

# Keck Science Assessment Rubric for Senior Thesis in Molecular Biology

Student Name: \_\_\_\_\_  
 Evaluator Name: \_\_\_\_\_  
 College: \_\_\_\_\_  
 Term: \_\_\_\_\_

| Learning Outcomes  | <b>Superior<br/>4</b>   | <b>Good<br/>3</b>  | <b>Fair<br/>2</b>   | <b>Poor<br/>1</b>  | <b>Score</b> |
|--|---|--|---|--|--------------|
| <b>Uses foundational principles to analyze problems in nature</b>                              | Student has fully and clearly articulated the foundational scientific principles pertinent to the project and has grounded the project in these principles. | Student has discussed foundational principles but has not fully grounded the project in these principles.  | Student alludes to foundational principles but connects them to the project in an indirect way.   | Student has not connected the project to foundational principles.  |              |
| <b>Develops hypotheses and tests them using quantitative techniques</b>                        | Student has clearly developed hypotheses and has used quantitative techniques to test them.   | Student has developed hypotheses but has not systematically used quantitative techniques to test them.   | Student has not clearly developed hypotheses and/or has used quantitative techniques only to a limited extent.  | Student has not developed hypotheses and has not used quantitative techniques.   |              |
| <b>Designs controlled experiments to test specific hypotheses on a molecular biology topic</b> | Student demonstrates a deep understanding of the role of control experiments in the testing of hypotheses in molecular biology.                             | Student demonstrates a substantial understanding of the role of control experiments in the testing of hypotheses in molecular biology.   | Student demonstrates a passable understanding of the role of control experiments in the testing of hypotheses in molecular biology.                           | Student demonstrates little understanding of the role of control experiments in the testing of hypotheses in molecular biology.                            |              |
| <b>Effectively communicates scientific concepts in writing</b><br>(Articulation)               | Each main idea is supported by detailed data or reasoning. All details are related to topic. Complete, correct documentation of a wide variety of sources.  | Clear overall though details and/or data in some paragraphs may be vague. Data cited may at times be insufficient to support conclusions. Documentation of a variety of sources. | Arguments presented are not integrated into a coherent flow; some details are irrelevant. Marginal documentation of sources; some key sources may be missing. | Many conclusions/main ideas are not supported by details. Unclear presentation and many details cited are irrelevant. Inadequate documentation of sources. |              |

| Learning Outcomes   | Superior<br>4  | Good<br>3  | Fair<br>2   | Poor<br>1  | Score |
|---|--|--|---|--|-------|
| <b>Effectively communicates scientific concepts in writing</b><br>(Style)   | Ideas/paragraphs/ sections are connected by effective transition words and phrases. Precise, interesting, and accurate word choice. Writing style enhances readability of writing. | Transitions used. Word choice is adequate to convey meaning.   | Few or no transitions. Overall style choppy.  | No transitions. Sentence style choppy. Vocabulary limited.   |       |
| <b>Effectively communicates scientific concepts in writing</b><br>(Grammar/Usage/ Mechanics)  | Free of spelling, capitalization, and usage errors. Few, if any, errors in punctuation. Sophisticated and consistent command of standard English.                                  | Number and type of errors does not interfere with meaning. Few, if any, spelling, capitalization, or usage errors.                                   | Number and type of errors may interfere with meaning at some points. Some spelling, capitalization, or usage errors. Some fragments and/or run-ons. Some errors in punctuation. | Number and type of errors obscure meaning. Frequent errors in spelling, capitalization, and usage. Many fragments and/or run-ons. Serious and frequent punctuation errors. |       |
| <b>Articulates applications of science in the modern world</b><br>(Student discusses “real-world” applications of science in his/her thesis.) | YES  | NO   |   |  |       |
| <b>Discusses and analyzes original scientific research articles on molecular biology topics</b>   | Student makes extensive reference to the primary literature in molecular biology and cogently analyzes the conclusions presented in the literature cited.                          | Student makes reference to the primary literature in molecular biology but does not fully analyze the conclusions presented in the literature cited. | Student makes reference to the primary literature in molecular biology but does not demonstrate understanding of the conclusions presented in the literature cited.             | Student has made only limited reference to the primary literature in molecular biology.  |       |