

## Brotzu Home Brew Guide

### Example from the Patent:

Example 1: preparation of a liposome mixture in the form of a lotion comprising 1% stearylamine

Phosphatidylcholine (Lipid S75 Humangrade) 1 g

DGLA 1.25 mg

S-Equol 7 mg

Ethanol 1 ml

L-propionylcarnitine 7 mg

Stearylamine 10 mg

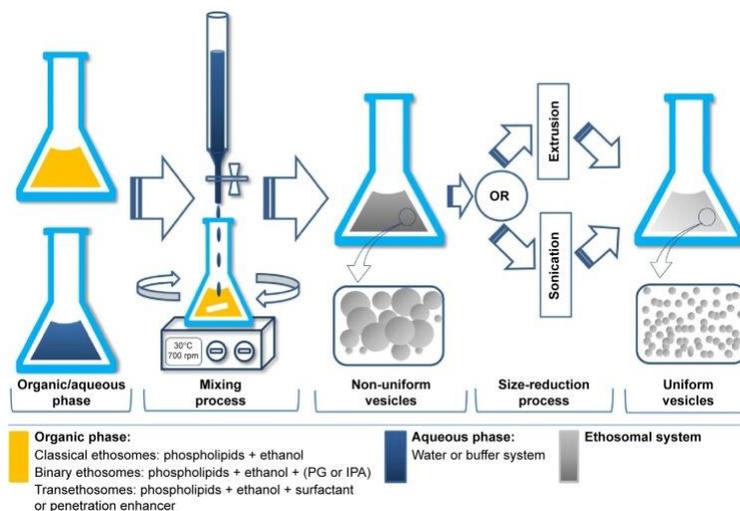
Sterile water 5 ml

DGLA, S-equol and stearylamine are dissolved in the dose of ethanol and phosphatidylcholine is added to the solution. Propionylcarnitine is dissolved in 5 ml of water and the thus obtained solution is added to the previous one. The resulting mixture is placed in a sonicator (Sonipress 150 kw) and submitted to 25 sonication cycles. Each cycle is composed of 5 seconds of full power sonication alternating with 2 seconds of rest. The lotion thus obtained is divided into 5 vials and each one is brought to the volume of 7 ml with additional sterile water. The lotion thus obtained is ready for use.

### A Guide for Making the Ethosome Alternative:

Ethosomes are simply liposomes but called such because they have a higher concentration of ethanol (~30%). The higher amount of ethanol results in better stability, and better penetration.

An example for what a typical ethosome setup will look like is illustrated below:



The addition of propylene glycol to ethosomes also has been shown to increase the stability, decrease the size distribution, increase drug encapsulation, and in most cases increase the penetration.

You'll notice from the diagram that once the solution is combined together the mixture can either be extruded or sonicated to form the uniform <200 nm vesicles. Studies indicate that both these methods produce similar results, and in fact, extrusion is actually superior in terms of uniformity. Since a decent probe sonicator is virtually unobtainable for the average person, an extruder is the obvious choice. Disposable syringe extruders can cost as little as \$9 per month.

#### Chemicals Needed:

- S-Equol (CAS# 531-95-3) [Price: ~\$2/mg]: 7 mg required
- DGLA (CAS# 1783-84-2) [Price: ~\$0.9/mg]: 1.25 mg required
- L-Carnitine [Price: <\$0.01/mg]: 7 mg required
- 95% Ethanol [Price: \$0.01/mL]: 10 mL required
- Sterile water [Price: <\$0.01/mL]: 20 mL required
- Phospholipon 90G [Price: \$1/g]: 1 gram required

**Total Cost:** ~\$16.20/month

#### Materials Needed:

- Extruder (NanoSizer MINI 100 nm) [Price: ~\$9/ea]: 1 required
- 1 mL Luer-Lock Syringe [Price: ~\$0.15/ea]: 2 required (for extrusion)
- Low deadspace needle [Price: ~\$0.09/ea]: 2 required (for extrusion)
- 30 mL Syringe [Price: ~\$0.15/ea]: 1 required (volume measurement)
- Amber 1 oz glass bottle with 1 mL eye dropper
- Glassware
- Mixing device (magnetic stirrer preferred)
- Scale or pre-weighed chemicals

**Total Cost:** ~\$9.63/month

#### **Grand Total: \$25.83/month**

#### Directions:

Measure out 10 mL of ethanol using a 30 mL syringe and pour it into a small (~100mL) glass container. Mix the 1 g of Phospholipon 90G, 7 mg S-Equol, and 1.25 mg DGLA into the ethanol. Stir until dissolved.

Measure out 20 mL of sterile water using a 30 mL syringe and pour into an empty small (~100 mL) glass container. Mix 7 mg of L-Carnitine into the sterile water. Stir until dissolved.

While continuously stirring the ethanol mixture, slowly (dropwise) add the L-carnitine in sterile water to the ethanol mixture. Stir solution for about 30 minutes to allow for adequate time for ethosome formation. (Ideal mixing speed is 700 rpm)

Draw up 1 mL of the ethosome solution into the 1 mL Luer-lock syringe. Position both syringes into the extruder unit. Push through the extruder unit 11 times to form a uniform ethosome solution. Place the 1 mL of extruded solution the amber 1 oz glass bottle. Repeat this sequence with the remaining 29 mL of unextruded ethosome solution.

Store in refrigerator. >1 month shelf life. Apply 1 mL daily.