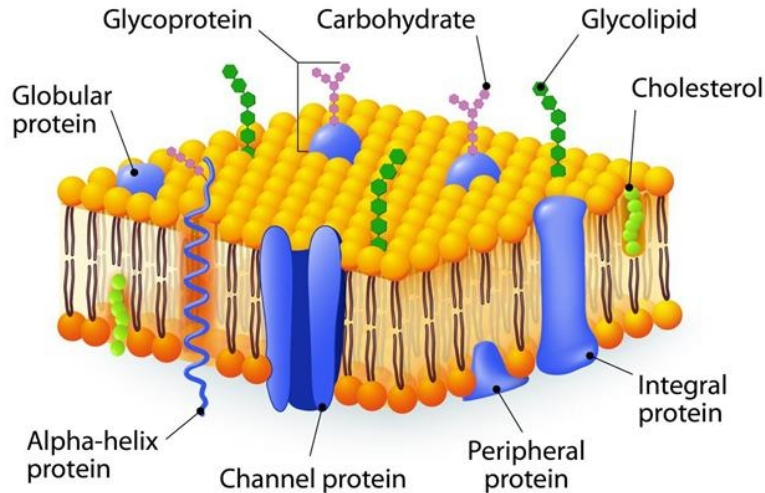


Day 16 - Biology - 9-19-24 to 9-20-24

## CLASSWORK - Unit 2



### 1) COLLECT LAB MICROSCOPES (20 min)

Walk to 400 Building as a class and collect lab microscopes. Carefully carry them back to Rm 310, so we can use them in labs.

### 2) LAB ACTIVITY

#### - PHOSPHOLIPID BILAYER WORKSHEET: (20 min)

- 1) Label and type in questions on your Chromebook, OR use the physical worksheet to answer questions and label.
- 2) Submit worksheet on Schoology once it is completed.

### 3) VIDEO NOTES: (20 min)

Endomembrane System – DeBacco University (5:39)

<https://www.youtube.com/watch?v=tf5Zrhi7G3I>

## 4) EXPLAIN/DRAW:

*Take a sheet of blank paper, fold in half hamburger to form (2) boxes.*

*Use 1-2 sheets of lined paper for the text. Explain, illustrate, and label your drawings.*

### FRONT (2 FRQ's)

#### Question 1:

To investigate whether red blood cells of animals lose the ability to take in glucose from their environment as they age, scientists collected red blood cells from guinea pigs that ranged in age from one day old to seven months old. Scientists incubated an equal number of red blood cells in separate culture dishes that contained a 300 nM solution of radioactively labeled glucose. The amount of radioactively labeled glucose present inside the red blood cells of each group was measured over time.

(a) **Describe** a difference between passive transport and active transport.

(b) **Justify** why the scientists used an equal number of red blood cells in each culture dish as a control.

(c) Glucose transporters are required for the facilitated diffusion of glucose into red blood cells. The scientists claim that the expression of the gene encoding these transporters decreases as guinea pigs age. If the scientists' claim is supported by experimental data, **predict** the effect of increased age on the amount of radioactively labeled glucose present inside the cells of each group.

(d) **Justify** your prediction in part (c).

**Question 2:**

The common wild oat is native to regions of Europe and Asia but is an invasive species in central California grasslands. In California, the common wild oat has almost completely replaced some species of native bunchgrass. Researchers found that aphids, a type of small insect that often carries plant viruses, have a much higher reproductive rate in grasslands that include the common wild oat than in grasslands composed of only native bunchgrass species. Additionally, the viruses carried by the aphids appear to affect only the native bunchgrasses and not the common wild oat. Native bunchgrasses infected by the virus have much higher death rates than do native bunchgrasses that are not infected.

- (a) Describe the change in the resilience of an ecosystem when there is a decrease in the number of species.
- (b) Explain how the addition of the common wild oat affects the number of native bunchgrass plants that can be supported by the California grasslands ecosystem.
- (c) Researchers suggest adding ladybugs, predators of aphids, to the California grasslands. Predict the effect of adding ladybugs on the abundance of the native bunchgrass population.
- (d) Justify your prediction in part (c).

## BACK (2 FRQ's)

### Question 3

Fireflies emit light when an enzyme luciferase catalyzes a reaction in which its substrate, D-luciferin, reacts to form oxyluciferin and other products (Figure 1).

In order to determine the optimal temperature for this enzyme, scientists added ATP to a solution containing D-luciferin, luciferase, and other substances needed for the reaction.

They then measured the amount of light emitted during the first three seconds of the reaction when it was carried out at different temperatures.

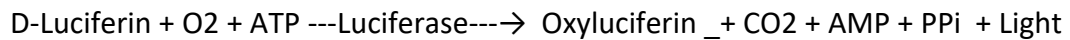


Figure 1: Light is emitted as a result of the reaction catalyzed by luciferase.

- a) **Describe** a characteristic of the luciferase enzyme that allows it to catalyze the reaction.
- b) **Identify** the dependent variable in the experiment.
- c) **State** the null hypothesis of the experiment
- d) A student claims that, as the temperature increases, there will be an increase in the amount of light given-off by the reaction in the first three seconds. **Support** the student's claim.

#### **Question 4**

Existing isolated brook trout populations in Newfoundland, Canada were once part of a larger population that was fragmented at the end of the most recent glaciation period about 10,000 to 12,000 years ago.

Researchers investigated 14 naturally separated stream populations of brook trout. They found that the populations are all genetically distinct and show differences in morphology.

a) **Describe** the prezygotic barrier that results in these genetically distinct populations.

b) Brook trout with longer fins are able to swim faster than brook trout with shorter fins. In on the Newfoundland streams, the main prey of the brook trout evolved to move faster. For brook trout living in this stream, **explain** the difference in fitness between longer-finned individuals and shorter-finned individuals.

c) If two morphologically and behaviorally distinct populations of brook trout remain isolated for many generations, **predict** the likely impact on both populations.

d) Researchers claim that there are more genetic differences between any-two current brook trout populations than there are between any-single current population and the ancestral brook trout population from which all the trout are descended. Provide reasoning to **justify** their claim.

## 5) HOMEWORK:

- 1) Complete the **Lab** activity
- 2) Finish the **Video Notes**.
- 3) Complete the **Explain/Draw** FRQ's

*Submit on Schoology when complete.*