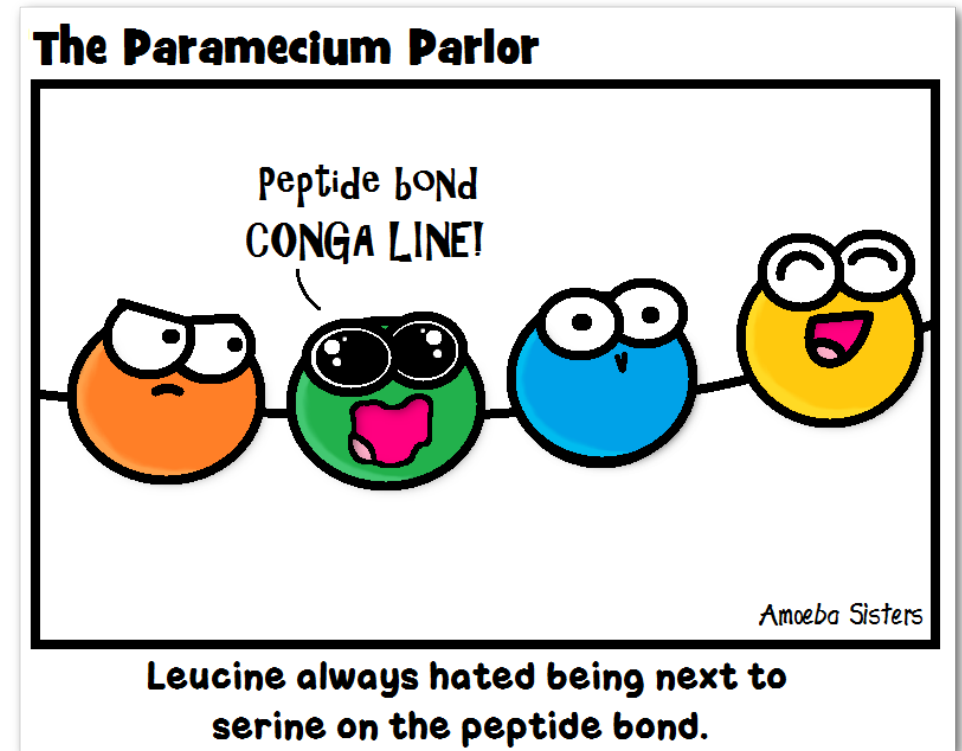


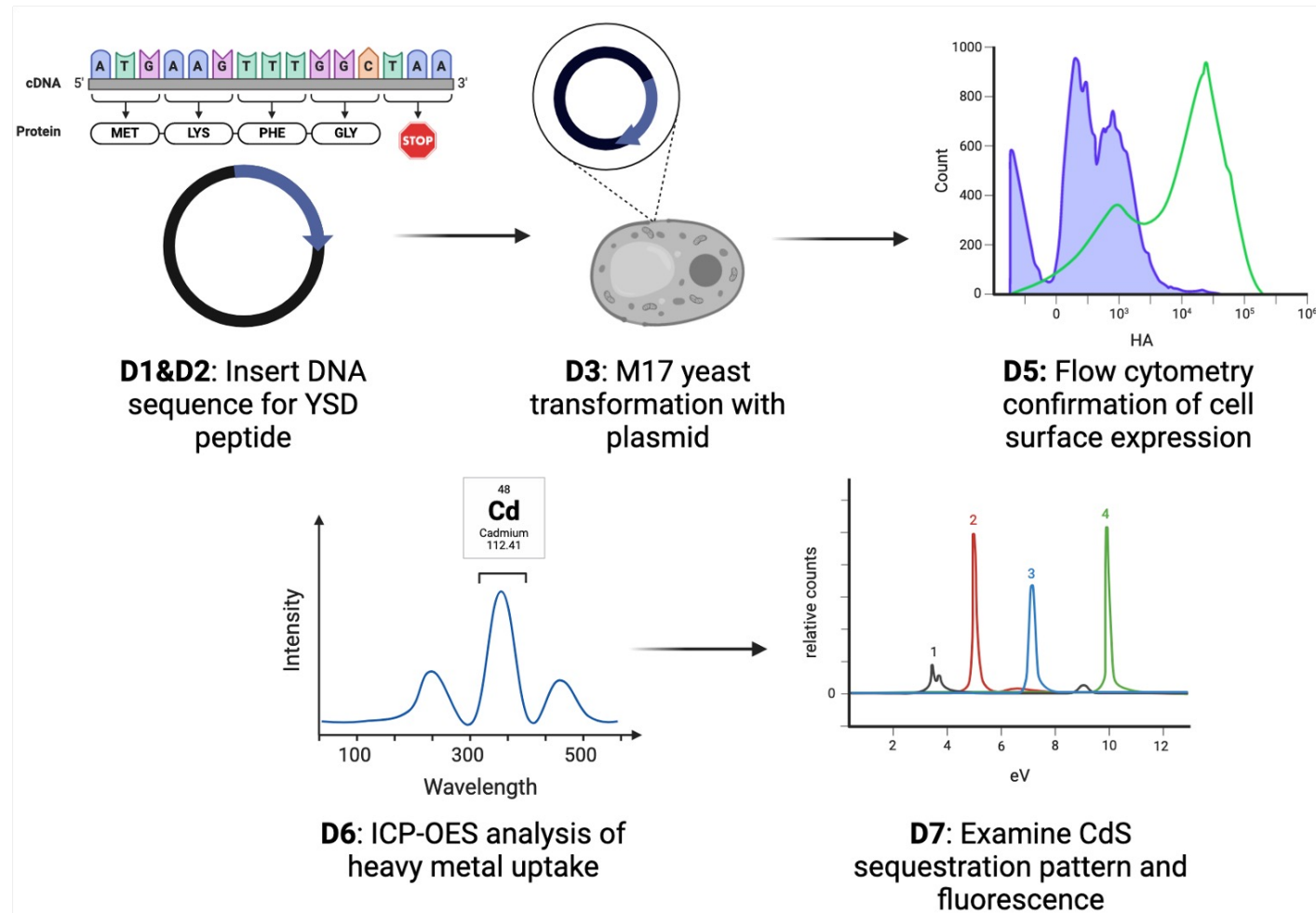
M2D1:

Determine peptide design strategy

1. Prelab discussion
2. Review literature to design display peptide sequence
3. Submit primers for peptide sequence



Overview of Mod 2 experiments:



What is your research goal?

- Genetically engineer a cells **surface display peptide** to **capture cadmium** in a model of **bioremediation**

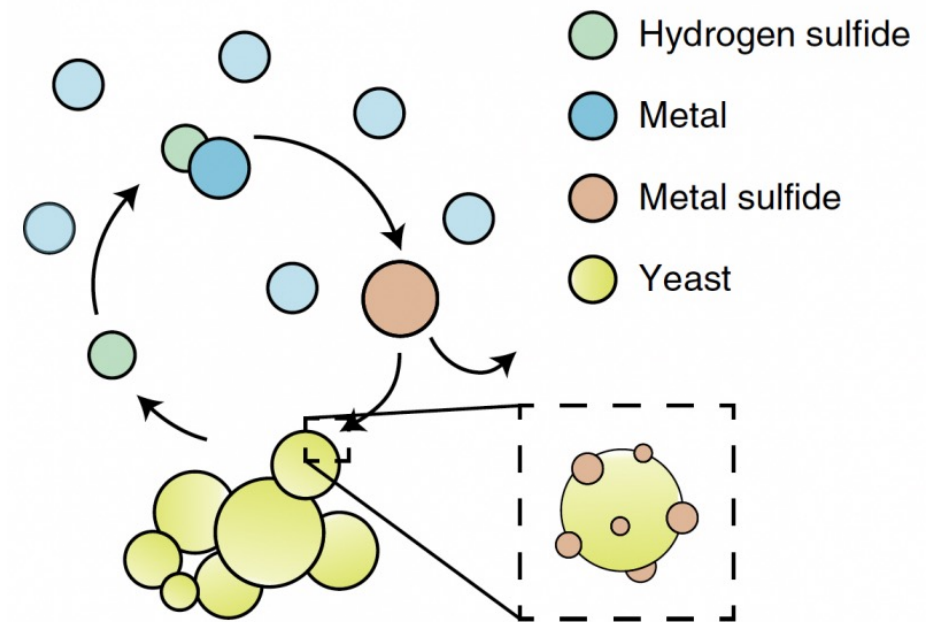
What is your experimental approach?

- **Engineer peptide** to capture cadmium sulfide from environment
- **Test peptide design** by assessing metal uptake and composition

Foundational work driving your bioremediation system

Concept: yeast cells produce hydrogen sulfide gas which reacts with metals causing metal sulfide formation

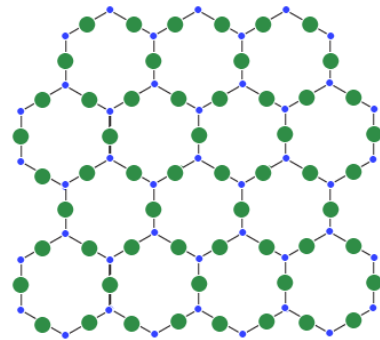
- Yeast cells with Δ Met17 mutation produce excess hydrogen sulfide gas
- Precipitated metals can be captured on the surface of yeast cells using peptides



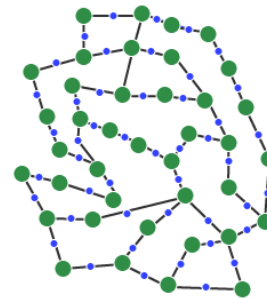
Your research will build on these foundations

- Take advantage of Δ Met17 yeast cells to increase production of hydrogen sulfide that can precipitate with cadmium in the environment
- **Design peptide that is:**
 1. specific to cadmium sulfide
 2. promotes cadmium sulfide to accumulate in crystalline arrangement

crystalline

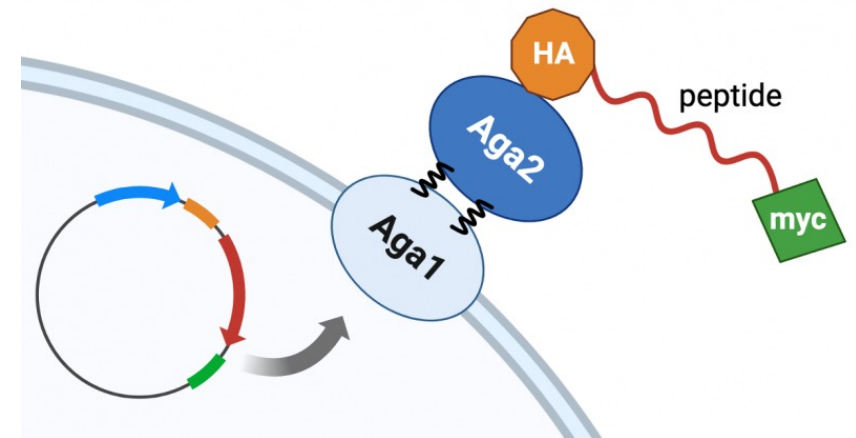


amorphous



How will you display your peptides on the yeast cell surface?

- Yeast surface display (YSD) used to 'show' peptides on the membrane of cells
- Genetic fusions used to attach display peptides to cell wall protein
- Sequence for display peptide inserted into expression vector to generate fusion
- Why display peptide on yeast cell surface?



How will you engineer your peptides?

- What amino acid residues have been shown to **remove cadmium** from an environment?
- What amino acid residues have been shown to **stably bind** cadmium?
- What amino acid residues have been shown to **slow precipitation** of cadmium sulfide?

Primers used to insert peptide sequence into expression vector

1. Choose amino acid residues for your display peptide
2. Translate amino acid residues into nucleic acid codons
3. We will include the tags and order!



For today...

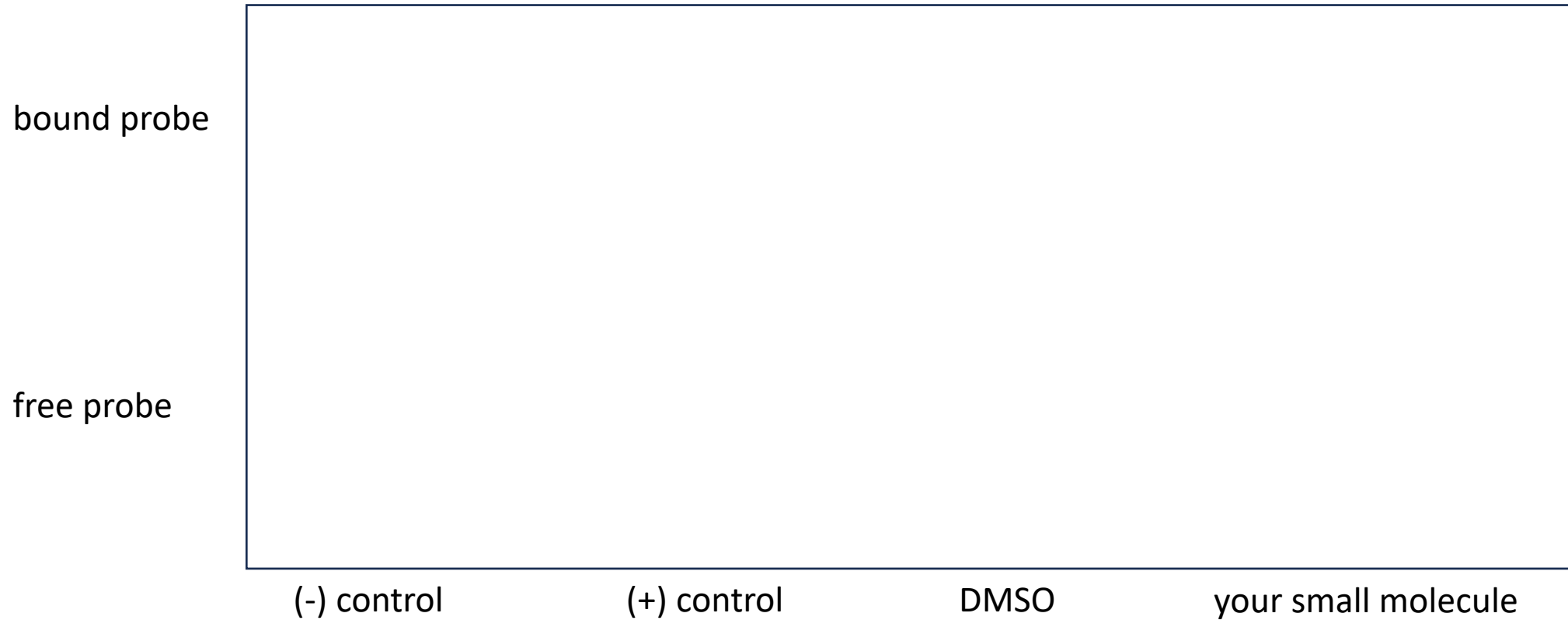
- Primers must be completed / submitted by 5p!

For M2D2...

- Reserve article for Journal article presentation and submit summary that highlights why you think the research is interesting

Notes on your EMSA results...

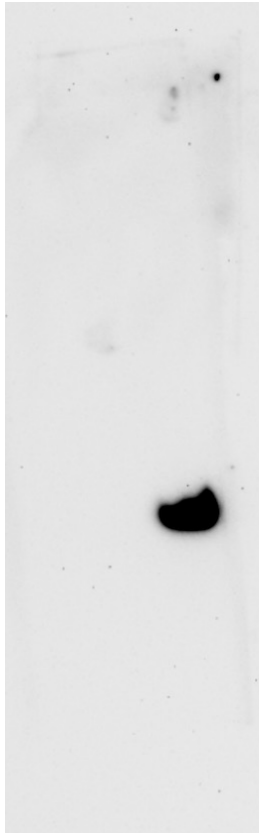
- What did you expect to see?



Notes on your EMSA results...

- What do you actually see? #realscience

free probe



DMSO

