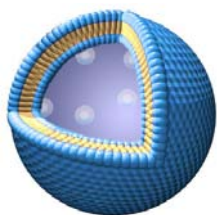


ENCAPSULATION OF A BETAMETHASONE-HP γ CD COMPLEX IN DEFORMABLE LIPOSOMES

Géraldine PIEL, Emilie DUCAT, Angeliki GRAMMENOS, Brigitte EVRARD,
Luc DELATTRE

Laboratory of Pharmaceutical Technology, University of Liège, Belgium



PURPOSE

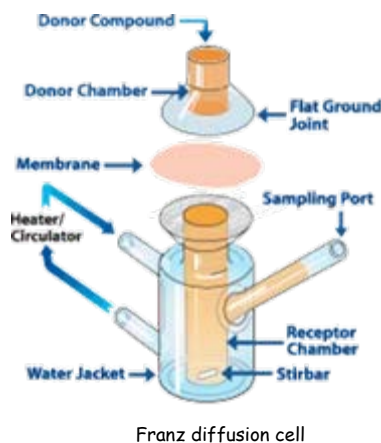
Previously, we have proved that inclusion of betamethasone in HP γ CD allows to obtain high betamethasone encapsulation levels in classical liposomes. Deformable liposomes are known to increase the cutaneous absorption of drugs.

The purpose of this study is to investigate the feasibility of deformable liposomes containing a betamethasone-cyclodextrin inclusion complex and to verify if these deformable liposomes increase the *in-vitro* release rate of betamethasone compared to classical liposomes

METHODS

Betamethasone-HP γ CD complex solution was prepared in the presence of 10 mM CD concentration. Deformable liposomes were prepared by the classical film evaporation method and were sequentially extruded through polycarbonate membranes of 0.4 μ m and 0.2 μ m pore size. Liposomes contain soya phosphatidylcholine and span 80® or sodium déoxycholate at 13.3 % m/m concentration. For the encapsulation of the betamethasone inclusion complex, the complex solution was used to hydrate the lipid film. Non encapsulated inclusion complex was eliminated by ultracentrifugation. Deformability of liposomes was evaluated by the extrusion method or by EPR spectroscopy.

The *in vitro* diffusion across a 800 nm polycarbonate membrane was evaluated using Franz diffusion cells. The betamethasone released was evaluated by HPLC while SPC was evaluated by an enzymatic colorimetric method.



RESULTS

Encapsulation efficiency

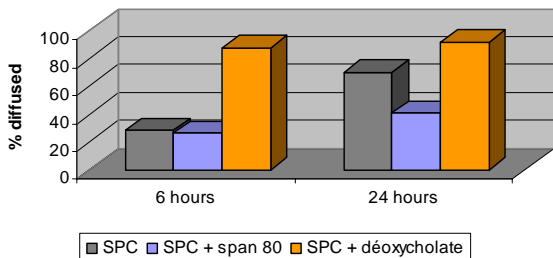
COMPOSITION	ENCAPS. EFFICIENCY (%)
SPC	1.53 \pm 0.12
SPC + span 80	1.96 \pm 0.08
SPC + deoxycholate Na	2.40 \pm 0.13

Deformability

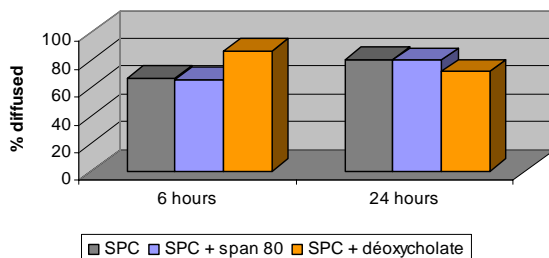
Deformable liposomes containing Span 80® or sodium deoxycholate at 13.3 % m/m concentration show a constant size for at least 14 days. Based on extrusion and EPR results, liposomes containing sodium deoxycholate show the best deformability results.

% of SPC and betamethasone released after 6 and 24 hours under non occlusive conditions

SPC



Betamethasone



CONCLUSIONS

Sodium deoxycholate-SPC deformable liposomes containing a betamethasone-HP γ CD inclusion complex show the best encapsulation efficiency and good deformability characteristics. This study shows that sodium deoxycholate-SPC deformable liposomes diffuse more rapidly through the PC membrane.