

## Arbutin-loaded Butylglyceryl Dextran Nanoparticles for Topical Delivery

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**Abstract :** Toward the development of colloidal systems that are able to enhance permeation across the skin, a material combining the non-toxic and non-immunogenic of dextran with alkylglycerols permeation enhancing property has been designed. To this purpose, a range of butylglyceryl dextrans (DEX-OX4) were synthesized via functionalization with n-butylglycidyl ether and the successful functionalization was confirmed by NMR and FT-IR spectroscopies, along with GPC with a degree of modification in the range 6.3-35.7 %. A reduced viscosity and an increased molecular weight of DEX-OX4 were also recorded when compared to that of the native dextran. DEX-OX4 was further formulated into nanocarriers and loaded with  $\alpha$ -arbutin prior to be investigated for their particle size, morphology, stability, loading ability, and release profiles. The resulting nanoparticles were found to be close-to-spherical and relatively stable at pH 5 and 7, with size 180-220 nm ( $\zeta$ -potential -22 to -25 mV), and a loading degree of 11.7 %. Lack of toxicity at application-relevant concentrations and increased permeation across skin biological membrane model were demonstrated by nanoparticles in-vitro results against immortalized skin human keratinocytes cells (HaCaT).

**Keywords :** butylglycerols, dextran, nanoparticles, transdermal

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