- Introductions
- 20.109 Philosophy
- Semester-Long Workflow
- Day-to-Day Workflow
- Lab Safety
- Self-/Guided Lab Tour

The two pillars of 20.109

- Authentic investigation
  - elements of design, unknown outcomes
- Authentic communication
  - professional style talks, visuals, writing

your investment are paramount for success of our collaboration

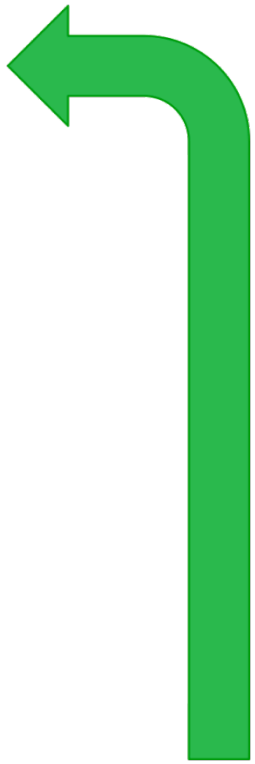
Collaboration with integrity:

Assignments done together should reflect equal contributions.

Assignments done individually can be *discussed* together.

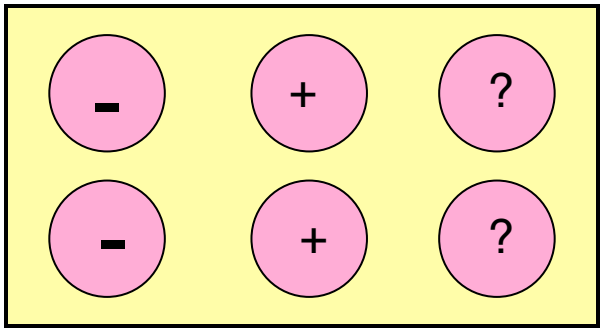
Towards independent research and professionalism

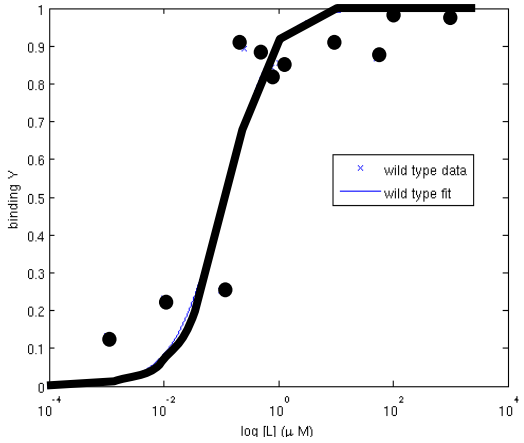
	Mod 1	Mod 2	Mod 3
Design	procedural	conceptual	free reign
Writing	report as pair → revision	report alone	team report
	homeworks/drafts individually		
Reading	as group read one deeply	as group cite more	skim many (read some!)



After 20.109, you should be able to…

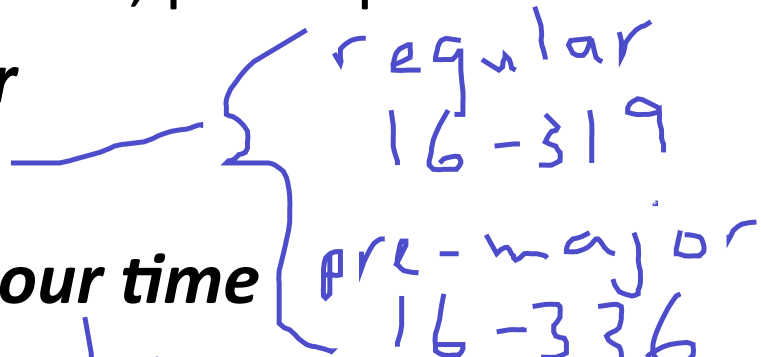
- Organize a lab notebook
- Implement laboratory protocols
- Design novel experiments with appropriate controls
- Interpret qualitative data
- Analyze quantitative data
- Recognize utility of models
- Examine the scientific literature
- Communicate in multiple modes
- Present salient points of your own





Semester-long workflow

- Work in pairs
- Broader community collaboration
- Assessments
  - Major: reports and presentations
  - Minor: HW, quizzes, notebooks, participation
  - ***Ask if something is unclear***
    - ***Available over email, OH***
  - ***Plan ahead and manage your time***



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Day-to-day workflow

- Hand in current HW, get old HW back
- Announcements and/or HW discussion
- Quiz 1:10 sharp 10'
- Pre-lab lecture
- Lab work
  - See wiki

From protocol to lab notebook

1. Begin by adding the correct amount of water to a 200 ul PCR tube. Add that amount +1 ul to a second PCR tube.
2. Next add the primers to each reaction. Be sure to change tips between additions.
3. Next add template to the first reaction tube.
4. Finally add PCR Master Mix to each tube, pipetting up and down to mix. Leave your tubes on ice until the entire class

Statement of purpose: Today we will design primers to delete 32 bp from the 5' end of GFP and flank the sequence with new restriction sites. Then we will prepare truncated GFP by PCR as an insert for later cloning.

<u>Design primers for GFP insert (M1D1 Part 1)</u>
See attached Word document.

<u>PCR to make GFP insert (M1D1 Part 2)</u>

Added 27 uL H20 to expt'l, 28 uL H20 to control sample.
Added [1 uL] primer and [20 uL] Master Mix (<u>last</u>) to both samples, and 1 uL template to expt'l only!
Rxn ready at 3 pm → on ice → thermal cycler started at 4 pm.

Lab notebook alternatives

- All include statement of purpose, conclusion, etc.
- Differ in treatment of protocols section

  (1) Cite protocols and write out only unique numbers/conditions

  (2) Write out summary protocol by hand (must include all numbers, but not lab tips, etc.)

  (3) Print out protocol and below/to side of section write out unique numbers/conditions

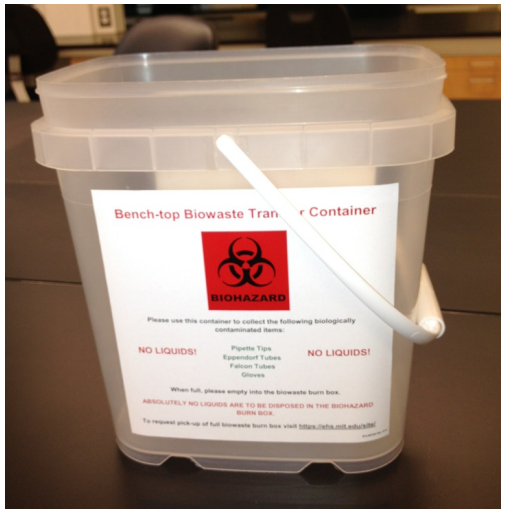
  (4) Some hybrid of the above that works for you!

Lab Safety

- Protection: gloves, glasses, coat, coverage
- Just in case… eyewashes, shower
- Hazards: materials (chemical (toxic, caustic)
  (biological (infectious)
  minor: splash hazards
- Waste disposal (less frequent)
  - chemical waste in fume hood (tubes → us)
  - biological liquid waste bleached (vacuum traps)

Waste disposal (frequent)

weak sharps
(main lab)



no liqs
or solids

biol. solids
(main & TC)

sharps
(TC lab)

everything ends up in burn box

true
sharps
(rare)

Time for demo and tour!