

BioBuilding: Synthetic Biology for Students: Design Assignment

Teacher Considerations

Using the bacterial photography system as inspiration, this assignment asks the students (individually or in groups) to use their imagination as they propose a design for a genetic system. The emphasis is on the decisions made by engineers during the planning of the design process and not on the genetics. The students are asked to consider existing technologies, risk, reward, and testing. Of course, they are expected to imagine a genetic system that will make a significant contribution to life on earth. You can worry about its feasibility later.

Resources (just a sample)

Here are some background readings and videos that teach about synthetic biology, its goals and projects. You may wish to provide your students with these resources.

[Decoding Synthetic Biology \(YouTube\)](#)

[What is synthetic biology?\(.pdf\)](#)

[A Life of Its Own \(.pdf\)](#)

[Our Synthetic Futures](#)

[Handmade Biology](#)

[Synthetic Biology: Tools to Design, Build, and Optimize Cellular Processes](#)

[Video on design and synthetic biology by James King \(Hastings Center\)](#)

[Explanation of the Engineering Design Process](#)

[Design criteria](#)

[Teacher's Domain video and essay on the Engineering Design Process](#)

- some links to older articles:

[How to Make Life](#)

[Life Reinvented](#)

You may also wish to see the type of projects that college synthetic biology students have designed as part of the [iGEM Competition](#). Please keep in mind that these projects put a much greater emphasis on the actual design of the genetic system than is intended by this assignment.

Assessment

Grading Rubrics

Design Assignment Rubrics and Scoresheets ([pdf](#))

Survey

To help us improve the labs, you can

1. send the students [here](#) where they can offer anonymous feedback.
2. "join a discussion" from the [\[BioBuilder homepage\]](#)
3. email us: "info AT biobuilder DOT org"

Thanks!