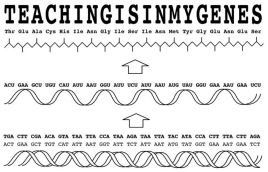
Synthetic Biology Workshop June 2014

University of Maryland, Baltimore County
Meyerhoff Chemistry Building
1000 Hilltop Circle
Baltimore, MD 21250



Tentative Schedule

Breakfast - 7:30-8:30 @ True Grits restaurant
Lunch - 12:15-1:00 in Room 256
Dinner - 6:00-7:00 in Room 256

Morning Break - 10-10:15 in Room 256
Afternoon Break - 3:15-3:30 in Room 256

Day 1 – Tuesday, June 24, 2014

4:00 – 4:15	Welcome	
4:15 – 4:45	Safety Training	
4:45 – 5:45	Overview • What is synthetic biology? • How is synthetic biology suited for undergraduates? • What are the goals of the workshop? Introduction of BioBrick and Golden Gate assembly schemes	*Seminar Room-(Room 120)*
6:00 – 7:00	Dinner	*TBD*
7:00 – 9:00	Introduction to the Registry Registry assignment to participants Synthetic biology project examples: medicine, energy, environment, technology Ethics and philosophy of SynBio	*Seminar Room*

Day 2 – Wednesday, June 25, 2014

7:30 – 8:30	Breakfast	*TBD*
8:30 – 8:45	Reflections on previous day, feedback on workshop so far and goals for Day 2	*Seminar Room*
8:45 – 10:00	Explore the iGEM Wiki Work as pairs of participants, describing past iGEM projects in area of interest	*Seminar Room*
10:00-10:30a	Break	*TBD*
10:30 – 11:30	Report iGEM projects (Why are these "synthetic biology"?)	*Seminar Room*
11:30 – 12:00	Sally O'Connor from NSF will talk about funding opportunities	*Seminar Room*
12:15-1:00	Lunch	*TBD*
1:00 – 2:30	Wet lab work • Run BsaI + ligase reaction with two plasmids	*SLC Lab Room 201*

- Transform cells with ligation above
- Obtaining Registry parts or building new parts
- Start PCR simulation of building a new part from genome template

2:30 – 3:15	Introduction to Math Modeling	*Seminar Room*
3:15 – 3:30	Break	
3:30 – 4:45	BioMath Exercises	*Seminar Room*
4:45 – 5:45	Synthetic Biology research presentation based on MWSU and DC student research	
6:00 – 7:00	Dinner	*TBD*
7:00 – 7:45	Birds of a Feather discussions – what issues do you see at this point?	*Seminar Room*
7:45 – 9:00	Participant pairs work on their plans for synthetic biology at their institution Brainstorm area of focus, understand overlapping interests, project ideas	

Day 3 – Thursday, June 26, 2014

7:30 – 8:30	Breakfast	*TBD*
8:30 – 8:45	Reflections on previous day, feedback on workshop so far and goals for Day 3	*Seminar Room*
8:45 – 10:00	How synthetic biology reconfigures biological understanding and ethical categories	*Seminar Room*
10:00 – 10:30	Break	*TBD*
10:30 – 11:30	Discuss lab methods and practices: Wiki, Oligator, Loligator, Primer Designer, GCAT-alog, RFP, sharing protocols online Assignment: generate a set of oligos that could assemble into a clonable promoter (Optional) Take online SynBio assessment (for students) checkboxweb.davidson.edu/Survey.aspx?s=a317ef10fb42498dbab5fb3e72d4d36c	*Seminar Room*
11:30 – 12:00	Announce project topic to group	
12:15 – 1:00	Lunch	*TBD*
1:00 – 2:00	Lab work • Load PCR products on gel • Take gel pictures • Observe colonies	*SLC Lab Room 201*
2:00 – 3:15	Work in pairs on topics for project presentation/discussion AMC, LH, TE, JP, KK consulting	
3:15 – 3:30	Break	*TBD*
3:30 – 6:00	Continue project work in pairs	*SLC Lab Room 201*
6:00-7:00p	Dinner	*TBD*
Evening	Continued project work in pairs, or free time	

Day 4 – Friday, June 27, 2014

7:30 – 8:30	Breakfast	*TBD*
8:30 – 8:45	Group Photo	*TBD*
8:45 – 9:00	Load presentations on instructor's computer	
9:00 – 10:00	Team presentations: 10 minutes for each pair for presentation/discussion/feedback	*Seminar Room*
10:00 – 10:15	Break	*TBD*
10:15 – 11:45	Team presentations continued	*Seminar Room*
11:45 – 12:00	Final discussion and wrap up	
12:00	Participants depart *(Optional lunch at TBD)*	

Short-Term Outcomes of GCAT Synthetic Biology Workshop

1) Everyone will learn as much as possible. We will all have fun, and the participants will begin a new phase in their teacher-scholar career.
2) Participants will learn some vocabulary and a new perspective that distinguishes synthetic biology from genetics and molecular biology.
3) Interdisciplinary teams will explore an area of common interest and investigate feasible projects for undergraduate research and possible course development.
4) Participants will develop a strategy to recruit and support undergraduates for research in synthetic biology.
5) Faculty from different departments will collaborate to find common ground, mutual understandings from different perspectives, and a shared vision of how to start a new research adventure.
6) Participants will consider and investigate practical ways of integrating philosophical and ethical components into their synbio projects through the active engagement of their undergraduates in scientifically-informed ethical discussions.

Long-Term Outcomes of GCAT Synthetic Biology Workshop

1) Participants will apply what they learn to develop an undergraduate research program in synthetic biology.
2) Participants will assemble multidisciplinary teams consisting of at least two faculty and two or more students from at least two different majors.
3) Faculty from outside biology will utilize the methods they learned to help design, construct, and test DNA-based devices as part of a synthetic biology research project.
4) Biology faculty will learn the language and tools of the trade from their partner's discipline to a level

of proficiency that they can help design, construct, and test a model of the device as part of a synthetic biology research project.

5) Faculty will include philosophical and ethical discussions in their classes to encourage students to think about the implications of their work.

Participants will be staying at:

Harbor Hall
University of Maryland
Baltimore County
Baltimore, MD
http://www.umbc.edu/reslife/communities/hbr.php