Find a lab bench and a partner!
Cubbies for bags next to entrance.
Pick up **5** handouts up front.

- 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
  - toward professional talks, writing, & visuals

your investment is paramount for success of our collaboration

Collaboration with integrity:

Assignments done together should reflect equal contributions.

Assignments done individually can be *discussed* together.

Semester-long workflow

- Work in pairs
- Broader community collaboration
- Assessments
  - Major: reports* and presentations
  - Minor: FNT, quizzes, notebooks, participation
  - ***Please ask if something is unclear***
    - *available over email, OH*
  - ***Key to success: plan ahead and manage your time***

16-319 small

16-336 pre-major

Day-to-day workflow

- Hand in homework (FNT), get graded FNT back
- Announcements and/or FNT discussion
- Quiz 1:10 sharp, 10'
- Pre-lab interactive lecture
- Lab work
  - see wiki (aka "your friend" --Shannon)

Pilot: electronic lab notebooks

- Flexibility and one-stop access for protocols and data
- Front/back matter still *matter*! (goals, conclusions)
- Let us know what is/isn't working
- Register for an Evernote account and 'share' your 20.109 notebook with Lizzie and Agi
  - If you use something other than your mit email address, let me know so that I can share my notebook with you
  - Lizzie: dollizzy@gmail.com
  - Agi: agi.stachowiak@gmail.com

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 [do xyz task]. Then we will prepare [xyz DNA] by PCR to use as [xyz component] for later cloning.

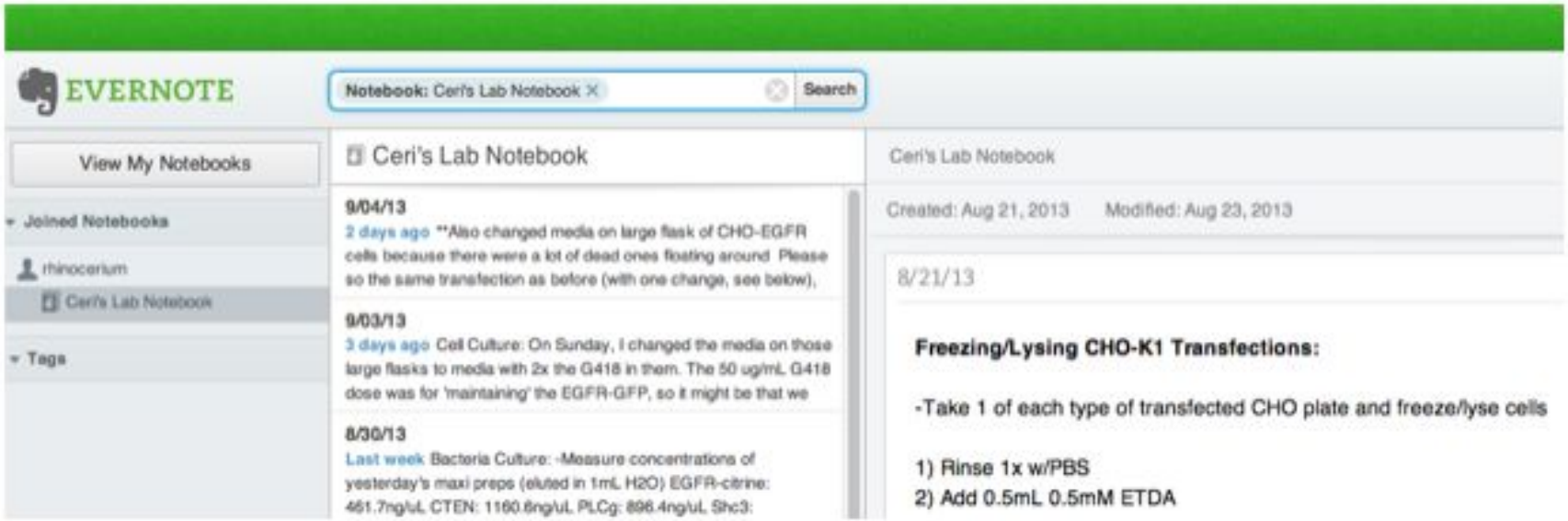
Design primers for GFP insert (M1D1 Part 1)
See attached Word document.

PCR to make GFP insert (M1D1 Part 2)

Copy protocol and fill in exact volumes for #1.
Optionally confirm (say, with checkboxes) key details such as adding Master Mix last, template only to experimental sample.
Add unique notes: Rxn ready at 3 pm → on ice → thermal cycler started at 4.

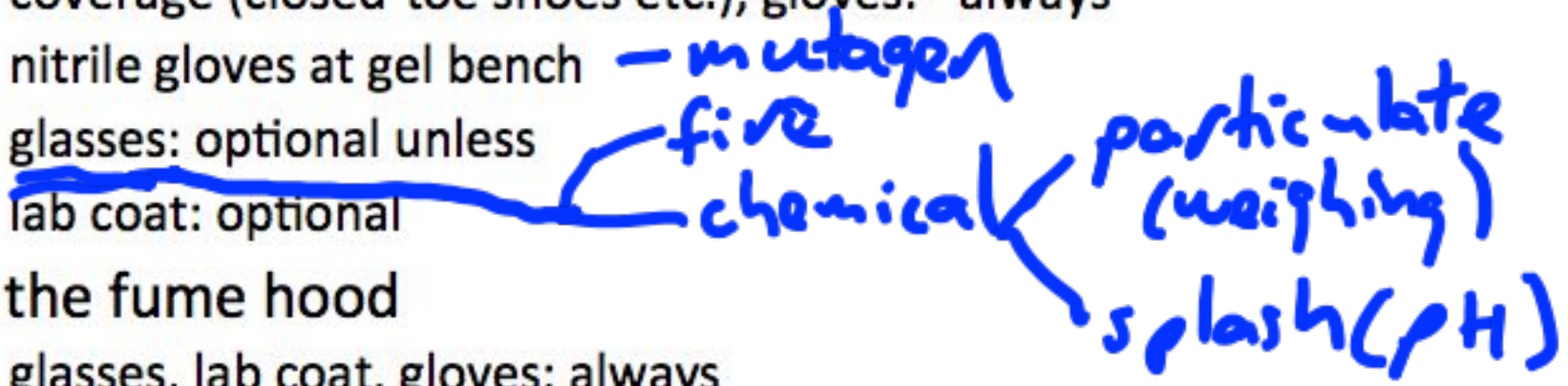
EN example

- Thanks to Shannon's UROP student Ceri!
- Protocols
- Linked Excel calculations
- Linked images



Lab safety: environments

- At the benches
  - coverage (closed-toe shoes etc.), gloves: ~always
  - nitrile gloves at gel bench
  - glasses: optional unless
  - lab coat: optional
- At the fume hood
  - glasses, lab coat, gloves: always
- In the tissue culture (TC) room
  - lab coat, gloves: always (except today)
  - no cross-contamination with main lab! (even today)
- Just in case… eyewashes, shower



Lab safety: material hazards

- Chemical
  - caustic
  - toxic (acute, mutagenic, or other effects)
- Biological
  - infectious
- Minor
  - irritants
- Related waste disposal (infrequent)
  - chemical waste in fume hood (tubes → us)
  - biological liquid waste is bleached (vacuum traps)
  - see also posted sink-safe lists

Lab safety: waste disposal (frequent)

general

- gloves
- tubes (plastic)
- tips & weak sharps

biological solids

- petri dishes

you dump daily

us full

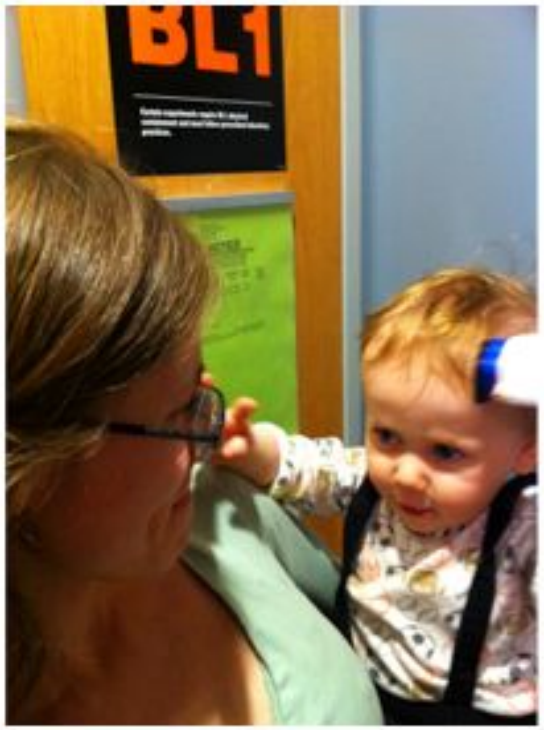
true sharps

- needles
- glass tubes + pipets

burn box

all ends up here!

And speaking of Petri dishes…



Inspiring toddler quote of the day: Why? *"Because that's why."*

Time for demo and tour!