

# Enhanced transdermal delivery of salbutamol sulfate via ethosomes

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## **Abstract**

The main objective of the present work was to compare the transdermal delivery of salbutamol sulfate (SS), a hydrophilic drug used as a bronchodilator, from ethosomes and classic liposomes containing different cholesterol and dicetylphosphate concentrations. All the systems were characterized for shape, particle size, and entrapment efficiency percentage, by image analysis optical microscopy or transmission electron microscopy, laser diffraction, and ultracentrifugation, respectively. In vitro drug permeation via a synthetic semipermeable membrane or skin from newborn mice was studied in Franz diffusion cells. The selected systems were incorporated into Pluronic F 127 gels and evaluated for both drug permeation and mice skin deposition. In all systems, the presence of spherical-shaped vesicles was predominant. The vesicle size was significantly decreased ( $P < .05$ ) by decreasing cholesterol concentration and increasing dicetylphosphate and ethanol concentrations. The entrapment efficiency percentage was significantly increased ( $P < .05$ ) by increasing cholesterol, dicetylphosphate, and ethanol concentrations. In vitro permeation studies of the prepared gels containing the selected vesicles showed that ethosomal systems were much more efficient at delivering SS into mice skin (in terms of quantity and depth) than were liposomes or aqueous or hydroalcoholic solutions.

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