

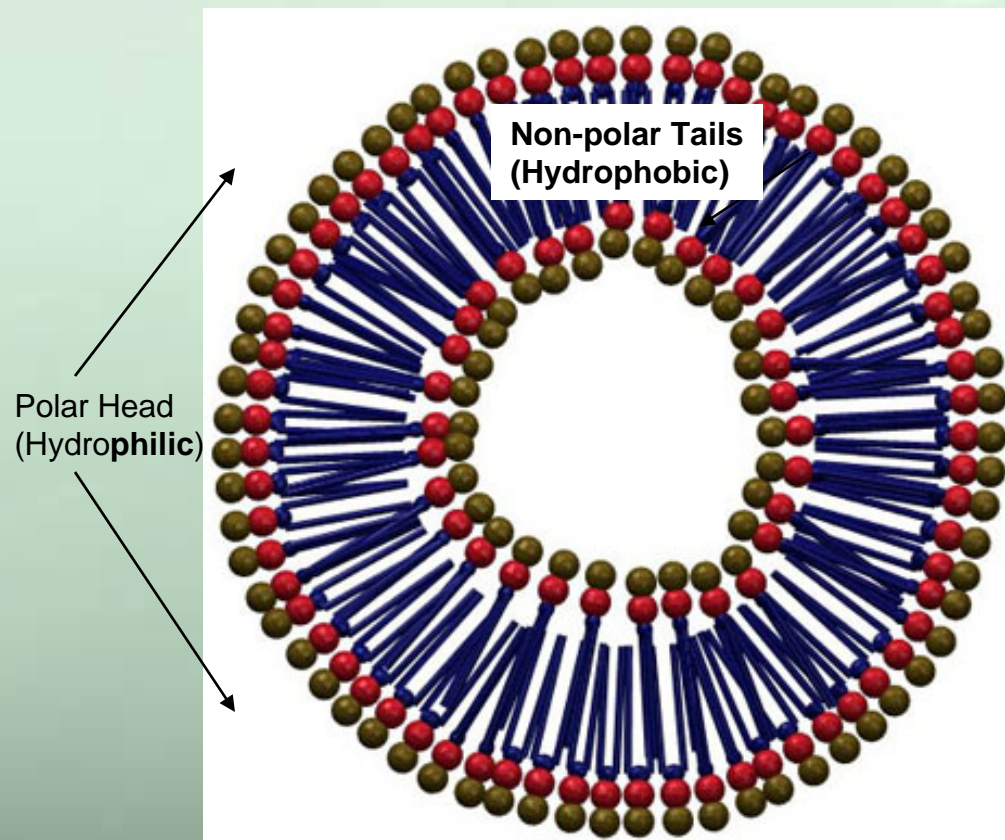


Liposomes: Vehicles for DNA, Drugs

Analysis of Membrane Fluctuations Induced via Laser Directed Deformation

Joe Meszaros, Wolfgang Losert, Cory Poole

Vesicle Composition: The Importance of Diversity

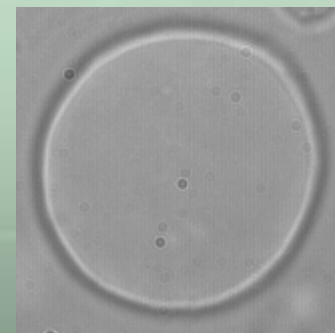
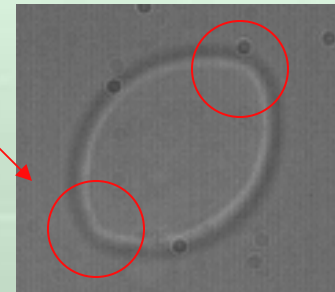


- Allows for self-assembly
- Excludes water from transmembrane space
- Permits incorporation of various molecules
- Large phosphate head

Minimizing Energy

- Local curvature matters
- Small κ , small E !
- Larger radii means smaller κ
- Circles, **not** ellipses
- Nature does the work

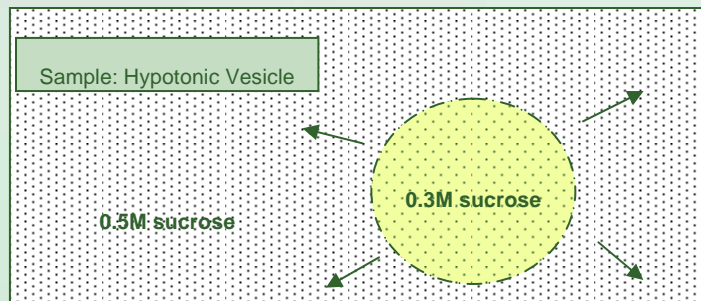
Regions of high steric strain



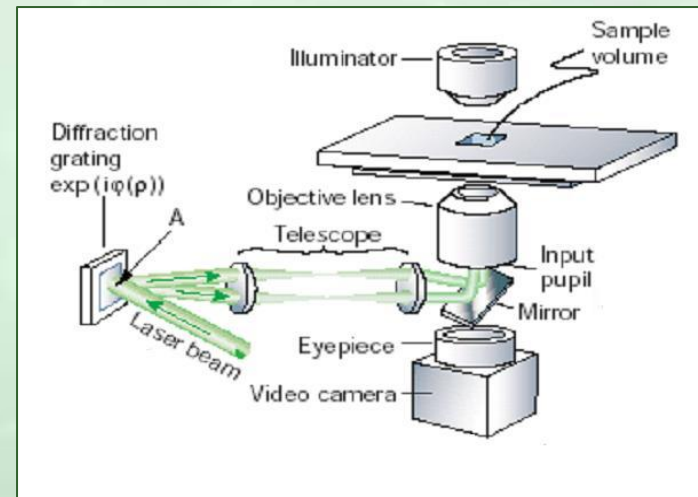
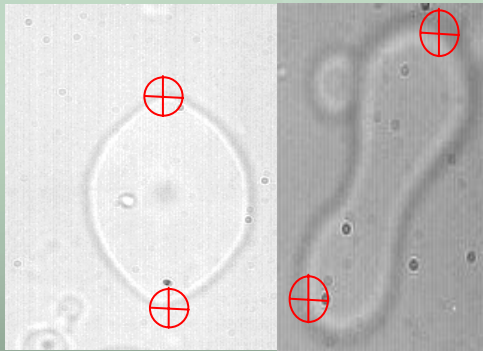
Energy



Inducing Deformations



A vesicle with a higher sugar concentration in its environment will have water diffusing outward.



Momentum of the laser photons traps particles with higher refractive indices (n).

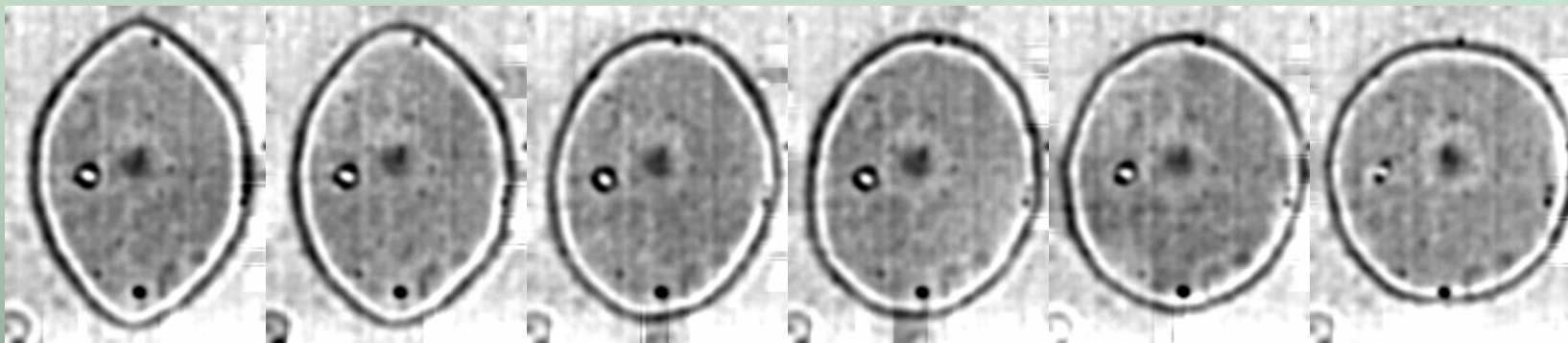
$$n_{\text{sucrose}} > n_{\text{glucose}}$$

In lieu of movies



0 seconds

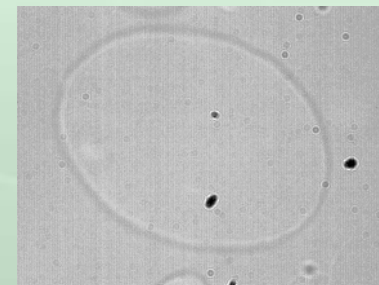
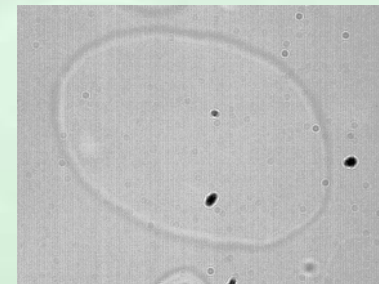
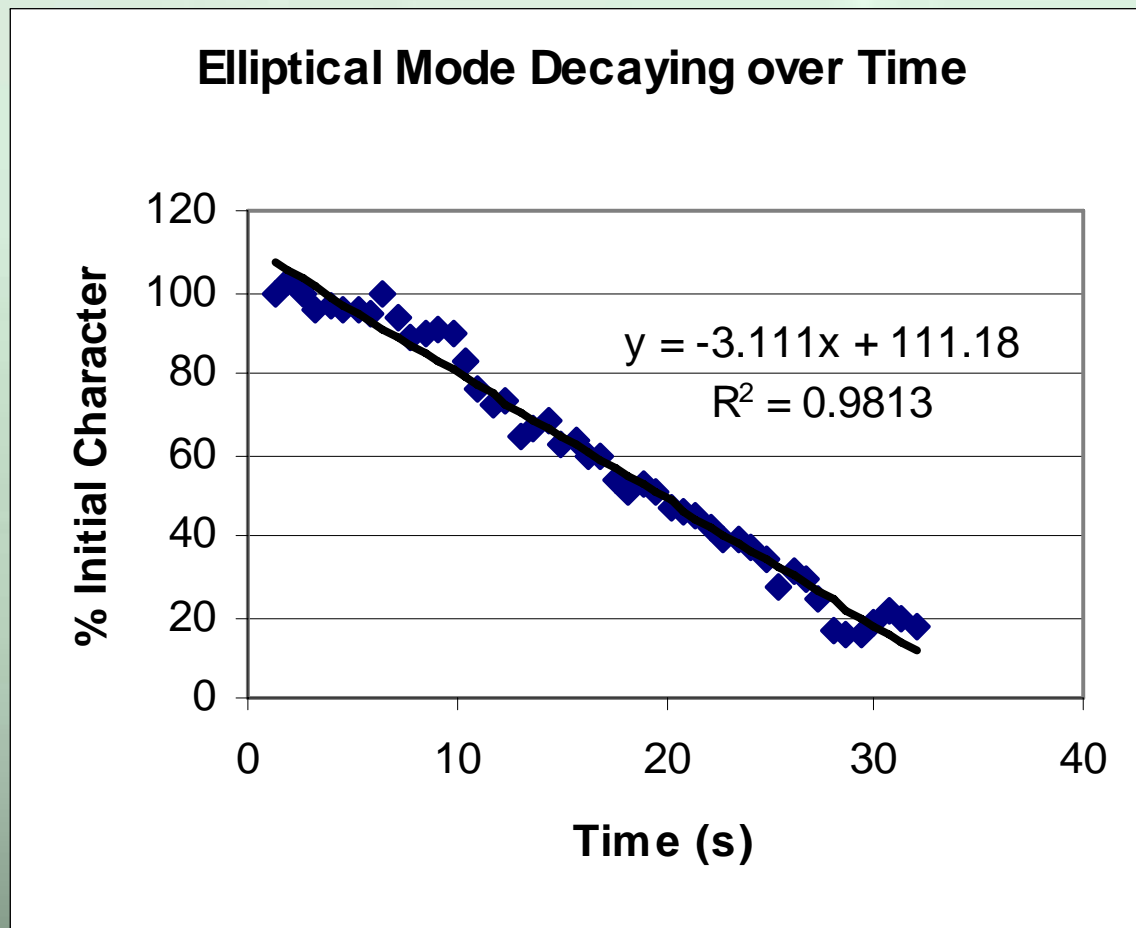
→ 4 seconds



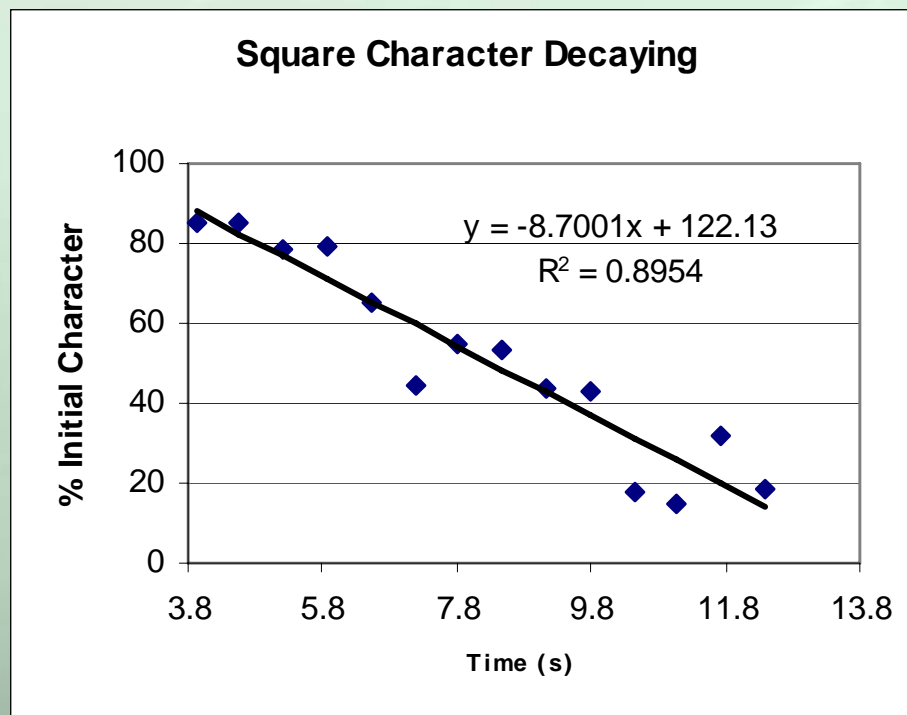
0 seconds

→ 30 seconds

Nature at Work: Losing the Elliptical Mode

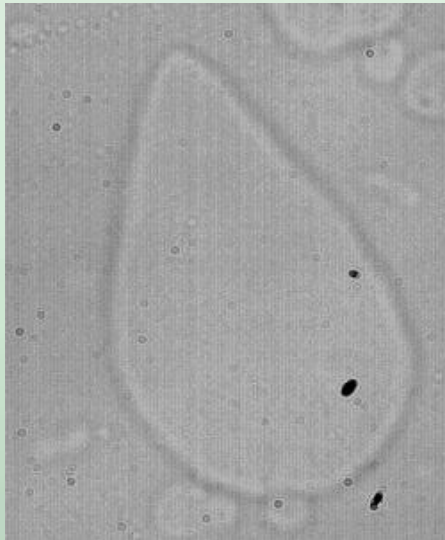


Visualizing Higher Modes

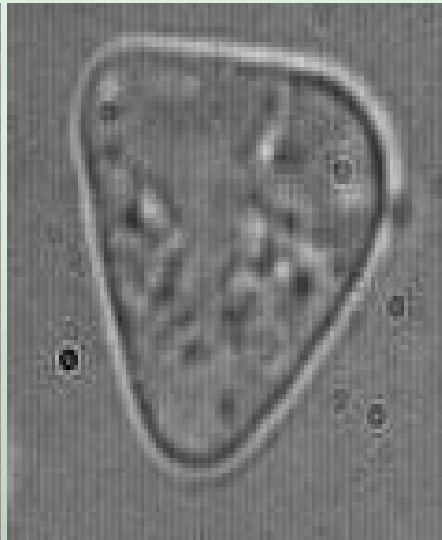


- Decay time = 10 s
- Elliptical decay time for the same GUV was 30 s
- 3x more rapid decay for the square mode

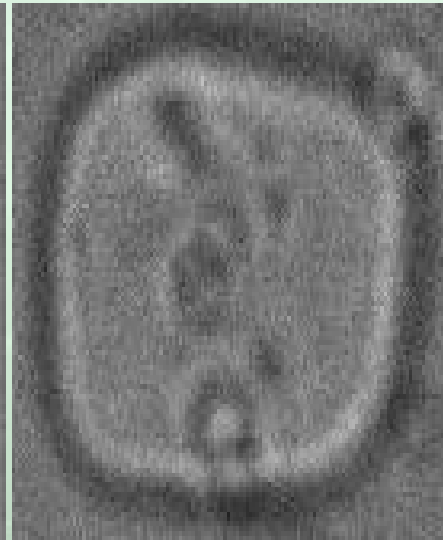
More Shapes to Amaze and Excite.



Teardrop



Slice of Pizza



TV screen



You decide!

- Appeal to the masses and guarantee more funding