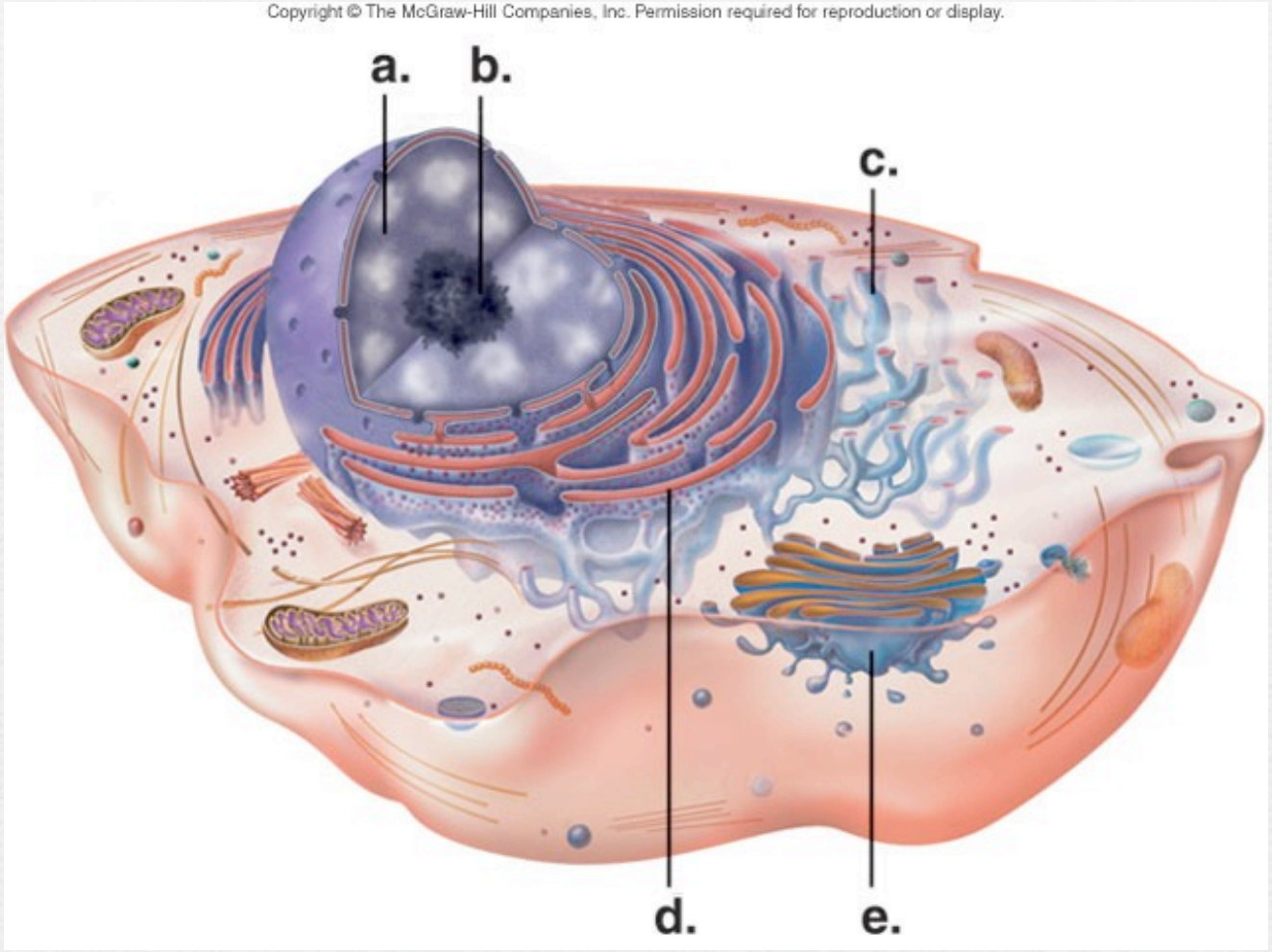
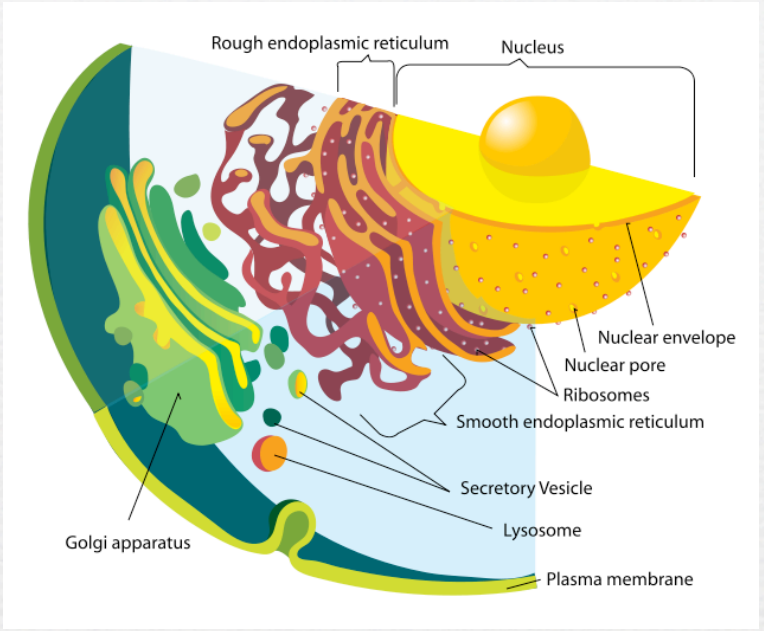
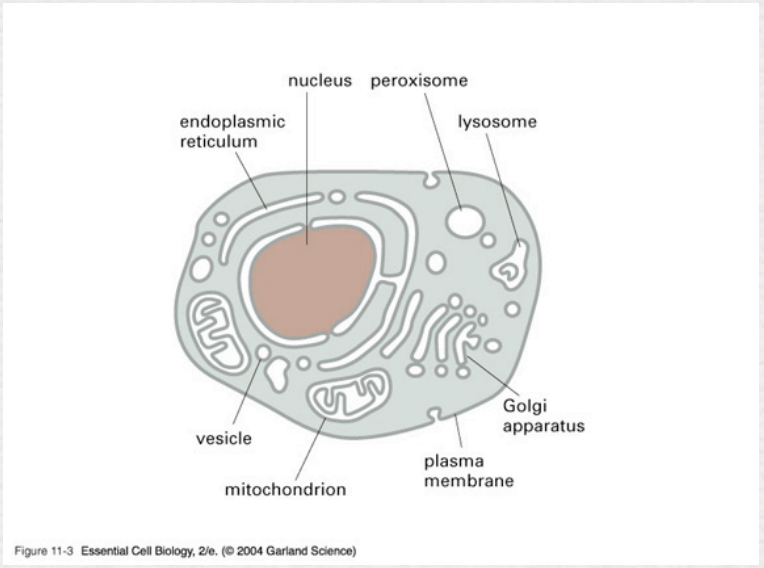
insane in the membrane







cells and their membranes

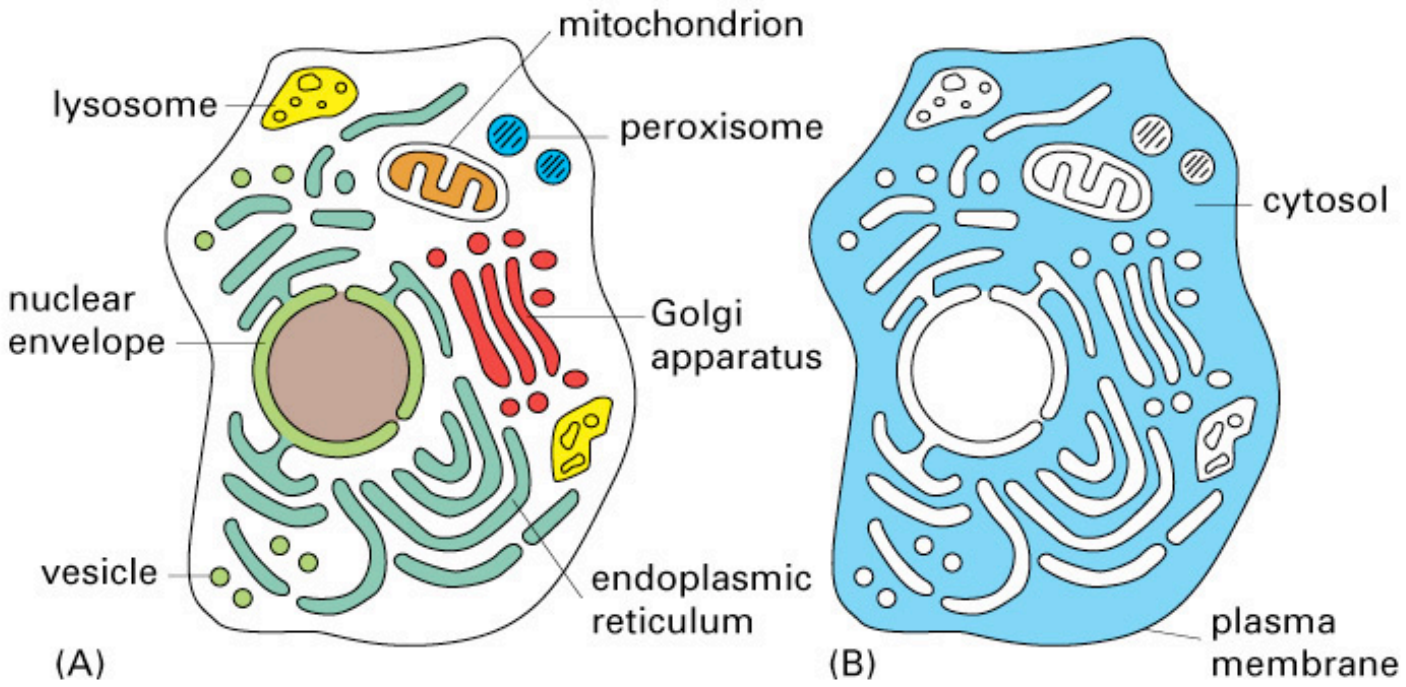


Figure 1-24 Essential Cell Biology, 2/e. (© 2004 Garland Science)

lipids

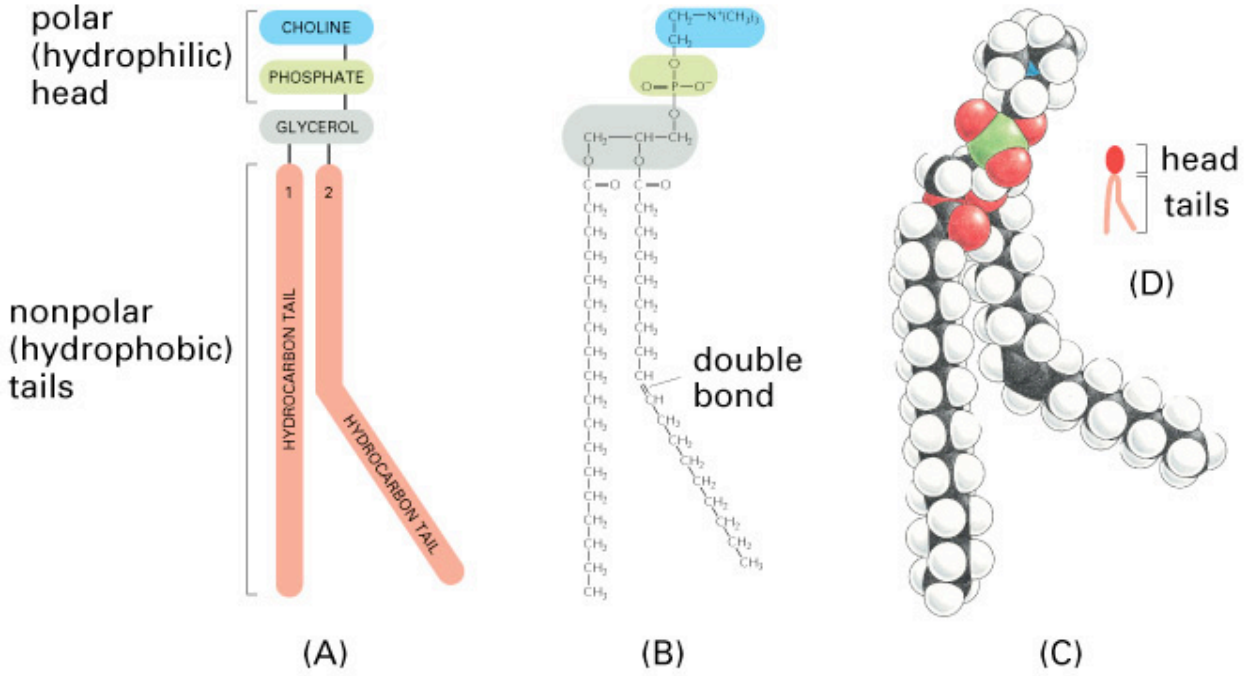
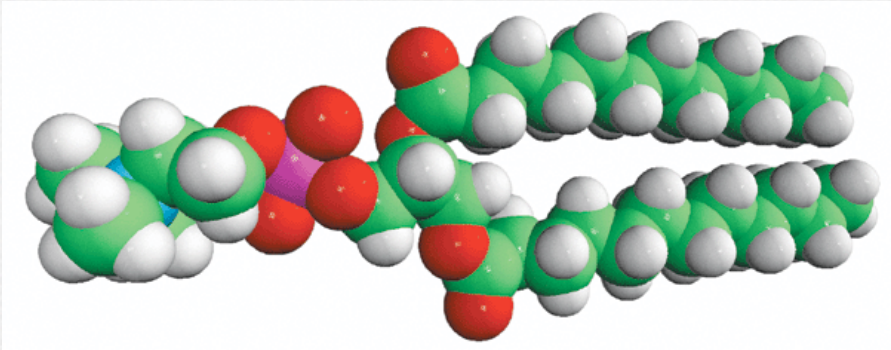


Figure 11-6 Essential Cell Biology, 2/e. (© 2004 Garland Science)

lipid bilayers



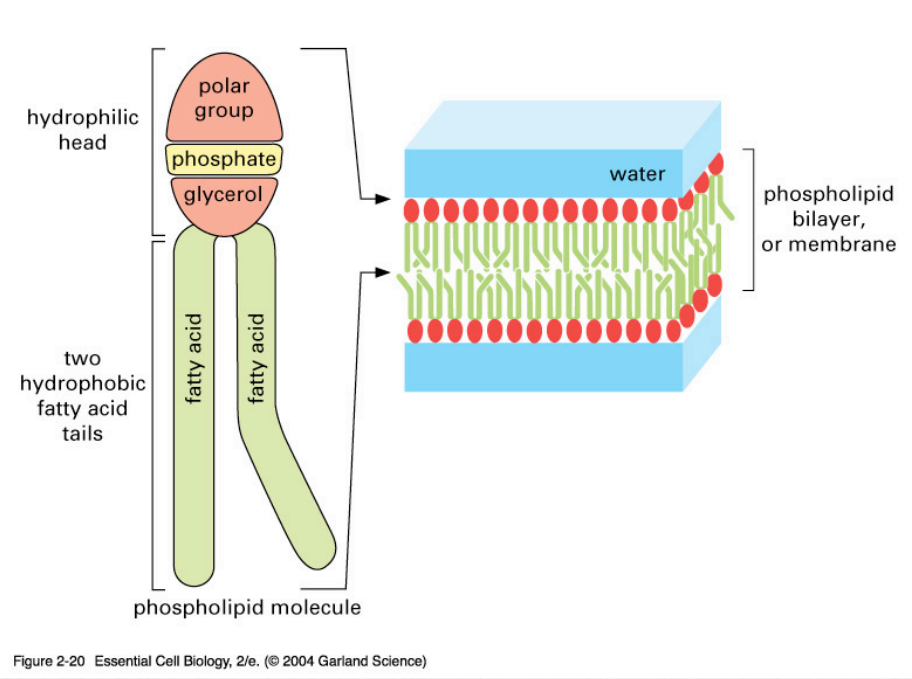
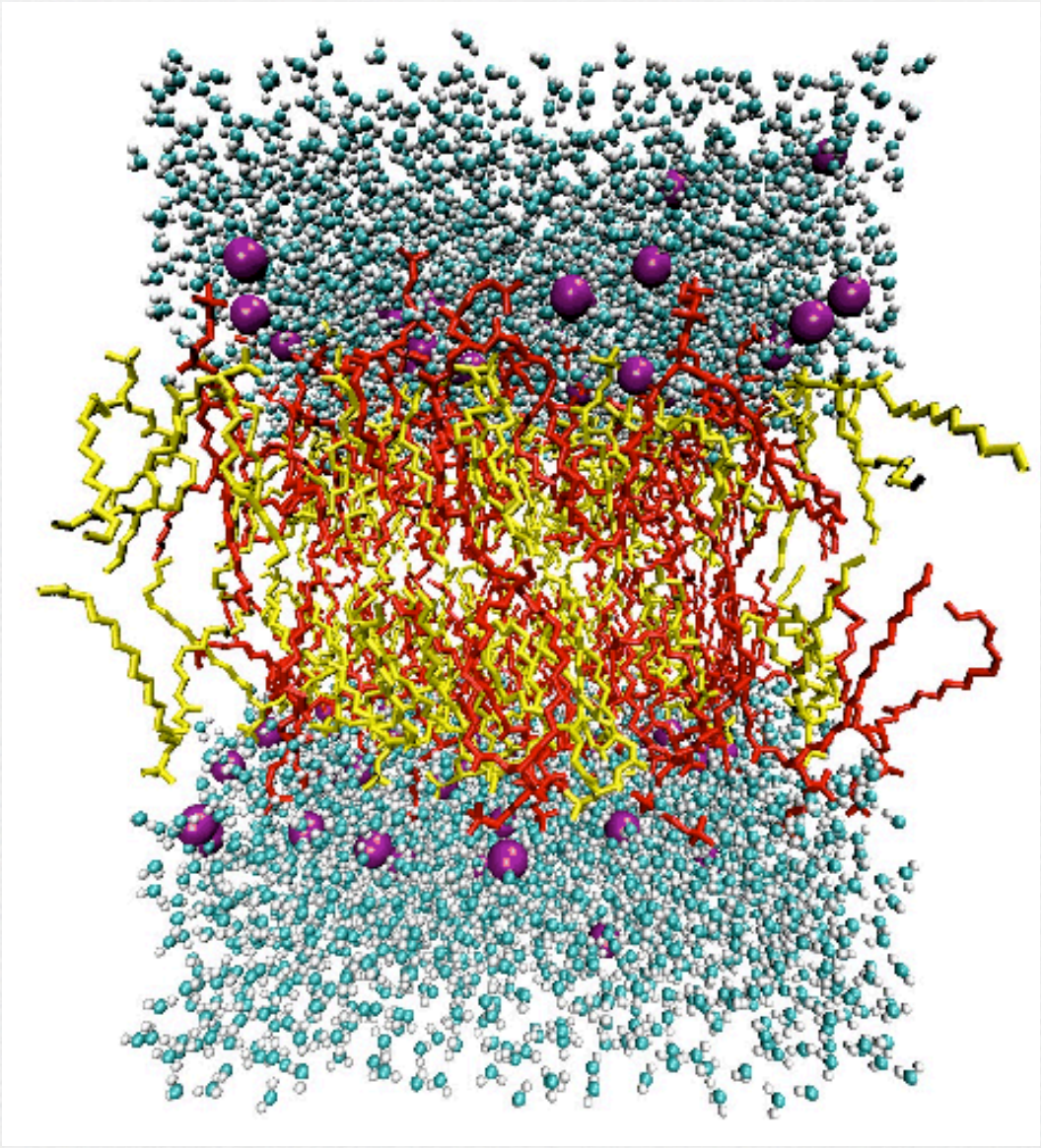


Figure 2-20 Essential Cell Biology, 2/e. (© 2004 Garland Science)



membrane traffic

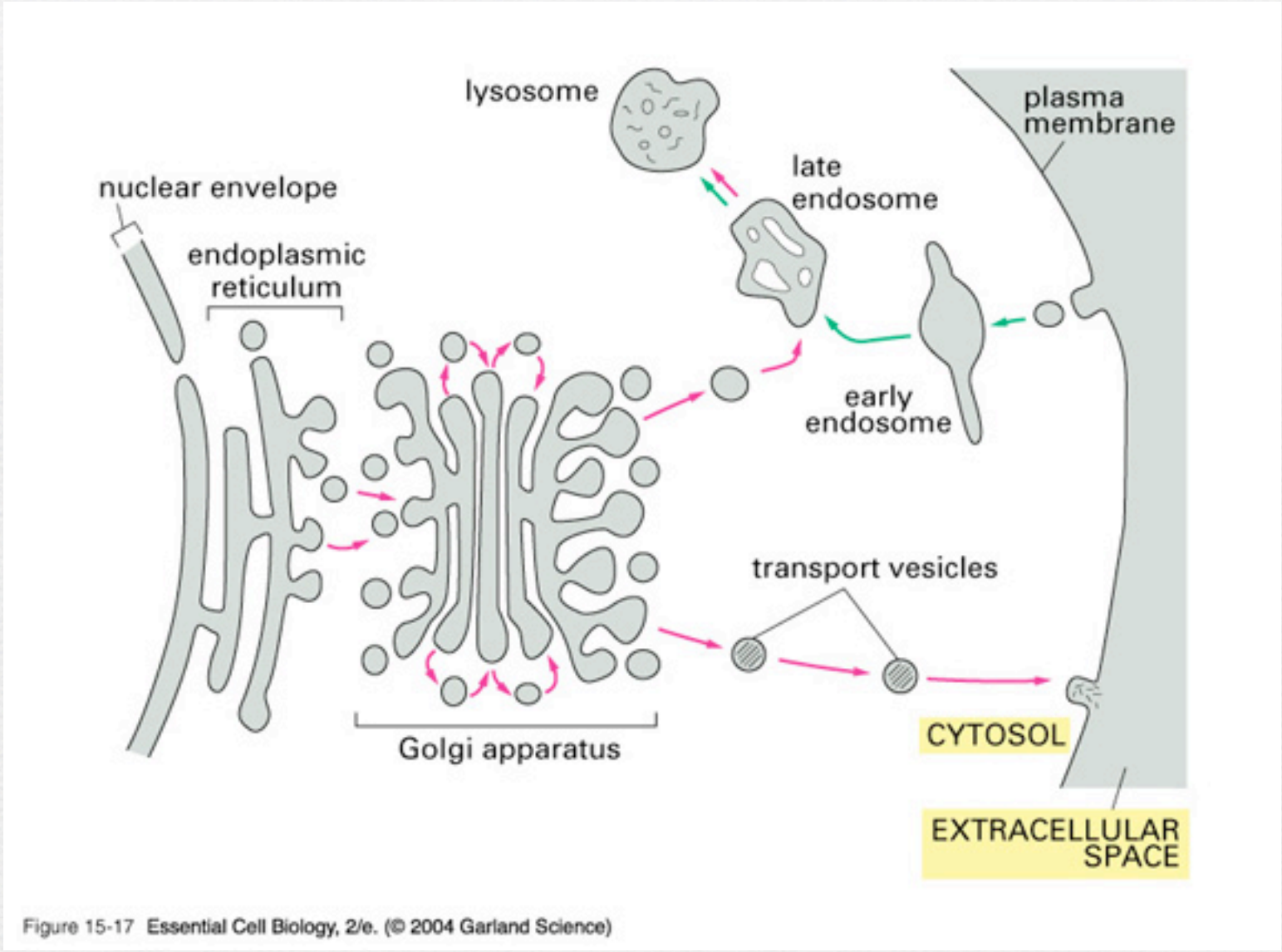
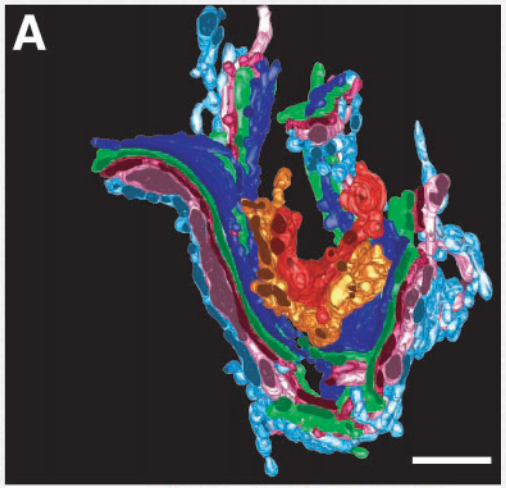
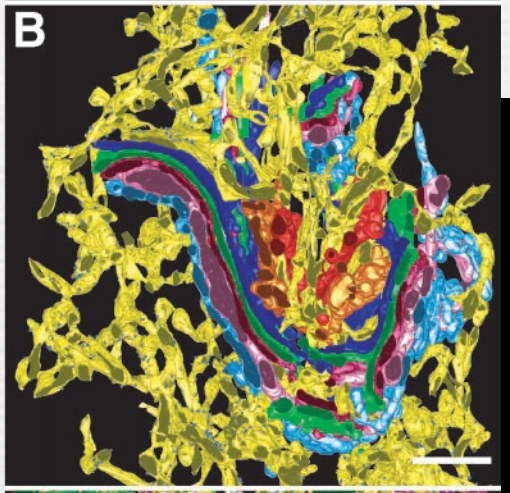
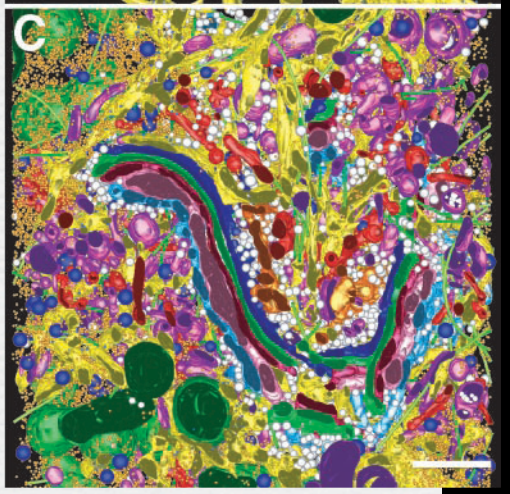


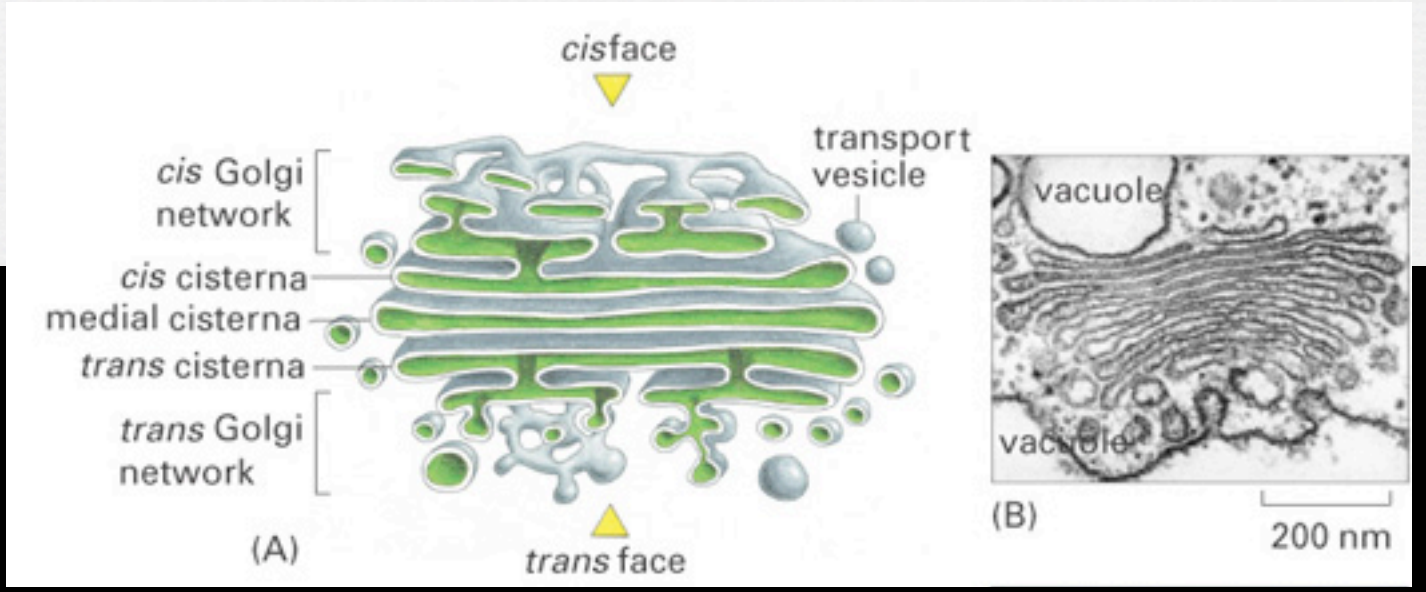
Figure 15-17 Essential Cell Biology, 2/e. (© 2004 Garland Science)

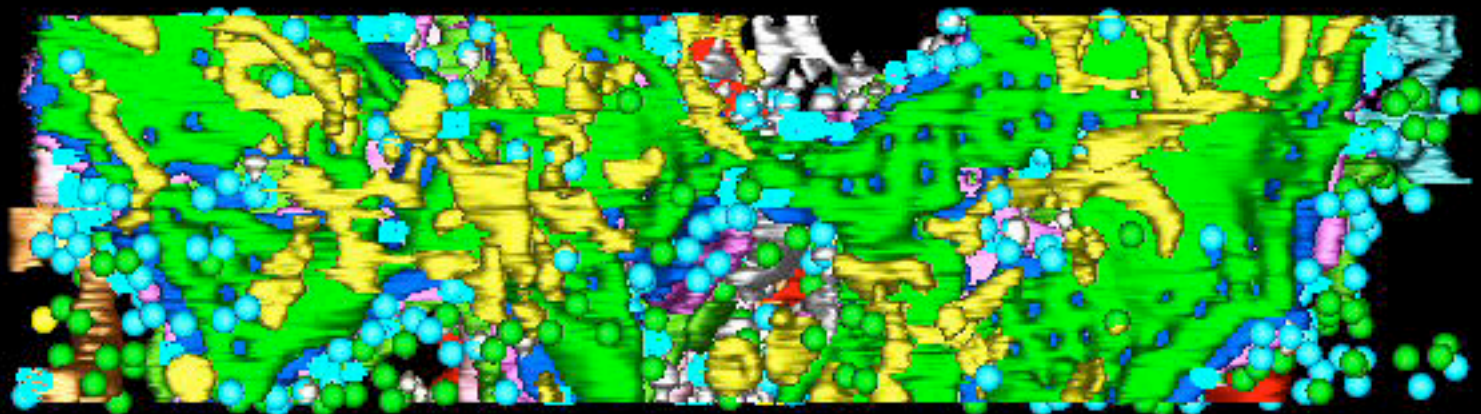
golgi


A

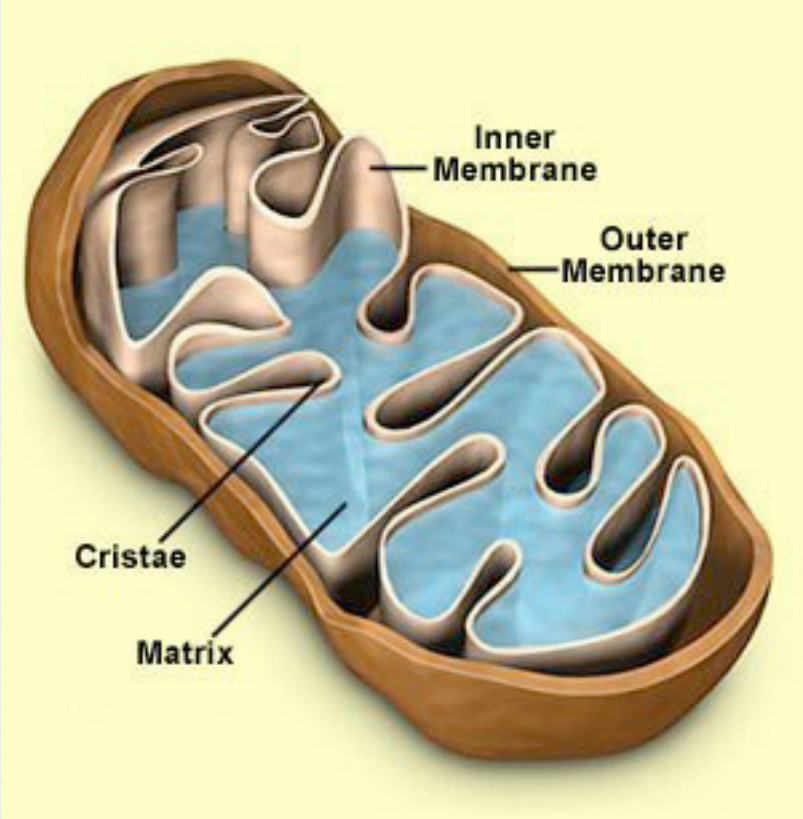

B


C

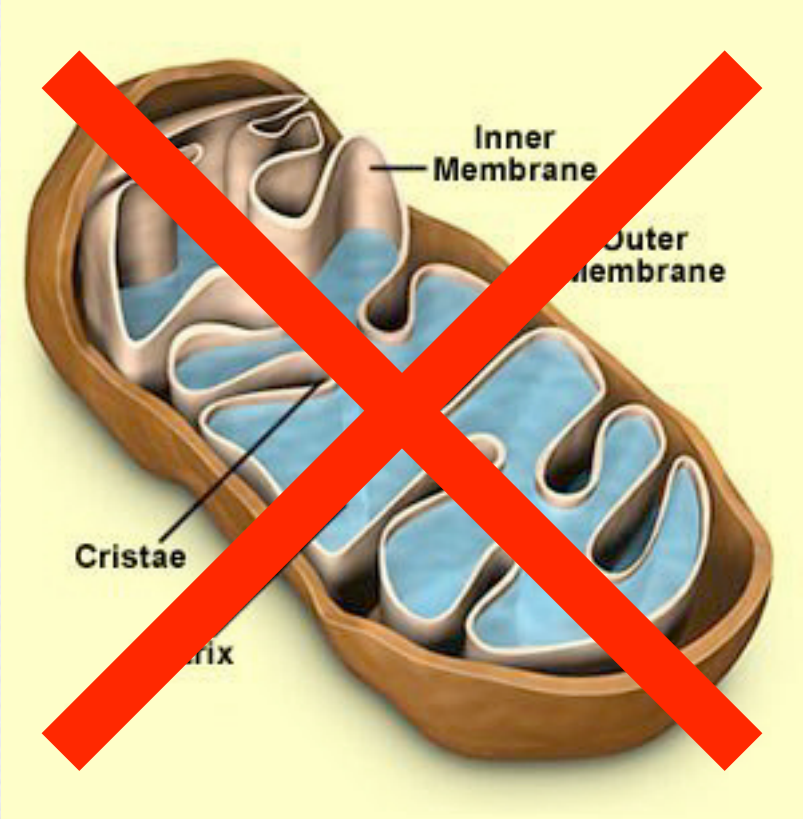

cisface
transport vesicle
cis Golgi network
cis cisterna
medial cisterna
trans cisterna
trans Golgi network
(A)
trans face
vacuole
vacuole
(B)
200 nm



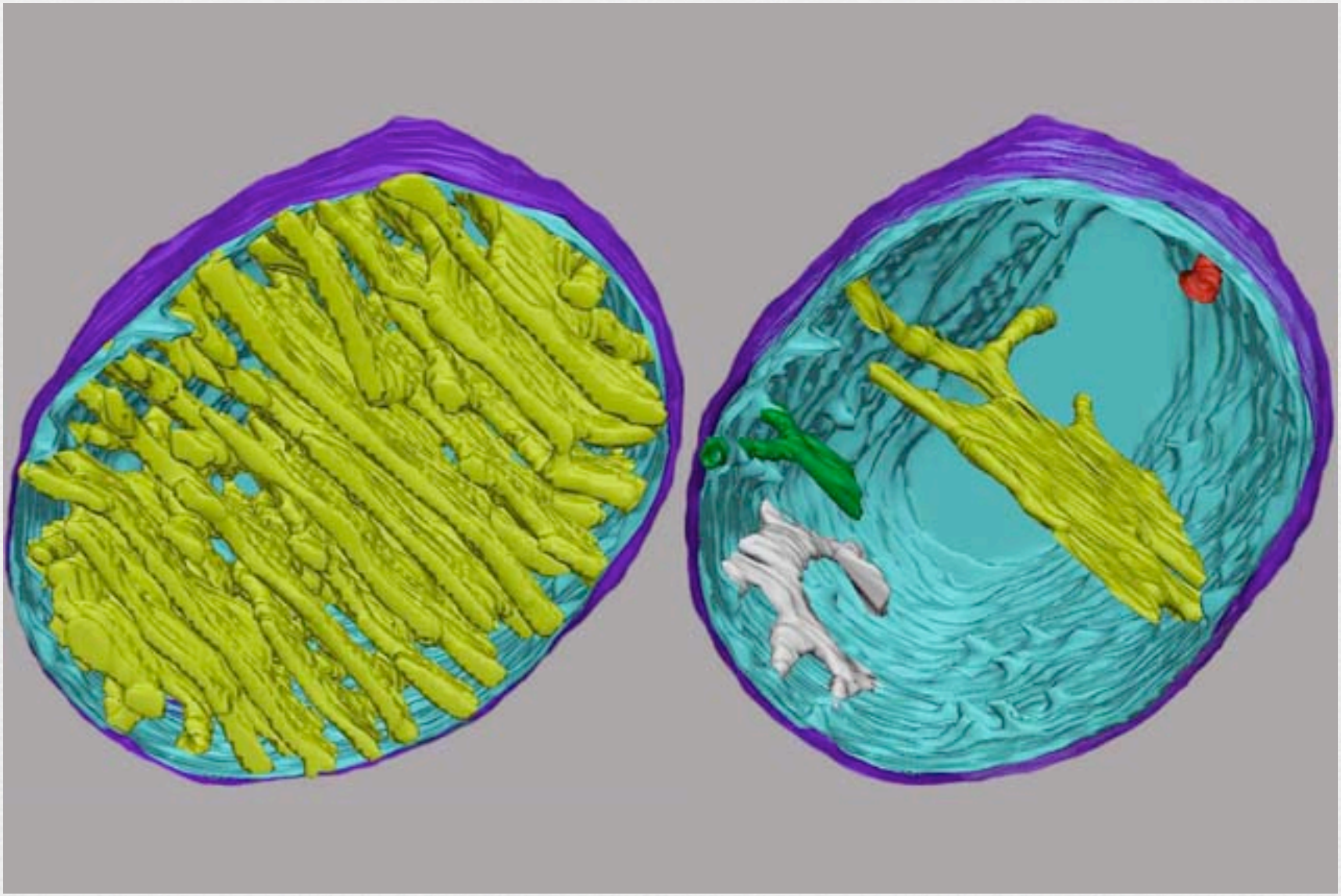
mitochondria

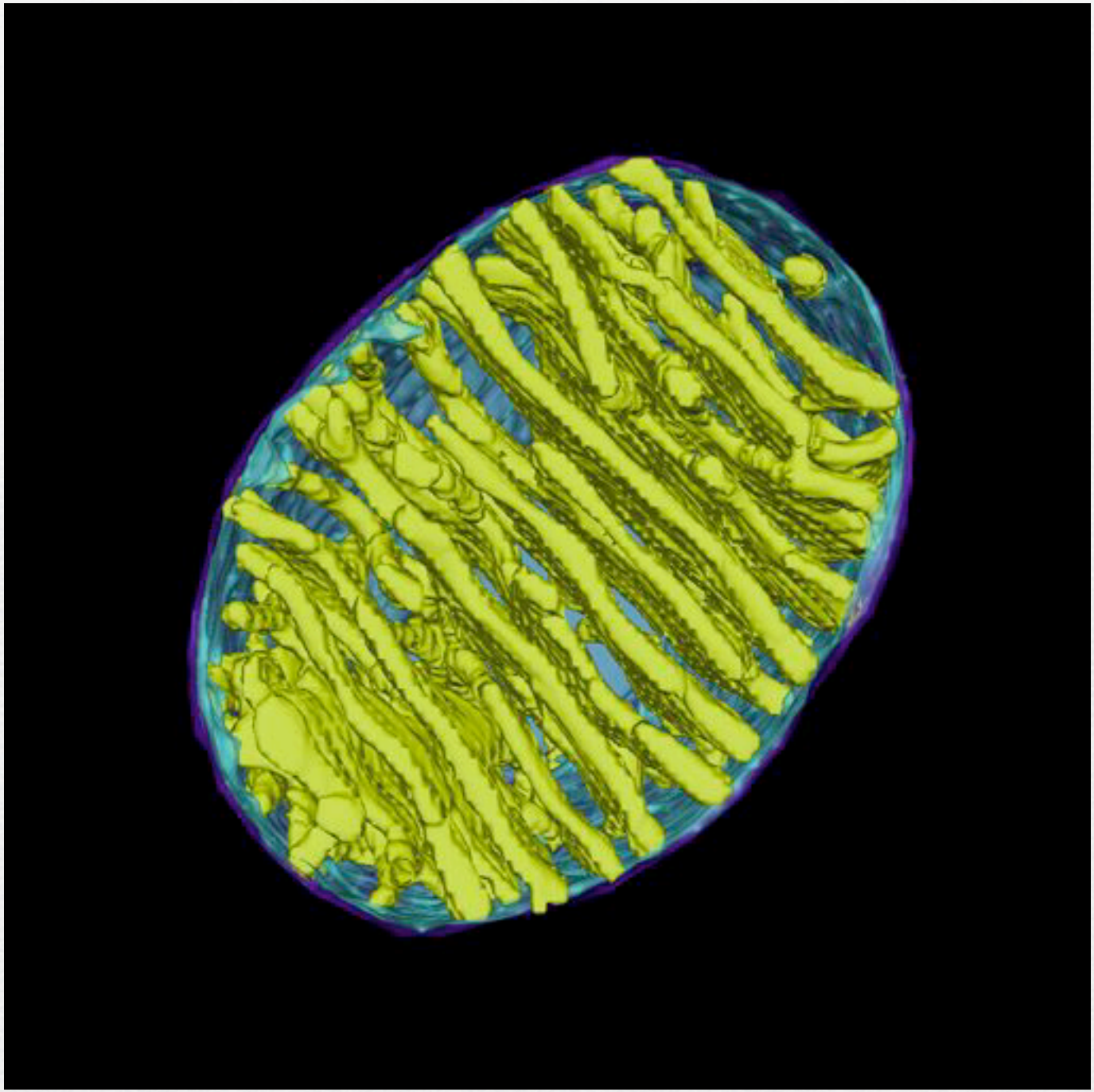


mitochondria

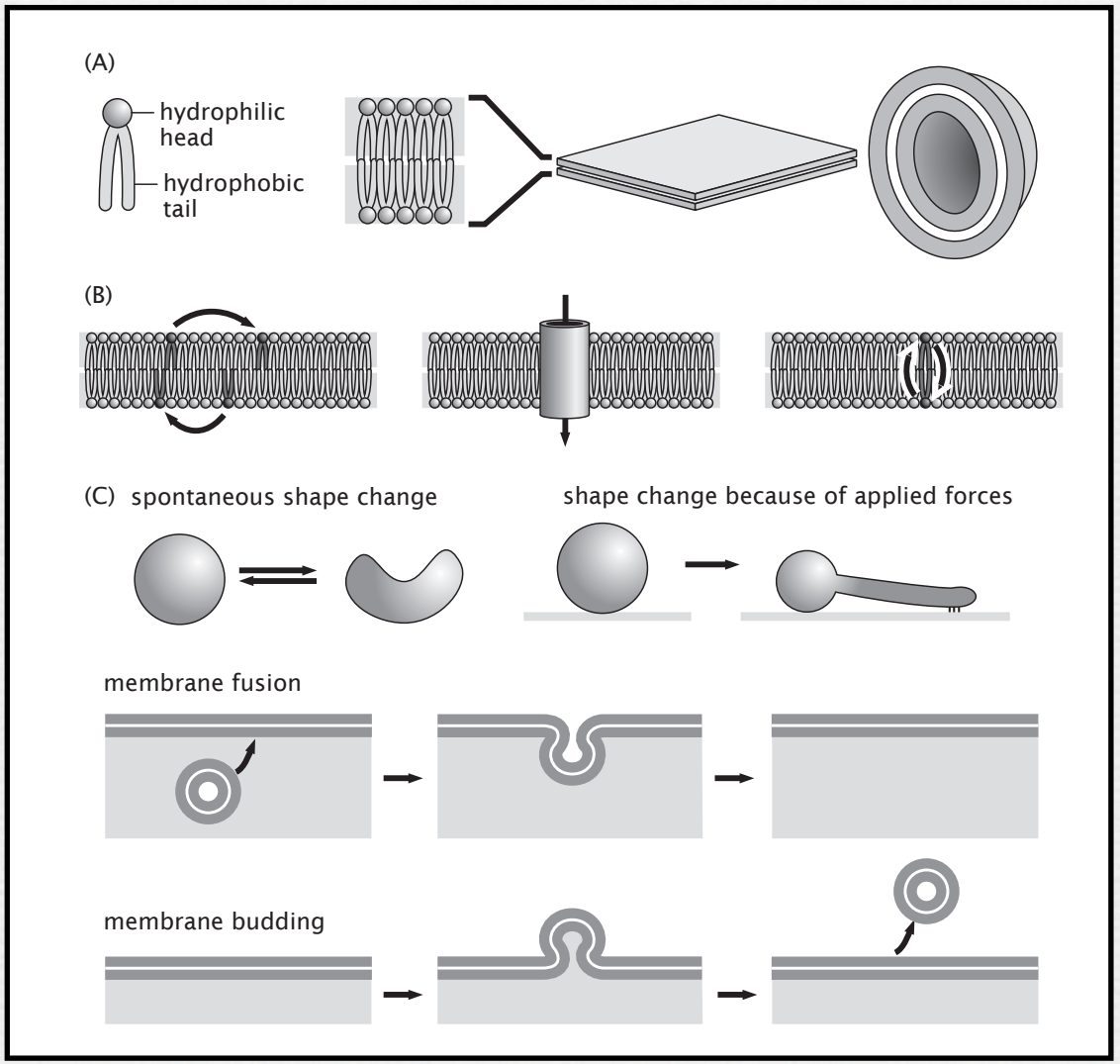


mitochondria

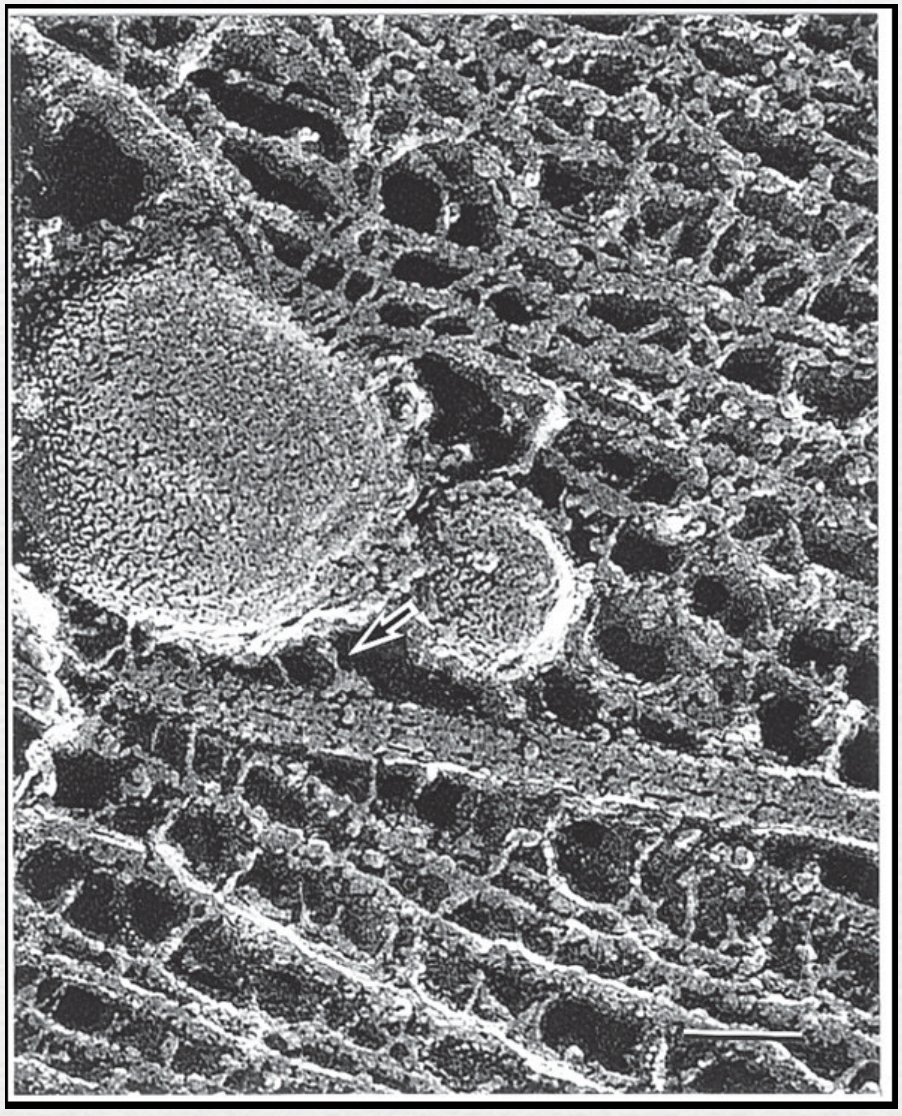




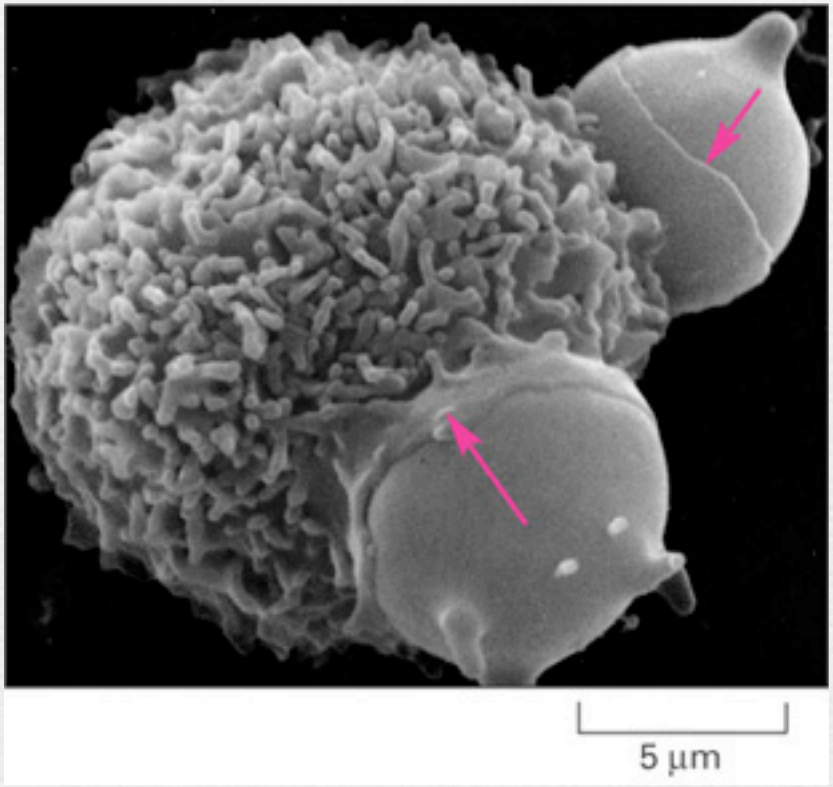
i know what the membrane did last summer

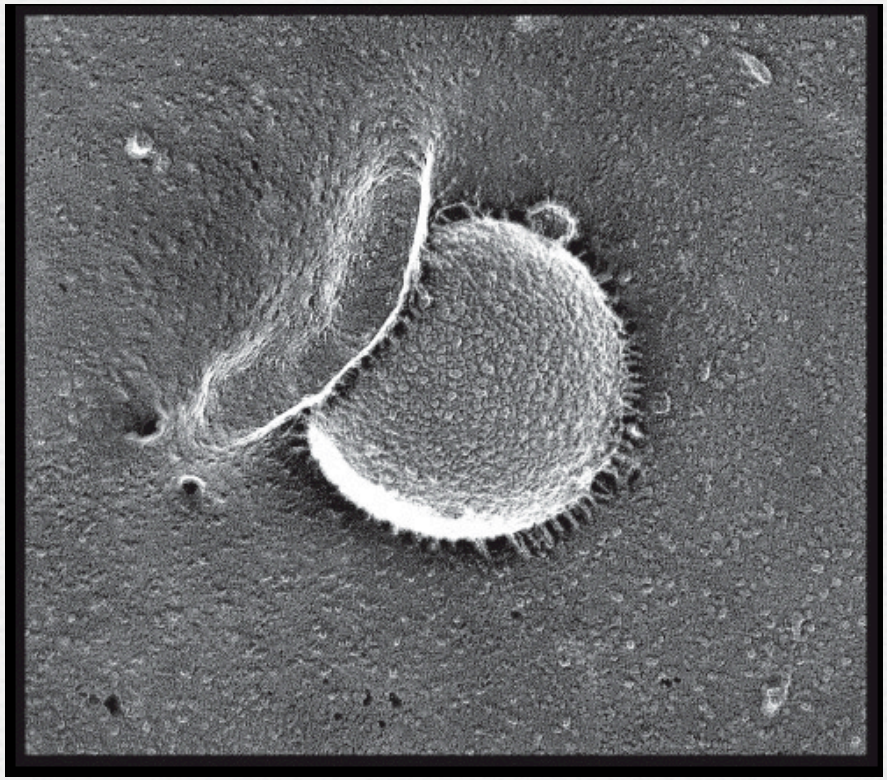


vesicle transport

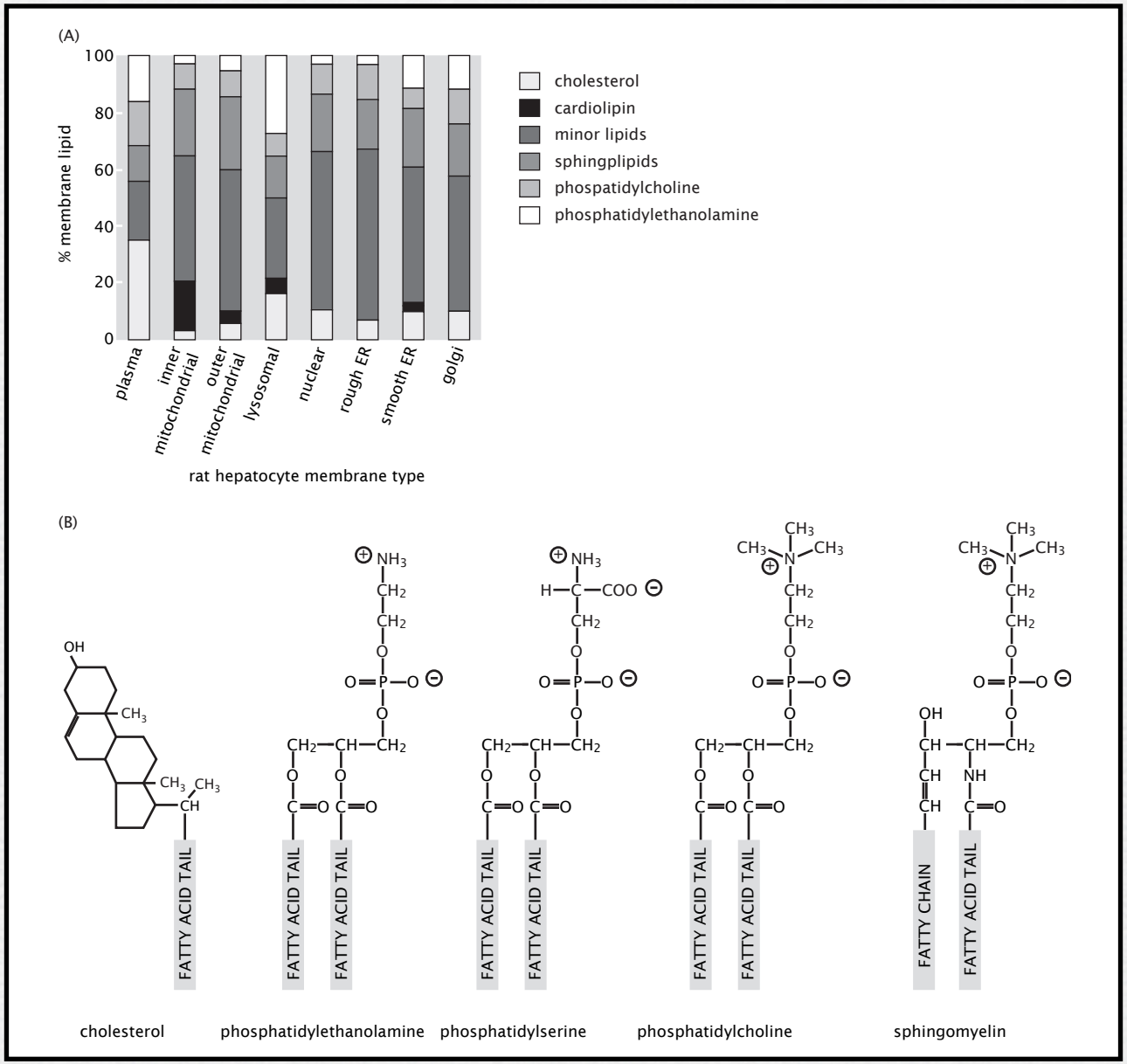


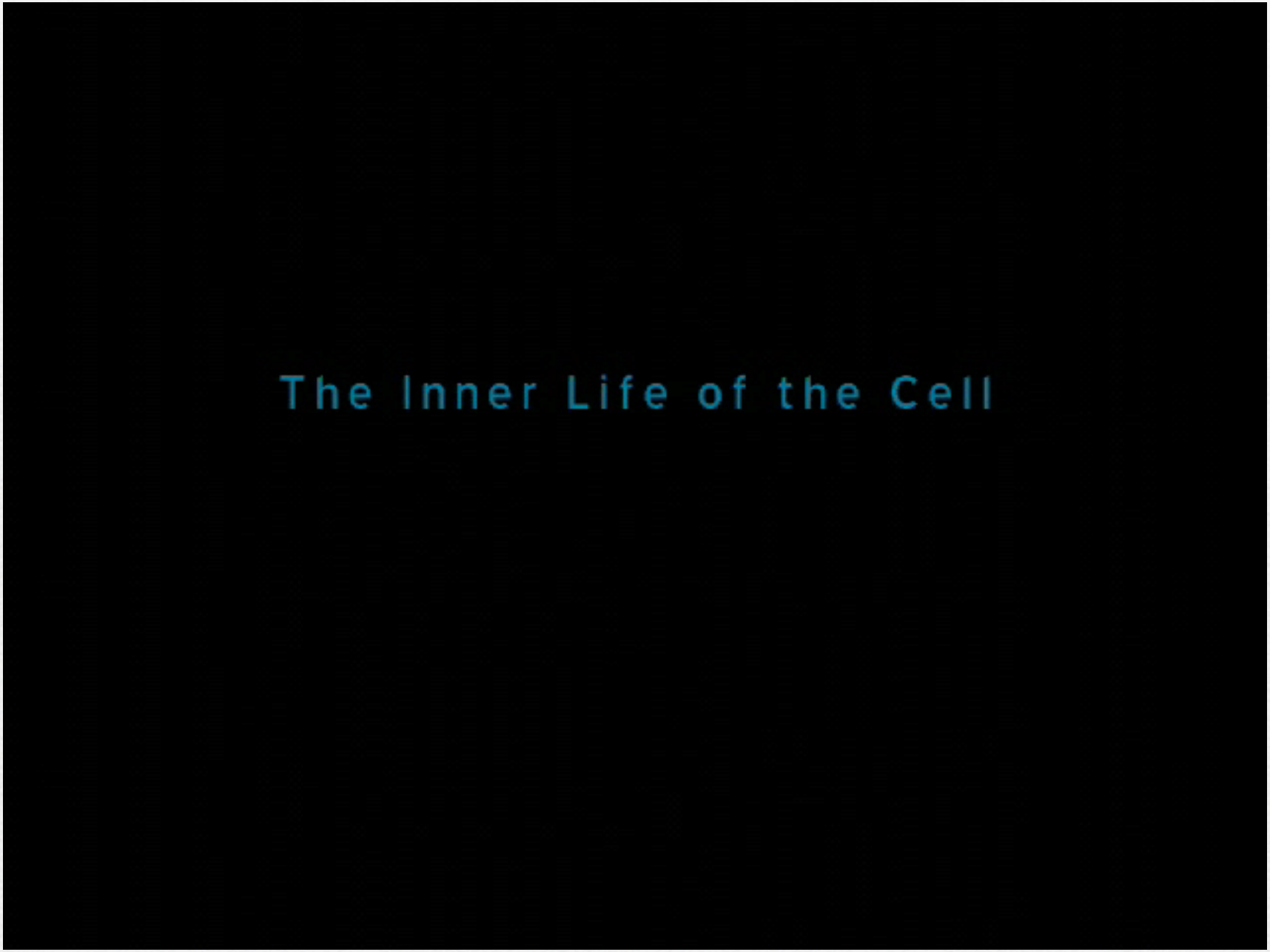
phagocytosis

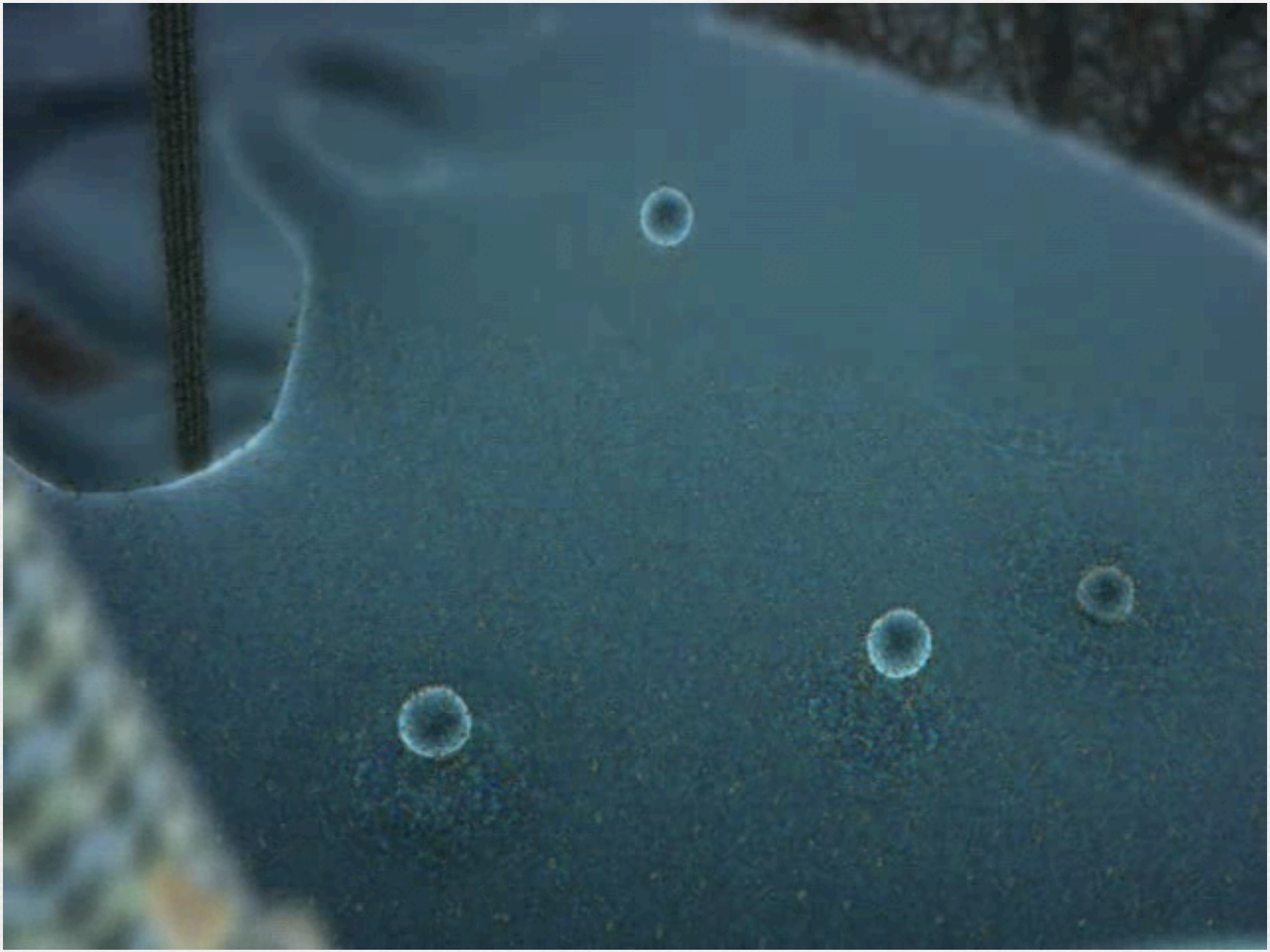


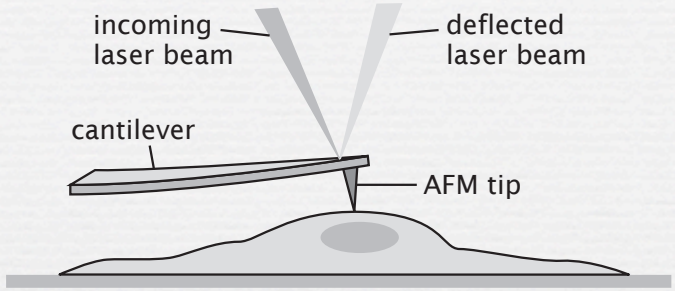


cell lipid census

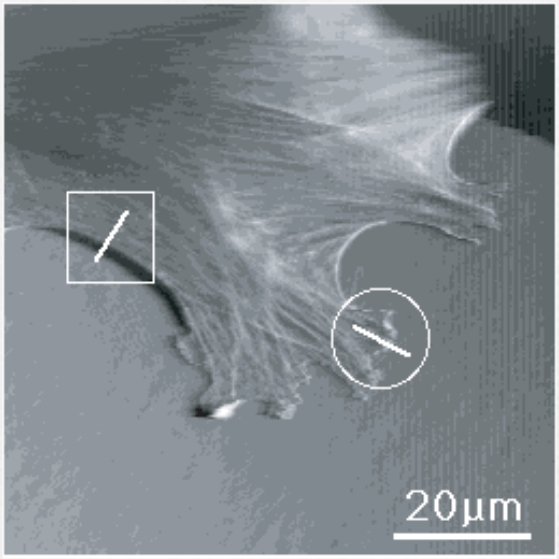



The Inner Life of the Cell

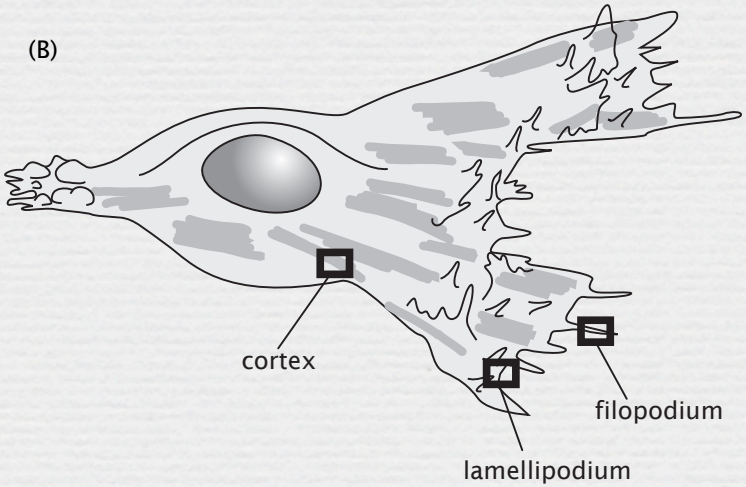




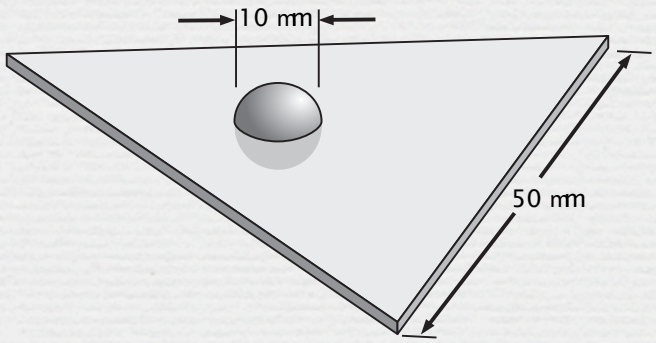
(A) POSITION ONLY

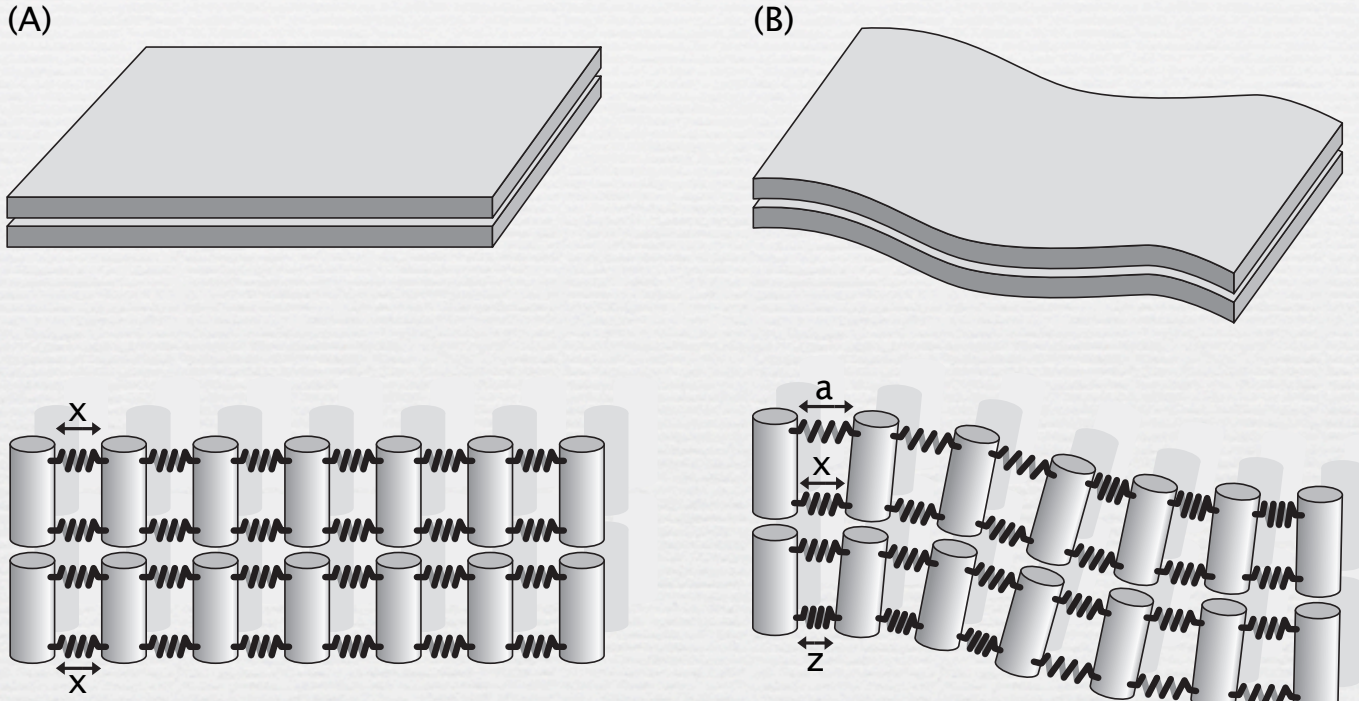


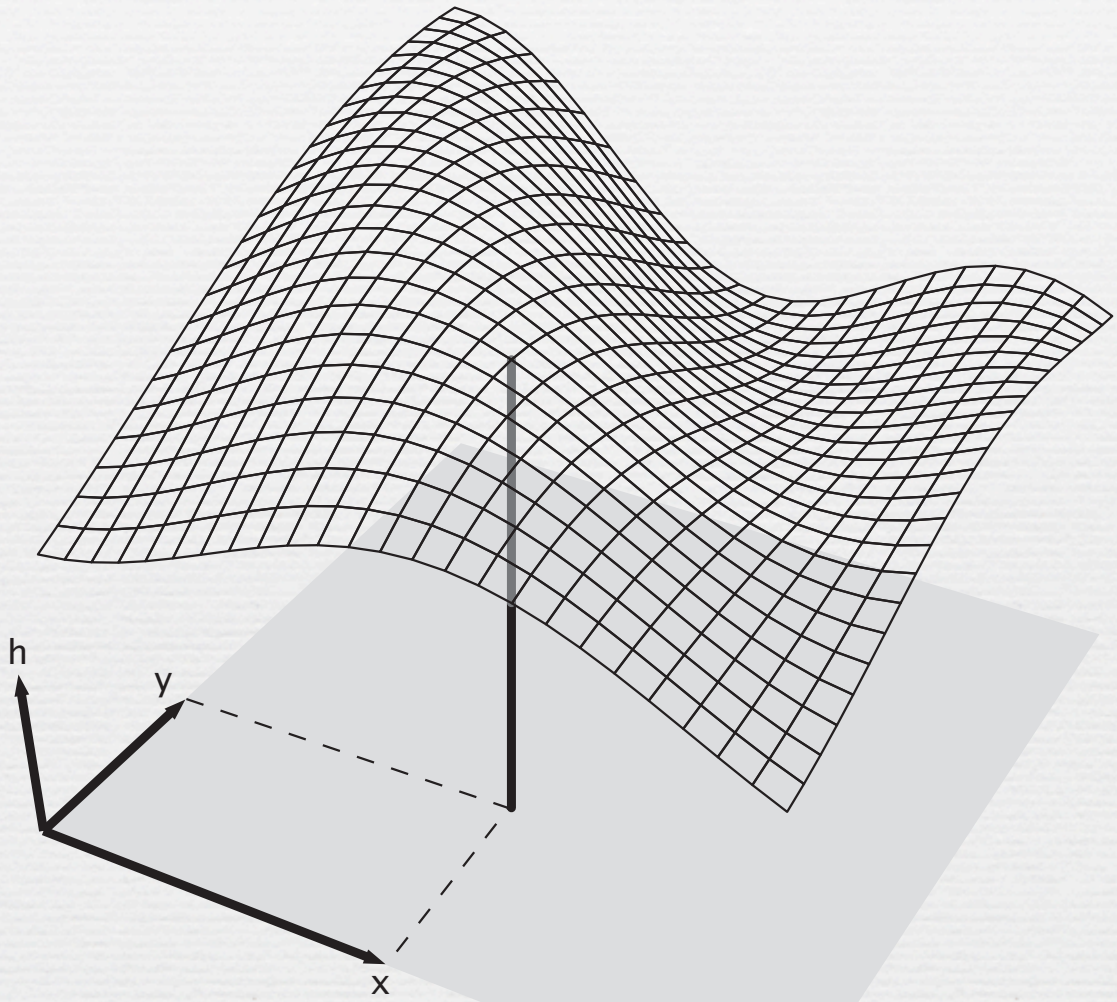
(B)

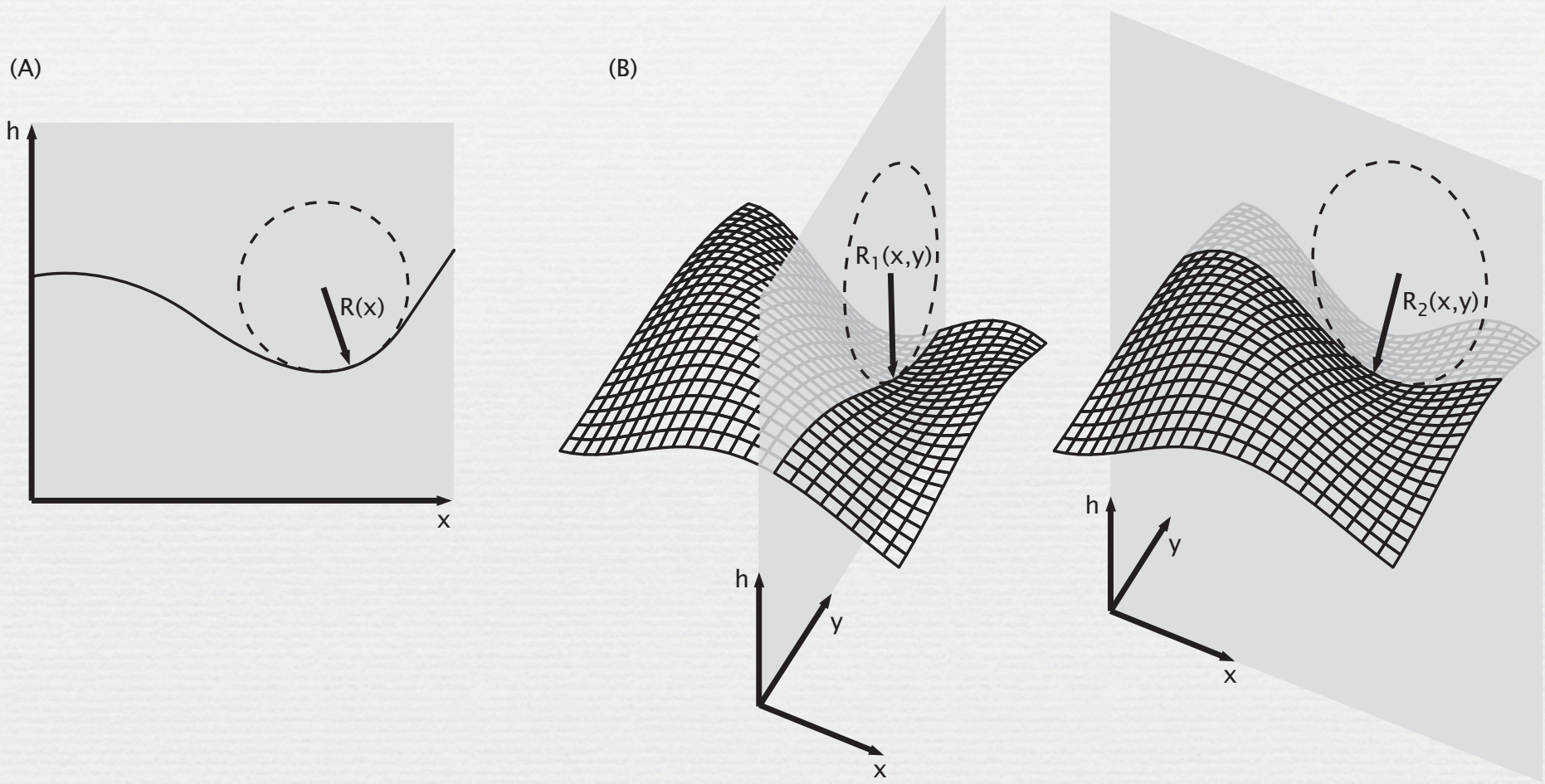


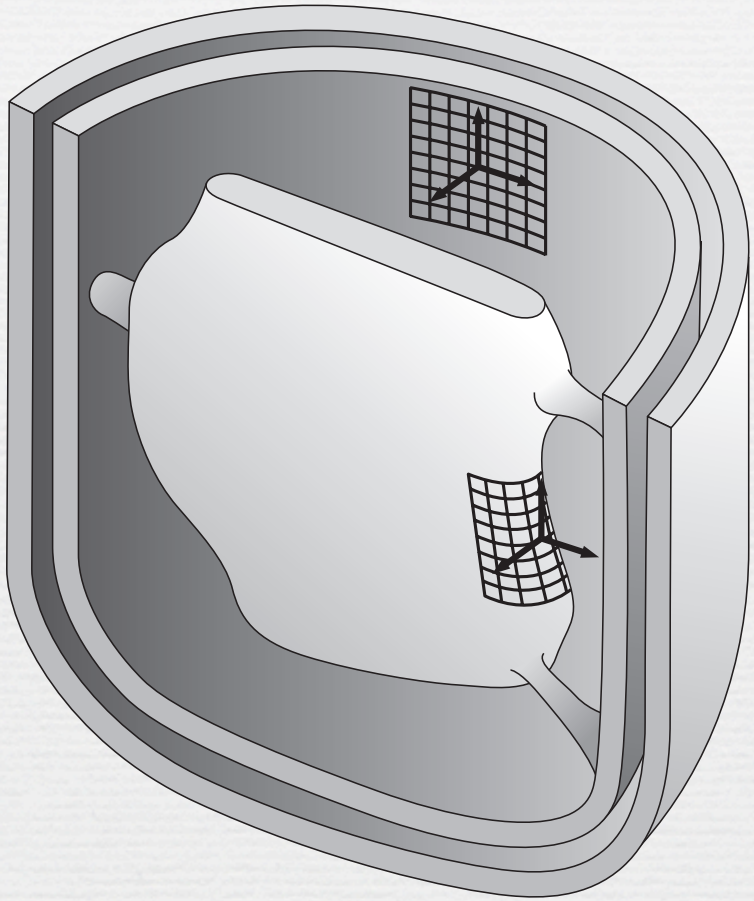
(C)



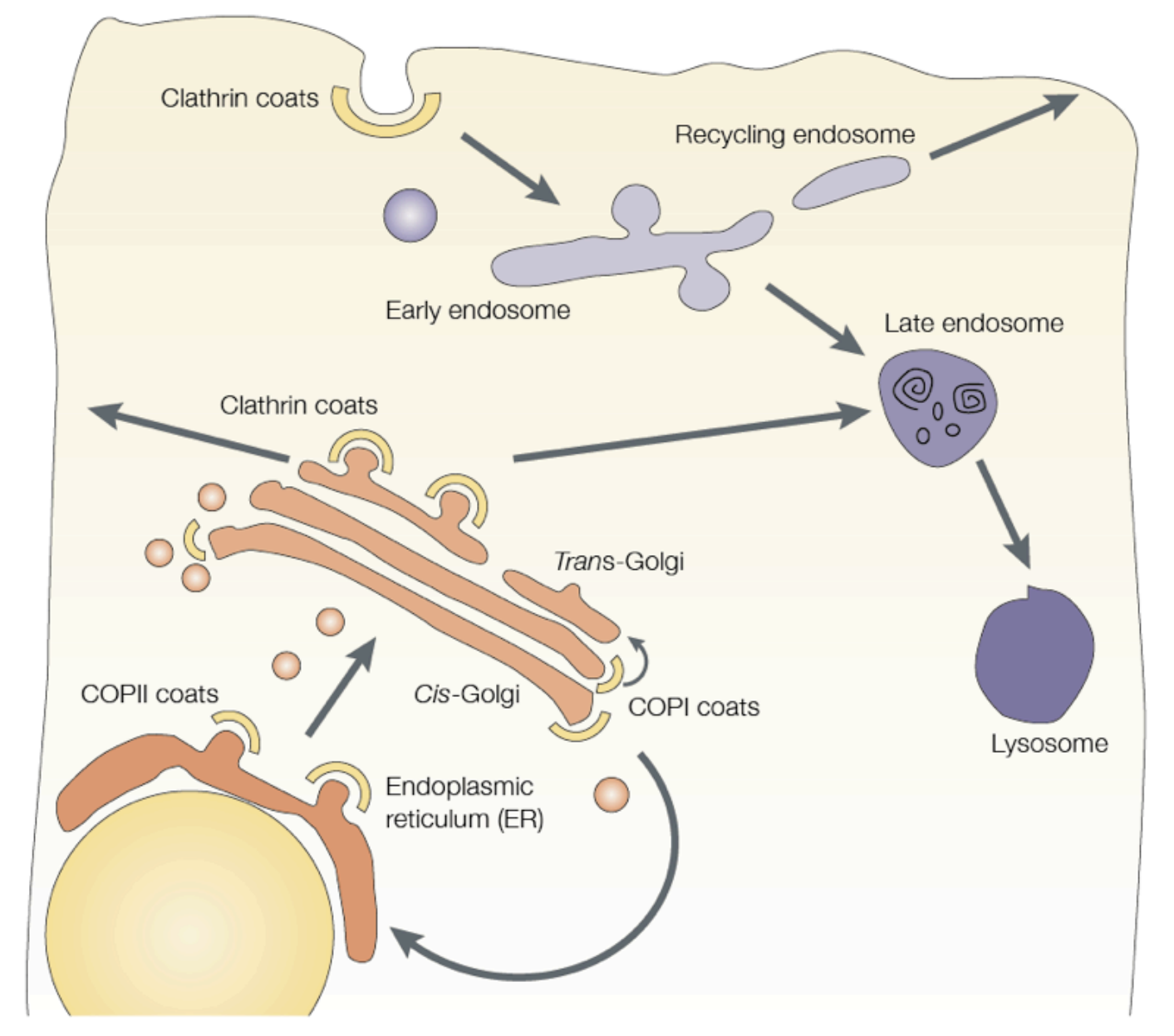

(A)
(B)
x
x
a
x
z


h
y
x

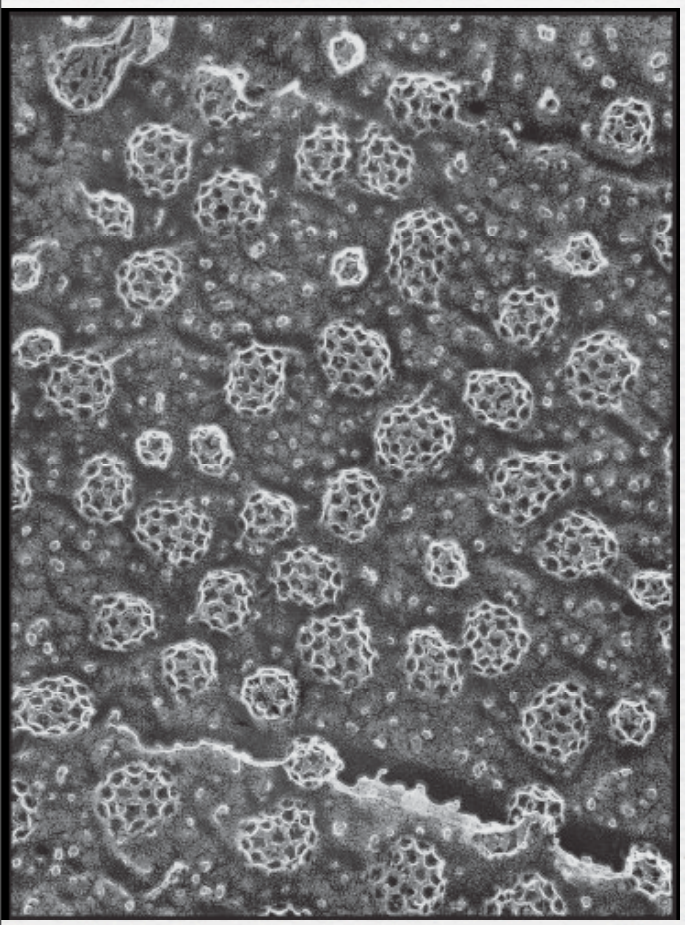

(A)
h
R(x)
x
(B)
R1(x,y)
h
y
x
R2(x,y)
h
y
x

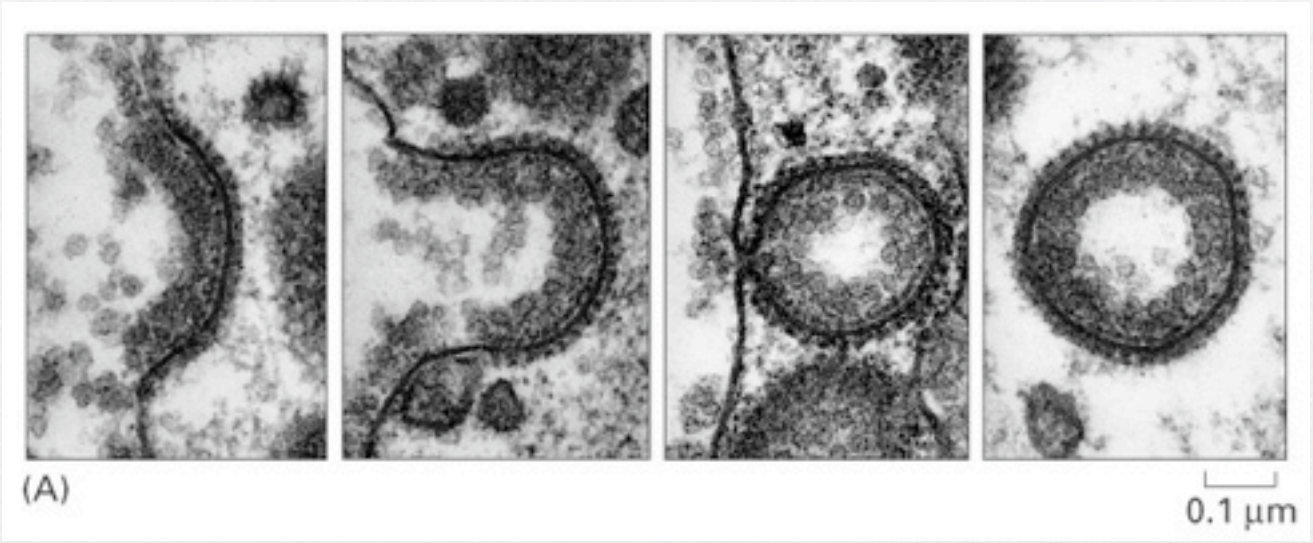


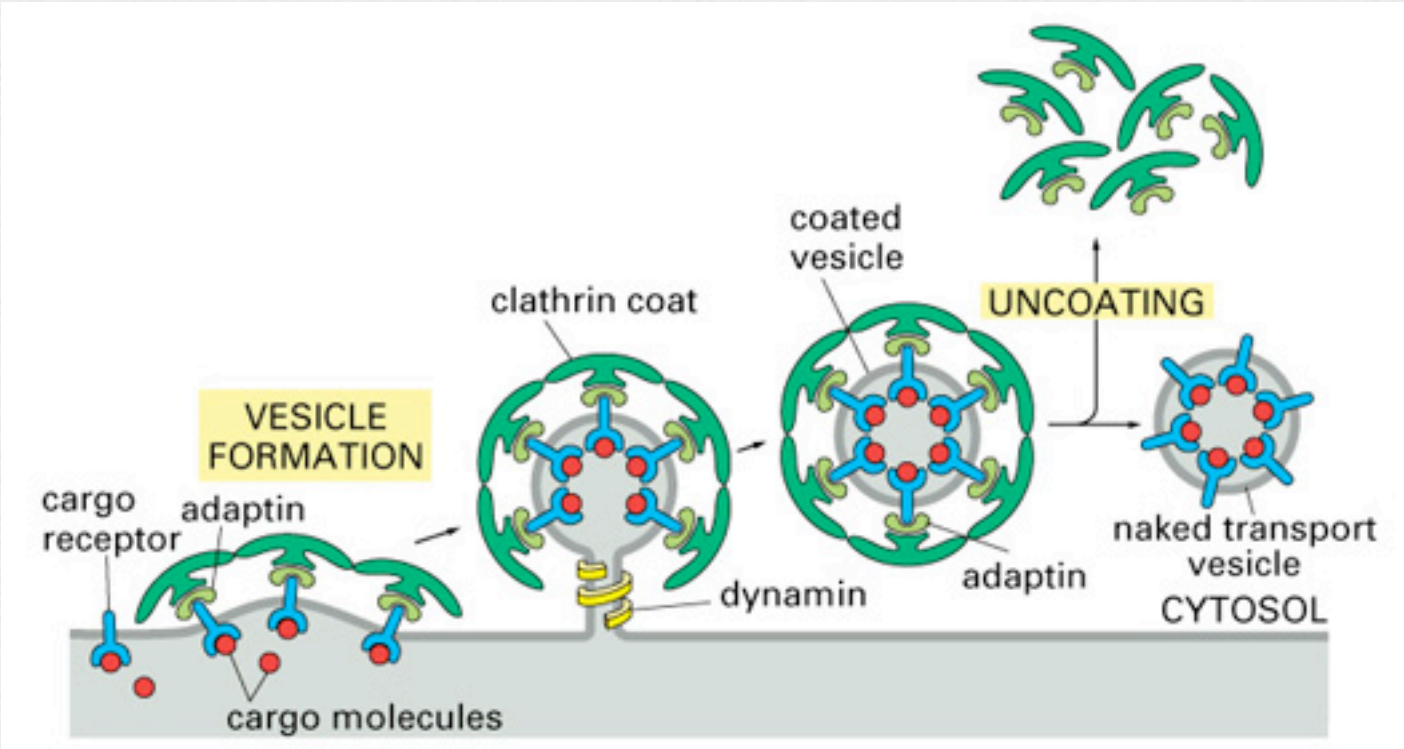
protein coats



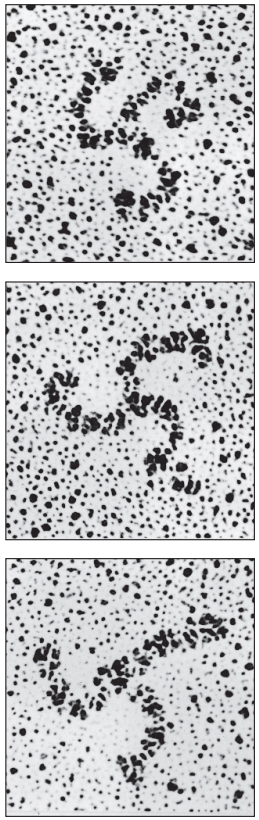
clathrin



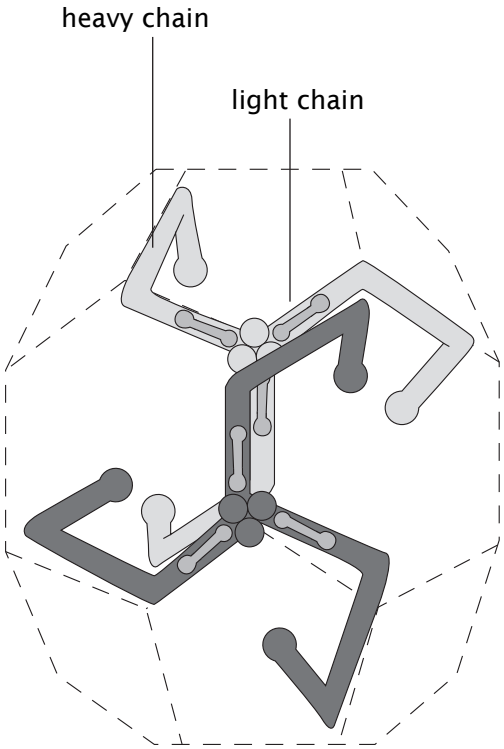

(A)
0.1 µm


coated vesicle
clathrin coat
UNCOATING
VESICLE FORMATION
cargo receptor
adaptin
dynamin
adaptin
naked transport vesicle
CYTOSOL
cargo molecules

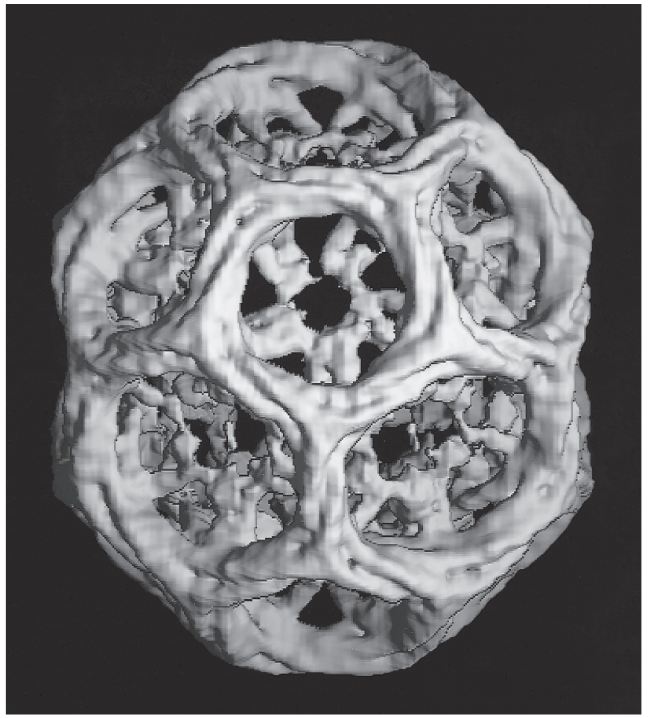
clathrin



(A)

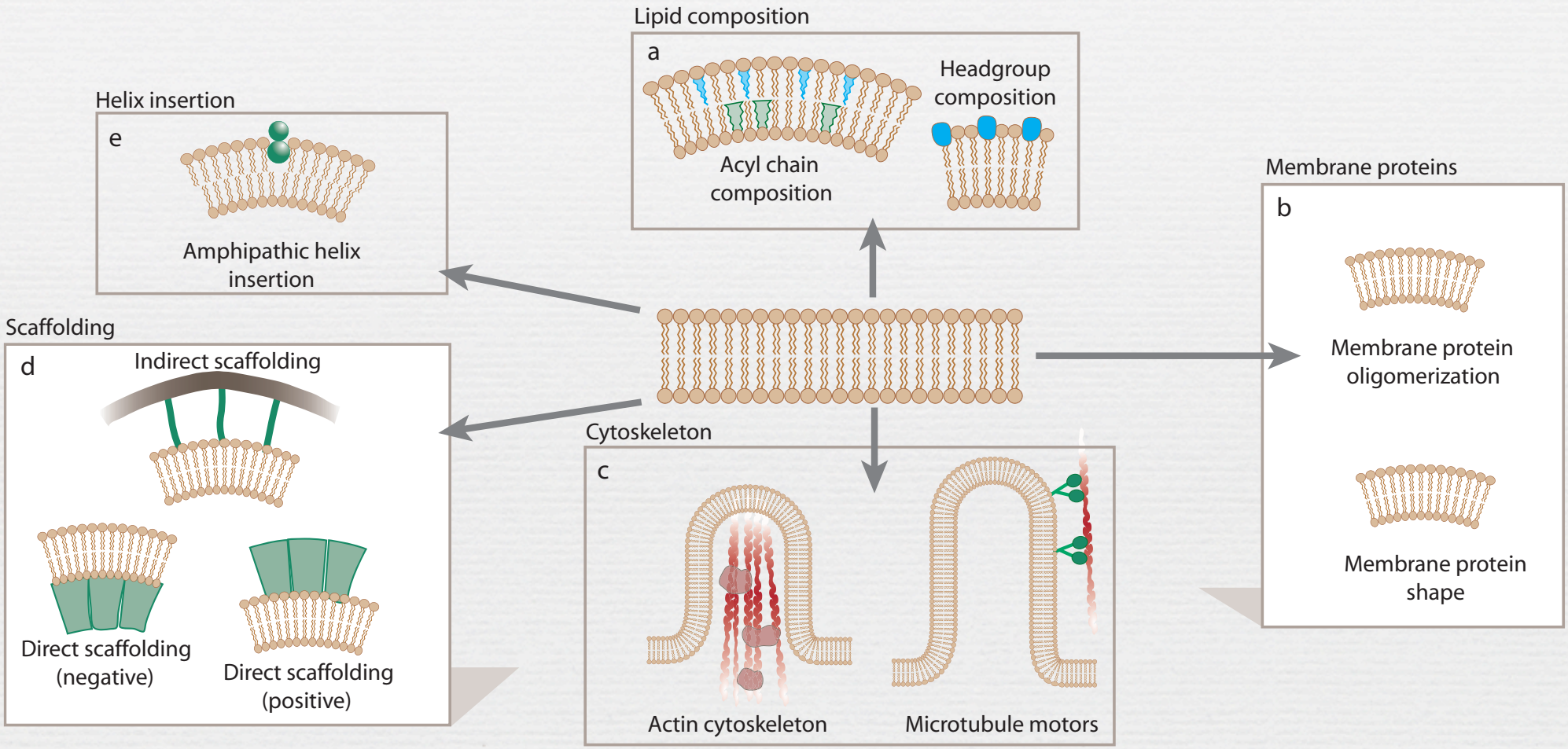


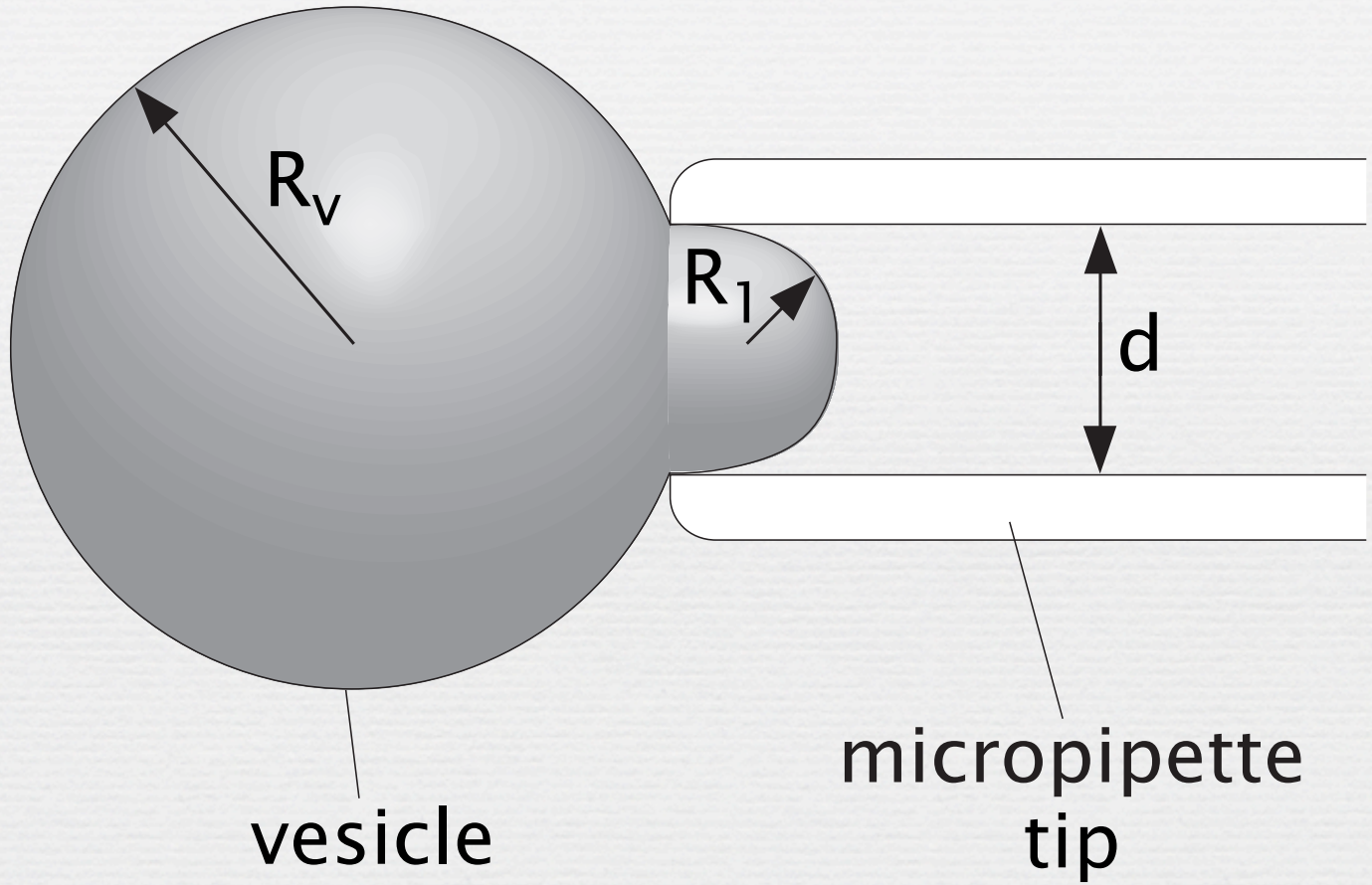
(B)

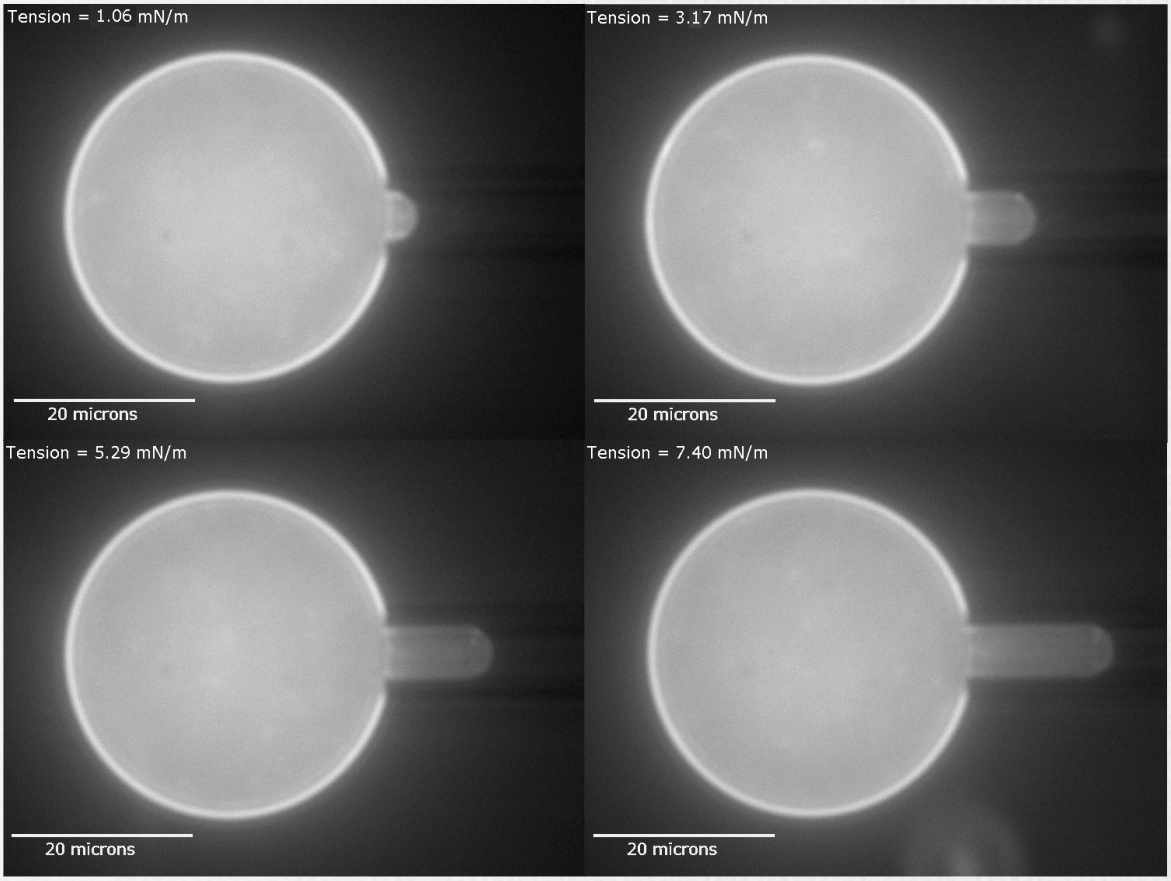


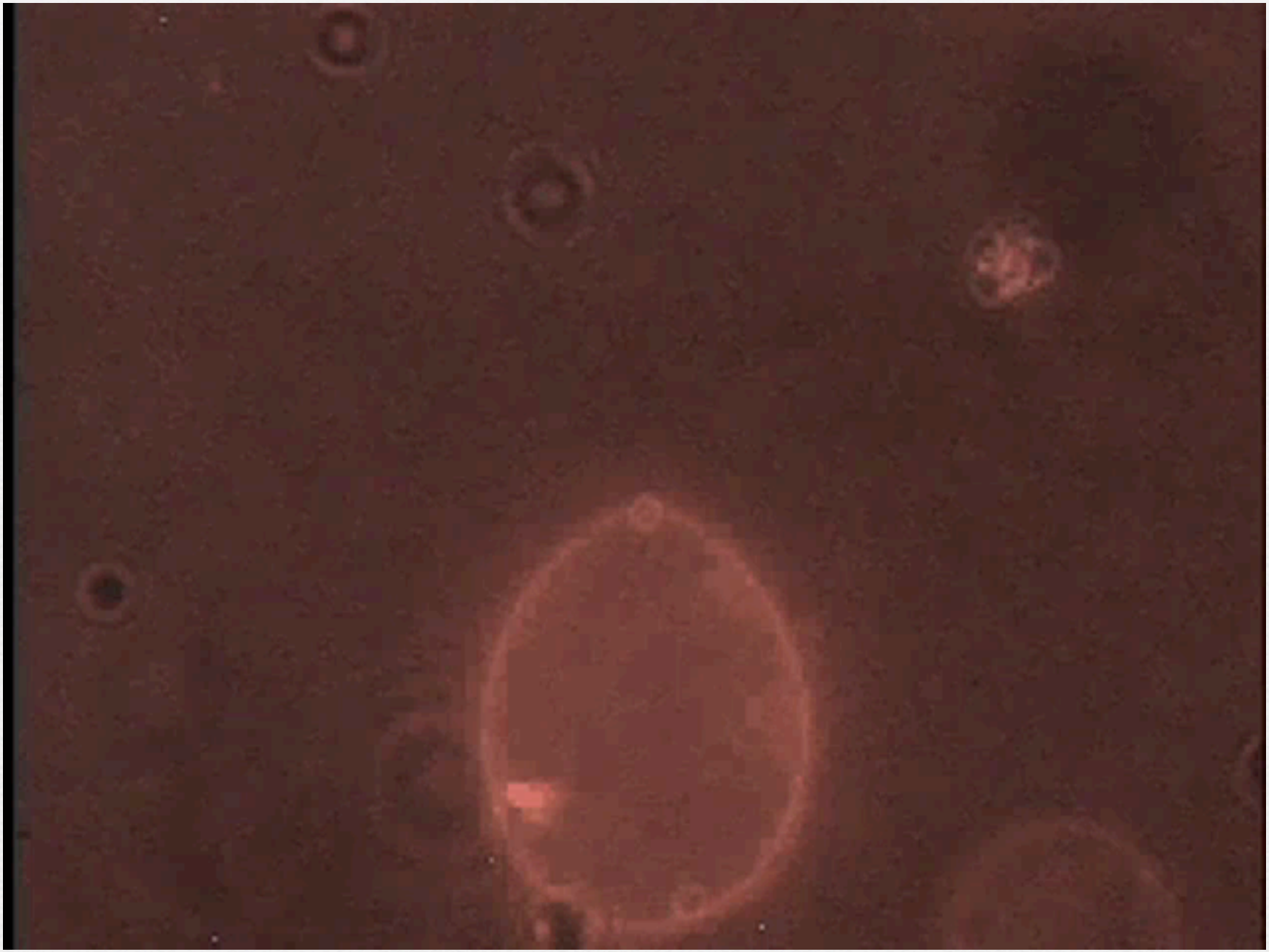
(C)

50 nm

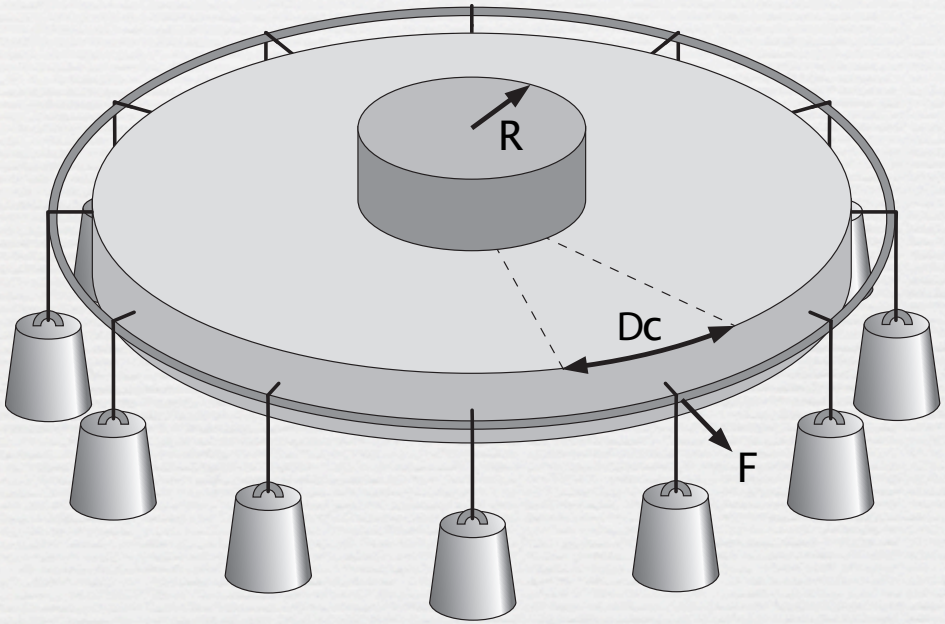

Lipid composition
a
Headgroup composition
Acyl chain composition
Helix insertion
e
Amphipathic helix insertion
Membrane proteins
b
Membrane protein oligomerization
Membrane protein shape
Scaffolding
d
Indirect scaffolding
Direct scaffolding (negative)
Direct scaffolding (positive)
Cytoskeleton
c
Actin cytoskeleton
Microtubule motors

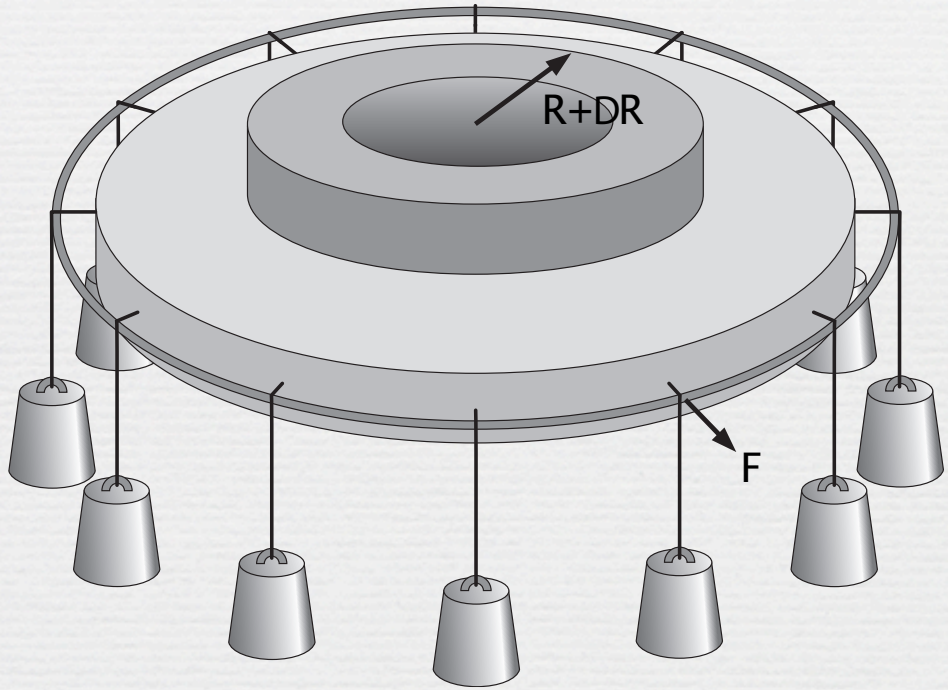

R_v
R_1
d
vesicle
micropipette
tip


Tension = 1.06 mN/m
20 microns
Tension = 3.17 mN/m
20 microns
Tension = 5.29 mN/m
20 microns
Tension = 7.40 mN/m
20 microns

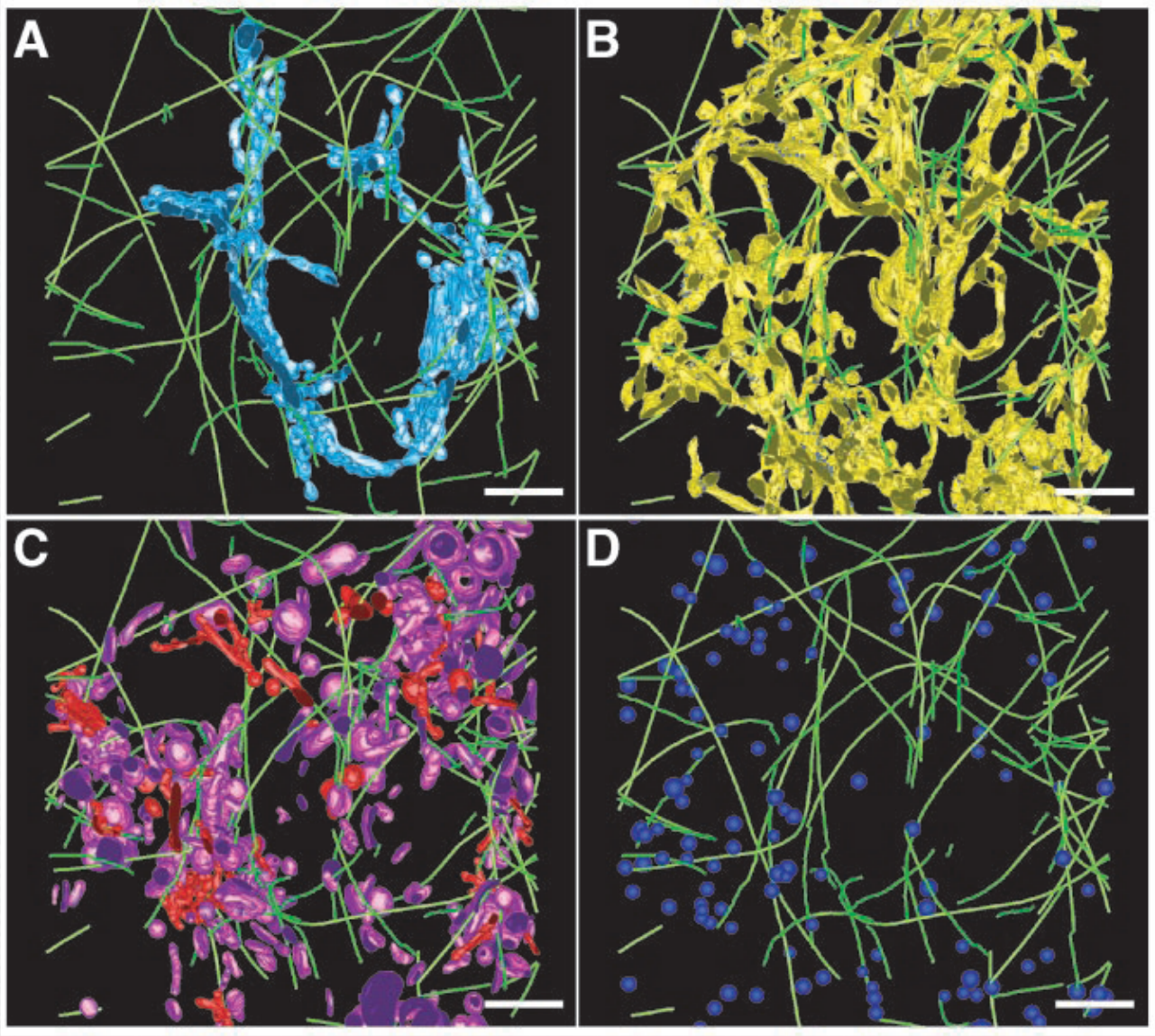


surface tension

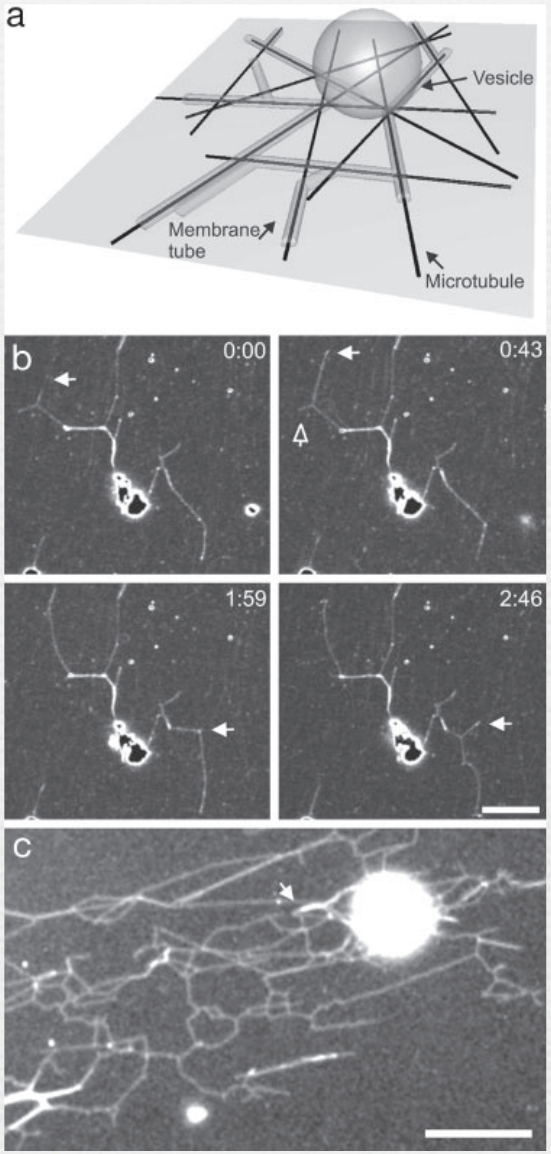


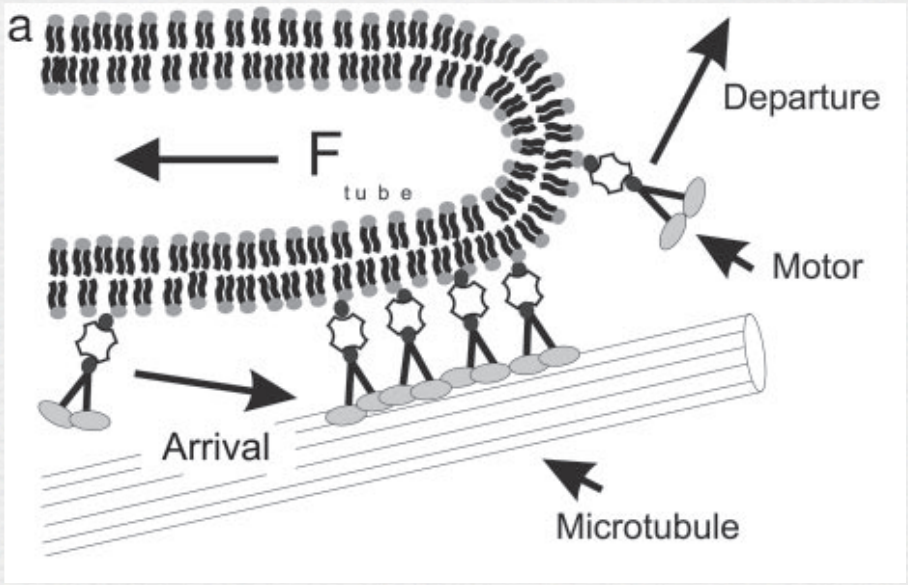


tethers in cells

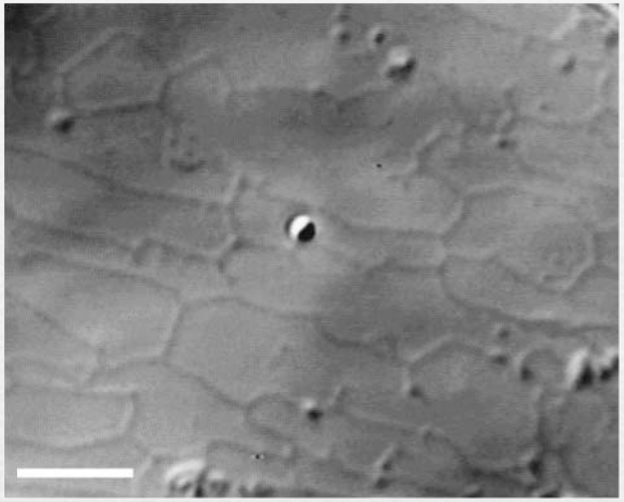


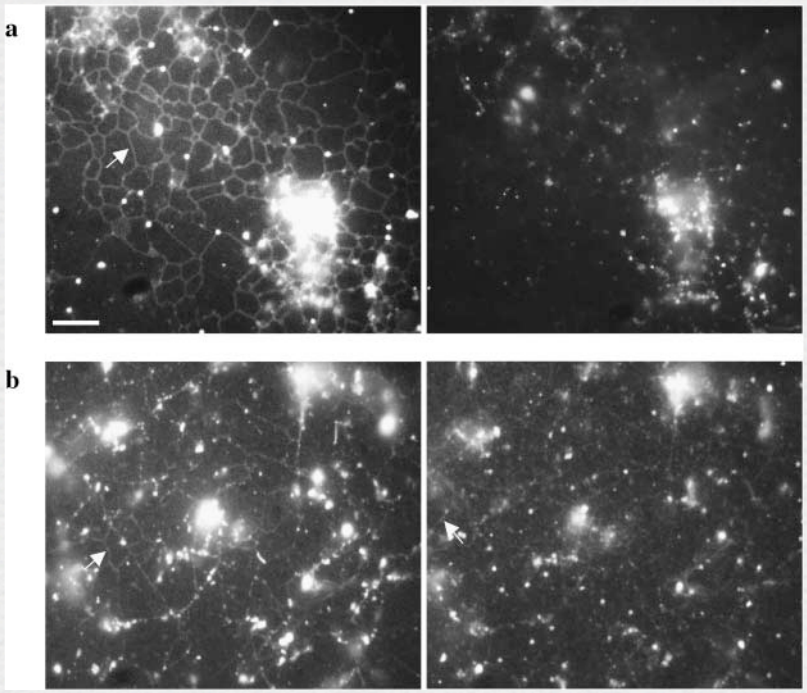
tethers in vitro





tethers: in vivo model





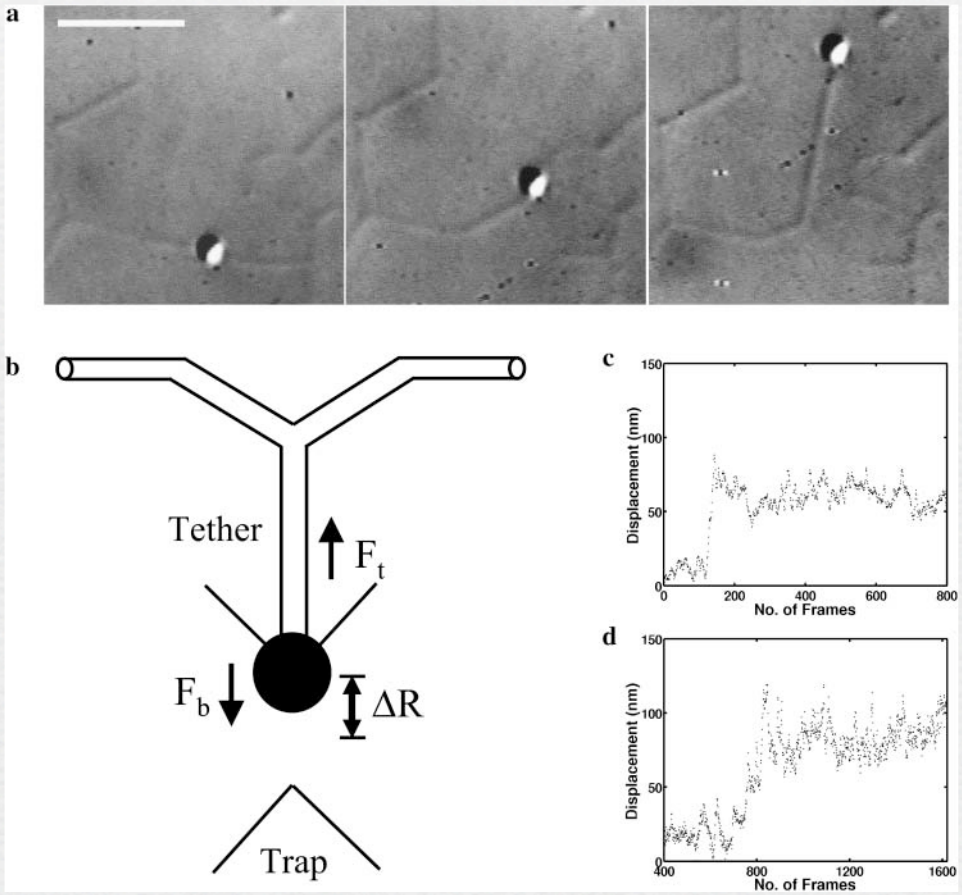
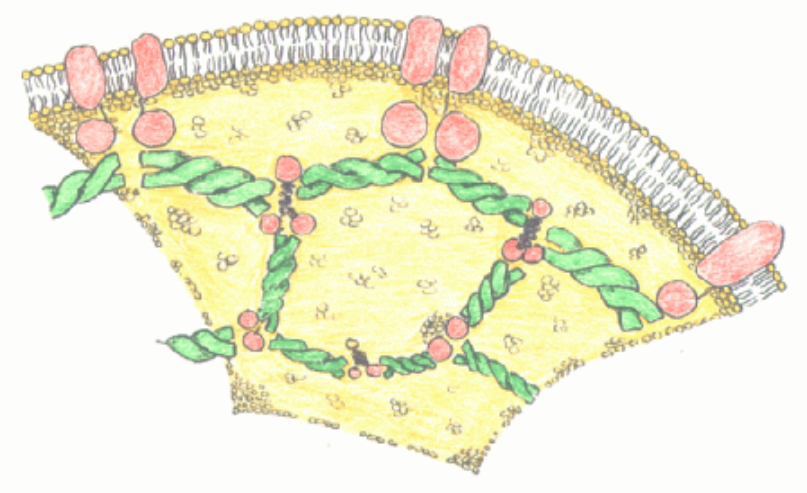
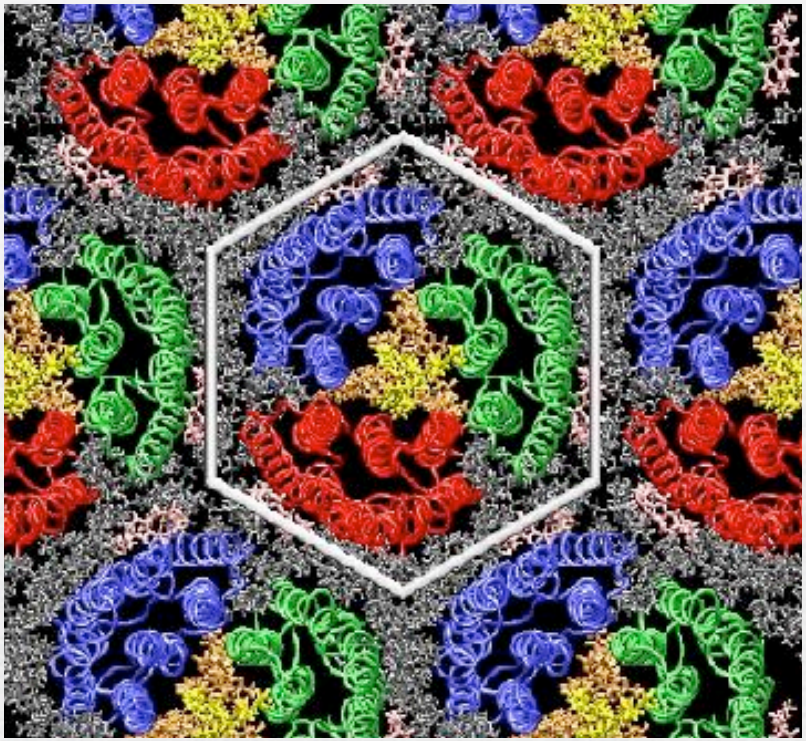


Image courtesy of simscience.org



Schulten



Keller