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## **RSV** loaded hyaluronic acid–DPPC microparticles as a wound healing system

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Chronic wounds like diabetic lesions and acute injuries like burns, causing large tissue losses, are frequent and researchers try to develop novel strategies to favor wound healing. Conventional 'topical' approaches in dermal tissue repair are being insufficient on the problems encountered during the treatment. Resveratrol (RSV) is a powerful antioxidant that stimulates cell proliferation in the dermis by protecting from protease enzymes, by increasing the functions of fibroblasts and by increasing the synthesis of collagen. RSV was incorporated into microparticles by spray drying to treat chronic wounds such as diabetic ulcers. RSV was loaded into microparticles consisting of dipalmitoylphosphatidylcholine (DPPC) and hyaluronic acid (HA), a polysaccharide naturally present within the skin, known to contribute to the healing process. Microparticles were evaluated in terms of production yield, size distribution, encapsulation efficiency, morphology, specific surface area, thermal properties and water content. Spherical and homogenous microparticles (span≤2) in a size range between 20-30  $\mu$ m were obtained with high encapsulation efficiency (≥97%). The effect of enzymes (hyaluronidase, phospholipase and lipase) on RSV release showed a dose-dependent pattern followed by a slow release stage. Cytotoxicity/proliferation and oxidative stress parameters (glutathione, oxidized glutathione, glutathione peroxidase, malondialdehyde, superoxide dismutase) obtained from human dermal fibroblast cell cultures revealed that formulations increased cell proliferation and the presence of RSV decreased oxidation in cells. RSV-loaded HA-DPPC microparticles appear as a promising formulation for wound healing due to synergistic effect of the ingredients.

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