Guidelines for Journal Club Presentation

Break the paper up into sections (introduction, figure 1, figure 2, table 1, etc., discussion). In class, have students or pairs of students draw their section assignment from a “hat.” (Alternatively, you can assign parts of the paper to students or pairs of students ahead of time but students tend to focus less on the whole paper if you choose this strategy.) Give students several minutes to review (now that they have their specific assignment) and prepare (especially if presenting in pairs). Each presentation should not exceed 10 minutes.

Give students the following instructions and expectations for their presentation.

Each student should read the whole paper several times to prepare for the journal club activity.

Introduction:

* Present all information in the introduction that is necessary to understand the rest of the paper.
* Put the research in this journal article in the context of the bigger scientific picture.
* What gaps in our knowledge are the authors trying to fill?
* What conclusion(s) do the authors come to as a result of the work they are presenting in this paper?

Results:

* State the purpose or goal of each figure or table as an answerable scientific question.
* Describe what method was used to collect the data in the figure. (Did they use a Western blot? Mass spec? An immunity assay? Etc.)
* Where are the controls in the experiment and do they show what you expect?
* Compare each experimental data point to the controls and, using the data, answer the question you believe was the purpose or goal of the figure/table.
* Does your conclusion agree with that of the authors?
* How does this experiment move the whole paper forward?

Discussion:

* How does the research presented in this paper connect to a theory or previous research?
* Critically evaluate the data presented in this paper. Where are the data presented in this paper strong? Where are the data weak?
* Were there any unique methods used?
* What are the future directions and implications of this research?
* Did the research presented in this paper convincingly lead to the conclusion the authors presented in the introduction?

Journal Club Example for Xu et al (2004) Conserved Translational Frameshift in dsDNA Bacteriophage Tail Assembly Genes. *Cell* 16:11-21.

* Use Figure 1 to cover the introduction to the data in this paper (can break this up into sections).
  + What gap in knowledge does this paper address and what makes the authors believe their hypothesis is correct?
    - Whether divergent sets of structural proteins have homologous structures and functions and share similar assembly mechanisms, even when the proteins have no detectable sequence similarity
  + Where is the gene using a frameshift typically located?
    - Between the tape measure protein and the major tail protein gene
  + How many protein products are made from a gene with a frameshift? In what ratio?
    - Two. 3.5% of the protein product is a result of the slip
  + What is a slippery sequence and how does it relate to the information in this paper?
    - XXXYYYZ (Y = A or T). Slip occurs at G/GT
  + What does this paper hope to show?
    - Direct experimental evidence verifying that frameshifting occurs as predicted in several phages and they map the frameshift precisely in HK97 and in Mu (an unusual -2). Argue that all these ds-DNA-tailed phages use a similar tail assembly pathway that probably evolved from a common ancestor.
* Summarize the information in Table 1 and Figure 2.
  + Where did the sequences for these genomes come from?
    - GenBank
  + How did the authors of this paper assess the potential for a frameshift in these genomes?
    - Genomes contain 2 overlapping ORFs with correctly positioned slippery sequence
  + Where in the table do the authors indicate potential slippery sequences?
    - Underlined nucleotide sequences
  + What is the significance of the “Group” column?
    - Include phages with similar G/GT sequences
* Figure 3
  + What is the central research question addressed in Figure 3?
    - Are two products of the expected size and sequence produced in the five phages tested?
  + What method(s) is/are used in this Figure?
    - Anti-T7 epitope tag Western blot and sequencing
  + What are the conclusions of the authors of the paper?
    - The two products of the expected sizes and sequences are produced.
* Figure 4
  + What is the central research question addressed in Figure 4?
    - Why does L5 have three bands instead of just two?
  + What method(s) is/are used in this Figure?
    - Western blots with anti-T7 tag and anti-HK97-gp5 antibodies
  + What are the conclusions of the authors of the paper?
    - The extra band is due to a termination codon read through
* Figure 5
  + What is the central research question addressed in Figure 5?
    - This figure looks at the unusual -2 frameshift in Mu. It asks if the nucleotide sequences in phages using a -2 frameshift are conserved and offers a potential mechanism.
  + What method(s) is/are used in this Figure?
    - Sequence comparison
  + What are the conclusions of the authors of the paper?
    - Yes, the sequences are conserved. Offers potential mechanism.
* Discussion (can break this up into sections)
  + How conserved is frameshifting and what are the evolutionary implications of frameshifting?
  + Describe the model for the mechanism of frameshifting presented in this paper.
  + What is the biological function of the frameshift?

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| --- | --- | --- | --- |
|  | 10-15 points | 5-10 points | 0-5 points |
| Introduction | Student accurately, completely, and clearly reported all relevant background, theories, and objectives. All gaps in current knowledge were identified. Authors’ conclusion was clearly and accurately communicated. | Student accurately, completely reported most relevant background, theories, and objectives. Lacked some clarity. Most gaps in current knowledge were identified. Authors’ conclusion was clearly and accurately communicated. | Student did not accurately, completely, and clearly reported relevant background, theories, and objectives. Gaps in current knowledge were not identified. Authors’ conclusion was communicated. |
| Results (figures/tables) | Accurately identified and clearly communicated the central question the figure targeted. Controls were accurately identified. Experiment was accurately, completely, and clearly explained. How the data moved the research forward was clearly communicated. | Accurately identified the central question the figure targeted. Controls were accurately identified. Experiment was accurately and completely explained. Presentation lacked clarity. How the data moved the research forward was communicated. | Did not accurately identify the central question the figure targeted. Controls were misidentified. Experiment was not explained with accuracy or clarity. How the data fit into the paper’s larger goal was not addressed. |
| Discussion | How the research in this paper connects to a theory or previous research was clearly presented. Students critically evaluated the paper so that their deep understanding of the paper was clear.  The future directions and implications of this research were accurately, completely, and clearly presented. | How the research in this paper connects to a theory or previous research was presented but lacked clarity or completeness. Students critically evaluated the paper but their deep understanding of the paper was unclear.  The future directions and implications of this research were presented. | How the research in this paper connects to a theory or previous research was not presented. Students evaluated the paper but whether they understood it was unclear. The future directions and implications of this research were not presented. |