Lab 9 Homework:

Insert your revised Research Proposal below:

In this lab we will study the effects of sugar on enzyme activity. We will prepare 6 different percent solutions of a sugar solution starting at 5% and stepping up by 5% each time. We'll combine the ph 7 buffer and our sugar solutions then add substrate to it and record on logger pro what happens in terms of enzyme activity for each. After recording each then we can make a graph or chart to represent visually how the different percent solutions of sugar affected the enzyme activity.

Translations

Translate –Translate the following phrases into your own words. After you have translated each of the excerpts, share your translation with a non-science major. Have that individual give feedback as to what your translation meant and record their response below.

Excerpt 1:
"We recently demonstrated an association of obesity and type 2 diabetes with increased gut permeability, which induced metabolic endotoxemia and metabolic inflammation"

Translation:
We recently demonstrated that obesity and type 2 diabetes are linked to a leaky gut, which lets certain harmful substances enter the bloodstream. This can lead to inflammation and other problems in the body's metabolism.

Response:
Obesity and type 2 diabetes can happen when the gut leaks and lets stuff into the bloodstream which can also make you sick.

Excerpt 2:
" *A. muciniphila* may represent 3–5% of the microbial community in healthy subjects, and its abundance inversely correlates with body weight and type 1 diabetes in mice and humans,"

Translation:
A type of bacteria called A. muciniphila makes up about 3-5% of the gut microbes in healthy people. There seems like when there's more of this bacteria, body weight tends to be lower, and there's a lower risk of type 1 diabetes in both mice and people.

Response:
People who are have more of certain bacteria that's naturally produced in the body tend to be less obese and have less chance of diabetes.

Cartoon:
Please insert cartoon of either experiment 2 or 3 below.
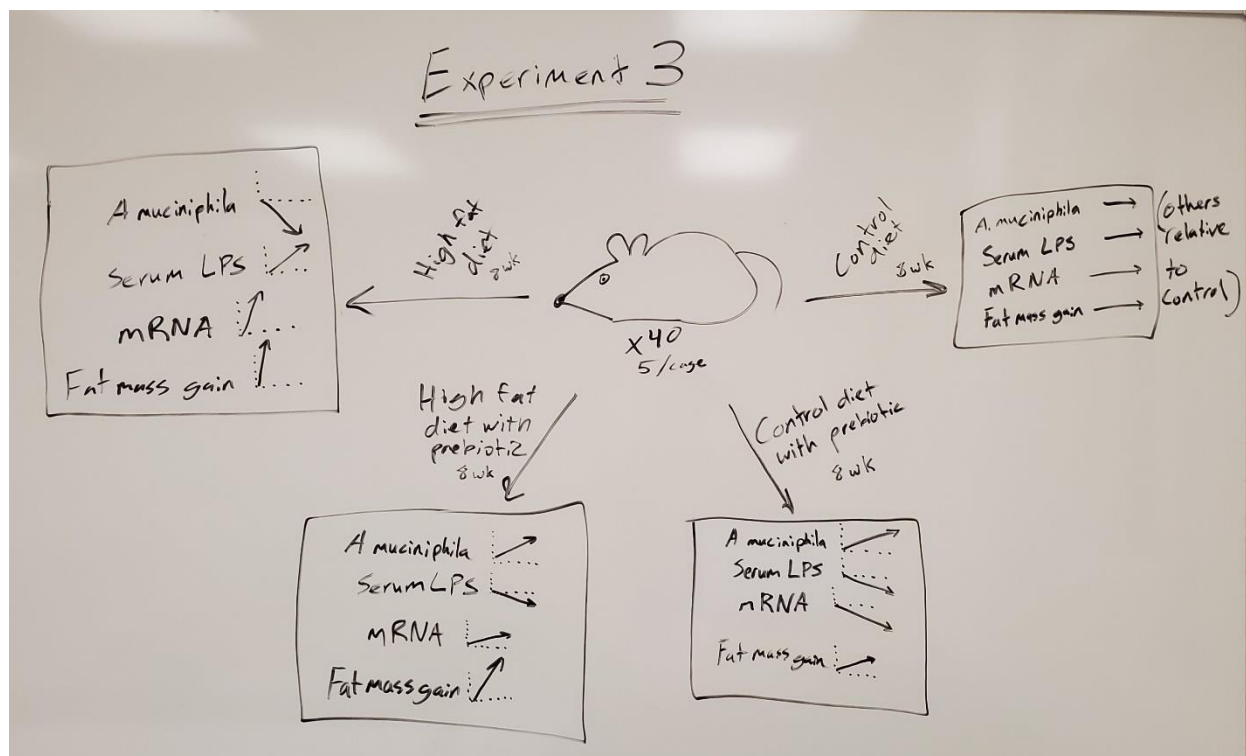
Critical Thinking

Complete the following activities for whichever experiment you did your cartoon for.

1. **Summarize the data (specific numerical values)**
   40 10 week old mice were split into 4 groups (10 mice each) and 5 per cage. First group had a control diet, second group had the control diet with an added 0.3g of prebiotic per day. The third group had a high fat diet made up of 60% fat and 20% carbohydrates and the fourth had the same high fat diet but with an added 0.3g of prebiotic a day. This continued for 8 weeks. At the end of this, the group with just the high fat diet dropped to about 7 A. muciniphila while the rest were at about 9.5. In terms of Serum LPS, the high fat diet went up to about 1.5 while the rest were at about 1. For the CD11c mRNA, the high fat only diet went up to about 3 while the rest were at about 1. And lastly for the fat mass gain, the high fat only diet went up to about 4.5, the high fat plus prebiotic went up to about 2.5, and the others were at about 1.

2. **Make an inference (what does the data tell us)**
   This data tells us that a high fat diet with no prebiotic reduces the A muciniphila bacteria in our guts and raises everything else up significantly compared to the other diets. However, a high fat diet with a prebiotic will result in similar amounts as both the control diets except for still a gain in fat mass but this gain is only about half as much as a high fat diet without prebiotic. It's also clear that the control diet and the control with a prebiotic are very similar and adding the prebiotic doesn't make much of a difference.