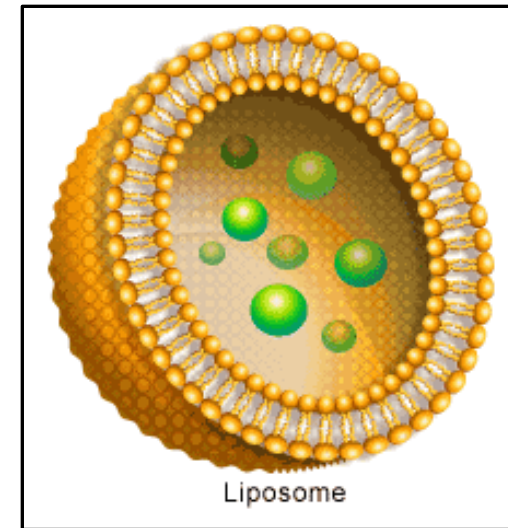


THE PREPARATION OF
LIPOSOMES

Alys Reed
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Louisiana State University
Mentor: Dr. Ram Devireddy
LA-SIGMA REU Summer 2012

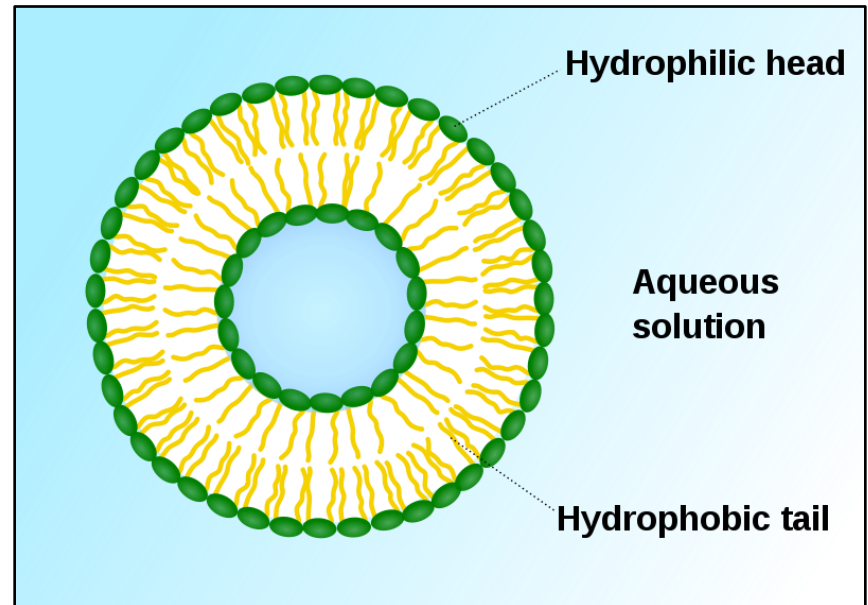
STRUCTURAL COMPONENTS

- Artificially prepared vesicle
- Concentric bilayer phospholipid structures enclosing aqueous core
- Lipid chains with surfactant properties
- Surface ligands

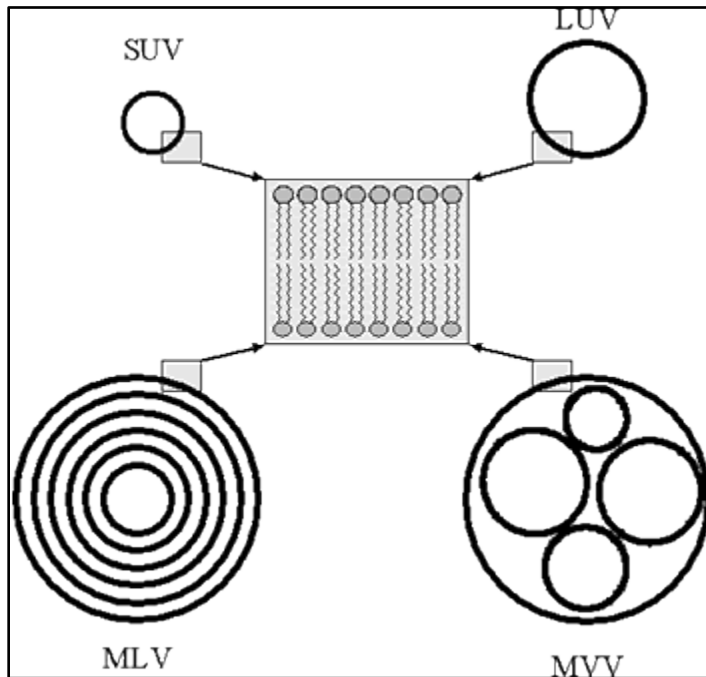


PHOSPHOLIPID'S STRUCTURE

- Amphiphilic
 - Contains both hydrophilic and lipophilic components
- Hydrophilic head
 - Alcohol and Phosphate group
- Hydrophobic tail
 - Long fatty acid hydrocarbon chains



TYPES AND CLASSIFICATION



- Distinguished by number of lamellae and size
- Small unilamellar vesicles – SUV
- Large unilamellar vesicles- LUV
- Multilamellar vesicles – MLV
- Multivesicular vesicles - MVV

TYPES AND CLASSIFICATION

SUV

- Smaller than 50 nm

LUV

- Larger than 50 nm

MV

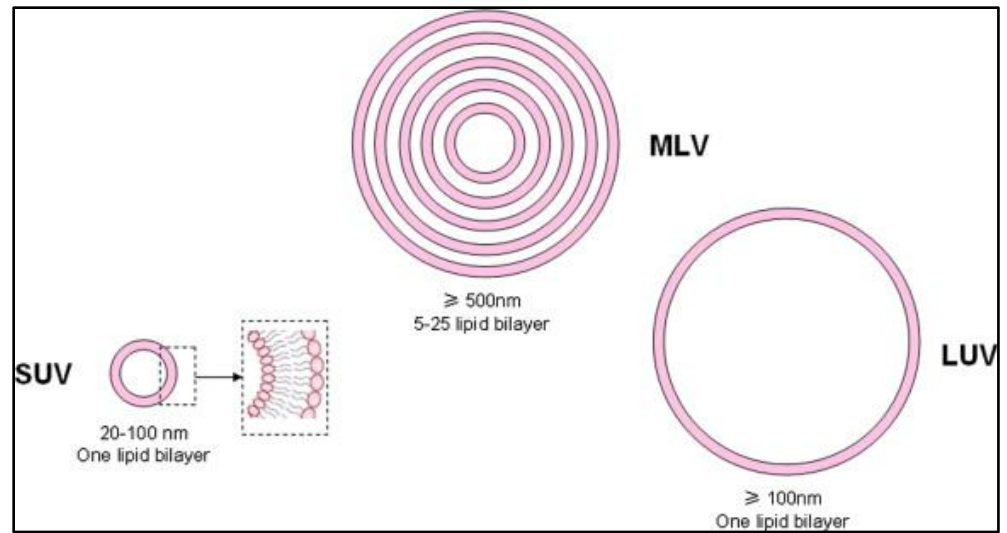
- 2,000 – 40,000 nm

GUV

- 10,000 – 10,000,000 nm

MLV

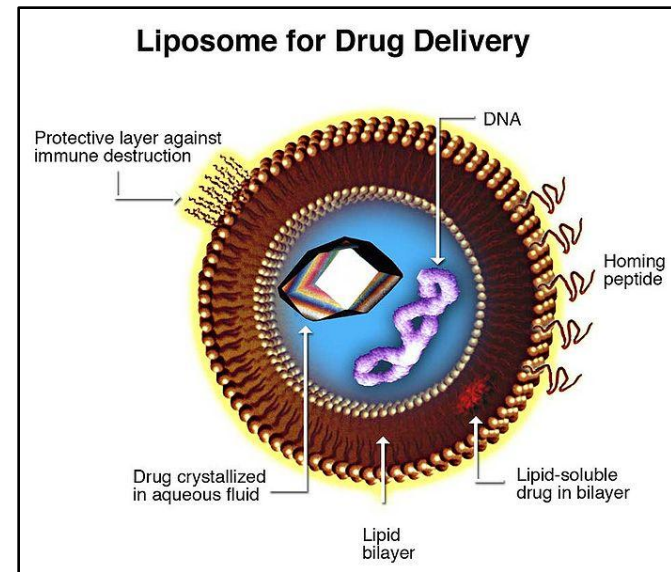
- 500 nm to 10,000 nm



CAPABILITIES

- Administration of nutrients and pharmaceutical
 - Vaccines
 - Vitamins and Dietary supplements
 - Delivery of dyes to textiles
 - Pesticides to plants
 - Enzymes and nutritional supplements to foods
 - Cosmetics to skin

- Model for artificial cells



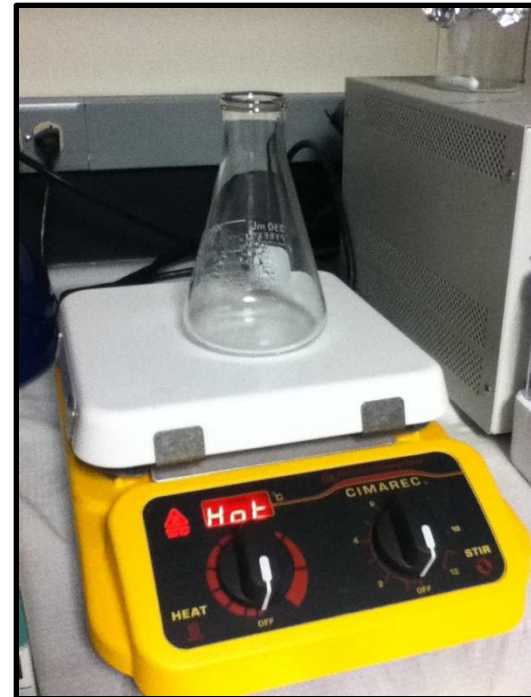
HEATING PREPARATION METHOD

WHY THE HEATING APPROACH?

- Simple and time efficient
- No organic solvent residues
- Sterilization not required
- Stable product
- Large scale production

CONS

- Population heterogeneous



PROCEDURE

LIPID COMBINATION



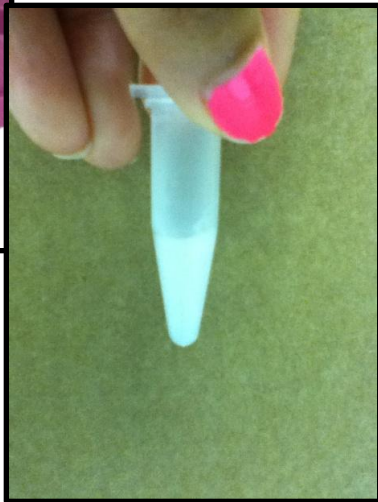
1,2-distearoyl-sn-glycerol-3-phosphocholine

MEASURE AND RECORD MASS OF LIPIDS

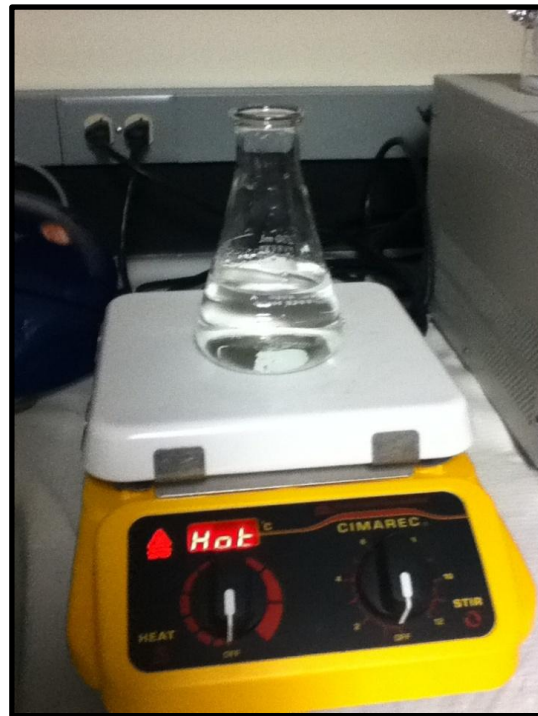


PROCEDURE

ADD PHOSPHATE BUFFER
SALINE TO LIPID SUSPENSION



HEAT IN FLASK AT MAX
TEMPERATURE 100°C



PROCEDURE

FILTRATION SYSTEM

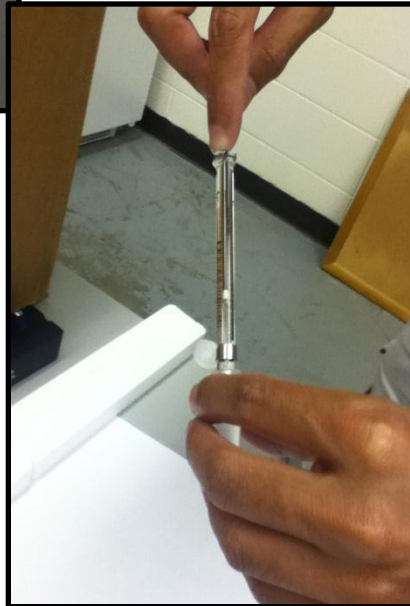


DISMEMBER AND INSERT MEMBRANE FILTER

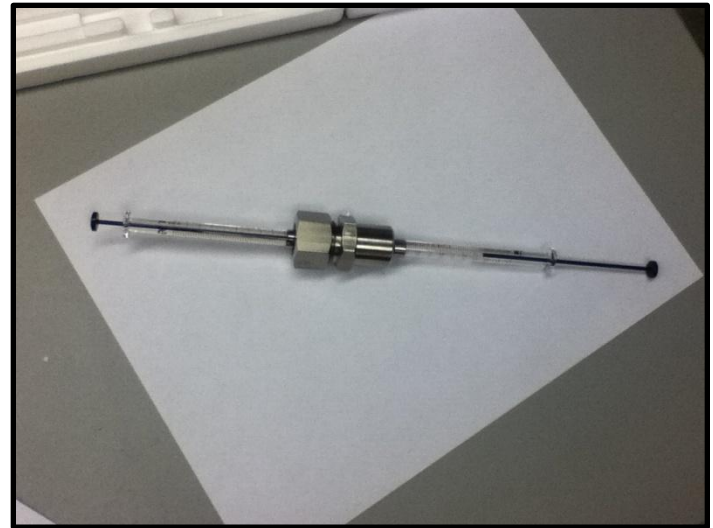


PROCEDURE

**RE-ATTACH AND OBTAIN 250 μ L
OF LIPOSOMES**



**ATTACH SECOND SYRINGE DIRECTLY
PARALLEL TO FIRST SYRINGE**



PROCEDURE

ALTERNATE INJECTIONS



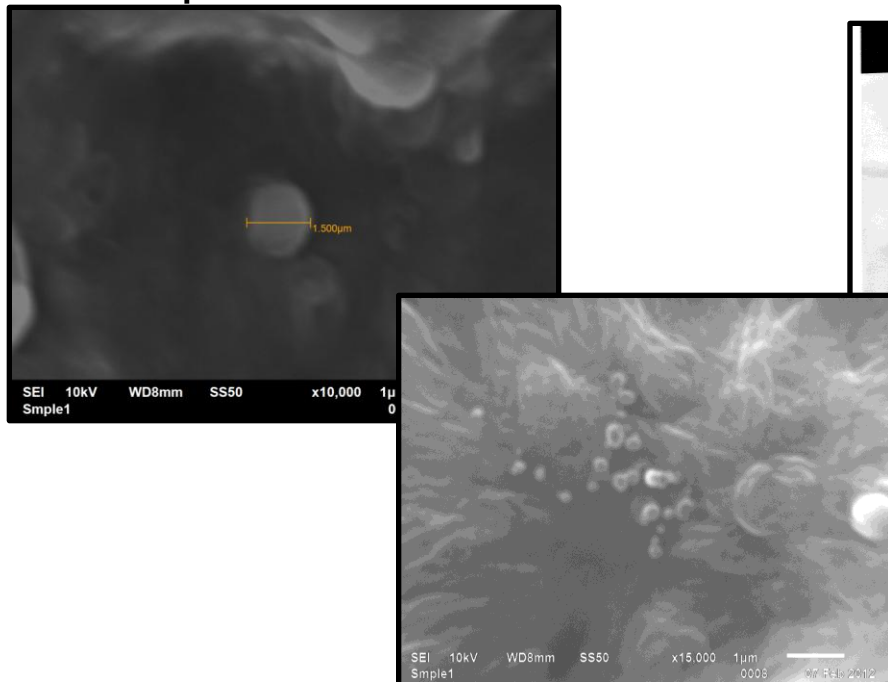
ANALYZE WITH MICROSCOPY



CHARACTERIZATION

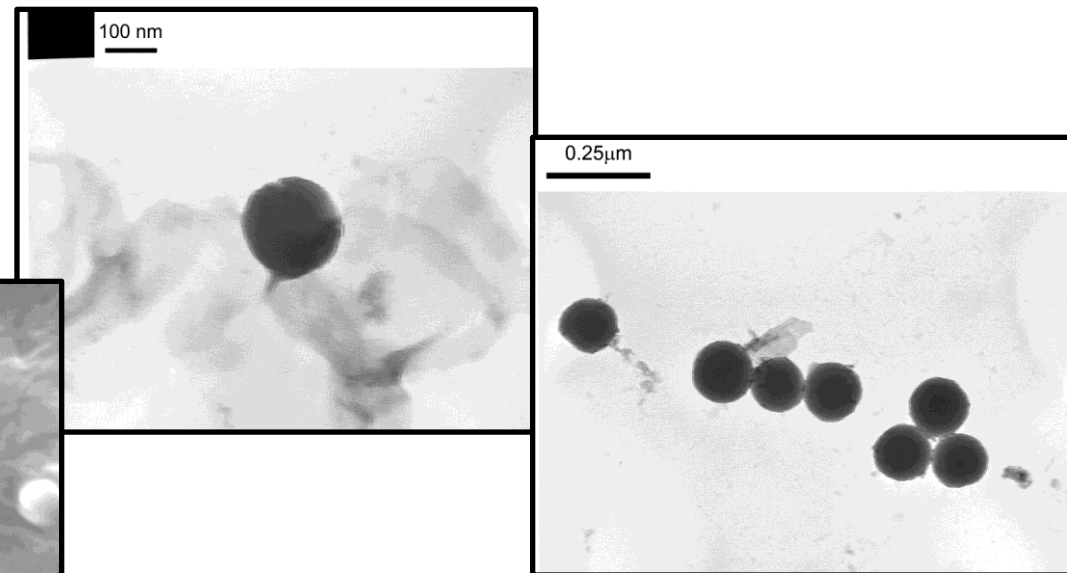
SCANNING ELECTRON MICROSCOPE- SEM

- Scans sample with a beam of electrons in a raster scan pattern



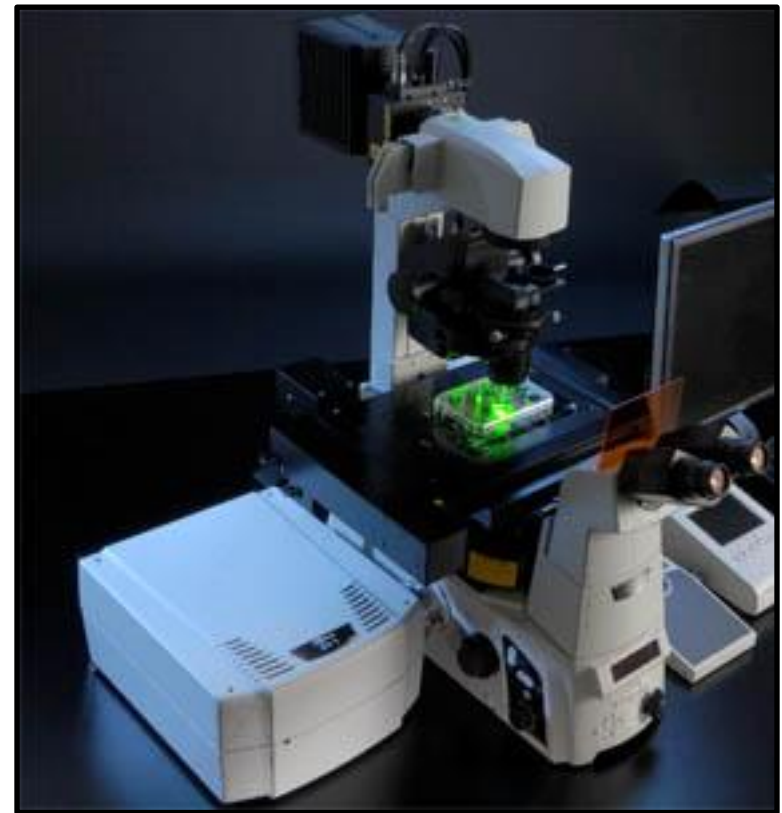
TRANSMISSION ELECTRON MICROSCOPE-TEM

- Beam of electrons transmitted through ultra thin specimen



FUTURE ENDEAVOURS

- Interaction between nanoparticles and liposomes



**ARE THERE ANY
QUESTIONS?**
