SEED Academy, Spring 2011
Synthetic Biology Module

Homework #4
Due March 12, 2011

1) **Back to your Final Project**
   Come in prepared to discuss your ideas with your classmates, TA and instructors! They certainly do not need to be "perfect" ideas at this very moment, but, considering the work you have done so far on them including beginning to gather real world information about organisms and biological interactions/systems interfaces, you should have some idea of the actual biology behind your project.

   As always, please feel free to send us questions.

2) **BioBrick Standard Assembly**
   Read "Idempotent Vector Design for Standard Assembly of BioBricks" (go to http://hdl.handle.net/1721.1/21168 and click on the biobricks.pdf file at the bottom of the page. The info relevant to you is the first 6 pages.). Answer the following questions (note parts d and e on the second page):

   a) What is the motivation for a standard assembly scheme?

   b) What does it mean for assembly to be idempotent?

   c) What are the 4 standard enzymes used in BioBricks assembly?

d) What enzymes should be used to cut a BioBrick part that we wish to add to the back of another part?

e) Indicate the recipe for a ligation of a plasmid and an insert. Your plasmid is 3000 bp and the insert is 1000 bp. Assume that all nucleotides are 1000 Da. Assume that you want 1 nM concentrations of each of the DNA components in your ligation.

Plasmid (10 ng/μL)	_____ μL
Insert (50 ng/μL)	_____ μL
Ligation Buffer (10X)	_____ μL
T4 DNA Ligase (Enzyme)	_0.5_ μL
Water	__ _ __ μL
Total	_10_ μL