

# Three Ideas Report

SEED Academy  
Synthetic Biology – Spring 2012

Now that your project groups have been assigned, it's time to start evaluating different ideas before you select one for your final project. For homework over the next two weeks, you are to choose three ideas and, as a group, prepare a brief **written report** on these ideas. A rough draft of this report is due at Session 5 (3/10/2012); the final report is due at Session 6 (3/17/2012).

Choose three project ideas. These could be ones that individual group members came up with for prior homework assignments, or new ones that you think of as a group. To prepare your three ideas, you will need to carefully consider, research, and *discuss as a group* the following questions. Your final report should have a brief (1-2 sentence) description of each project idea, and at least a paragraph on each question for each idea (total 9 paragraphs).

1. **What is the challenge to address?** What *specific* need or purpose will your project serve? Why is it important to address that challenge?

- *(For example: the BactoBlood iGEM project addresses the shortage of blood for transfusions, which save lives. The bacterial photography iGEM project addresses the challenge of making bacteria detect light/darkness and produce a specific response, which has many potential applications in the general area of bio-sensors.)*

2. **What has already been done?** What are the existing technologies that compete with your project? How will your approach differ from theirs?

- *(For example: the bacterial photography project competes with biological light-sensors (eyes), but is much simpler because eyes are large, complicated, multicellular organs instead of simple systems residing in a single cell. It also competes with mechanical light-sensors (cameras), but a biological light-sensor will be easier to interface with biological responses, such as growth or producing a certain chemical.)*

3. **What do we know about the challenge?** Research the general biology of your chosen topics. What is known, and what is still unknown to scientists studying your topic? Does your research suggest any specific approaches you could take, or key parts you could 'borrow' from nature?

- *(For example: some ways that living things sense light include photosynthesis proteins, the light-sensitive proteins in your retina, and members of a group of proteins called histidine kinases, which bacteria frequently use to sense their environments... that last one looks interesting. (from Googling 'bacteria light sensing'))*

## REQUIREMENTS:

- The rough draft of your report should have at least a few sentences written on each of the three questions above, for each of your three ideas.
- *Every group member must contribute* to your group's report. You may divide up the work however you like, but you must mark each section of the report with the names of the group member(s) who were primarily responsible for researching and writing it.
- Both rough and final drafts should be typed or neatly handwritten.
- Consult instructors *early and often* about your ideas! This is a quick way to find out if your ideas are too broad, too narrow, or simply impossible with current levels of biotechnology.