

1. What kind of experimental evidence would indicate that a protein crosses from one side of the membrane to the other?
2. Type 1 and type 2 topologies consist of a single transmembrane helix, but in opposite orientations. How might this be established experimentally?
3. How would you determine that a protein had multiple trans membrane helices?
4. How can a cell tell when one of its integrins has bound to an appropriate ligand?
5. A partial sequence of glycophorin (amino acids 51-100) is

Val Tyr Pro Pro Glu Glu Glu Thr Glu Glu Arg Val Gln Leu Ala His His Phe Ser Glu  
 Pro Glu Ile Thr Leu Ile Ile Phe Gly Val Met Ala Gly Val Ile Gly Thr Ile Leu Leu  
 Ile Ser Tyr Gly Ile Arg Arg Leu Ile Lys.

Use the table of values given in lecture 26 to draw a hydropathy plot.. Compare your result with Fig. 12-17 a) in Lehninger p.403.

6. A partial sequence of LacY (Lactose permease) is

ILE SER LEU PHE SER LEU LEU PHE GLN PRO LEU PHE GLY LEU LEU SER ASP LYS LEU GLY  
 LEU ARG LYS

Draw the helical wheel for this sequence. What does it tell you about the probable function and location of this subsequence?

7. Compare the role of the HIV fusion protein GP41 described in Lehninger pp. 406-407 with the mechanism of SNARE mediated fusion.

How is the viral fusion mechanism similar to SNARE mediated fusion?

How is it different?

Why does the virus not have an equivalent for NSF and SNAP?

Why does the SNARE mechanism need NSF and SNAP?

8. How do symport and antiport transporters maintain strict 1:1 stoichiometry for transport?

Symport:  $A_{out} + B_{out} \rightarrow A_{in} + B_{in}$

Antiport:  $A_{in} + B_{out} \rightarrow A_{out} + B_{in}$