tons of terrific teaching tips

Preface to this document

Welcome to the McManus Lab! During your training here, you will have the opportunity to present at lab meetings, journal clubs, seminars, and conferences.

Treat each presentation as an opportunity to improve upon your teaching skills; excellent written and oral communication skills are valuable assets to your professional toolkit. The emphasis of this document is on planning a clear and informative lecture for your colleagues and offers a compendium of helpful pointers.

Practice and fine tune your teaching skills, a great lecture can open doors and make a significant impact in promoting science to the community.

your presentation is a teaching experience

prepare in advance

do your homework ahead of time

every presentation should have a solid (i.e. ~15-20 minute) introduction

demonstrate enthusiasm and a little humor

when appropriate, use adjectives that convey the excitement

extraordinary, ridiculous, amazing, terribly flawed, awesome, incredible ;-)

making the best possible images and slides

follow the 1:1:1 rule

one slide, one idea, one minute

read the 'tons of terrific teaching tips'

useful points to improve yourself and the lecture experience

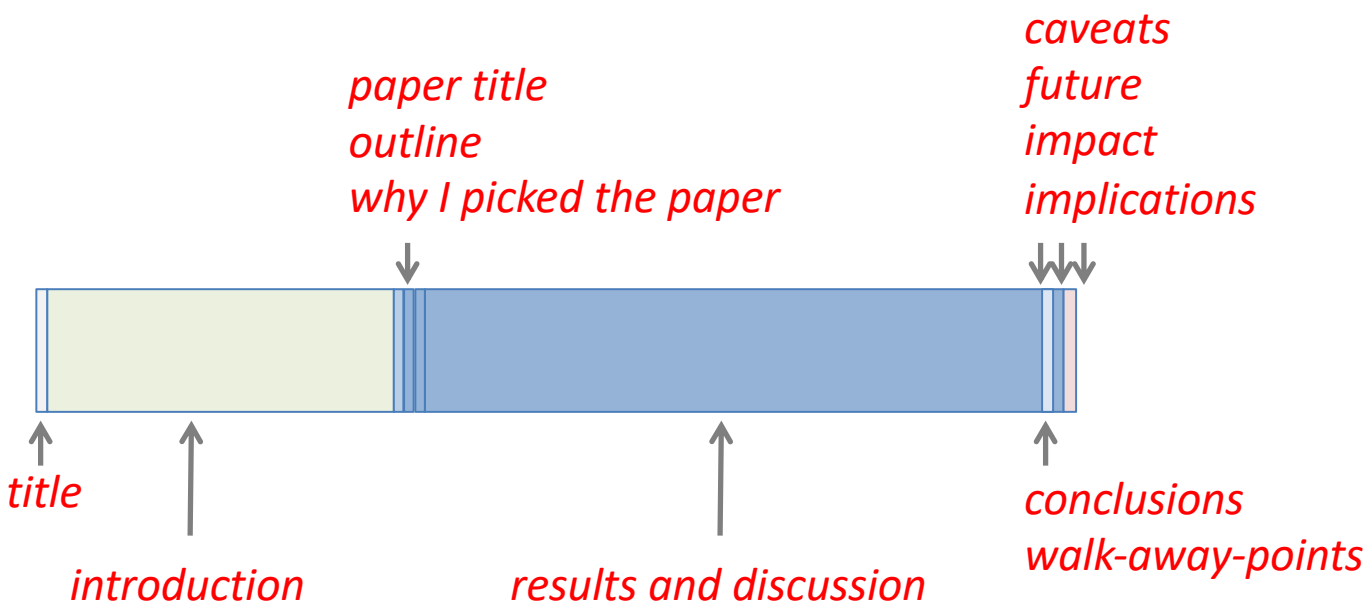
do your best and experiment to develop your style

morphology of a solid presentation

use a formula

make it easy for your self and the audience

example:



WAR

phage

bacteria

points:

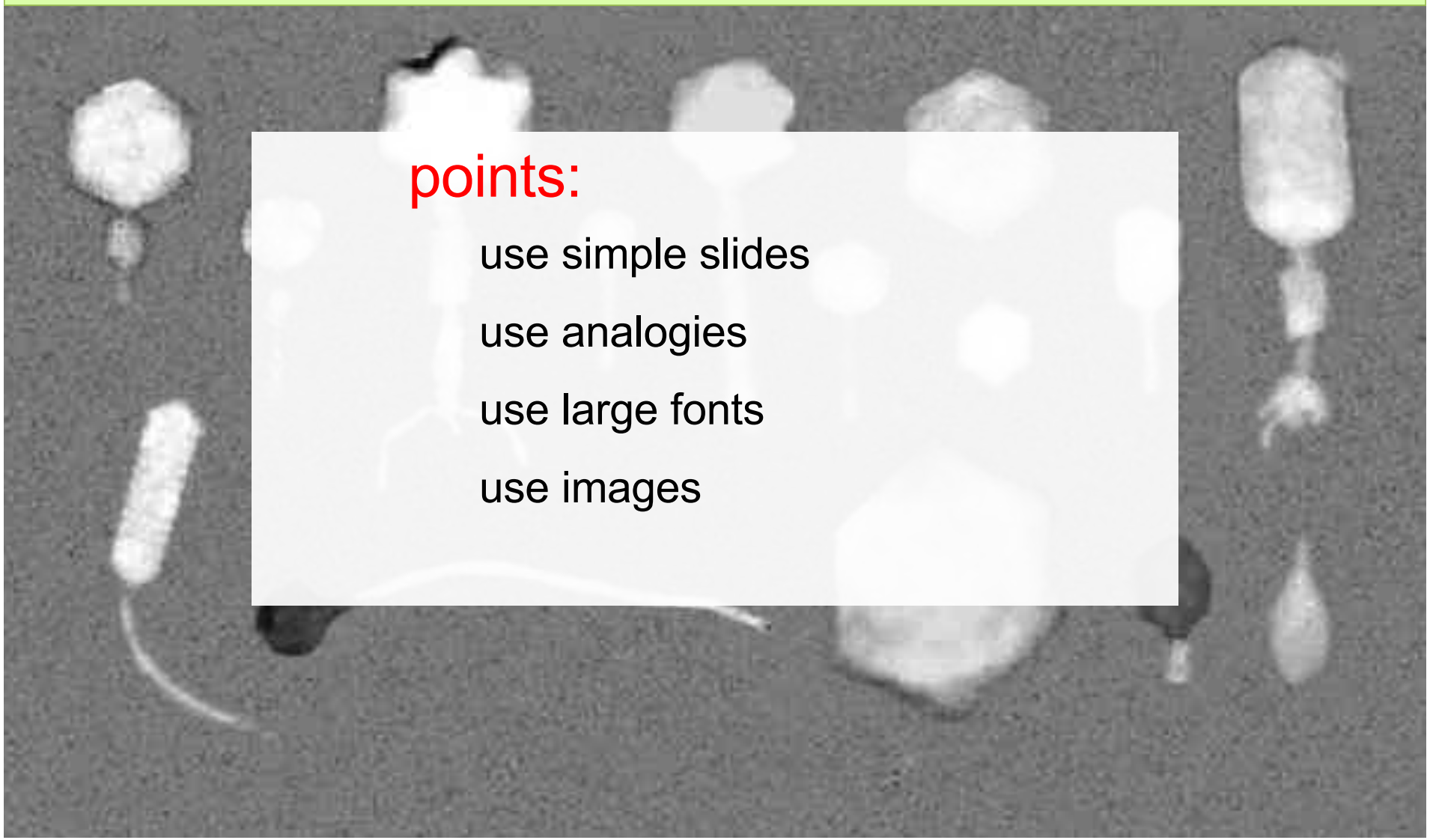
a striking image will alert the audience

your title slide can set a tone

your can set your theme

immunity

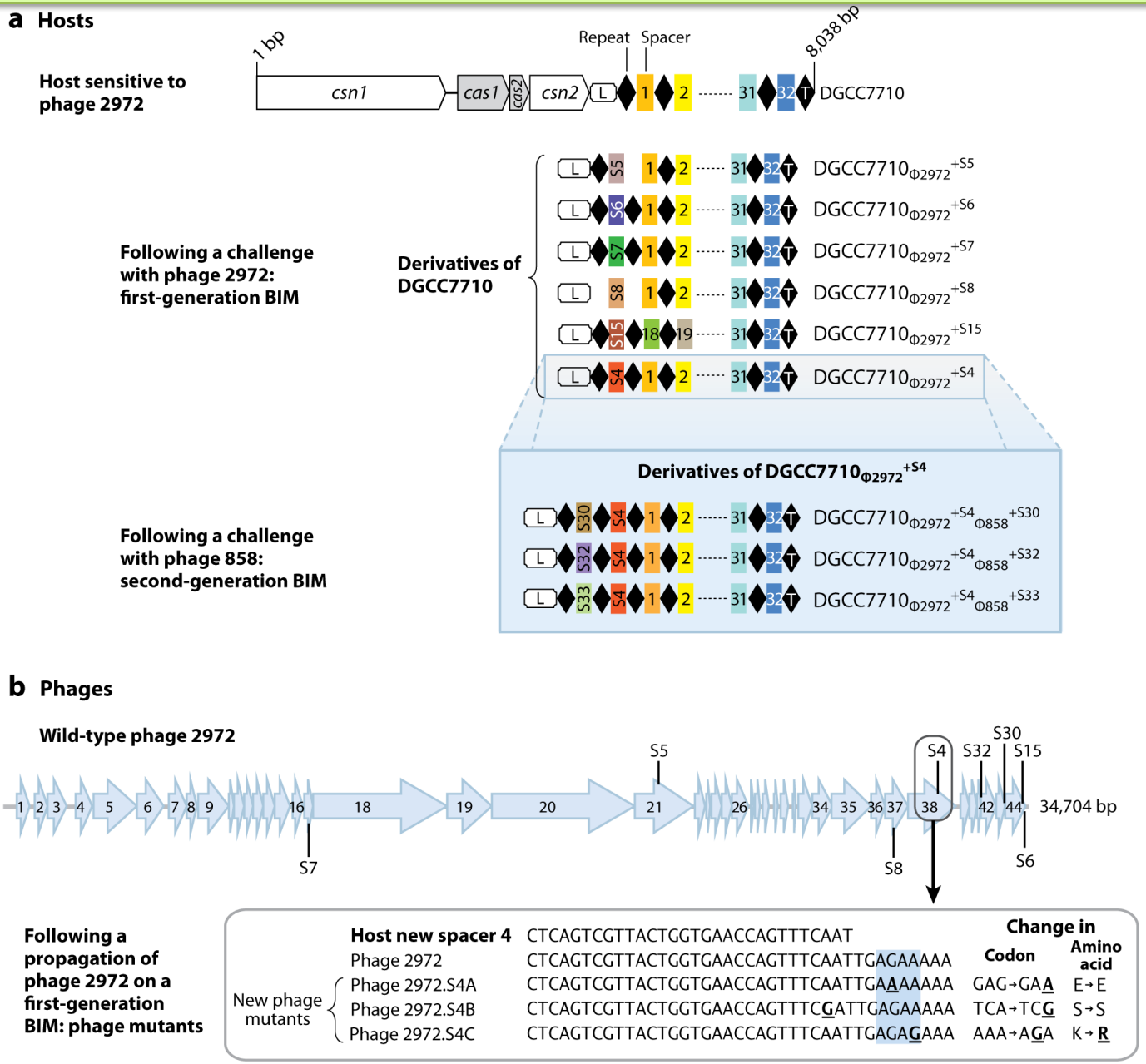
up to 9×10^8 virions per milliliter can be found in microbial mats



points:

- use simple slides
- use analogies
- use large fonts
- use images

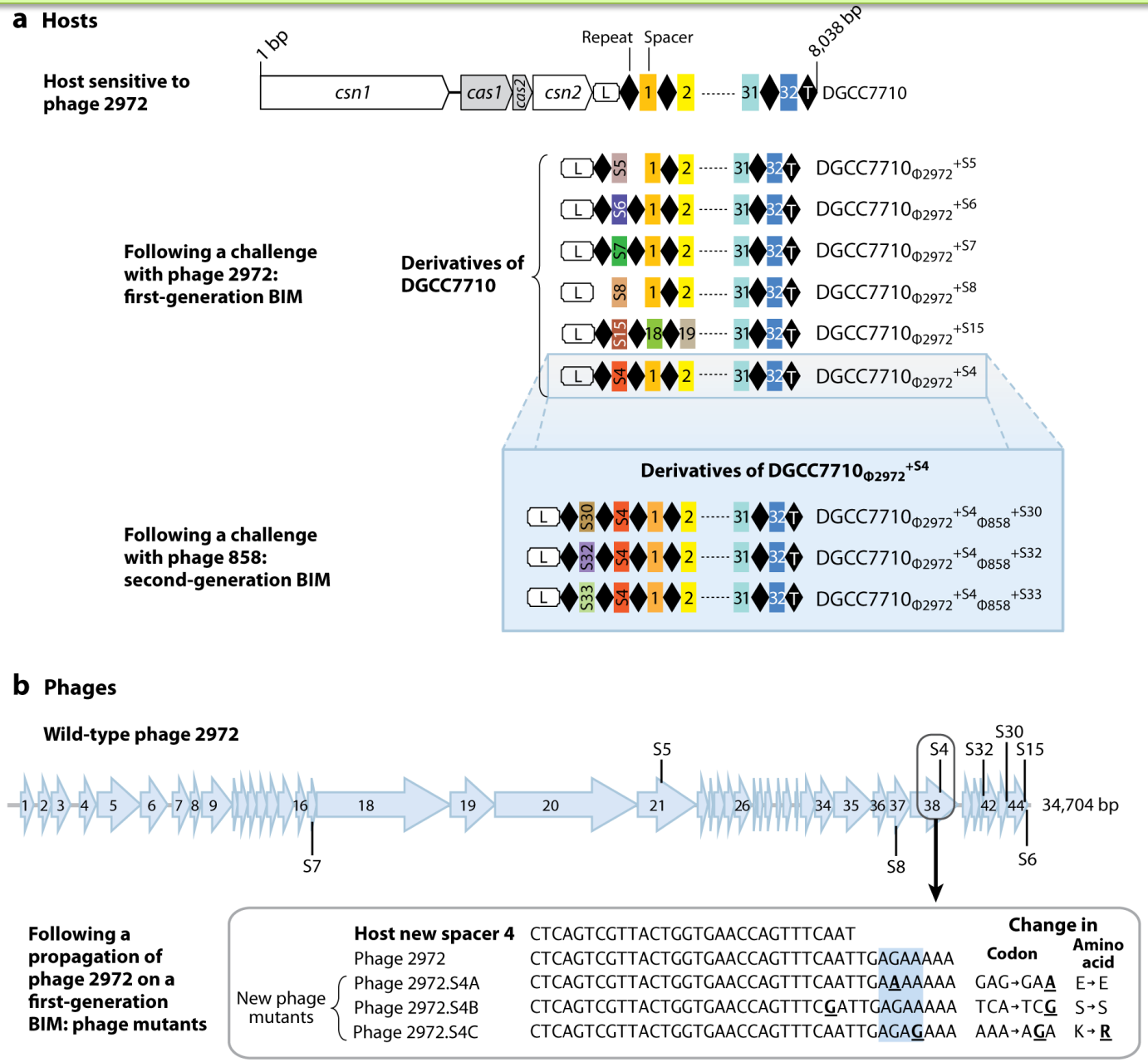
Figure 1



great figure for a publication
terrible figure for a presentation

Deveau et al, 2010. Annual Reviews Microbiology. 64:475-93

The ebb and flow of the battle

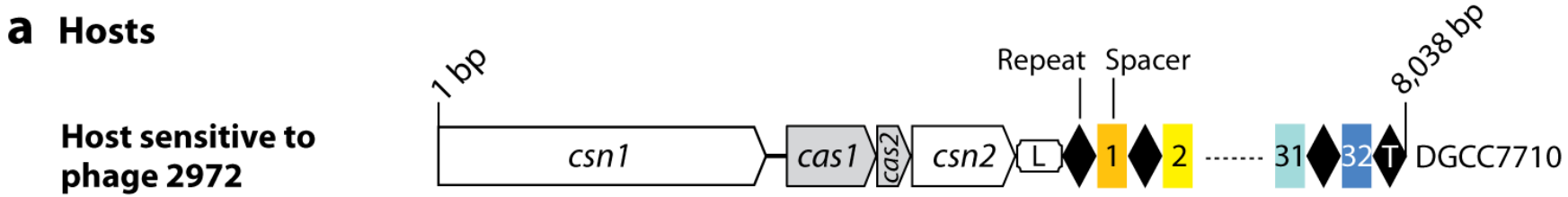


animation is better but still—this is a busy slide

Deveau et al, 2010. Annual Reviews Microbiology. 64:475-93

layout of the CRISPR allele

instead, create simpler slides:
It takes the same amount of time
to present the same material distributed
to multiple slides



space below can be used for:

- brief points
- illustrations
- or leave it blank!

Deveau et al, 2010. Annual Reviews Microbiology. 64:475-93

tips for fielding questions

don’t make it personal

when presenting data, no need to be defensive

all data have caveats and can be criticized

deflect questions that you don’t know the answer

no one is an expert on everything

engage the group, realize that we are all students

Q&A and discussion is high value

prepare your lecture to reserve time for Q&A

if one person has a specific Q, chances are that others have the same Q

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TONS OF TERRIFIC TEACHING TIPS

Welcome to the McManus Lab! During your training here, you will have the opportunity to present at lab meetings, journal clubs, seminars, and conferences. Treat each presentation as an opportunity to improve upon your teaching skills; excellent written and oral communication skills are valuable assets to your professional toolkit. The emphasis of this document is on planning a clear and informative lecture for your colleagues and offers a compendium of helpful pointers. Practice and fine tune your teaching skills, a great lecture can open doors and make a significant impact in promoting science to the community.

To help guide you, below is a list of useful teaching considerations. Some of these points were shamelessly stolen/modified from websites and publications in an effort to collate a useful and comprehensive guide. Hence these points were modified from a spectrum of sources, including our professional experiences. Many of the below presentation guidelines were taken from TED (free) and the BBC Active Video for Learning (paid) websites—which provide nice resources for delivering captivating presentations and educational videos; these can be ideal for new teachers wanting to refine their teaching style to better engage and stimulate an audience. Although this documents refers to students, consider that we are all 'students' and your lecture audience will be hungry to learn what you have to teach. *In no particular order, consider the following:*

Start with the big picture. Don't assume that your students know the pedagogical purpose of your presentation. Instead, explain how the lecture relates to previously-learned material and the course themes and goals in general. When teaching a class, begin the lecture with a short review of the key points from last class (or your last presentation at lab meeting), and end with a preview of the topics for next class (or in the case of lab meetings, your next research steps). The day before the presentation, you might also use email or an announcement to your class to inform or remind students of what the pedagogical goals of the upcoming presentation.

Engage the audience from the beginning. As a lecturer, the first five minutes of your lecture provides a golden opportunity to get your students to sit up and pay attention. Start with the obvious – introduce yourself, explain your objectives for the lecture and outline learning outcomes. If you begin your presentation with passion and enthusiasm, your students are more likely to engage from the outset. You can so this by varying your vocal speed and pitch, as well as your facial expressions. Smile often. Consider using humor when appropriate.

Tell them what you're going to say, say it, then tell them what you've just said. Before discussing the day's topics, provide an overview of what will be discussed. After covering the topics, end with a restatement of the key points. When speaking, repeat yourself to an extent that would be redundant in writing to facilitate student note-taking. Like a pop song, great lectures have a "chorus": key points that the speaker returns to throughout, and that will stick in the students' minds. When the lecture is over, involve students in re-capping the highlights.

Keep the lecture outline visible for students. Write it on a corner of the blackboard or leave it up on an overhead. Return to the outline periodically to show your progress through the material and to reinforce key points.

Make explicit transitions between topics with mini-summaries. Link current material to previously-learned content and future lectures. Be explicit about how one topic connects to the next, or ask your students to explain the connections. By linking new material to previously-learned content, you help students understand and organize this new information in their minds.

TONS OF TERRIFIC TEACHING TIPS

Keep your students engaged: Design your lecture in ten- to fifteen-minute concept blocks. Adult attention spans average ten to twenty minutes, so change pace every fifteen minutes or so to relieve monotony and recapture students' interest. Intersperse mini-lectures with discussions or other activities. Maybe organize your blocks around the manuscript figures.

Maintain regular eye contact with your students. By doing so, you create connections with them, are able to gauge their note-taking, and discourage distracting audience noise.

Speak clearly, but use a conversational tone. Think of the lecture as an opportunity to speak with the students, not at them.

Ask the students periodically if they are capturing everything. Make changes to your volume and visual aids as necessary. Be careful with your use of the laser pointer (ie don't wave it around like a light sabre!), but judiciously and briefly point at the referenced data.

Move around the room, and use natural gestures. This movement is especially important for engaging large audiences. Changes help to refocus students' attention, but remember to move with purpose so you avoid distracting your students. In other words, don't just hide behind the podium, stand next to it and even move across the front of the audience.

Interact with your students to create positive rapport with them. Promote discussion by staging questions. Pause regularly so that students can ask for clarification. Plan to stay after your lecture to chat with your audience and answer their questions.

Follow a formula. Use this PowerPoint slide deck containing an example formula. This template is not in concrete—indeed, adapt it as needed to accomplish your goals. You will develop your own style, theme, and format as you further develop your presentation skills.

Use visual aids to stimulate and focus students' attention. Multimedia aids using sound, color, and/or animations have an even greater power to attract and maintain students' attention, particularly in large audiences where the impersonal situation makes students feel less involved. Visual aids should be a support for, not the focus of, your lecture. They also should not replace your personal interaction with the students. No 'useless props'. Let your media or pictures 'tell a thousand words'. Use animations to show how problems can be solved, to showing a mechanistic process, or perhaps to build a model in real time. Such animations are often clearer for students than seeing an entire complicated diagram at once.

Make each visual count. If you are using PowerPoint, Keynote for a discussion-centric presentation, etc, aim for twelve to twenty slides for a fifty-minute lecture. Be conscious of speeding through the slides and/or overloading students with content— a common problem with electronic types of media.

Control the audience. If you are doing a great job, you may get lots of questions (um, if you are doing a poor job, you may get lots of questions). Control your audience to keep things on time. Don't hesitate to respond with, "Thank you for asking that question—I will be covering it at the end and please bring it up later". You are solely responsible for making sure your material gets covered.

TONS OF TERRIFIC TEACHING TIPS

Don't feel impelled to teach everything. When presenting data and journal clubs, consider that the notion that most data are superfluous and supplementary and may not make for great oral presentations. Use your judgement to determine what is most relevant to your audience, distinguishing data that will interest only those aficionados who will perform the assays and experiments. Use the key figures to deliver the concepts!

Reveal visual information gradually rather than all at once. This keeps students focusing on your oral development of each point, instead of rushing to copy down the material (although some people always take notes, consider generously providing your lecture notes and slides as a supplement). Alternately, you could show all the points, then go back to explain each one.

Make sure there is high color contrast between the background and the text for your slides. For slide presentations, the contrast often needs to be more pronounced than on printed material like a manuscript. Black text on a white background is often the easiest to read when the ambient light is high (i.e. we don't teach in a darkroom!). Use larger font sizes and more slides rather than jamming a lot of text onto a few slides – that's better for everyone.

Whenever possible, keep your slides simple. Don't try to display two much data on a slide. Many teachers make the mistake of presenting all subunits of a figure… making a complex slide and difficult to present and follow. Instead, break up the figure and show one relevant point for each slide.

Follow the 1:1:1 rule. <u>One</u> concept presented on <u>one</u> slide that takes <u>one</u> minute to describe. The remainder of the time can be spent posing questions and catering to discussion. Of course, this 1:1:1 rule is not a hard-and-fast law, but instead a guideline to convey that you need to keep your slides and presentation simple. If you spend 5 minutes on a single slide, ideally this will be five minutes of interactive discussion with the audience.

Simplicity through images. Don't regurgitate long bullet-point lists and text on a slide. No more than ~30 words per slide. Think simplicity. Pictures are much better than words in an oral presentation.

Real estate is expensive in San Francisco. Don't display a figure as a tiny picture in the middle of the slide…. E X P A N D the figure to occupy all four corners of the slide. In this way it will be easier to read from the back of the room.

Practice your lecture beforehand. For your first few lectures, practice to ensure that you have an appropriate amount of material and activities for the time available. Students' questions and learning activities can take up to 50% more time than you may first think!

Avoid writing out a complete lecture script. A script is too time-consuming to prepare, and it will prevent you from maintaining eye contact with the students. As you read, your voice will project downward, and you will appear disengaged from the audience. Your ability to be spontaneous will be hindered. Also avoid using visual aids as your notes; your reading from an overhead or computer screen will not keep the students engaged, since your visual focus still will not be on them.

TONS OF TERRIFIC TEACHING TIPS

Do prepare at least a few notes to outline your talk. When preparing and giving a lecture, it is usually useful to prepare notes. Experiment to find out what kind of notes work best for you, e.g., a detailed outline, a list of major points, a tree diagram. Your notes should include key definitions, proofs, solved problems, examples and analogies. If you think you might get nervous in front of a large audience, make sure you know exactly what you are going to say at the beginning of your lecture—and at the end of lecture. Think "conceptual bookends" that frame your presentation. Consider that that the first and last 5 minutes of a presentation is a 'make or break' a winning talk.

Be flexible when following your notes. Look at faces. Watch students' level of interest (or confusion) to determine how much time to spend on a topic and what level of explication is required. Your notes should be flexible enough to let you adjust the depth and order of the content based on students' feedback. Your notes are there if needed, but the lecture should arise out of your interaction with the students, not the notes themselves.

Spark curiosity with tidbits. As before, your introduction *needs* to engage, excite, challenge and create expectations, so add in interesting or little-known facts to spark curiosity from the very beginning. For example, "end-to-end laying the DNA from all the cells in your body would create a string that would stretch from the sun and back more than 300 times". Such tidbits, even when superficial, can be wonderful analogies to enliven an audience. Importantly, stay aware by scanning the room after the first five minutes will give you a good indication of how engaged your students appear to be.

Consider your overall framework. When preparing the framework of your lecture, consider the conceptual sequence of your material and make sure that it's presented in a clear and logical manner. The pace should be well controlled so that you are able to move through the material keeping students engaged throughout.

Organization is everything. One of the crucial elements to a successful lecture is the planning process. You need to be fully confident about the content, structure and delivery of the material before you begin, so organization is a key part of successful lecturing.

Avoid jargon. There's nothing more likely to disengage your audience then endless jargon and abbreviations. If you are lecturing on a specialist subject, don't assume that your students will understand jargon from the outset – making your lecture accessible and clearly understood is critical.

Work on your presentation style. Good lecturing is a process of continuous improvement, so always strive for best practice with your presentation style. You can be animated without being theatrical – after all, you are not putting on a show – but you need to keep your students' attention. Avoid fidgeting and keep body language strong and confident.

Passion and enthusiasm goes a long way. Don't be afraid to show your genuine passion and enthusiasm for your subject. Conveying lecture material in an enthused and passionate manner will instantly attract attention and will help students to focus and endorse your point of view.

TONS OF TERRIFIC TEACHING TIPS

Consider the caveats, future directions, and impact of the work. Papers offered in this course were selected for a reason. What was the reason?

Pose reflective questions. Sometimes the simplest way of using active learning techniques in the classroom is to ask reflective questions, not yes or no questions, but those that require students to think. For example, "What would you do in this particular situation? How would you approach solving this problem?" Reflective questions are difficult and will require time to think, so be prepared to wait for an answer (likely at least 30 seconds). Endure the silence. Up to a point…where you may need to re-ask the question in a different way.

Watch your tone of voice. Make sure that you vary the intonation of your voice when presenting lectures. Use humor and conversational tone to help maintain attention. It can help to practice your first presentation in front of friends and research colleagues in your lab.

Pace the lecture well. Try to pause at regular intervals to ensure that your students are still engaged and attentive. Ask questions to see if they are keeping up with the pace; this will help you to organize future lectures effectively. Don't underload or overload them!

Strive to remember names. This point is mostly for us PIs (!) who sometimes have anomic aphasia, but remembering your students' names will help to build relationships when asking questions or engaging in interactive sessions.

Comment on successful engagement. As a new lecturer, take every opportunity to praise your students. If your students are clearly engaging with your material then acknowledge this and show your appreciation. Positive feedback is a key aspect of building good relationships with your student audience. Thank them out loud for particularly incisive questions or discussion points, sometimes even referring back to their contributions during the presentation. When you do so, mention them by name if you can.

Choose a compelling exit question. In the same way that you need to start the lecture by sparking curiosity, finish with a compelling exit question that furthers students' learning and introduces a new perspective. If your students leave the room actively engaged, then you've succeeded.

Achieve a polished finish. Achieving a structured finish is a key part of a successful lecture. Bring the material back to the original questions posed at the beginning, refocus attention and confirm what you will be covering in the next lecture.

Feedback and evaluation. Proactively seek opportunities for feedback at the end of sessions – this is one of the greatest ways to learn and improve for the future. You can solicit feedback from your PI, your friends and colleagues, and even random audience members.

Strive for continuous improvement. Lecturers should be continuous learners; strive for improvement, ask for advice and be excited by the opportunity to learn something new about successful lecturing. After your presentation, make personal notes on what you want to improve upon for your next presentation. What went really well? What can be improved?