

Pharmaceutics and Novel Drug Delivery Systems

October 04-06, 2018
Moscow, Russia

Ayşe Nur Oktay et al., Int J Drug Dev & Res 2018, Volume 10
DOI: 10.21767/0975-9344-C1-002

Nanoformulations for dermally application

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In pharmacy, most of the attention is focused on improved dermal delivery of poorly soluble drugs. The skin which is the biggest organ in our body has great importance because it provides protection of the organism against environmental factors and organization of body heat and water loss. Thus it forms a suitable region for drug application with its large surface area to obtain local and systemic effects. There are many advantages of dermally application, such as reducing gastrointestinal side effects, providing drug accumulation at the specific region, self-administration of the patient, high patient compliance compared to other drug delivery routes. However, especially stratum corneum layers of skin plays a critical role in limiting the delivery of most drugs, thus the drug permeation through the skin becomes a rate limiting step for absorption. In recent years, several methods have been examined to increase the permeation of drugs into or through the skin. One of the promising approaches is the use of nanoparticulate delivery system such as nanosuspension, solid lipid nanoparticles, nanogels etc. Nanonization of drug particles (100-1000 nm) increase its surface area, dissolution, saturation solubility, permeability and final results is high dermal bioavailability. In our studies, Flurbiprofen (FB) was selected as a model drug which is one of the nonsteroidal anti-inflammatory drugs and it is used to treat gout, arthritis, rheumatoid arthritis and sun burn. But it has low water solubility (BCS Class II). To improve its solubility and thus permeability in or through the skin, FB nanoformulations (nano suspensions and nano gels) were successfully obtained for dermally application. These studies demonstrated that nano formulations are very effective for improving dermal bioavailability of lipophilic drug substances.

Recent Publications

1. Okyar A, Özsoy Y and Güngör S (2012) Novel formulation approaches for dermal and transdermal delivery of non-steroidal anti-inflammatory drugs. IntechOpen DOI: 10.5772/28461.
2. Vega E, Egea M A, Ramirez M L G, Garcia M L, Sanchez E, Espina M and Calpena A C (2013) Flurbiprofen PLGA-PEG nanospheres: Role of hydroxy- β -cyclodextrin on ex vivo human skin permeation and *in vivo* topical anti-inflammatory efficacy. Colloids and Surfaces B: Biointerfaces 110:339-346.
3. Oktay A, İlbasmış Tamer S and Celebi N (2017) Cyclodextrine based nanogels and phase solubility studies of flurbiprofen as a chemopreventive agent. Proceedings 1(10):1005.

Biography

Ayşe Nur Oktay is a Research Assistant of Pharmacy Faculty at Gazi University in Turkey. She is a PhD student at Gazi University Department of Pharmaceutical Technology under the mentorship of Professor Dr Nevin Celebi. Her research is focused on nano suspension, high pressure homogenization technique, nanogel, skin permeability studies, quality by design and drug delivery. She is an Inventor of two project which are supported by Scientific Research Project Foundation of Gazi University and The Scientific and Technological Research Council of Turkey. She has 3 oral presentation in 2017; about nano suspensions at "7th BBBB International Conference on Pharmaceutical Science - New Trend and Achievements in Pharmaceutical Sciences and Pharmacy Practice, Balatonfüred/Hungary" and at "2nd International Gazi Pharma Symposium Series, Ankara/Turkey" and about nanogels at the "2nd International Conference on Natural Products for Cancer Prevention and Therapy, Kayseri, Turkey".

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