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Dermal application of nanostructured lipid carriers containing lidocaine

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Effective topical local anesthesia is a challenge, because most of the marketed formulations have moderate skin penetration properties, rapid but short effect. Innovative dermal formulations are needed to overcome the barrier function of the skin and provide sufficient and prolonged local anesthesia. We developed and investigated a lidocaine-containing nanostructured lipid carrier (NLC) system. NLCs as drug carrier systems offering many benefits: good physical stability, possibility of scale-up and controlled drug delivery, and low cost. Topically applied lipid particles can reduce transepidermal water loss (TEWL) and increase skin hydration, thereby they facilitate the penetration of the incorporated drug and support the physiological conditions of the skin. NLC was prepared by ultrasonication method. To characterize the carrier system different *in vitro* investigations were performed: particle size and zeta potential measurements, Fourier- transform infrared and Raman spectroscopy, Differential Scanning Calorimetry and X-ray diffraction measurements. Release and skin penetration of lidocaine-NLC was examined by Franz diffusion cell and Raman spectroscopic mapping. The *in vivo* effect of the formulation was followed by measurement of skin hydration and TEWL. Our results confirmed the developed lidocaine-NLC is a promising vehicle for topical local anesthesia. The considerable penetration properties of this NLC formulation was proved by Franz diffusion cell and Raman spectroscopic mapping experiments. Furthermore, skin hydrating and occlusive effect makes this NLC a favorable dermal carrier system.

Biography

Erzsébet Csányi is the Associate Professor at Institute of Pharmaceutical Technology and Regulatory Affairs. She is the head of Topically used liquids and semisolids R&D group.

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