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ERRATUM

Corrections to the paper by Vemuri published in 17 328 (1991).

The following pages are corrected version of part of the above referenced paper.

EFFECT OF SUGARS ON FREEZE-THAW AND LYOPHILIZATION OF LIPOSOMES

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ABSTRACT

Various sugars were investigated for their ability to protect liposomes against fusion and leakage during freeze-and-thaw or lyophilization processes. Size of liposome was measured before and after the events with a light scattering technique. Leakage of the content of the liposomes was noted by HPLC. The water soluble drug, metaproteenol sulfate, was encapsulated in the liposome which was made of egg phosphatidylcholine (EPC)/egg phosphatidylglycerol (EPG)/cholesterol (5:1:2). Addition of 1% lactose to the liposome suspension prevented the fusion between liposomes but not the leakage of the content. Freeze-thawing caused more damage to the liposomes than the freeze-drying/reconstitution. After freeze-thawing, one-third of the encapsulated drug leaked out from the liposomes. The freeze-drying did not cause additional leakage.

Figure 3

Effect of various freezing rates on the freeze-thaw damage to percent encapsulation of liposomes in the presence of lactose. Lactose was added to the liposome suspension prior to freezing. The frozen samples were then thawed at room temperature for analysis. Key: □ , frozen in one minute; △ , frozen in five minutes; ○ , frozen in 1/2 hour; ● , control, before freezing. Each of the data points is an average of three values obtained on three different lots. The vertical bars denote one standard deviation.

Figure 4

Effect of various freezing rates on the freeze-thaw damage to the vesicle size of liposomes in the presence of lactose. Lactose was added to the liposome suspensions prior to freezing. The frozen samples were then thawed at room temperature for analysis. Key: □ , frozen in one minute; △, frozen in five minutes; ○ , frozen in 1/2 hour; ● , control, before freezing. Each of the data points represent an average of three values obtaining on three different lots. The vertical bars denote one standard deviation.

Figure 5

Effect of various freezing rates on the lyophilization damage to the percent encapsulation of liposome in the presence of lactose. Lactose was added

to the liposome suspension prior to freezing. The frozen samples were then lyophilized and reconstituted for analysis. Key: □ , frozen in one minute; △ , frozen in five minutes; ○ , frozen in 1/2 hour; ● , control, before freezing. Each of the data points is an average of three values obtained on three different lots. The vertical bars denote one standard deviation.

Figure 6

Effect of various freezing rates on the lyophilization damage to the vesicle size of liposome in the presence of lactose. Lactose was added to the liposome suspension prior to freezing. The frozen samples were then lyophilized and reconstituted for analysis. Key: □ , frozen in one minute; △ frozen in five minutes; ○ frozen in 1/2 hour; ● , control, before freezing. Each of the data points obtained on three different lots. The vertical bars denote one standard deviation.

Figure 7

Effect of lactose concentration on osmolality of liposome before and after freeze-thawing. Key: ● , before freeze-thawing; and ○ , after freeze-thawing. Each point is an average of nine determinations. The vertical bars on the points denote one standard deviation.