

# In vitro characterization of new stabilizing albumin nanoparticles as a potential topical drug delivery system in the treatment of corneal neovascularization (CNV)

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## Abstract

The aim of this work was to study the preparation process and the *in vitro* release of human serum **albumin nanoparticles** stabilized by Gantrez<sup>®</sup> ES-425, which was loaded with **antiangiogenic drugs**(suramin and bevacizumab). Nanoparticles were prepared by coacervation and stabilized with Gantrez<sup>®</sup>ES-425(Nps-Ga). As control, albumin nanoparticles cross-linked with **glutaraldehyde** (Nps-Glu) were prepared. Nps-Ga displayed a mean size of about 210 nm whereas Nps-Glu showed a mean size of 158 nm. For suramin-loaded nanoparticles, the stabilization process did not show any significant effect on the drug with neither glutaraldehyde nor Gantrez<sup>®</sup>. On the contrary, for **bevacizumab**, only nanoparticles stabilized with Gantrez<sup>®</sup> displayed important payloads (97 µg/mg nanoparticle) of the active form of the antibody. For nanoparticles with glutaraldehyde, only a very low amount of the loaded bevacizumab remained active. Regarding the *in vitro* release studies, **suramin** showed a release mechanism influenced by the type of **stabilizing agent**. Finally, bevacizumab released from Nps-Ga was characterized by a small burst effect followed by a sustained release rate.

In summary, albumin nanoparticles stabilized by polymer coating were successfully obtained and are a promising delivery system for the topical treatment of CNV.