**Laboratory II – *Make Up Module***

**LEARNING OBJECTIVES**

1. Evaluate primary literature for relevance to developing experiments.

2. Communicate and refine experimental protocols.

3. Collaborate on the elaboration of a long-term group project.

Please highlight all your answers with a yellow background or use a different color font that is easy to read.

**ACTIVITY 1: CRITIQUE OF EXPERIMENTAL DESIGN**

Read the following brief question/hypothesis and experimental design and determine how this design can be improved. Be specific.

EX: How can we minimize the effects of multi-drug resistant strains of bacteria in our hospitals?

**Hypothesis:** The use of antibacterial soap is causing a rise in multi-drug resistant strains of bacteria found in hospitals.

**Design:** Study two similarly sized hospitals. Have one hospital continue to use antibacterial soap. The other hospital will use standard (non-antibacterial) soap. Take swab samples from the door handles of both hospitals and grow these samples in Petri dishes with different antibiotics. Count the number of bacteria colonies in each dish and compare.

1. At your table (or with your group), critique the above experimental design.

a. How can it be improved? Give a minimum of three specific improvements you would make.

1.

2.

3.

b. Consider what type of literature you would want to cite that would be relevant to this experiment.

c. Be prepared to report out to the class.

**ACTIVITY 2: EVALUATE PRIMARY LITERATURE**

**How do you choose relevant primary literature articles for citation?**

Primary literature is a peer-reviewed, first-person account of scientific research that scientists commonly use to communicate research findings between each other. When referencing other work that was previously done in their field of research, scientists must ensure to accurately and appropriately select citations for the work

to which they refer. The purpose of this assignment is to familiarize you with determining the relevance of primary literature for papers that you may read or write yourself. **Throughout the semester, we will be looking at and assessing primary literature in order to get more comfortable choosing, reading, and interpreting scientific publications.**

Read the following passage and, using the [four articles provided on the laboratory website](https://wordpress-projects.wolfware.ncsu.edu/bio-183-lab-yhnn8gz/unit-1labs-1-3-summer-online-module/) (See “Full Journal Articles” in red), select the article that best fits as a citation for the underlined bold sentence. Answer the questions below:

EXPOSURE TO ENRICHED ENVIRONMENTS INCREASES STEM CELL PROLIFERATION IN THE BRAIN

Adult neural stern cells (NSC) are progenitor cells that keep proliferating and differentiating into new neurons throughout most of the adult life of an organism. In several species of mammals, two specific brain regions have been documented to harbor neural stem cells: the dentate gyrus of the hippocampus and the subventricular

zone of the lateral ventricles (SVZ). While the function of the hippocampus is to process spatial navigation and long term memory, the SVZ, on the other hand, produces neuroblasts (immature neurons) destined to be integrated in the olfactory bulb (supposedly for better smell differentiation).

In the last couple of decades, neuroscientists have been attempting to decipher the mechanism affecting NSC proliferation. In theory, active stern cells that would produce more neurons, would in turn provide specific regions of the brain a greater ability to change and adapt (a process known as plasticity). Among the many factors that have been suggested to enhance stern cell activity both in the hippocampus and the subventricular zone is the exposure of animals to a richer, more complex environment. **Several experiments have now demonstrated that stem cell activity in the hippocampus could be increased by exposing mammals to a richer, more complex environment (citation).** If correct, this discovery would support and partly explain the idea that adult mammals such as humans who keep challenging their brain by constantly exposing it to novel stimuli would retain a greater level of plasticity all throughout life.

Questions:

1. Which one of the four articles provided on the lab website would be the best fit as a citation for the underlined sentence above? Explain why.

2. Explain why each one of the three other articles is a less desirable for this purpose.

**ACTIVITY 3: GROUP RESEARCH PROJECT DISCUSSION *(Make Up Students will need to be in contact with their group to complete work within their group google folder - all of before the next week of lab)***

As a group, continue to brainstorm and decide on a topic for the research project on which you will work together for the rest of the semester. Each member of your group will sign their name (sign in) and contribute ideas that will be recorded in Google documents that will be shared between all members of the group and your TA. The group may be making this folder OR the TA. Your TA will need to approve your idea before you leave lab this week and further develop your Project Proposal that is due next week.

If you are not present in lab this week, you should STILL contribute to your group in your group’s Google Folder that was set up last week in lab OR by your TA. If the Google folder was not set up last week, be on the lookout for an email from your TA and/or your group to be sure you participate in brainstorming to decide upon a topic.

**Fill out the following about the topic that the group decides upon:** *(you will need to wait for TA approval to the group on the topic – but this needs to be completed before you turn in the Unit 1 Handouts next week by the start of lab)*

1. The name of your pathogen – common and scientific
2. Provide a brief explanation of what it is and what it infects.
3. Why this pathogen was chosen to study.

Due to the Wednesday Feb. 15th University Wellness Day, we will not meet in our usual larger lab sections for Unit 1 Week 3 of lab. Instead, we are combining Weeks 2 & 3 this week in Lab. The Final Group Project Proposal is due submitted **next week** in Moodle by the start of Unit 2 Week 1 – Microscopes and Cells Lab. You will need to work with your group IN the Group Google folder to add your contribution to the Group Proposal.

View the **Assignment Details** on the lab website for the **Group Review Paper Proposal and References** – see the yellow assignment callbox box. Beyond writing about your proposed topic, each group member will need to use your Library Search Skills and find an appropriate primary literature article to contribute to use for the project. The Primary Literature Activity you did Week 2 should be helpful for this. The Lab Website has a variety of Resources to help you with this (see the links at the bottom of the [Unit 1 webpage](https://wordpress-projects.wolfware.ncsu.edu/bio-183-lab-yhnn8gz/unit-1labs-1-3-summer-online-module/)).