

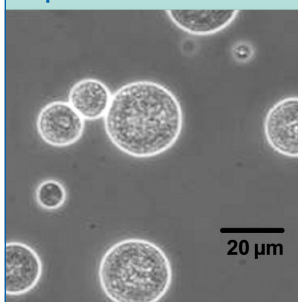
SYRINGEABILITY ASSESSMENT OF DEPOFOAM® MULTIVESICULAR LIPOSOMES WITH NARROW-GAUGE NEEDLES

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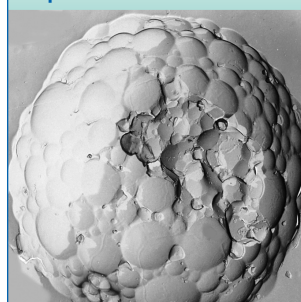
INTRODUCTION

DepoFoam® is a ready-to-use aqueous suspension of sustained-release multivesicular liposomes. The small size (typically 10–30 micron) and the elasticity of the liposomes allow DepoFoam formulations to be used with small-gauge needles. Long-term stability of DepoFoam is well documented through the commercial products DepoCyt® and DepoDur®. This poster summarizes the outcomes of a study conducted to test for changes in DepoFoam products following expression through narrow-gauge needles.

Phase Contrast Micrograph of DepoFoam® Particles



FF-SEM Image of DepoFoam® Particle



OBJECTIVE

- To test the impact of passage through narrow-gauge needles on particle size distribution, total drug content, and percent of drug released from DepoFoam suspensions.

METHODOLOGY

- DepoFoam suspensions containing encapsulated small molecules (bupivacaine, MW 288) or biomolecules of sizes 4kD (undisclosed) and of 19kD (IFN- α -2b) were manufactured using a proprietary double-emulsion method (Pacira Pharmaceuticals, San Diego, CA). DepoFoam suspensions were drawn into and expressed through syringes of varying gauges (21–30G). Following expression, they were tested to determine if passage through the needle resulted in changes in:
 - Particle size distribution (Horiba LA-910 laser light scattering detection)
 - Suspension drug concentration (RP-HPLC)
 - Percent encapsulated drug (RP-HPLC)

RESULTS

Particle Size Distribution

- The particle size distribution of each of the DepoFoam suspensions was measured before (control) and after syringing to determine the effect of syringing on particle integrity and/or aggregation. The particle size distribution of the small-molecule and of each of the 4kD and 19kD biomolecule-containing formulations was unchanged as a result of passage through the syringe/needles (Figures 1, 2, and 3).

Suspension Concentration

- The drug concentration of each of the DepoFoam suspensions was measured before (control) and after syringing. The drug concentration of the small-molecule and of each of the 4kD and 19kD biomolecule-containing formulations was unchanged as a result of passage through the syringe/needles (Figures 4, 5, and 6).

Percent Encapsulation

- The drug concentration of each of the DepoFoam supernatants was measured before (control) and after syringing to determine the impact of syringing on leakage of drug from the particles. The supernatant concentration of the small-molecule and of each of the 4kD and 19kD biomolecule-containing formulations was unchanged as a result of passage through the syringe/needles (Figures 7, 8, and 9).

CONCLUSIONS

- DepoFoam sustained-release multivesicular liposomes can be injected through narrow-gauge needles (21–30G), with no impact on particle integrity or drug encapsulation.
- This study demonstrated that DepoFoam sustained-release formulations can be administered through needles as narrow as 30G without impacting quality.

BUPIVACAINE

Figure 1. Particle Size Distribution of Small-Molecule Formulation Before and After Syringing

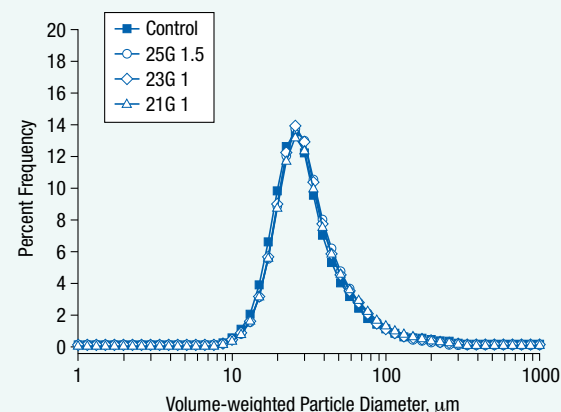


Figure 4. Suspension Concentration of Small-Molecule Formulation Before and After Syringing

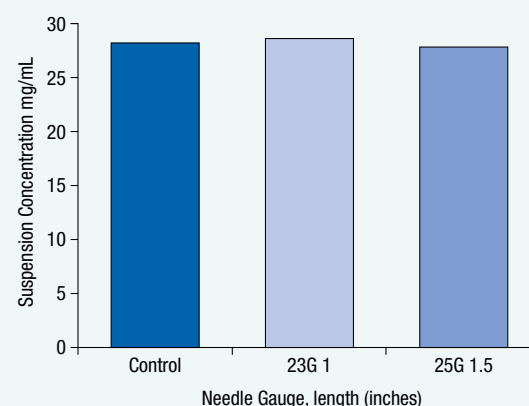
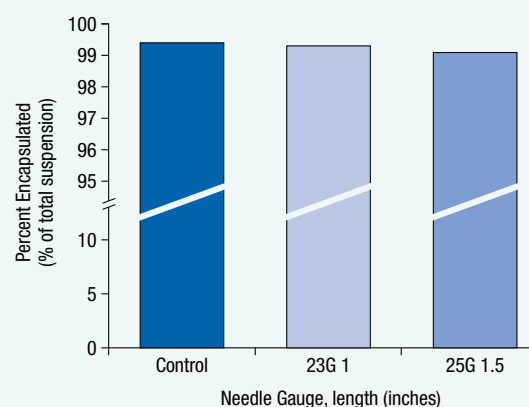


Figure 7. Percent Encapsulation of Small-Molecule Formulation Before and After Syringing



4kD PEPTIDE

Figure 2. Particle Size Distribution of 4kD Formulation Before and After Syringing

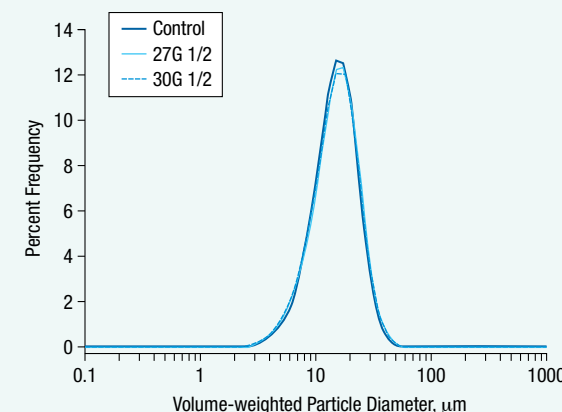


Figure 5. Suspension Concentration of 4kD Formulation Before and After Syringing

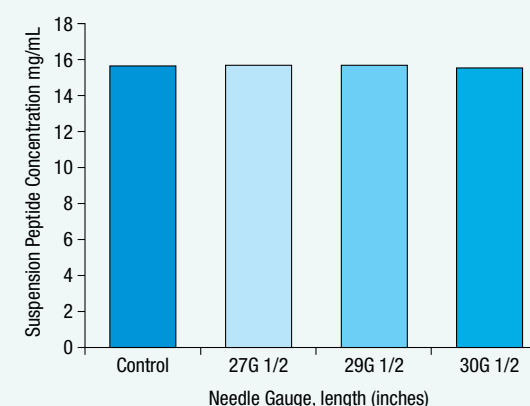
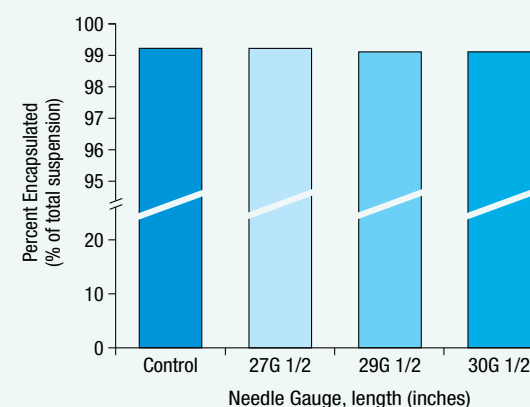


Figure 8. Percent Encapsulation of 4kD Formulation Before and After Syringing



IFN- α -2b

Figure 3. Particle Size Distribution of 19kD Formulation Before and After Syringing

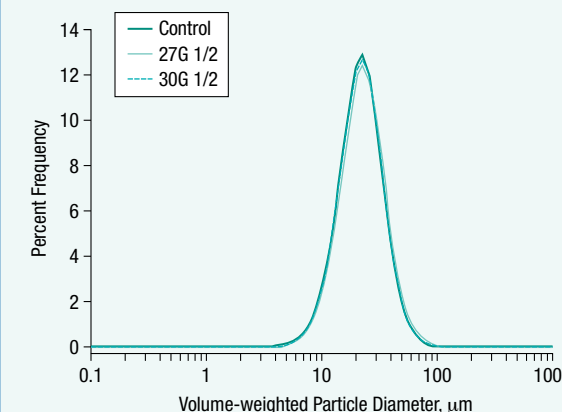


Figure 6. Suspension Concentration of 19kD Formulation Before and After Syringing

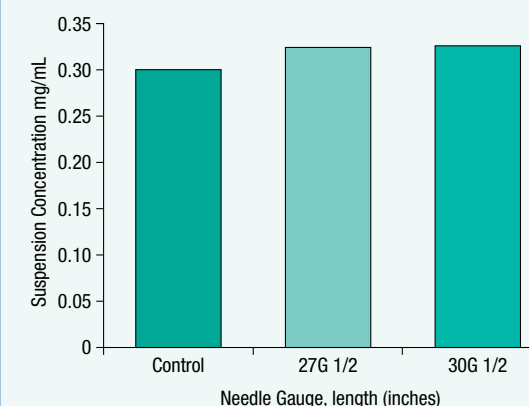


Figure 9. Percent Encapsulation of 19kD Formulation Before and After Syringing

