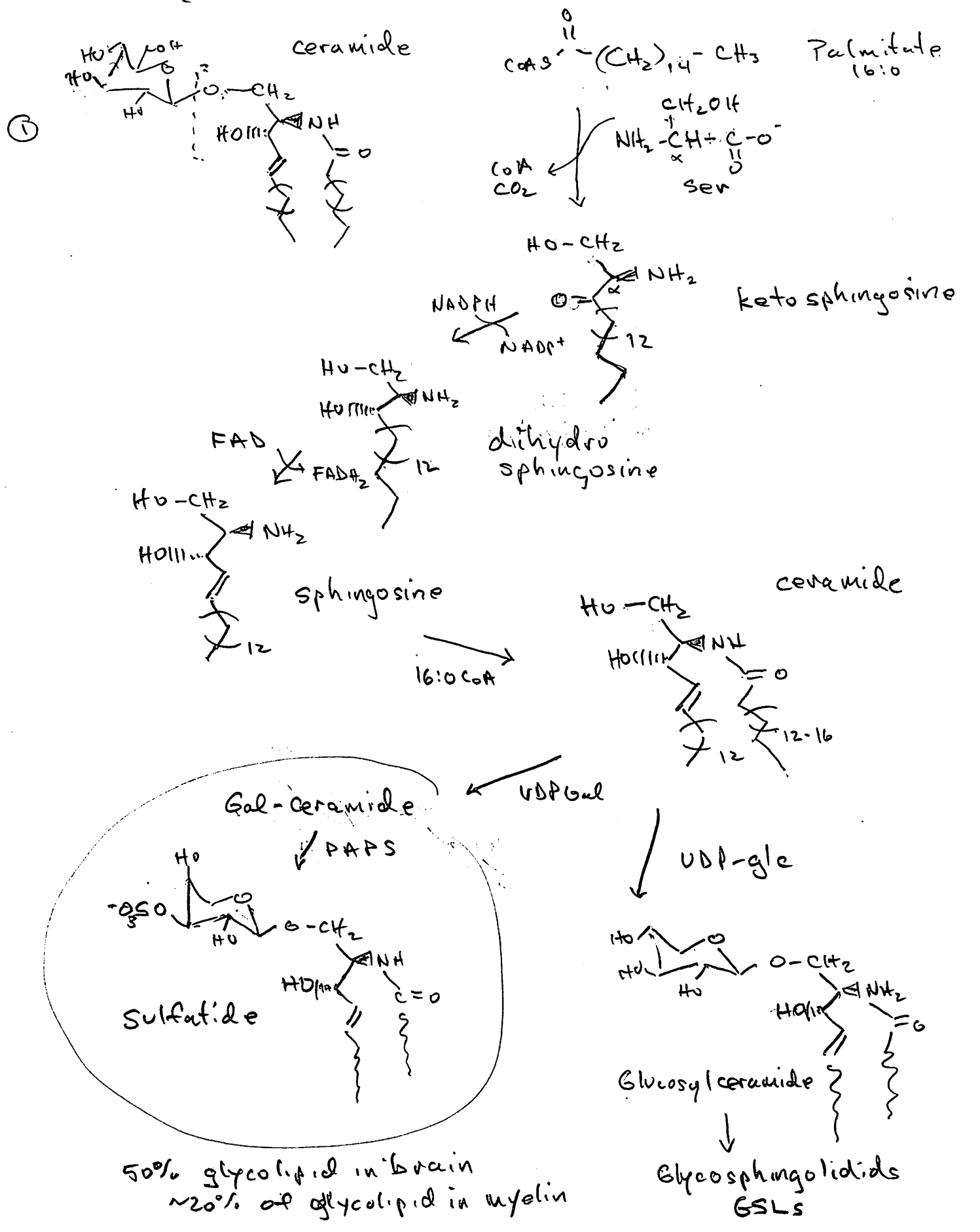
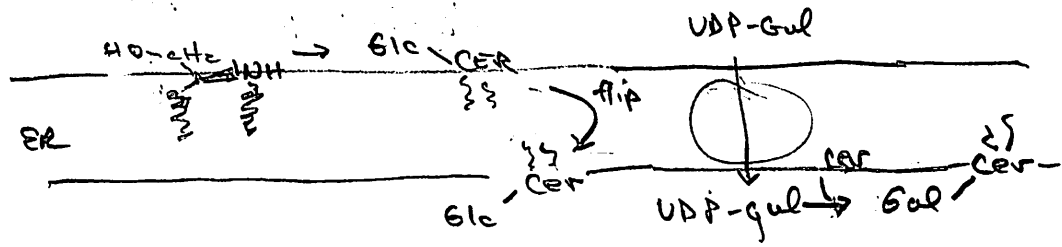


# Glycolipids



# Topology

What other glycosylation rxns require flipping?



## Slide 1

- Nomenclature - horrible
- Gangliosides - contain sialic acid or serve as precursors
- but there are different core structures

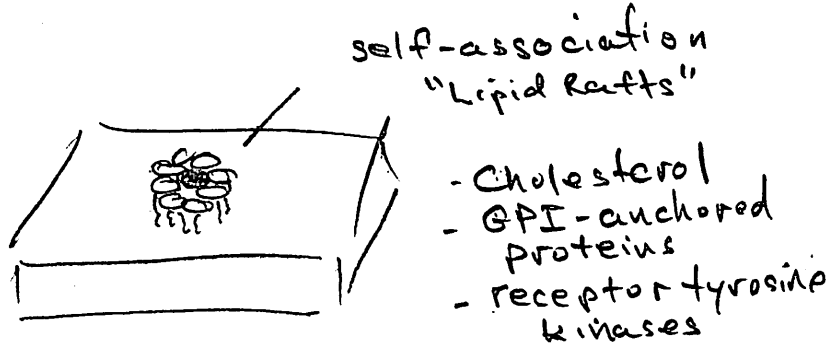
## Slide 2

GNX → N = M, P, T, Q for n = 1, 2, 3 or 4 Sia  
 → ganglioside  
 X = # of neutral sugars  
 ∴ GM3 = monosialylated, 2 neutral sugars  
 Sia-Gal-Glc-Cer

# Function

"Cis" Regulation  
glycan-protein

Eg. EGF Receptors  
PDGF "  
InsR

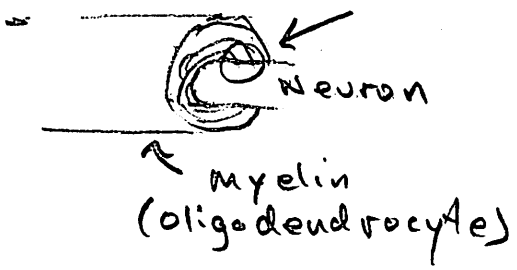


- Induce clustering

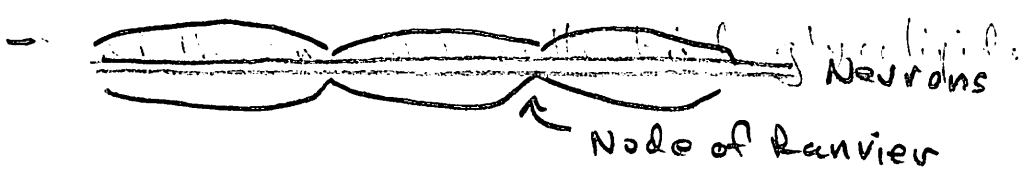
Many bacteria toxins have AB<sub>5</sub> subunit structure where B = binding subunit, A = toxin

## Slide 3 cholera toxin "induced clustering"

# "Trans" regulation



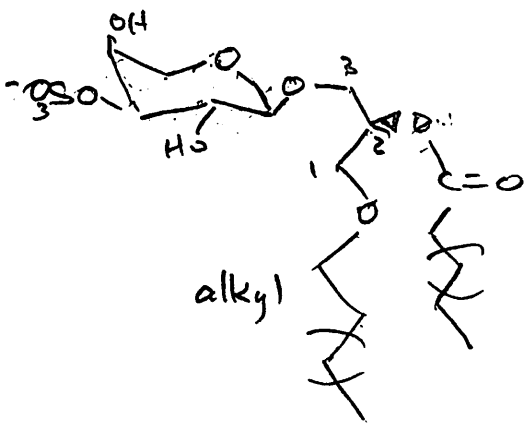
BDI and BTI on myelin binds to MAG (myelin-associated glycoprotein) on neuron



Gal cer and sulfatide at nodes

loss of these lipids alters nerve conduction

## Glycero glycolipids

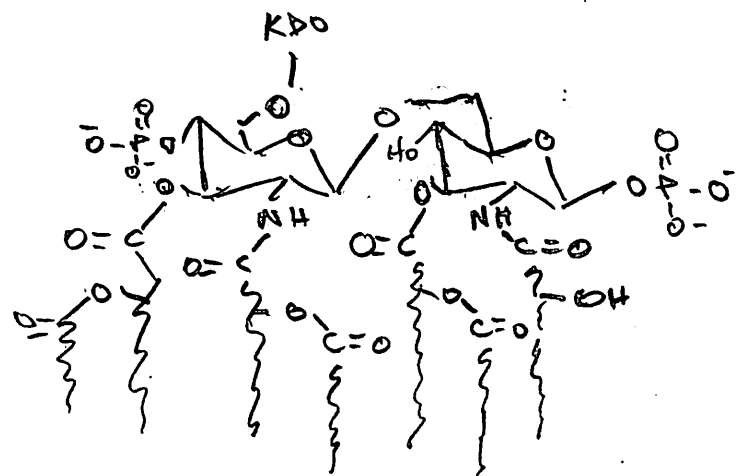


Seminolipid

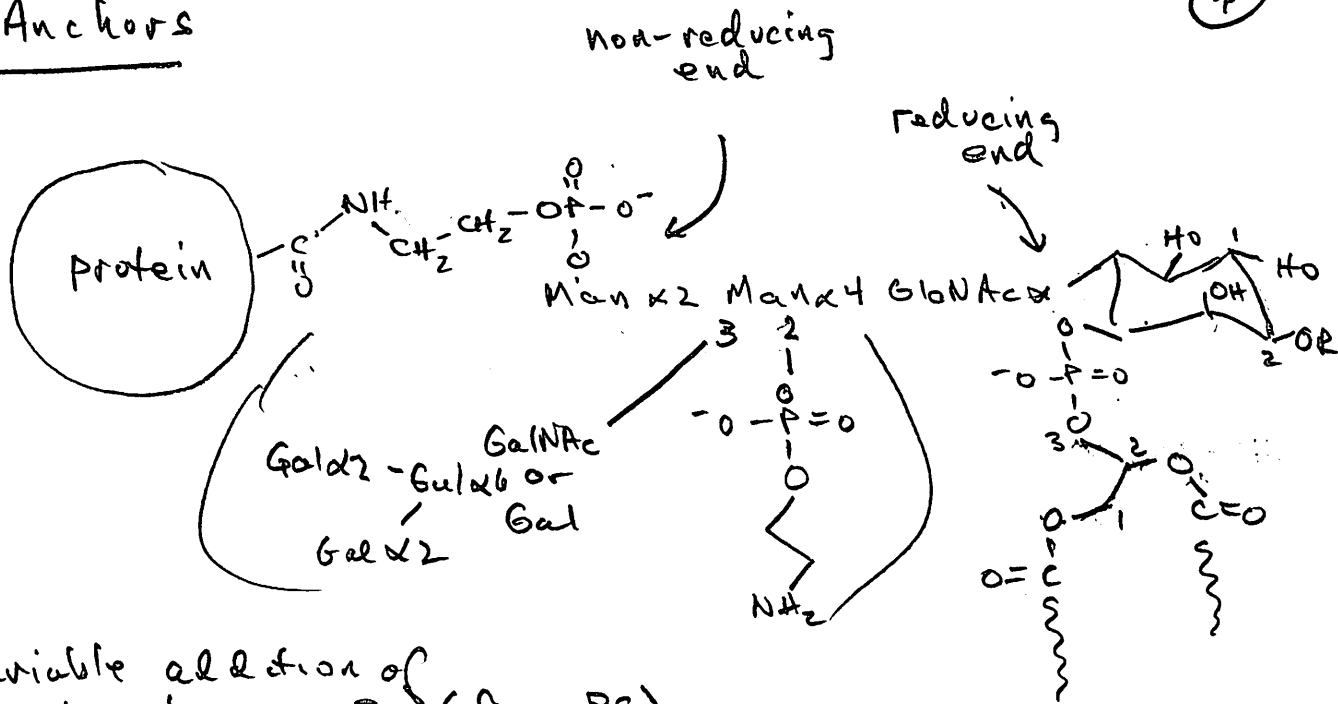
built on glycerol backbone

- Plants contain monogalacto, digalacto etc glycerol glycolipids

## Saccharolipids



# GPI Anchors

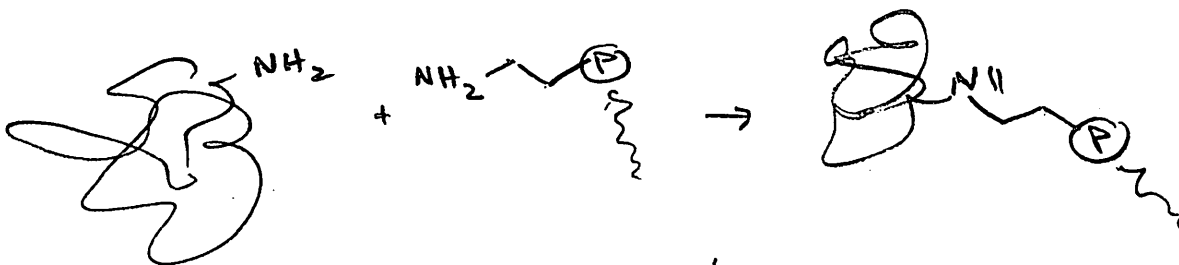


- variable addition of ethanolamine-P (from PE)
- variable fatty acids
- variable fatty acylation (C2) of myo-inositol ring

## Topology

Slide 4

Protein undergoes transamidation



- Typically protein is transmembrane, then is transferred to GPI
- Can release protein with PI-phospholipase C
- Extractable in Triton X-114 micelles, so it floats in ultracentrifuge
- labels with  $[^3H]$ myo-inositol
- Often GPI-anchored proteins found in lipid rafts

Examples

- Alkaline phosphatase - involved in host defense against LPS

- Acetylcholinesterase

- Variant surface glycoprotein of Trypanosomes

- CD59 + Decay Accelerating Factor - these prevent RBC lysis

Loss of PIGA → Paroxysmal Nocturnal Hemoglobinuria (a hemolytic anemia)

. Somatic mutation in bone marrow stem cells

Symptoms in dark colored urine due to hemoglobinuria