Welcome to 20.109(Fa18) W/F section!

Laboratory fundamentals of biological engineering

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MIT BE
BIOLOGICAL ENGINEERING

MOD0: Orientation/Lab Tour

09/07/18

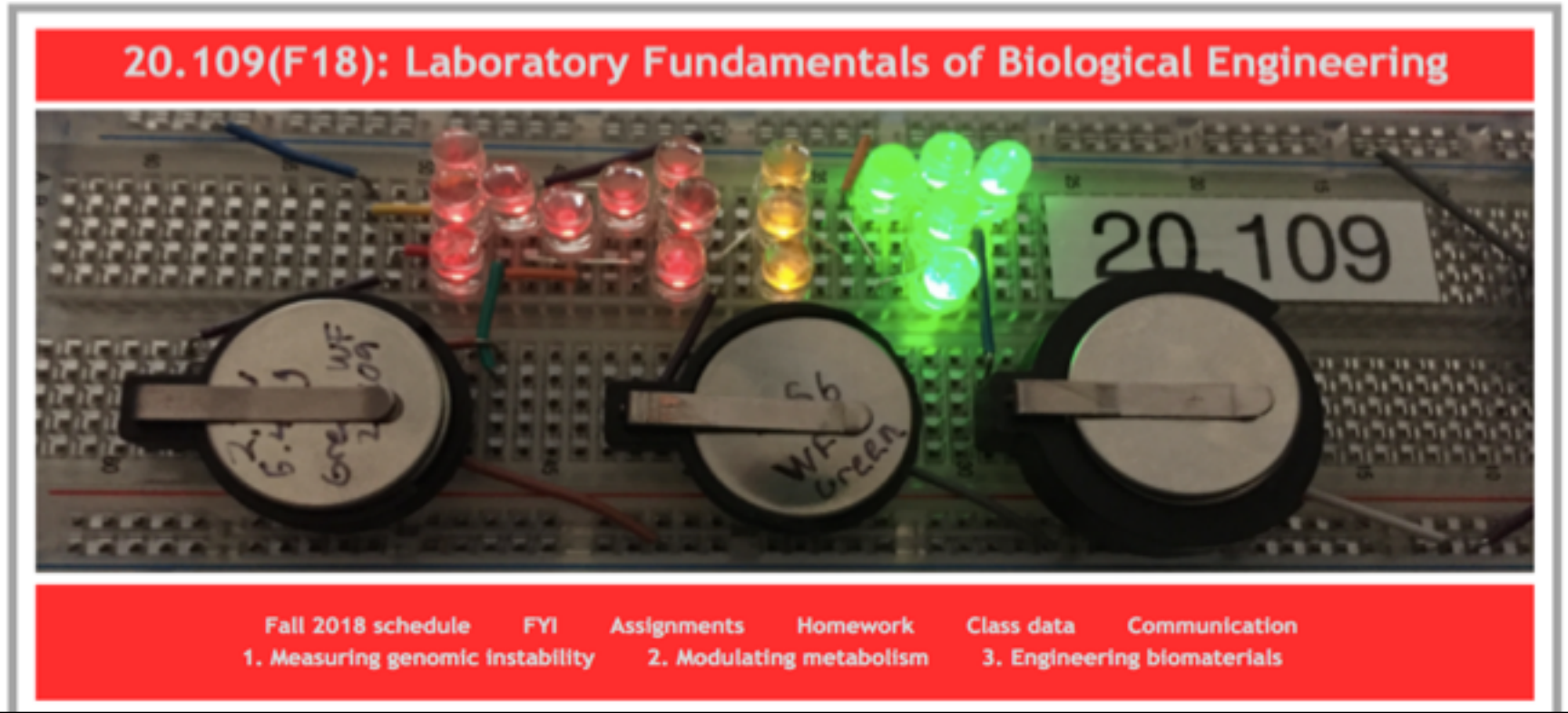
1. EHS training
2. Let's get to know each other
3. Intro to 20.109 lab "Pre lab"
4. Start lab orientation: your first protocol!
5. Prep for M1D1

Core missions of 20.109

- Collect **authentic** data
  - Elements of design, unknown outcomes
- Practice **communicating** your science
  - Written & oral, in homework and assignments, a lot of feedback
- Working in **collaboration** with colleagues
  - Experiments completed in teams
  - Assignments are completed individually or in teams (as noted)
  - Class-wide collaboration (for data acquisition and analysis)
  - Punctuality
  - Integrity (*personal* reflections)
- The faculty are here to help – **come to us with questions!**

The wiki is your best friend

http://engineerbiology.org/wiki/20.109(F18):_Fall_2018_schedule



Bookmark the Schedule page

MODULE	DAY	DATE	LECTURER	LABORATORY EXPERIMENTS	ASSIGNMENTS
		R/F Sept 6/7	NLL	Orientation	
1	1	T/W Sept 11/12	BE	Practice tissue culture and prepare microwell array	Laboratory orientation quiz Homework due
1	2	R/F Sept 13/14	BE	Design cell loading optimization experiment and research cell lines	Homework due
1	3	T/W Sept 18/19	BE	Prepare and treat cells for genomic instability experiment	Homework due
		R/F Sept 20/21	Comm Lab	Lecture, but no laboratory Career fair student holiday	
1	4	T/W Sept 25/26	BE	Complete genomic instability experiment and load cells for sub-nuclear foci assay	Laboratory quiz Homework due
1	5	R/F Sept 27/28	BE	Analyze instability experiment data and treat cells for sub-nuclear foci assay	Homework due
1	6	T/W Oct 2/3	BE	Complete sub-nuclear foci assay	Homework due
1	7	R/F Oct 4/5	BE	Practice statistical analysis methods and complete data analysis	Laboratory quiz Homework due

Keep track of assignment due dates
(See Assignments tab on wiki)

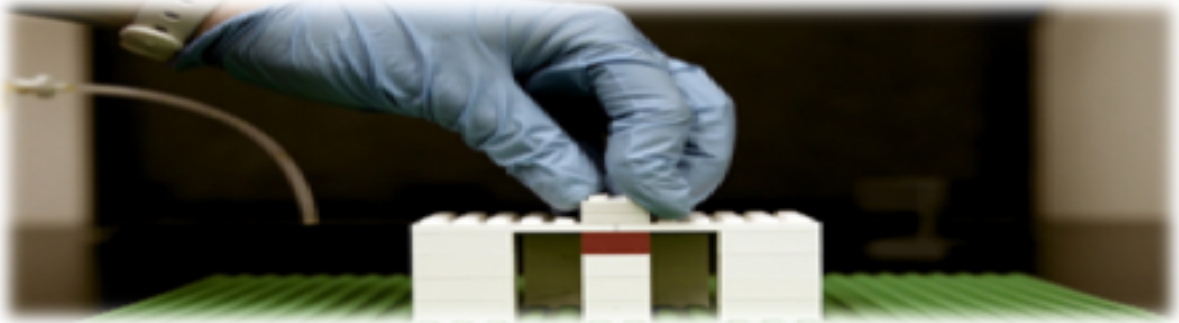
Module	Assignment	% final grade	Due date
1	Data summary	15	10/8 (draft), 10/20 (revision)
1	Mini-presentation	5	10/13
2	Journal club presentation	15	~~10/23 or 25~~ 10/24 or 10/31
2	Research article	20	11/12
3	Research proposal presentation	20	~~12/6~~ 12/7
3	Mini-report	5	12/10
all	Homework and Lab notebook	10	daily
all	Participation and blog	5	after module, see wiki
all	Quizzes	5	2 per module

individual : 60%

team: 40%

Homework builds to major assignments

- Only 10% of final grade?!
- Give it your best:
  - Consider homework a first draft
  - Never gratuitous, building blocks toward final reports and oral presentations
  - We give a lot of feedback (will prove helpful)
  - Great tool to keep ahead of the game and pace your work



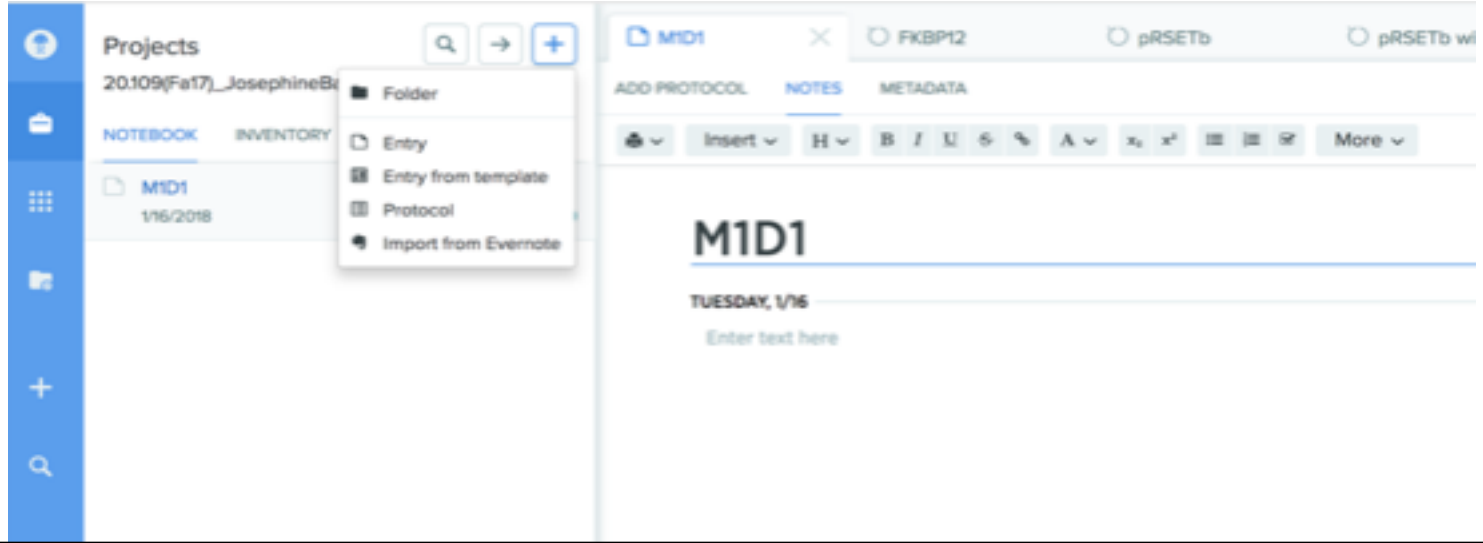
Owens and Hart, Lab on a LEGO
Image by Melanie Gonick, MIT News

A typical day in 20.109

- Lab starts at 1:05pm
  - Let us know ahead of time if you will be late or have a conflict
- Quiz (on lectures and labs)
  - M1D1, M1D4, M1D7…keep track on wiki!
- Turn in homework as pdf on Stellar by 1:05pm
- Prelab: interactive discussion ~ 15-45 min
- Design and Experiment!
  - Keep notes in Electronic lab notebook (Benchling)
  - Q&A throughout the afternoon

Lab notebook in Benchling

- Set up an account: benchling.com
- Entitle your project “20.109(F18)_YourName”
  - Make each module a new folder
  - Make each day a new entry within appropriate folder
- Share with Leslie & Jai: lesliemm@mit.edu, jaip@mit.edu



Personal protective equipment (PPE)

Item	Worn (BE guidelines)
Gloves 	- When working with chemical or biological materials ➢ Change when entering tissue culture room!
Lab coat 	- When working with chemical or biological materials ➢ Change when entering tissue culture room!
Goggles 	- When handling large quantities of powder or liquid due to chance of splash - When pipetting toxic chemicals (mutagens) - When using ethanol burners - In conjunction with face shield at UV transilluminator

Be sure to dispose of waste correctly

regular trash can

benchtop waste

sharps container

liquid waste vacuum flask

NO LIQUIDS!

paper
paper towels

ANYTHING NOT bio or chem waste

- plastic pipette tips
- gloves
- plastic tubes

- needles
- anything glass: pipettes tubes
- razor blades

- spent cell culture media
- bacteria media

→ No chemical waste ←

Everyone has waste responsibilities

regular trash can

benchtop waste

sharps container

liquid waste vacuum flask

Please empty benchtop waste daily

biowaste box

Today

- Find partner and bench / team color
  - Record choice at front bench
- Complete lab orientation—there will be a quiz!
  - http://engineerbiology.org/wiki/20.109(F18):Lab_tour
  - No lab notebook entries required today

For Wednesday

- Respond to poll on best office hours times (emailed later today)
- Find homework (http://engineerbiology.org/wiki/20.109(F18):Homework):
  - Lab notebook in Benchling
  - Be ready for orientation quiz
  - Screen capture (or print) EHS training certificate(s) to turn in, preferrably online
  - Read Mod1 overview page and M1D1 introduction