**Week 9: Redesign Control Element v2.0 & Submit 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.
* Formulate and test new hypothesis based on past results.

**Pre-Lab**

Before you come to lab

1) Evaluate your rough plan for experiments on a DNA control element version 2. 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 cloned DNA control elements 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 have roughed out 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 a graph your expected results comparing the positive control to your v1 and v2 designs. rClone teams should [consider mFold](http://unafold.rna.albany.edu/?q=mfold/RNA-Folding-Form) to examine mRNA structure. (<http://unafold.rna.albany.edu/?q=mfold/RNA-Folding-Form>)

4) During lab, you will write your research proposal. 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 v1 results mean
* new DNA sequence you want to test (two named oligos with sticky ends)
* figure of designed element in the testing plasmid
* new experimental design 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)

We will add your new parts to the Registry next week while the GGA is running.

I need one volunteer from each group to come on Monday to my research lab (Wall 325) at 4:30 pm.