Formulation and *in vitro* release evaluation of brimonidine tartrate in liposomal gel based on hydroxypropyl cellulose

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AIM OF THE STUDY

BRIMONIDINE TARTRATE → **LIPOSOMES**

PREPARATION

THE THIN FILM HYDRATION METHOD

Large unilamellar vesicles – LUVs, Multilamellar vesicles - MLVs

CHARACTERIZATION

LIPOSOMES

-loading efficacy

size

LIPOSOMAL GELS based on

- Hydroxypropyl cellulose 3.5% (B I)

- Carbopol 940 2% (B II)

Poloxamer 127 20% (B III)

***In vitro* release and plotting to Higuchi diffusion model**

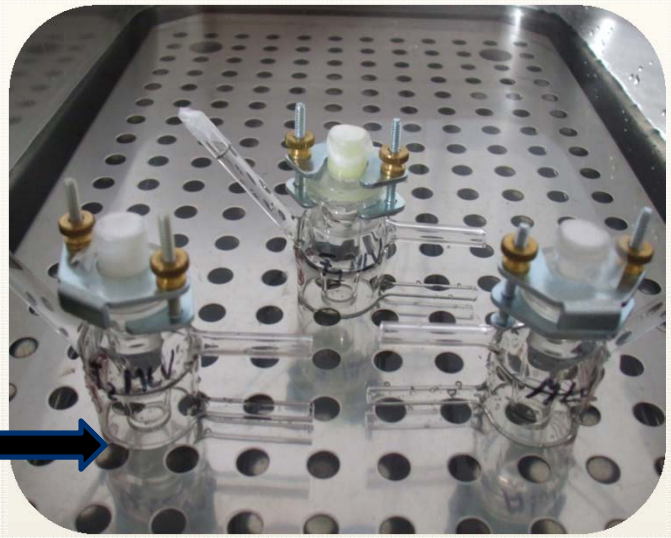
METHODS

In vitro BT release – Franz cell

0,2 ml sample – 12 hours

0.5 g liposamal gel

Cellulose membrane
(Mw 12 000 – 14 000D)



Buffer phosphate
pH = 7.4

T= 37 °C ± 0.2°C
50 rpm

RESULTS AND DISCUSSIONS

Loading Efficacy

Sample	Loading efficacy (%)	BT content (mg/ml)
F1 MLV	24.11 (± 1.13)	14.46
F1 LUV	41.30 (± 3.46)	24.78
F2 MLV	22.85 (± 1.87)	13.71
F2 LUV	40.25 (± 2.36)	24.15
F3 MLV	27.78 (± 0.96)	16.67
F3 LUV	42.35 (± 3.03)	25.41

RESULTS AND DISCUSSIONS

Liposomes size

Sample	Size (nm)
F1 MLV	901 (± 5.13)
F1 LUV	104 (± 3.03)
F2 MLV	897 (± 5.77)
F2 LUV	110 (± 2.93)
F3 MLV	910 (± 3.66)
F3 LUV	102 (± 2.11)

RESULTS AND DISCUSSIONS

Table 1. Comparison of the diffusion rates, correlation coefficients and the cumulative released drug after 12 h.

Liposomal gel	**Diffusion rate (slope of the lines)**	**Correlation coefficients**	**Drug amount released over 12 h (μg/cm^2)**
F1 LUV BI	45.5265	0.9126	1278.14
F1 LUV BII	21.3408	0.8612	598.41
F1 LUV BIII	95.4915	0.9654	2534.17
F1 MLV BI	91.3007	0.9798	2470.31
F1 MLV BII	76.1863	0.9445	2317.22
F1 MLV BIII	83.2218	0.9670	2425.07
F2 LUV BI	56.2568	0.9819	1819.54
F2 LUV BII	39.2024	0.9739	1475.78
F2 LUV BIII	110.5287	0.9683	3234.02
F2 MLV BI	93.6222	0.9720	2569.54
F2 MLV BII	81.1333	0.9330	2410.22
F2 MLV BIII	88.4425	0.9657	2530.93

CONCLUSIONS

- The liposomes obtained in this study proved to be stable
- The HPC based gel has the best release characteristics in large multilamellar vesicles
- The liposomal formulations can be used as topical delivery systems in treatment of facial erythema of rosacea