Meeting minutes
bootcamp day 3
5.26.10

Synthetic biology

"engineering microbial 'polka dots' toward synthetic biology":

Synthetic biology uses only sequence info in order to implement an objective biological system. Biological systems *engineering* employs and modifies naturally existing biological systems in order to make them behave as intended. iGEM tends to fall into the biological systems engineering category since we take existing parts and put them together rather than coming up with a sequence.

System design:

Parts vs device vs system
ie: radio vs radio+speakers.
protein vs multiple proteins (ie: repressors) to create an inverter vs multiple interacting inverters.

Principles in biological systems engineering:
1. Abstraction—provide a big picture without detailed characteristics of the intended system (part, device and system)
2. Standardization—enable interfacing among parts, devices, and systems. Predictable/reproducible performance. (we don't have to worry about this so much since most of what we use is in biobrick format)
3. Decoupling—efficient way to deal with complexity. Getting rid of interference. Considering other effects of utilization of the metals
4. What devices are needed for the system. Think about what existing devices to couple with the devices we want to make.
5. Connect the devices needed.
6. Implementation, detailed design of parts needed. What promoter, RBS, terminator do we want to use? What kind of regulation?
7. Part level system configuration—how all the parts interact in the system.
8. Synthesis, compilation, DNA layout, sequence information.
9. Debugging the system. Looking at each part, testing if it works in the system, where something might have gone wrong if it's not working. Individually test each part in the device by putting GFP downstream to receive output from each element and manually introduce input signal.
10. Final output and sequence information.

Intial simple modeling: Think about where the system will fail. Metal toxicity, low transcription/translation activity.

Make sure to provide good documentation of our device. Don't necessarily have to get everything working.

Plan out objectives for the summer, steps for achieving the goal.

Research topics:

1. Metal resistance
2. Magnetosomes
3. Metal mobilization
4. Metal immobilization

Wiki Editing:

upload picture to profile, update profile.