

Biochemistry I CHEM 4401
Extra Credit Assignment – Membrane Proteins (3 pt)

Membrane proteins are essential features of biological membranes. They can perform many functions, including transport of solutes, binding and transmission of extracellular chemical messages, and attachment to other cells. In this extra credit exercise, you will use a protein database we examined earlier this semester (ExPASy) to investigate a membrane protein of your choice

Chapters 11 and 12, including Tables 11.3, 11.5, 11.6 and 11.7 include a number of membrane proteins. Choose one of these or another that interests you and do your best to answer the questions below. Use the ExPASy website (<http://us.expasy.org/>), and its associated links to find the information you need. Turn in your completed assignment when you come to the Biochemistry I final (December 11th). Remember, if you've already received extra credit for judging the St. Patrick's Science Fair you cannot also claim points for this assignment.

Questions

1. What is the name of your protein?
2. From what species was it isolated?
3. What is its molecular mass (M_r value) in daltons?
4. Does the protein consist of more than one subunit? If so, are the subunits the same (*Homo-*) or different (*Hetero-*). How many amino acids are in each subunit?
5. What is the function of the protein? What biological process(es) is the protein involved in?
6. Where is the protein's cellular location (cell surface? Organelle?). Can you tell if it is a peripheral or integral membrane protein (integral membrane proteins will have transmembrane regions)?

7. What is the identity of the ligand or substrate that it binds, moves or acts upon? (remember, substrates pertain to enzymes, while a ligand could be chemical messenger or an ion/solute that gets transported). Draw the chemical structure of this substrate or ligand.

8. Include the amino acid sequence of the protein if available. Highlight the ligand binding site, or catalytic site if it is an enzyme. Which amino acids are these and what class of amino acids does each belong to?

9. Does the protein undergo any post-translation chemical modification (PTM)? What type(s)?

10. If the protein is an enzyme, what is its Enzyme Commission (E.C.) number?