Namae

**Cell Membrane Structure and Function**

*Directions: Navigate to the following virtual model of the animal cell membrane:* [*http://www.bio.davidson.edu/people/macampbell/111/memb-swf/membranes.swf*](http://www.bio.davidson.edu/people/macampbell/111/memb-swf/membranes.swf) *and read the Welcome directions. Click on the right hand arrow above the “Membrane Structure” and go on to the answer the questions by clicking on the highlighted words to access informational pop-ups on each word, reading the text, or interpreting the diagrams.*

**Page 1 Questions:**

1. Define what the Fluid Mosaic Model means.

2. Biological membranes are made up of which 2 of the major carbon-based compounds we studied already?

3. What are the 3 classes of amphipathic molecules?

4. What is the most noticeable characteristic of lipids when they are in an aqueous (water) solution?

5. Quiz question: are the primary determinants of membrane structure,

while carry out membrane function?

**Page 2 Questions:**

6. Another name for cell membrane:

7. Function of the nucleus.

8. Briefly summarize the process of protein synthesis.

9. What are the 2 types of endoplasmic reticulum and what are their functions?

10. Function of the golgi apparatus.

11. Major process(es) carried out in the mitochondria (you shouldn’t even need the computer for this one!).

12. Function of the lysosome.

**Page 3 Questions:**

13. Detail the 5 major functions of the cell membrane by scrolling over the delineated areas of the cell shown on page 3. (FOR AREA 4 IN THE DIAGRAM, READ EACH OF THE CHANGEOVERS SO YOU CAN READ INFORMATION ON EACH ORGANELLE PRESENT)

Area 1:

Area 2:

Area 3:

Area 4:

Area 5:

**Page 4 Questions:**

14. Phospholipid defined:

15. Glycoprotein defined:

16. Cholesterol defined:

17. Difference between saturated and unsaturated fatty acids.

**Page 5 Questions:**

18. Why do you think we also use the alternate name “triglyceride” for phosphoglyceride (hint: look at the molecule in the diagram)?

19. Quiz question: List the molecular components common to all phosphoglycerides.

**Page 6 Questions:**

20. Quiz question: What are the 3 major lipid types in the cell membrane?

**Page 7 Questions:**

21. As you saw in Janine Benyus talk on Biomimicry, and as you see when you click on the animation of the graphic on page 7, what is self-assembly?

22. What is the reason that lipids are such good self-assemblers? And the fact that they don’t even need an enzyme to do it!!

23. What is meant by the “the hydrophobic effect”?

24. How do membrane lipids and other lipids like oil compare?

25. What are the 2 forces that keep a cell membrane intact? Define each!

**Page 8 Questions:**

26. From the animation, can an individual membrane lipid molecule flip? YES or NO (circle one)

27. From the animation, can membrane lipid molecules flip-flop from one side of the membrane to the other? YES or NO (circle one)

28. From the animation, can a membrane lipid move laterally along the same side of the membrane? YES or NO (circle one)

29. Describe what is meant by the terms “membrane fluidity”? How many dimensions can lipids move in along the membrane?

**Page 9 Questions:**

30. What 4 factors contribute to membrane fluidity?

31. From the animation, how does high and low temperatures affect fluidity of the membrane?

Why does it do this?

32. From the animation, how does long and short lipid tail length effect fluidity of the membrane?

Why does it do this?

33. From the animation, how does the high and low degree of unsaturation effect fluidity of the membrane?

Why does it do this?

34. How does cholesterol contribute to membrane fluidity?

35. Quiz question: What type of bonding dominates interactions between lipid tails and limits fluidity. WHY does it do this?

**Page 10 Questions:**

36. Is the phospholipid bilayer symmetrical? Please explain. *Remember…Y.O.L.O., yo!*

37. Quiz question: How is cell membrane asymmetry preserved? Why don’t lipids flip flop through the bilayer from one side to the other?

**Page 11 Questions:**

38. What are the 2 types of membrane proteins? Describe each please. *Cuz’ I need to know!*

39. How does the amount of protein (protein content) differ between plasma membranes and organelle membranes?

40. What purpose does membrane-spanning helices (plural of the word helix) in integral membrane proteins?

41. What is a transmembrane domain?

42. Do integral membrane proteins ever flip and reverse their orientation?

43. Quiz question: How can you identify a transmembrane helix just by examining the amino acid sequence of a protein?

**Summary Page 12 Questions:**

44. How does the term “Fluid Mosaic Model” describe our current understanding of cell membrane structure?

**GOOD JOB, YOU MEM-BRAIN-IAC….YOU’RE DONE!!**