**113 Lab Learning Objectives**

**Week 7: synthetic lab #6**

Learning Objectives for Promoter Discovery

*Skills*

* Produce graphical data for oral and written presentations.

*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.

**Week 7: Information and Natural Selection lab #3**

Learning Objectives for Environmental Information and Natural Selection

*Skills*

* Prepare DNA for sequencing.
* Use ApE software to analyze DNA sequences.

*Cognitive*

* Employ a scientific approach to answer biological questions and test hypotheses.
* Analyze experimental data and reach logical conclusions.
* Connect environmental information to evolution using lab experiment as example.
* Explain what TAS2R38 has to do with taste and natural selection.
* Describe how DNA is sequenced using PCR product as template.

**Bio113 Week 7**

Before you come to lab

1) Organize all your data from the synthetic biology module on promoter research.

2) Download the [free ApE software](http://biologylabs.utah.edu/jorgensen/wayned/ape/) if you plan on using your own computer in lab. The lab computers already have ApE installed.

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

A) What is a SNP and what does this term have to do with TAS2R38?

B) What would you expect to see if a person is heterozygous for a particular SNP and you sequence both alleles at the same time?

C) What did you learn about your promoter that you built from scratch?

D) What sort of information is encoded in a promoter sequence?

**Week 7**

In Lab

**Information and Evolution: Genetics of Perceiving Danger Module (an 8 week project)**

1) Load your PCR products from your TAS2R38 alleles onto the 0.7% agarose gel. You will electrophorese your DNA to determine the size of the DNA band.

2) [Prepare these PCR products for sequencing](http://gcat.davidson.edu/GcatWiki/index.php/Prepare_PCR_product_for_sequencing) in the barcode tube provided to you. Put your name and barcode on the sheet of paper on the front bench.

3) Download the zipped folder of DNA sequences and perform the analysis below. You will view the sequences using ApE (a plasmid editor – free and works on Mac and Windows). Use the Ape TAS2R38 Guided Tour file to learn how to use ApE and find the TAS2R38 SNPs of interest.

**Information: Design and Build a New Promoter (an 8 week project)**

4) Spend the rest of your time preparing for your oral presentation. Details will be presented during lab. [Oral report grading rubric is online.](http://www.bio.davidson.edu/113/grade_Rubrics.html#oral)

5) On week 9, your lab group will be notified one hour before lab who is presenting each section for your oral report. This is to help you learn all four sections of the report an not just one section.

6) Each person will play [iBOP Bingo](http://www.bio.davidson.edu/113/iBOP_Bingo.pdf) to help everyone avoid common mistakes in oral presentations.

7) Take CATME survey.