Oral Presentation Evaluation Form

Group Lab Oral Presentation — Genomics & Bioinformatics (50 points total)

Group Number:
Students:
Date:
Presentation Duration: 15 minutes + 5 minutes for Q&A

Evaluation Criteria

1. Introduction & Background (10 points)

Introduces Aquaporins (AQPs) as membrane channel proteins that facilitate water and solute transport across cell membranes. Covers key structural features (six transmembrane helices, two NPA motifs, hydrophobic loops) and the five plant subfamilies (PIPs, TIPs, NIPs, SIPs, XIPs), with emphasis on their roles in abiotic stress responses — particularly drought, salinity, and osmotic stress — as discussed in class. Presents the study organism (*Artemisia tridentata*, big sagebrush) and its biological and ecological relevance. Clearly states the research question and objectives (mining a draft genome scaffold for an AQP-coding gene). Information is logically organized, concise, and engages the audience. Drawing on the course group activities and the associated article (Melton et al. 2022) to frame the biological context is expected for top scores.

Score	Criteria
9–10	Excellent introduction demonstrating strong understanding of AQP biology: structural features (six transmembrane helices, NPA motifs), plant subfamilies and their functional differences, and their roles in abiotic stress responses (drought, salinity, osmotic stress). *Artemisia tridentata* context is clearly established. Research question and objectives are precisely stated. Presentation draws explicitly on course group activities and/or Melton et al. 2022 to frame the context. Information is logically organized and highly engaging.
7–8	Good introduction with adequate coverage of AQP structure and subfamilies. Abiotic stress role mentioned but not developed. Objectives clear. Limited integration of course material or article.
5–6	Basic introduction present but AQP biology is superficial (e.g., general water channel description only, subfamilies not distinguished, abiotic stress not mentioned). Research question stated but vague. Little or no connection to course activities or article.

Score	Criteria
3–4	Introduction incomplete; key AQP structural or functional features missing or incorrect. Abiotic stress role absent. Objectives unclear. No integration of course material.
0–2	Introduction largely absent or poorly delivered with minimal biological context or clarity.

Score: ____/10
Comments:

---

2. Materials & Methods (10 points)

Clearly describes genome mining, ORF prediction, annotation, and validation steps appropriate for oral communication. Describes tools, software, and databases used with enough detail for comprehension. Methods are presented in an understandable, well-structured way for the audience.

Score	Criteria
9–10	Workflow clearly and accurately described, covering all steps: genome mining, ORF prediction, annotation, and validation. Tools, software, and databases are identified with sufficient detail. Methods are well-structured and easy to follow.
7–8	Most steps well-described with minor omissions or lack of detail in one area. Tools mostly identified. Overall structure is clear.
5–6	Methods present but incomplete or unclear in multiple steps. Some tools or databases omitted. Reproducibility limited.
3–4	Several methodological steps missing or incorrectly described. Difficult to follow the workflow.
0–2	Methods largely absent, illogical, or contain major errors throughout.

Score: ____/10
Comments:

---

3. Results (12 points)

Results focus on ORF prediction (candidate ORFs identified on the assigned scaffold), protein BLAST annotation (identification of the AQP-encoding sequence and subfamily), and structural validation: transmembrane helix prediction (TMHMM), NPA motif identification, and 3D protein

structure modeling (Phyre2). Mentioning the scaffold ID is acceptable but not essential, as scaffolds were provided. Figures, tables, and slides are clear, correctly labeled, and enhance audience understanding. Results are accurate and complete, presented without misinterpretation.

Score	Criteria
11–12	Results are complete, clearly explained, and accurate. ORF prediction, BLASTp annotation, and all three validation steps (TMHMM, NPA motifs, Phyre2) are covered. AQP subfamily is correctly identified and interpreted. Figures and tables are clear, correctly labeled, and effectively enhance understanding. No misinterpretation.
8–10	Most results well-presented. One validation step missing or briefly mentioned. Figures mostly clear with minor labeling or explanation gaps. Results are mostly accurate.
5–7	Results present but incomplete. Multiple validation steps missing or unclear. Some figures absent, poorly labeled, or not clearly explained. Minor inaccuracies or misinterpretations present.
3–4	Results substantially incomplete. Major components (e.g., annotation or validation) absent or misinterpreted. Figures inadequate or missing.
0–2	Results largely absent, incomprehensible, or contain major errors.

Score: _____/12
Comments:

---

4. Discussion & Interpretation (10 points)

The core expectation for this section is that students clearly identify which AQP gene/subfamily was found in their scaffold and justify that assignment using their results (BLASTp hits, NPA motif configuration, transmembrane helix count, Phyre2 3D structure). Beyond identification, they should explain what that gene does — its transport function based on subfamily (e.g., water transport for PIPs/TIPs, alternative substrates such as urea or ammonium for NIPs with mutated NPA motifs) — and connect it to the biology of *Artemisia tridentata*. Discussing the role of AQPs in abiotic stress responses and drought tolerance is not mandatory but constitutes a strong plus for top scores. Integration of the course group activities and/or Melton et al. 2022 to support interpretation is expected for the highest marks. Discusses limitations, uncertainties, and potential next steps.

Score	Criteria
9–10	Clearly and correctly identifies which AQP gene/subfamily was found in the scaffold and provides a well-reasoned justification based on all lines of evidence (BLASTp, NPA motifs, TMHMM, Phyre2). Explains the gene's transport function and biological significance in *A. tridentata*. Integrates course material and/or Melton et al. 2022. Discusses the role of AQPs in abiotic stress/drought tolerance and addresses limitations and potential next steps.
7–8	Correctly identifies the AQP gene/subfamily and provides adequate justification using most lines of evidence. Biological function explained. Some integration of course material or article. Abiotic stress or drought tolerance briefly mentioned. Minor weaknesses in reasoning or limitations discussion.
5–6	AQP gene/subfamily identified but justification is partial or relies on a single line of evidence. Biological function acknowledged but superficially discussed. Little integration of course material or article. Abiotic stress role not addressed. Limitations or next steps absent or vague.
3–4	AQP gene identity stated without meaningful justification, or subfamily incorrectly assigned. Discussion largely descriptive. No integration of course material. Biological significance poorly explained.
0–2	No clear identification of the AQP gene found, or discussion demonstrates fundamental misunderstanding of the results or AQP biology.

Score: ____/10
Comments:

---

5. Communication & Engagement (8 points)

All group members contribute and respond to questions. Speech is clear, confident, and well-paced; avoids excessive reading from slides. Effectively engages listeners, maintains attention, and handles questions professionally.

Score	Criteria
7–8	All group members contribute meaningfully and respond to questions confidently. Speech is clear, well-paced, and confident throughout; minimal reading from slides. Audience is effectively engaged and questions are handled professionally.
5–6	Most members contribute; one member less active. Delivery mostly clear with minor issues in pacing or occasional reading from slides. Engagement mostly maintained; questions handled adequately.
3–4	Participation uneven; some members contribute little. Some reading from slides; pacing inconsistent. Audience engagement limited; questions handled with difficulty.
1–2	Few members contribute actively. Unclear delivery, frequent reading from slides, or poor pacing. Minimal audience engagement; questions poorly handled.
0	No meaningful participation, communication, or audience engagement.

Score: ____/8
Comments:

Presentation Penalties

Issue	Penalty	Applied
Exceeding 16 minutes (1-minute leniency applied to the 15-minute limit)	Up to −3 points	
Exceeding 6 slides	−1 point per extra slide	
Failing to present	See Late Work Policy	

Penalty Deductions: ____ points deducted
Comments:

Final Score

Section	Points Available	Score
1. Introduction & Background	10	
2. Materials & Methods	10	
3. Results	12	

Section	Points Available	Score
4. Discussion & Interpretation	10	
5. Communication & Engagement	8	
Subtotal	**50**	
Presentation Penalties	−3 max	
Total Score	**50**	