloidal carrier system stabilized with polysorbate 20 and polysorbate 80', *African Journal of Biotechnology*, 10(9), pp. 1684–1689. doi: 10.5897/AJB10.1667.
- Iman, S. N. (2018) Pengaruh Perbandingan Lipid Padat Oleum Cacao-Beeswax Dan Lipid Cair Minyak Zaitun Terhadap Karakteristik NLC-APMS. *Skripsi*. Universitas Airlangga.
- Jenning, V. and Gohla, S. (2000) 'Comparison of wax and glyceride solid lipid nanoparticles (SLN®)', *International Journal of Pharmaceutics*, 196(2), pp. 219–222. doi: 10.1016/S0378-5173(99)00426-3.
- Kaur, S. *et al.* (2015) 'Nanostructure Lipid Carrier (NLC): the new generation of lipid nanoparticles', *Asian Pacific Journal of Health Sciences*, 2(2), pp. 76–93.
- Kharia, A. A., Singhai, A. K. and Verma, R. (2012) 'Formulation and evaluation of polymeric nanoparticles of an antihypertensive drug for gastroretention', *International Journal of Pharmaceutical Sciences and Nanotechnology*, 4(4), pp. 1–12. doi: 10.22270/jddt.v8i6.2018.
- Khurana, S., Bedi, P. M. S. and Jain, N. K. (2012) 'Development of nanostructured lipid carriers for controlled delivery of mefenamic acid', *International Journal of Biomedical Nanoscience and Nanotechnology*, 2(3–4), pp. 232–250. doi: 10.1504/IJBNN.2012.051218.
- Matusiak, J. and Grządka, E. (2017) 'Stability of colloidal systems - a review of the stability measurements methods', *Annales Universitatis Mariae Curie-Skłodowska, sectio AA – Chemia*, 72(1), p. 33. doi: 10.17951/aa.2017.72.1.33.

- Miranda, M. *et al.* (2019) 'Nanostructuring lipid carriers using *Ridolfia segetum* (L.) Moris essential oil', *Materials Science and Engineering C*. Elsevier, 103(May), p. 109804. doi: 10.1016/j.msec.2019.109804.
- Lakshmi P. K., *et al.* (2017) 'Oils As Penetration Enhancers for Improved Transdermal Drug Delivery: a Review', *International Research Journal of Pharmacy*, 8(4), pp. 9–17. doi: 10.7897/2230-8407.080440.
- Lambers, H. *et al.* (2006) 'Natural skin surface pH is on average below 5, which is beneficial for its resident flora', *International Journal of Cosmetic Science*, 28(5), pp. 359–370. doi: 10.1111/j.1467-2494.2006.00344.x.
- Li, B. and Ge, Z. Q. (2012) 'Nanostructured lipid carriers improve skin permeation and chemical stability of idebenone', *AAPS PharmSciTech*, 13(1), pp. 276–283. doi: 10.1208/s12249-011-9746-3.
- Loo, C. H. *et al.* (2013) 'Effect of compositions in nanostructured lipid carriers (NLC) on skin hydration and occlusion', *International Journal of Nanomedicine*, 8(January), pp. 13–22. doi: 10.2147/IJN.S35648.
- López-García, R. and Ganem-Rondero, A. (2015) 'Solid Lipid Nanoparticles (SLN) and Nanostructured Lipid Carriers (NLC): Occlusive Effect and Penetration Enhancement Ability', *Journal of Cosmetics, Dermatological Sciences and Applications*, 05(02), pp. 62–72. doi: 10.4236/jcdsa.2015.52008.
- Mrudula, B. *et al.* (2017) 'Nanostructured Lipid Carriers Based Drug Delivery System: A Review', *Indo American Journal of Pharmaceutical Research*, 7(03), pp. 8045–8058.
- Mukherjee, S., Ray, S. and Thakur, R. S. (2009) 'Solid Lipid Nanoparticles : A Modern Formulation Approach in Drug Delivery System', *Indian Journal of Pharmaceutical Sciences*, (July-August), pp. 349–358.
- National Center for Biotechnology Information. PubChem Database. Coenzyme Q10, CID=5281915, <https://pubchem.ncbi.nlm.nih.gov/compound/Coenzyme-Q10>, pada tanggal 19 Desember 2019.
- Nielsen, J. B. (2006) 'Natural oils affect the human skin integrity and the percutaneous penetration of benzoic acid dose-dependently', *Basic and Clinical Pharmacology and Toxicology*, 98(6), pp. 575–581. doi: 10.1111/j.1742-7843.2006.pto\_388.x.

- Pardeike, J., Hommoss, A. and Müller, R. H. (2009) 'Lipid nanoparticles (SLN, NLC) in cosmetic and pharmaceutical dermal products', *International Journal of Pharmaceutics*, 366(1–2), pp. 170–184. doi: 10.1016/j.ijpharm.2008.10.003.
- Patel, H. J. *et al.* (2011) 'Penetration Enhancers for Transdermal Drug Delivery System: A Review', *IJPI's Journal of Pharmaceutics and Cosmetology*, 1(2), pp. 67–80.
- Pathan, I. B. and Setty, C. M. (2009) 'Chemical penetration enhancers for transdermal drug delivery systems', *Tropical Journal of Pharmaceutical Research*, 8(2), pp. 173–179. doi: 10.4314/tjpr.v8i2.44527.
- Phatak, A. and Chaudhari, P. (2013) 'Development and Evaluation Of Nanostructured Lipid Carrier (NLC) Based Topical Delivery Of An Antiinflammatory Drug', *Journal of Pharmaceutical Respiration* 7(8), pp. 677–685.
- Purbowati, G. D. (2017) Penetrasi In Vitro Tretinoin dalam Sistem Nanoemulsi Dibandingkan Sistem Emulsi Konvensional pada Kosmetika Anti Aging (Menggunakan Fase Minyak Virgin Coconut Oil). *Skripsi*. Universitas Airlangga.
- Rahmah, S. (2019) Formulasi dan Karakterisasi Fisika Nanostructured Lipid Carrier (Nlc) Coenzyme Q10 Menggunakan Setil Palmitat dan Virgin Coconut Oil (VCO) Perbandingan 70:30, 80:20 dan 90:10 dengan Metode High Shear Homogenization dan Ultrasound, *Journal of Chemical Information and Modeling*. doi: 10.1017/CBO9781107415324.004.
- Rajan, R. and Vasudevan, D. T. (2012) 'Effect of permeation enhancers on the penetration mechanism of transfersomal gel of ketoconazole', *Journal of Advanced Pharmaceutical Technology and Research*, 3(2), pp. 112–116. doi: 10.4103/2231-4040.97286.
- Remington, J.P. (2005) '*The Science and Practice of Pharmacy*', 21th Ed., Philadelphia: Philadelphia University of the Sciences, p. 313, 316, 763.
- Ribeiro, L. N. M. *et al.* (2017) 'Natural lipids-based NLC containing lidocaine: from pre-formulation to in vivo studies', *European Journal of Pharmaceutical Sciences*. Elsevier, 106(October), pp. 102–112. doi: 10.1016/j.ejps.2017.05.060.
- Rohmah, M. *et al.* (2019) 'Formulasi dan Stabilitas Nanostructured Lipid Carrier dari Campuran Fraksi Stearin dan Olein Minyak Kelapa Sawit',

- Jurnal Aplikasi Teknologi Pangan*, 8(1), pp. 23–30. doi: 10.17728/jatp.3722.
- Rowe, R. C., Sheskey, P. J., and Quinn M. E. (2009) *Handbook of Pharmaceutical Excipients*, Sixth Edition, London : The Pharmaceutical Press, p. 5 – 6; 17 – 19; 75 – 76; 389 – 390; 466 – 468; 470 – 472; 473 – 474; 549 – 553; 675 – 678
- Sahu, G. *et al.* (2014) ‘A Review of Current and Novel Trends for Anti-Ageing Formulation’, *International Journal Of Pharmaceutical, Chemical and Biological Sciences*, 4(1), pp. 118–125. Available at: [www.ijpcbs.com](http://www.ijpcbs.com).
- Sayuti, K. and Rina Yenrina (2015) *Antioksidan, Alami dan Sintetik*, 2015;(1)7-29. Padang: Andalas University Press.
- Schwarz, J. C. *et al.* (2012) ‘Nanocarriers for dermal drug delivery: Influence of preparation method, carrier type and rheological properties’, *International Journal of Pharmaceutics*. Elsevier B.V., 437(1–2), pp. 83–88. doi: 10.1016/j.ijpharm.2012.08.003.
- Schreml, S., Kemper, M. and Abels, C. (2014) Skin pH in the Elderly and Appropriate Skin Care, *European Medical Journal*, 2 (November 2014), pp. 86–94.
- Setya, S., Talegaonkar, Sushama, Razdan, Dr. B. K. (2013) Nanoemulsions: Formulation Methods and Stability Aspects. *World Journal Of Pharmacy and Pharmaceutical Sciences*, 3(2): 2214-2228.
- Shah, R. *et al.* (2015). *Lipid Nanoparticles: Production, Characterization and Stability*, SpringerBriefs in Pharmaceutical Science & Drug Development, DOI 10.1007/978-3-319-10711-0\_2
- Sharma, B. and Sharma, A. (2012) ‘Future prospect of nanotechnology in development of anti-ageing formulations’, *International Journal of Pharmacy and Pharmaceutical Sciences*, 4(3), pp. 57–66.
- Sharma, N. *et al.* (2010) ‘Nanoemulsion: A new concept of Delivery System’, *Asian Journal of Research in Pharmaceutical Science*, 9(1), p. 39. doi: 10.5958/2231-5659.2019.00006.7.
- Shekawat, P. B. (2013) ‘Preparation and Evaluation of Clotrimazole Nanostructured Lipid Carrier for Topical Delivery’, *International Journal of Pharmacy and Pharmaceutical Sciences*, 4(1), pp. 407–416.

- Shoviantari, F. (2017) Efektivitas, Iritabilitas, dan Stabilitas Fisik Coenzym Q10 dalam Sistem Penghantaran Nanoemulsi dan Nanostructured Lipid Carrier (NLC) sebagai Kosmetika Antiaging. *Tesis*. Universitas Airlangga.
- Shrivastava, A. (2014) 'A Review on Peppermint Oil', *Asian Journal of Pharmaceutical and Clinical Research*, 2(2), pp. 27–33.
- Shukla, T. *et al.* (2018) 'Lipid nanocarriers', in *Lipid Nanocarriers for Drug Targeting*. Elsevier Inc., pp. 1–47. doi: 10.1016/b978-0-12-813687-4.00001-3.
- Sriarumtias, F. F., Tarini, S. and Damayanti, S. (2017) 'Formulasi dan Uji Potensi Antioksidan Nanostructured Lipid Carrier (NLC) Retinil Palmitat', *Acta Pharmaceutica Indonesia*, 42(1), pp. 25–31.
- Suprobo, G. and Rahmi, D. (2015) 'Pengaruh Kecepatan Homegenisasi terhadap Sifat Fisika dan Kimia Krim Nanopartikel dengan Metode High Speed Homogenization (HSH)', *Jurnal Litbang Industri*, 5(1), pp. 1–12.
- Suwalie, E. R. and Soraya Ratnawulan Mita (2017) 'Terpen Sebagai Peningkat Penetrasi Pada Sediaan Transdermal', *Farmaka*, 15(3), pp. 102–110.
- Svilenov, H. and Tzachev, C. (2014) 'Solid lipid nanoparticles—a promising drug delivery system', *Nanomedicine*, pp. 187–237.
- Tadros, T. F. (2013) *Emulsion Formation, Stability, and Rheology*. First, *Emulsion Formation and Stability*. First. Edited by T. F. Tadros. Wiley-VCH Verlag GmbH & Co. KGaA. doi: 10.1002/9783527647941.ch1.
- Tamjidi, F., Shahedi, M., Varshosaz, J., & Nasirpour, A. (2013) 'Nanostructured lipid carriers (NLC): A potential delivery system for bioactive food molecules', *Innovative food science & emerging technologies*, 19, 29-43. doi: 10.1016/j.ifset.2013.03.002
- Tian, Y., Chen, L. and Zhang, W. (2016) 'Influence of Ionic Surfactants on the Properties of Nanoemulsions Emulsified by Nonionic Surfactants Span 80/Tween 80', *Journal of Dispersion Science and Technology*, 37(10), pp. 1511–1517. doi: 10.1080/01932691.2015.1048806.
- Üner, M., Karaman, E. F. and Aydoğmuş, Z. (2014) 'Solid lipid nanoparticles and nanostructured lipid carriers of loratadine for topical application: Physicochemical stability and drug penetration through rat

- skin', *Tropical Journal of Pharmaceutical Research*, 13(5), pp. 653–660. doi: 10.4314/tjpr.v13i5.1.
- Wahyuningsih, K. A. (2011) 'Astaxanthin Memberikan Efek Proteksi Terhadap Photoaging', *Journal of Medicine*, 10(3), pp. 149–160.
- Wei, Keat,. et al. (2014) 'Law, culture and massively multiplayer online games', *International Review of Law, Computers and Technology*, 28(1), pp. 45–59. doi: 10.1080/13600869.2013.869919.
- Yang, S. K. et al. (2018) 'Mode of action: Synergistic interaction of peppermint (*Mentha x piperita* L. Carl) essential oil and meropenem against plasmid-mediated resistant *E. coli*', *Records of Natural Products*, 12(6), pp. 582–594. doi: 10.25135/rnp.59.17.12.078.
- Zaki, N. M. (2016) 'Strategies for oral delivery and mitochondrial targeting of CoQ10', *Drug Delivery*, 23(6), pp. 1868–1881. doi: 10.3109/10717544.2014.993747.