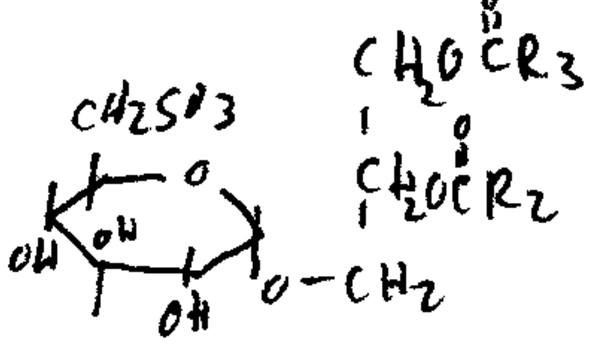
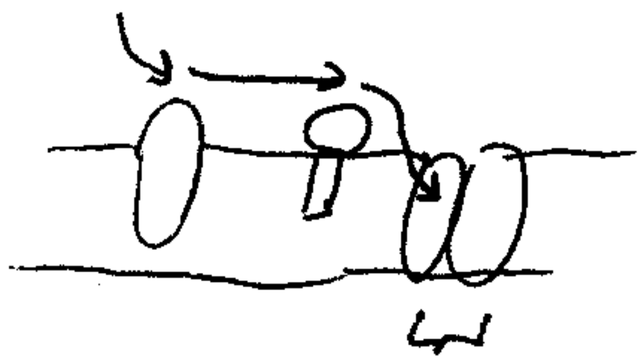
Chris Somerville: Arabidopsis Lipid Metabolism



Plant Sulfolipid - may f(x) as a surrogate for phospholipids when P starved

Plants & lipids
- Mt vs Cpsts have v. diff. lipid composition (70-wise)
- freezing effects likely lipid dependent
- lipid metabolism for membranes related to that for storage

Arabidopsis Lipids
- variation in composition w/in plant
- Problem - many of the enzymes are not soluble.
  - but I is soluble



DeSaturases are membrane embedded

Solution
- brute force ... can ~~detect~~ mutagenize at v. v. high levels and use chromatog. to detect mutants
- have mutants for virtually every step
- mutants have virtually No PHENOTYPE other than chromatogram and some mutants have higher growth rates at high T°.

Except MUTANTS were not as viable for long term in low T°.

Fluorescence
- can use to monitor changes in membranes

Mapping Mutations

- Arab. 70,000 Kbp DNA
- mapped Fad3 to nearest RFLP
- took YAC and probed cDNA library

Pathway

all elements of pathway are functional and accumulate to specific levels.

Not

A ↓ 18:0 → X%

B ↓ 18:1 → Y%

C ↓ 18:2 → Z%

D 18:3 → W%

Freezing

Problem - as ~~soil~~ fluid freezes osmolarity in cell increases in non-frozen part & shrinkage happens.