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The use of fatty acids as absorption enhancer for pulmonary drug delivery

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Abstract

A limitation in the systemic uptake of many inhalable drugs is the restricted permeation through the pulmonary epithelial layer barrier. One strategy to bypass the epithelial layer when delivering non-permeable drugs is to alter the paracellular transport, allowing the uptake of drugs into the systemic circulation. In this study, the potential of sodium decanoate (Na dec), docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) as absorption enhancers has been investigated to increase pulmonary paracellular permeability by modulating epithelial cells' tight junctions. By incorporating Na dec, DHA and EPA, separately, into a nebulising formulation, the aim was to enhance the absorption of a fluorescent marker (flu-Na, used as model drug) across pulmonary epithelial cells (Calu-3).

Results indicate that the aerosol performance of all the nebulizing formulations containing absorption enhancers was significantly better than control. Furthermore, the *in vitro* cell assays demonstrated a significant increase in paracellular transport of the fluorescent marker with Na dec and DHA

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