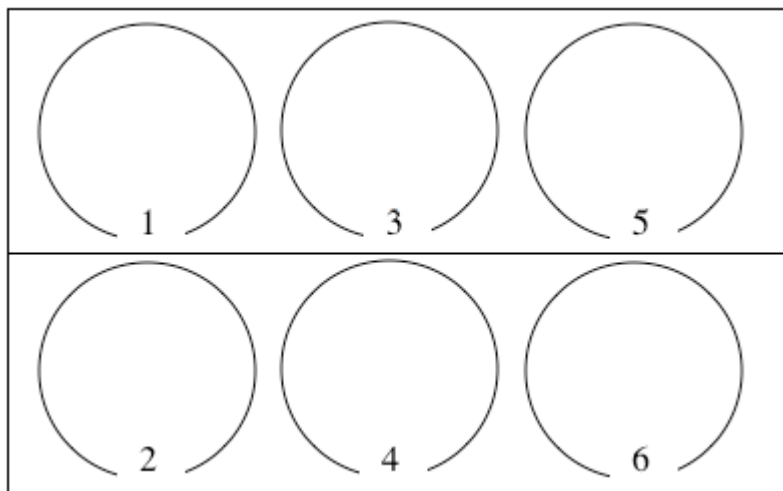


Protocol

Part 1: Optimizing panning conditions

The only thing real ground rule here is that everyone will compare pCT-CON and pAu1. What experimental condition you vary in the panning protocol is up to you. The drawing below can be used to sketch your experimental set up. It may be possible for you to work on the other parts of today's experiments while the yeast are incubating with the gold.



Six-well dish to help plan your experiment

Part 2: Library rescreen

Examine the Petri dishes that you spread last time. Count the number of colonies on each plate. It is OK to count only 1/2 or 1/4 or 1/8 of the colonies if they are densely growing. In these cases, try to find a representative sector to count and don't forget to multiply for the total number of colonies on the plate. Circle four colonies that are nicely isolated from others on the "library" petri dish. Label those colonies "A" "B" "C" or "D".

Next you should set up four tubes with 2.5 ml of glucose-containing media and four tubes with 5 ml of galactose-containing media. Use colored dots to label the tops of each "A" "B" "C" or "D." Use sterile technique since these will be used to grow any gold binding candidates for next time.

Finally use a sterile dowel to transfer some of the correct colony from your petri dish to the glucose-containing media, and balance the tubes on the roller wheel in the 30° incubator. Give the galactose-containing media to the teaching faculty who will inoculate them before next lab. You should also return to the teaching faculty the petri dish from the library screen so it can be stored until next time.

Part 3: Research proposal

Writing a research proposal requires that you identify an interesting topic, spend lots of time learning about it, and then design some clever experiments to advance the field. It also requires that you articulate your ideas so any reader is convinced of your expertise, your creativity and the significance of your findings, should you have the opportunity to carry out the experiments you've proposed. To begin you must identify your research question. This may be the hardest part and the most fun. Fortunately you started by finding a handful of topics to share with your lab partner. Today you should discuss and evaluate the topics you've gathered. Consider them based on:

- your interest in the topic
- the availability of good background information
- your likelihood of successfully advancing current understanding
- the possibility of advancing foundational technologies or finding practical applications
- if your proposal could be carried out in a reasonable amount of time and with non-infinite resources

It might be that not one of the topics you've identified is really suitable, in which case you should find some new ideas. It's also possible that through discussion with your lab partner, you've found something new to consider. Both of these outcomes are fine but by the end of today's lab you should have settled on a general topic or two so you can begin the next step in your proposal writing, namely background reading and critical thinking about the topic.

A few ground rules that are 20.109 specific:

- you should not propose any research question that has been the subject of your UROP or research experience outside of 20.109. This proposal must be original.
- you should keep in mind that this proposal will be presented to the class, so try to limit your scope to an idea that can be convincingly presented in a ten minute oral presentation.

Once you and your partner have decided on a suitable research problem, it's time to become an expert on the topic. This will mean searching the literature, talking with people, generating some ideas and critically evaluating them. To keep track of your efforts, you should start a wiki catalog on your OpenWetWare user page. How you format the page is up to you but check out the "yeast rebuild" or the "T7.2" wiki pages on OpenWetWare for examples of research ideas in process. As part of your "for next time assignment" you will have to print out your wiki page specifying your topic, your research goal and at least five helpful references that you've read and summarized.