Leslie

Welcome to F15 20.109!

1. Introductions & 20.109 Mission
2. Intro to Wiki & Semester Overview
3. Daily Operations
4. Lab Safety
5. Lab Notebook
6. Lab Tour (...your first protocol!)

20.109 mission

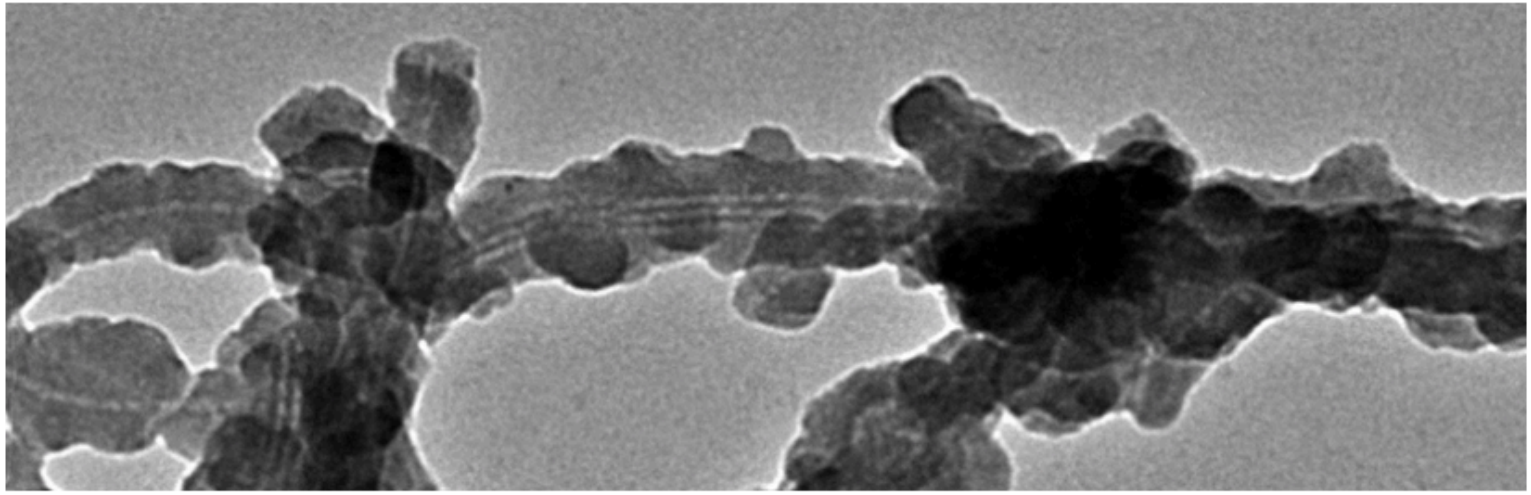
- Aim 1: Novel investigations

- Aim 2: Authentic communication

- Aim 3: Integrity-based collaboration
  - Contributions to team assignments
  - Independent completion of individual assignments

Your new best friend: *the 20.109 wiki*

20.109(S16): Laboratory Fundamentals of Biological Engineering



Home People Schedule Spring 2016 Assignments Homework Lab Basics Wiki Basics
Protein Engineering System Engineering Biomaterials Engineering

Welcome and details for Spring 2016 [edit]

Lecture: T/R 11-12 (16-220)
Lab: T/R 1-5 or W/F 1-5 (56-322)
People: Instructor and student web pages may be found at the linked **People** page.

Welcome to 20.109! For some of you this will be the first time in a research lab and for others it will not; either way, it is our goal to make this class a useful and fun introduction to experiments and techniques in biological engineering. There is not time enough to show you everything you'll need to know if you go on to do research, but after taking this class you should feel confident and familiar with some

and lab protocols. You will develop good habits at the bench, ones that will increase the likelihood

http://engineerbiology.org/wiki/20.109(S16)

Bookmark me!

Semester overview: schedule

MOD	DAY	DATE	LECTURER	LABORATORY EXPERIMENTS	ASSIGNMENTS
		T/W Feb 2/3	NLL	Orientation	
1	1	R/F Feb 4/5	NLL	In silico cloning	**Lab orientation quiz** Homework due
1	2	T/W Feb 9/10	NLL	Design mutation primers	Homework due
1	3	R/F Feb 11/12	NLL	Site-directed mutagenesis	Homework due
		T/W Feb 16/17		Presidents' day holiday	
1	4	R/F Feb 18/19	NLL	Prepare expression system	**Lab quiz** Homework due
1	5	T/W Feb 23/24	NLL	Induce protein expression	
1	6	R/F Feb 25/26	NLL	Purify protein	Homework due
1	7	T/W Mar 1/2	NLL	Characterize protein expression	Homework due
1	8	R/F Mar 3/4	NLL	Assess protein function	**Lab quiz** Homework due
2	1	T/W Mar 8/9	LDS	Introduction to cell strains and plating	Homework due
2	2	R/F Mar 10/11	LDS	Western analysis and system conditions	Protein engineering summary draft due Sat, Mar 12 at 5 pm
2	3	T/W Mar 15/16	LDS	Wes… DNA…	Homework due …eering mini-presentation due Tue/Wed, Mar …pm
2	4	R/F Mar 17/18		Journal club I	Journal club I slides due Thu/Fri, Mar 17/18 at 1 pm

20.109(S16):Complete Western and prepare damaged DNA (Day3)

The secret to 20.109: *Time Management*

Assignments in 20.109

Major assignments (80%)

Module	Topic	Assignment	% of final grade	Links to description and/or evaluation
1		Protein engineering summary	15	Assignment description
		Protein engineering mini-presentation	5	Assignment description and evaluation rubric
2		Journal club presentation	10	Assignment description and article sign-up Evaluation rubric (PDF download)
		System engineering research article	25	Assignment description
3		Research proposal presentation	20	Assignment description Evaluation rubric (PDF download)
		Biomaterials engineering mini-report	5	Assignment description and evaluation rubric

Daily Work (20%)

- Notebook
- Quizzes
- *Homework*
- Participation
- Blog posts

Homework

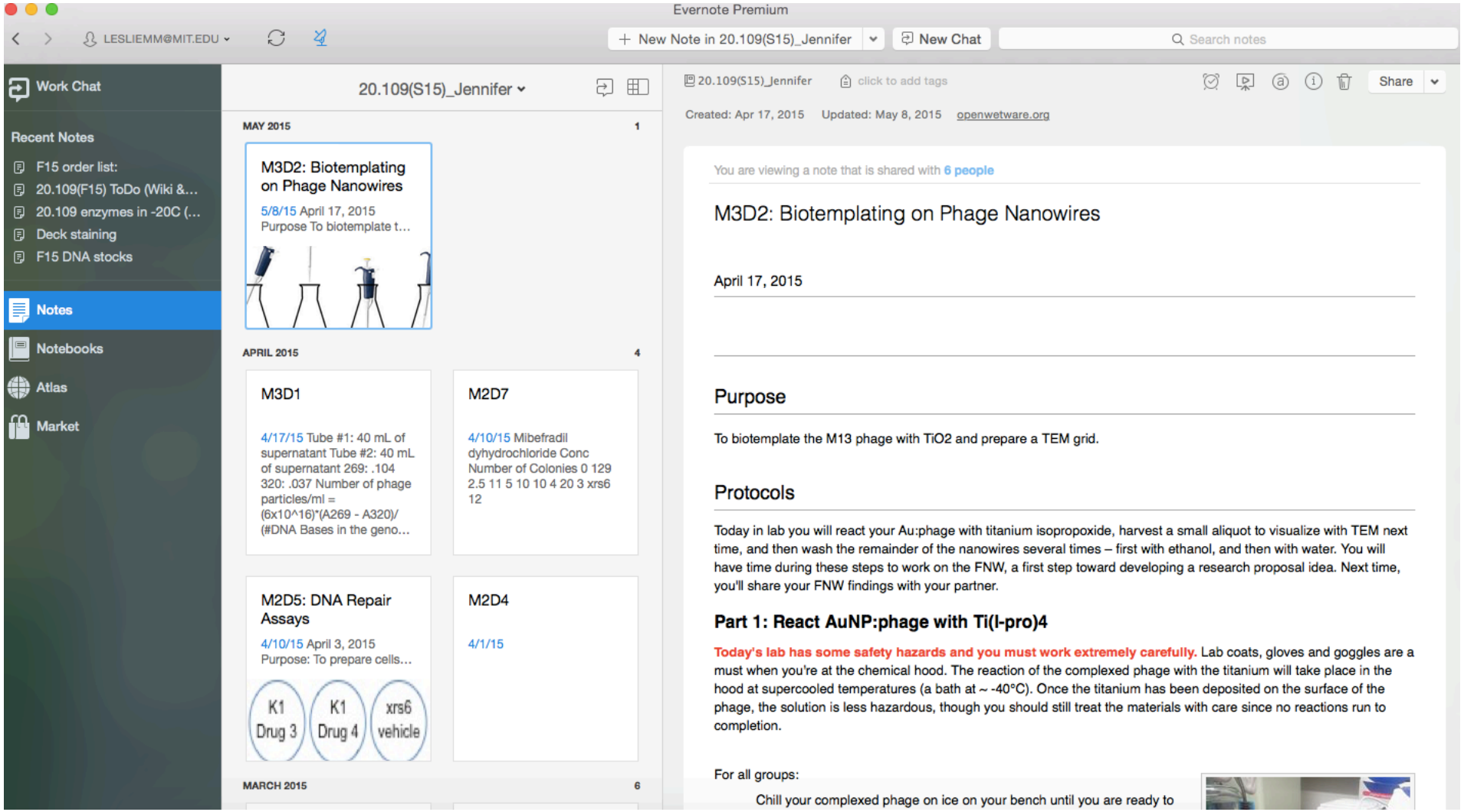
- Only 7% of final grade(?!)
- Give it your best:
  - never gratuitous, building blocks toward big-point assignment
  - a lot of feedback will prove very helpful
  - great tool to keep ahead of the game and pace your work

Daily Operations:

- Hand in homework- receive graded homework
- Quizzes: 15 points, ~15minutes (2X per module)
- Pre-lab lecture & discussion
- The fun stuff = science! → evernote lab notebook

The key to daily 20.109: *The wiki is your friend*

Lab Notebooks: Evernote (evernote.com)



Evernote Lab Notebooks:

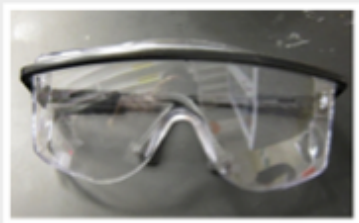
- Register for an Evernote account and create a 20.109 notebook.
- Please use your name in the title of your notebook
  - For example: 20.109(F15)_Leslie
- Read the wiki page called “Guidelines for maintaining your lab notebook” (under Assignments tab)

IMPT: Share your evernote lab notebooks with:

- me (lesliemm@mit.edu)
- Maxine (jonas_m@mit.edu)
- Jing Zhang (jgzhang@mit.edu)

No PPE from main lab should go to the tissue culture room (TC room).

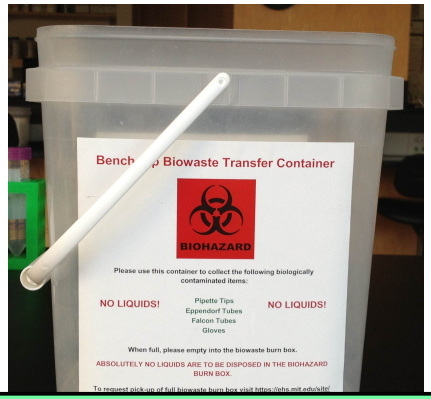
Personal Protective Equipment (PPE)

Item	Required	Recommended
Safety glasses 	• At hood. fume • When using ethanol burners. • Add face shield at UV transilluminator.	• Large quantities of liquid or powder (even if not strictly hazardous) due to chance of irritation by splash, dust, etc.
Lab coat 	• At hood. fume • In TC room. biomaterial	• See above.
Gloves 	• Working with hazardous materials (w/r/t chem or bio). • Nitrile for greater hazards (e.g., EtBr).	• Working with any material. • Touching gloves-on equipment.

almost always

Managing Biological Waste:

Benchtop waste:



Empty daily

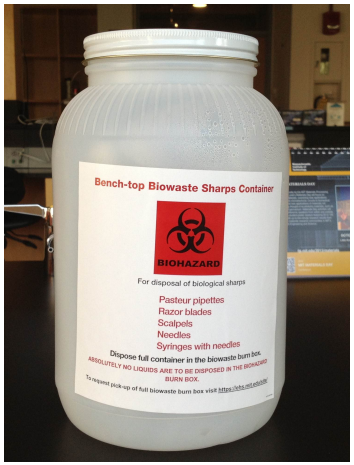
- -pipetman tips
- -kimwipes
- -gloves
- -tubes
- -plastic pipettes (5ml, 10ml....)

NO LIQUIDS!

Biowaste Box:

agar bacteria plates

Sharps container:



- -glass tubes
- -glass pasteur pipettes
- -razors

Today in the lab:

- Find your lab partner, pick your bench, check out your space, and sign up on the lab map up front!
- Complete lab orientation
- Check out the homework for M1D1 (due on Thursday, 2/4).
- Respond to the Office Hours doodle poll later today