SCIENCE PRESENTATIONS

How you present science is really important, not only for your careers but for the entire science process. Presentations push you to think broadly and deeply. Any presentation of your work (a talk, a poster, or a paper) should strive to answer the following basic questions:

Setting up the story:
What is the big scientific problem my presentation addresses?
What is the problem's significance?
What are the general and specific questions that my presentation addresses?
What is(are) the hypothesis(es) of my presentation?

Telling the story:
What is the audience looking at (what am I trying to show)?
How should the audience interpret my presentation?

The grand finale:
What do I conclude?
What did we learn about the big scientific problem?
What remains to be learned?

This document aims to help you with presenting talks and posters. However, the broad goals stated above are a guide to always keep in mind when preparing any kind of presentation.

A. ORAL PRESENTATIONS (Seminars, talks, lectures)

GENERAL TIPS:

1. **Try to have a conversation with the audience**. Don't recite a memorized script. Try to talk directly to people in the audience, as you would if you were sitting down with just one person.

2. **Pictures tell a thousand words: Don't make the audience read lots of text.** Use as few words on your slides as possible. You want the audience to listen to you, not read, or else you will lose them. Use cartoons, images, or short phrases instead of written sentences and then **use your voice** to tell us what you want us to know.

3. **Keep your slides simple: Don't cram too much info into one slide, and make things as big as possible.**

4. **NEVER assume the audience knows more than you**. You need to tell us the ideas, methods, and info; unless they are very common knowledge. It helps to know your audience to judge this. Don't use jargon unless you define it clearly or unless it's really common.

5. **Don't make your audience read your mind, or figure out what your slides are about**. You must tell the audience the problem, goal, prediction, or question you're addressing. You must show them what to look at in the data. You need to state what **you** conclude from an observation, and importantly: state what your main points or ideas are (including for background information), even when the point/idea seems obvious, and even though the audience may have their own ideas/interpretations.

6. **For the most important ideas, conclusions, and points: slow down, pause, and emphasize**.   Look us in the eye and make your point like you're telling us something important.

7.   **Good flow comes from smooth transitions between slides.**   The goal should be to try and tell a story, where one slide leads to the next. So, try to organize slides so that the central point from one slide leads logically to the next slide. Sometimes, this means organizing results NOT in chronological order (what was done first), but in an order that makes a better story. When presenting, make statements that connect the slides together. This takes practice. NOTE: Sometimes you just have to switch gears and tell a new different story. When you do this, pause, and make it clear that's what you're doing.

8. **Less is more: Don't cram too much data or info into a tal**k. You don't have to show every last piece of data you ever got. A good rule of thumb is about 1 slide/min or LESS. (Less if you have several complex slides that demand a lot of time). Exceptions: several slides that really are replicates that build up to one slide....these count essentially as one slide (this is a good technique by the way).

9. **Practice**: This may seem contradictory with point #1 but it really is not. It's easiest to practice in front of people, even just one person. As a student, at least one practice should always include your advisor.

SPECIFIC ELEMENTS OF GOOD ORAL PRESENTATIONS.

1. Every good story has a beginning:

At the beginning of every research talk, tell us about the big question/problem:
Give the audience a sense of the big picture, the general questions, and the problem: What is the central question, broad hypotheses, or problem that your talk addresses and why is it important? (Again, use slides with cartoons, simple images and very short phrases). Then, give us the background needed to understand this problem and what you did to address it. <u>Do not give background that is not relevant to your presentation</u>. NOTE: It can also be effective to reverse this: tell a story of prior findings and what they might mean, and then state a paradox, big problem, or grand hypothesis revealed by these findings. OR, even better, you can do both approaches: state the big picture problem, tell a story, then state big specific issues that come from this story, which you will now add to with your new results.

2. Every good story has an unmuddled middle:

- **For every experiment or set of closely related experiments: State the specific question, hypothesis, prediction, goal, or problem that is being addressed**. Ask yourself: Why did I do this? And then tell your audience, in the form of a prediction of a hypothesis, a question or a problem you address in the experiment. In general, the best scenario is the following: 1. State a clear specific hypothesis directly tied to your experiments (If there is one specific hypothesis that all your experiments address, you can state the hypothesis once, just before the results slides; or, if you address several hypotheses state them before each set of data slides). 2. Then, for each experiment slide, state specific predictions of that hypothesis(es) addressed by the experiment. 3. Then transition to pt #4: "to test this prediction, I did this experiment.....". Alternatively, you can pose a question, then state how you addressed it.

-**Explain the experiment: Tell us what you did and what the panels/gels show.** Again, don't assume the audience knows anything other than the most common techniques. And importantly, you need to tell the audience what's being shown and what they should look at: directly point at the key image, gel band, line on a graph, or table entry. If you make people spend time trying to figure it out, your message will get lost.

- **For each result or set of closely related results: what does it mean?** Tell us what you conclude from EVERY result you present. The ONLY exception to this is if a set of closely related experiments together lead to the same conclusion: In this case, it may work best to wait and make your conclusion after presenting each of the related results.

- **Minimize the complexity of data slides**: It's better to split up graphs/images/gels into separate slides then to have too many on one slide. Your slides should **NEVER** look like a multipanel figure in a paper.

> -Use photoshop or equivalent to crop unnecessary info and to reorganize into logical easy-to-follow patterns: e.g. for gels, you rarely have to show every lane. Same for cell images (e.g. immunofluorescence); often you only need the key result and the key control.

> -Alternatively, or in addition, talk ONLY about the key lane/image/number/panel. <u>You don't have to talk about everything on your slide.</u>

- <u>Focus on the MOST important</u> result(s) and <u>emphasize them</u>.   You don't have to show every piece of data you ever generated. This is especially important for short talks (10-15 min). You should talk about key controls (more on this later).

-Sometimes its better to use images or cartoons instead of text to label things, depending on what it is.

-Make your images, labels, and words BIG and easy to see. It often helps to set up in the lecture room/hall beforehand, then go the back of the room and look at your slides to ensure that the audience can see what you want them to.

-Use titles for most slides: Keep them short and, most importantly, make them meaningful. Don't use too many words but don't be vague either; they should state the key point. For example, the title can state a conclusion or pose a question. NOTE: this is not critical for every slide, but it can be very helpful, especially if you need reminders on the key points you want to make.

-About controls and problems with your data:
-It <u>is</u> important to show and discuss critical controls for the most important results.

-Try to anticipate the biggest issue other people might have and address it directly, up front. ALWAYS try to think of alternative explanations to your (and others) data.

-If your data don't address a specific caveat or rule out other valid explanations: FESS UP!; i.e. Tell us directly what you don't know or haven't ruled out.

3. Every good story has an ending!! (even if it isn't happily ever after)

At the end of every research talk, tell us what it all means or what it could mean.

1. The best thing to do is to relate your findings back to the big problem presented at the beginning. A good way to do this is to propose models with cartoons that fit your data, or refer back to and alter a model that you started with. At a minimum, you should summarize BUT don't use lots of sentences on your slides.

2. Tell us what important questions remain, and, even better, tell us what NEW questions arise from your results, if possible.

NOTE: In grad student talks, it is very common (and good for your committee) to tell us what you plan to do next. BUT: Don't just throw up a laundry list of random experiments and controls you plan to do. Again, tell us WHY you want to do these things in the future. Give your plans context: state the important next questions or predictions to test and maybe give an idea of what you plan to do to address these. You can and should do this even if the next thing to do is a missing but seemingly boring control for a flawed experiment you presented: You can re-state the problem the flawed experiment addressed, and state a trivial explanation you want to rule out.   Again: Working hard to figure out WHY you want to do what you plan to do is VERY crucial: It can convince you it IS important AND keep you from doing something unimportant.