**Week 8: Redesign Control Element v2.0 & Draft Research Proposal**

Learning Objectives for DNA Control Element Discovery

*Skills*

* Produce graphical data for oral and written presentations.
* Write research proposal with past results, modified design, and predicted outcomes.

*Cognitive*

* Employ a scientific approach to answering biological questions and test hypotheses.
* Analyze experimental data and reach logical conclusions.
* Synthesize experimental results for oral and written presentations.
* Formulate and test new hypothesis based on past results.

**Pre-Lab**

Before you come to lab

1) Evaluate your rough plan for round two of experiments on a DNA control element. Refresh your memory on data from the first round of experiments. Locate the paper(s) on which the first iteration was based.

2) Answer each of these four questions in two sentences or less.

A) Are DNA control elements modular such that you can swap out one part for another?

B) How can you test a new DNA control element if the first iteration has already been cloned into the testing plasmid?

C) What was the value of doing PCR on your first iteration of cloned DNA control element?

D) What additional information would you like to know about your second iteration DNA control element to be sure you have tested the same sequence you designed?

**Information: Design a Revised Plan of Action to Test a DNA Control Element**

In Lab:

3) Your group should draft a new experiment to further explore a DNA control element. You will build on what you drafted last week. You should draw the new design using PPT, and sketch your expected results.

4) You need to draft a research proposal. You will be able to work on this proposal next week too, but the more time you put in today, the less you will have to do next week. The final proposal that will be graded needs to contain these parts:

* previous results (yours or another group’s; include figure + legend)
* hypothesis of what the results mean
* new DNA sequence you want to test (two named oligos with sticky ends)
* figure of designed element in the testing plasmid
* new experiment to test your v2.0 DNA control element
* appropriate control *E. coli* strains
* predicted results from DNA control element v2.0 and controls (sketch + figure legend)