

# Nanostructured lipid carriers for intraocular brimonidine localisation: development, in-vitro and in-vivo evaluation

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## Abstract:

Brimonidine ocular hypotensive effect can be enhanced by increasing residence time and corneal penetration. The current work aimed to formulate, evaluate and compare nanostructured lipid carriers (NLCs) to solid lipid nanoparticles (SLNs) and commercial eye drops for controlled brimonidine delivery. NLCs prepared by modified high shear homogenisation were spherical with a mean size of  $151.97 \pm 1.98$  nm, negative zeta potential (ZP) of  $-44.2 \pm 7.81$  mV, % entrapment efficiency (EE) of  $83.631 \pm 0.495\%$  and low crystallinity index (CI) (17.12%), indicating a better drug incorporation. Moreover, they kept stable during storage at 4 °C for 3 months. Permeability coefficient of NLCs was 1.227 folds higher than that of SLNs. Histological examination revealed localisation of NLCs in the anterior ocular chamber. NLCs revealed the most sustained and highest intraocular pressure (IOP) lowering activity ( $-13.14 \pm 1.28$  mmHg) in rabbits. In conclusion, NLCs is a promising approach for IOP reduction compared to eye drops and SLNs. © 2018 Informa UK Limited, trading as Taylor & Francis Group.

## Reference:

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