BIOC/MCB 555 Fall, 2024
Class Meets on Mondays from 1-2:20 PM in Room 419 RAL; Meetings with the instructor (Professor Nair) are by appointment in his 314 RAL office suite

SUMMARY INSTRUCTIONS

Topic Selection

Pick a published research paper (not a review), preferably from 2019 to 2021, of current interest in the area of Biochemistry-Molecular Biology. The specific topic must NOT be closely related to your own research project, although some overlap – e.g., methodological – is permissible. Try to choose a topic of general, rather than specialized interest. Papers in newly developing areas are often the most interesting.

Topic Approval

By Sept. 8, submit an electronic pdf (or link) of the selected paper for approval to the instructor (snair@illinois.edu). Your paper must be approved by Professor Nair. If you need help in selecting a topic, please check with Professor Nair.

Presentation Requirements and Responsibilities

Limit the presentation length to **25 minutes** and prepare it using PowerPoint (or equivalent).

Make sure that the interface between your laptop and file works properly for remote classroom set up with the projector in 419 RAL; and secure laser pointers or any other accessories that you might use for your presentation. Consult the 419 RAL reservation schedule (with Dr. Nair) when planning to test the projector interface. If you experience "technical difficulties" with your presentation that could have been resolved by planning ahead, points will be deducted from your presentation score.

Presentation Elements

The introduction should contain sufficient background material to enable the audience to understand and appreciate the overarching goals/questions of the paper as well as how the results are likely to impact general knowledge in the area.

The significance of the research should be clear by the end of the presentation and explicitly stated. Accordingly, you should clarify the logic of each experimental approach and the implications of resulting data throughout your presentation.

Conclude by summarizing the results and their implications. Clarify any instances where you disagree with the conclusions drawn by the authors. Consideration of the relationship between the experimental design, the resulting data, and data interpretation can be useful in this regard. Analyze the conclusions drawn by the authors. Are they valid? Do they offer new insights? What should be done next?

The grade in this course is based on the following:

30% Students are expected to attend *all* talks, to participate by asking questions and engaging in discussions, and by submitting informative critiques of each presentation.

70% Instructor evaluation based on your presentation and the post-presentation one-on-one meeting with the instructor.

EXPECTATIONS, GOALS, ADVICE, AND INSTRUCTIONS

Class Attendance: Expectations and Etiquette

Attendance is required and, along with participation, is a major part of the grade assessment. You are expected to arrive on time in order to allow the speaker to start promptly and to finish in time for all to make their next class or engagement. If you cannot attend a class, you ***must*** let the instructor and course coordinator know in advance. It would be good manners to let the speaker know too. E-mail is fine.

It is imperative that we maintain a safe, respectful, and friendly environment so that we can fully develop and appreciate the unique combination of background and experience that we each bring into the classroom. As classmates, we are **all part of a shared endeavor** that aims to hone our communication skills as well as to further develop skills such as observation, analysis, interpretation, reflection, evaluation, inference, explanation, problem solving, and decision making which ultimately define our personal and scientific world view. This is an important class for you, and one I hope will be enjoyable.

Three Training Goals

As a presenter, your goal is to make a professional-style presentation of a high quality (but not necessarily flawless) piece of work. This will, and should, take a good bit of effort. Remember, you will be evaluated on your presentation, not on the paper. Your skill in answering questions is an important part of your presentation. Questions are important to the scientific discourse and are therefore an important part of all seminars. Yet, many people are intimidated by having to answer questions posed by the audience. One way to become comfortable is to anticipate questions that the audience might pose ***as you prepare your presentation***. In other words, think about the questions that you would ask if you were in the audience.

As a member of the audience, your goal is to become comfortable participating in the scientific exchange. You are expected to read each article *before* class and to **come prepared with questions to ask**. Participating in discussions entails following the logic of the presentation, listening carefully to the questions and answers that follow, and becoming comfortable with voicing your own thoughts. Don't be afraid of "sounding ignorant". Amazingly sometimes "incorrect" statements actually stimulate novel ideas and approaches. This classroom is a safe environment, so **dare to voice your thoughts, and even to be "wrong"**. It can be quite liberating.

As an evaluator, your goal is to help each presenter to improve his or her skills. *Use the Critique Sheets to provide specific comments – be positive as well as critical.* Remember, your job is to critique the presentation *not* the paper. However, your thoughts on the **choice** of the paper are valuable. Giving only numerical scores is *not* adequate. Note: your comments will be made available to the speaker in an **anonymous** form. As you will see, your role as an evaluator will also improve your own presentation skills.

Advice on Choosing a Paper

Choose a research paper that excites you and that you thoroughly understand! This will help you to prepare for questions from the audience. The paper should be fairly recent (2018 to 2020) but it must NOT be a review and the specific topic must NOT be closely related to your own research topic. **Choose a paper from a good quality journal** such as Biochemistry, Cell, EMBO J., J. Mol. Biol., J. Biol. Chem., Biochem. (ACS), Chem. Biol., Molec. Cell. Biol., Structure, J. Cell Biol., J. Immunol., PLoS (Public Library of Science) – but there are *many* others. You could rely on sites that give citation rankings. Here's one: http://www.icast.org.in/FACTOR.html. However, do not be overly impressed by the rankings - they vary considerably between fields, and high values are very much dominated by biomedical journals and reviews. Most experimental research journals with IFs larger than 2 or 2.5 are basically OK (these are the top 20-25% of all journals). **Also, with no exceptions, there can be rubbish in any journal --- so exercise your own judgement.**

In choosing your paper, consider whether it provides a sound basis for creating a presentation that includes the following elements. Your introduction should clarify the problems that the research addresses as well as why it is important to solve these particular problems within the context of the relevant field. Crafting a good results and discussion section will hinge on whether you choose a good quality paper with sufficient methodological detail so that you can properly understand how the experiments were performed. Additionally, the depth and scope of the experiments should mirror the stated aims of the research. Your conclusion section should evaluate the authors' claims and inform the audience about the broader implications of the research.

Crafting the Presentation

The presentation should last no more than 25 minutes. This will leave time for about 10 minutes of audience discussion. I suggest you plan ~7-10 minutes for introduction, background and significance, approximately ~10-15 minutes for results and interpretation, and about ~5 minutes for final conclusions. You should **PRACTICE** your presentation several times to get the timing right. Practice has the additional advantage of increasing your confidence and calming your nerves when you actually face the audience.

Develop a story, but not a mystery. Your presentation should have a clear narrative and a logical and directional linkage between each part or sub-topic. Where there are two distinct threads that come together in the conclusion, make it clear where you are starting a new thread and state that they will come together at the end. Say when you are digressing intentionally and that you will come back to the main topic later. Do *not* present the work as a mystery or whodunit, with you revealing all, but only at the end. This is really tiresome for those who can see the end coming; and it will probably lose everyone else.

Your presentation should have a beginning, middle and end

You will need to develop an **introduction** that will allow your audience to follow the science with ease, and to understand the significance of the work and its implications. **Do not skimp on this**. It is often good practice to provide an outline slide at the beginning, and you may wish to return to this slide each time you move on to another section. Alternatively, you may want to create a figure (or use a published one) that provides a road map to the problem and to your presentation.

The **results** should be presented in a well-organized fashion, with clear figures. ***Edit figures to serve your purposes*** – do not show material that you are not using in your talk. Sophisticated or novel methodology may need to be described in some detail. You must read the methods carefully and understand them thoroughly. This facilitates critical thinking and enables you to identify conclusions that might have been inadvertently influenced by specific aspects of the experimental design.

Conclude by summarizing, discussing and evaluating the results and their implications. Analyze the conclusions drawn by the authors. Are they valid? Include any thoughts that you have about the interpretation of the results. Does the research offer new insights? Discuss what should be done next, including any specific ideas that you have with regard to furture experiments or the trajectory of the field.

Be prepared to answer questions and to engage in a discussion.

A Good Figure is Worth 1000 Words!

Use, find, or create *good* figures. - especially for the introduction. You should look for figures (or design your own) that clarify previous observations (background) that serve as the foundation for the research. In addition, include figures that clarify the significance of the topic, and the nature of the questions being asked - and sometimes a preview of the answers. Creating cartoons to summarize models and interpretations, etc. is also very useful.

Obviously, include data figures from the paper, ***but edit them*** to fit your presentation. Slides should not be crammed with information. For example, divide panels into separate figures. Another strategy is to build up quite complicated figures by using progressive addition and animated entries.

You are **NOT** obligated to show all of the paper's figures. In fact, showing too much data ("getting deep into the weeds") may bore your audience and distract them from the central message of the presentation. Exercising your discretion is important to the success of the presentation.

Develop a Personal Presentation Style

Your presentation style should be professional – meaning make a serious effort to talk seriously about science. It's great if you can be relaxed, but don't be overly casual. Your attitude reflects the respect that you have for your audience. You should also consider that some people may draw conclusions about your professionalism and scientific credibility based on the way you dress.

A presentation is essentially an organized and formalized conversation – **with you as the teacher**. Don't be intimidated by the formalization. Instead, **focus on your passion for the subject**. This will animate your voice and it will keep your audience on track. It will also increase the chance that you make eye contact with your audience, not just the instructor or people you know. Your passion will also inform your decisions about presentation organization because you will be operating from a position of caring whether the audience actually learns about this new and interesting research. So, picking a topic that fascinates you is a good first step in crafting a well-organized and engaging presentation.

Never simply read the entire content of a slide to the audience. Your job is to lead them through the information. Of course, all figures, graphs, and cartoons must be fully labeled, but be sure not to get ahead of the audience. For example, take a step-wise approach to leading them through the data and helping them to understand its implications. Headings also help to clarify the information content of figures and tables as well as the implications of the data.

Use your laser pointer to draw attention to important elements on a slide – don't wave it all over the place, and don't leave it on all the time.

If the story is complicated, try using summary or progress slides as you go along.

Be *very* aware and wary of jargon and acronyms – minimize their use, define all carefully and thoroughly, include definitions repeatedly on your slides (you don't need to repeat them verbally, they are just there for the audience to see). Even in your own research area, don't assume everyone knows - or likes - the same jargon.

Some speakers like to throw out one or two questions on the work as they go along – especially if they intend to come back to them later, or if they want to stimulate their audience to think about and possibly comment on at the end. This might include things that they think may be actually wrong or special in some way.