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## Development and characterization of lidocaine transdermal system with Self-Emulsifying Nanosystem (SENS)

Sridhar Gumudavelli, Meghana V, Tanya G, Yamini K and Srinidhi B  
Ascent Pharmaceuticals, Product Development Department, USA

The objective of this work is to develop and characterize Nano-emulsion based transdermal system (NTS) having Lidocaine in Nano-emulsion form. This second generation Nano-emulsion based transdermal drug delivery system has several advantages over traditional gel and transdermal systems (TS). NTS are therapeutically more effective compared to gel and conventional transdermal patches. Nano-emulsion components including surfactants and co-surfactants enhance skin permeability thereby increasing therapeutic efficacy and bioavailability of the drug molecule. Moreover, the release profile can be modulated by altering the ratio between surfactant, co-surfactant, and solvents.

Lidocaine NTS was prepared by casting Lidocaine-polymer matrix on non-woven felt with a thickness of 1.4 mil using Optimags coating machine. Coated non-woven felt was dried at ambient temperature for 20-25 minutes till dry matrix thickness remains 1.28 mil to achieve 14 g/140 cm<sup>2</sup> drug content per patch size. Lidocaine self-emulsifying nanosystem was prepared by dissolving Lidocaine in surfactant, co-surfactant, lipophilic, and hydrophilic solvents then incorporated into a cross-linked super absorbent polymer matrix containing high molecular weight cationic, anionic polymers stabilized with preservatives, chelaters, and stabilizers. The rate of drug release, adhesiveness, stickiness, and cooling effect were controlled through a combination of polyacrylate and cross-linking agents. Lidocaine SENS was characterized for globule size, potency, and transmittance. Furthermore, *in-vitro* skin permeation testing was also carried out using a franz diffusion cell with an effective diffusional area of 0.64 cm<sup>2</sup> and 5 ml receiver chamber capacity using Asian (59 Male) skin.

### Biography

Sridhar Gumudavelli completed his Masters at the age of 23 from Kakatiya University, India, under the eminent Prof. C.K.Kokate. He also earned a Gold Medal in Pkg. technology from IIP, India. He is the director of Product Development in Ascent Pharmaceuticals Inc., a premier generic drug development organization. He has published more than 25 papers on various scientific podiums and patented various drug delivery technologies including modified release solid and liquid dosage forms.

[meghanavidiyala@yahoo.com](mailto:meghanavidiyala@yahoo.com)

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