

***Rubric: Present a research proposal for the project.*** Your proposal should contain key aspects of the relevance and scientific background to your project, should clearly state your hypothesis and indicate the predictions that it makes for the model system you will use to explore it. For each prediction you should indicate what you will measure and how you will measure it, together with any necessary controls. For each experiment proposed you should indicate how you will analyze the data and how you will decide whether the data is consistent with or refutes your hypothesis.

Criterion	Research Element Template	Exemplary-Excellent	Adequate (add comment for student)	Inadequate (add comment for student)
Appropriate title, relevance & big picture described	T1	Title informative, related to big picture and gives information re the approaches to be taken		
Provides appropriate relevant scientific background, identifying gaps in knowledge the project will fulfill	T2	Indicates rationale for clustal analysis and relates to big picture. Understands and uses sufficient sequences to legitimize analysis. Location and potential interactions of residue clearly illustrated		
Give a brief overview of the hypothesis and its predictions and model system to be used	T3	Relates hypothesis to function of chosen residue in the native structure- uses graphics to illustrate, relates to properties that can be measured experimentally		
For each prediction, discusses what must be measured, presents appropriate experiments and discusses appropriate controls	T3, T4, T5	Uses characteristics of conservation (size, charge, polarity, chemical properties etc) and relates to chosen mutations (s)		
For each experiment can relate how the data will be collected and analyzed and indicates potential technical and theoretical limitations of the experiment. Discusses the role of instrument or project collaborations as appropriate	T5	Indicates what the experiments actually tell you versus can be inferred from the experiments		
Clearly indicates dependent and independent variables and addresses issues of other variables that must be considered. Considers repeatability of key experiments	T6	Details dependent and independent variables and discusses other variables that must be controlled		
Clearly indicates what must be compared to appropriately test the hypothesis and how the significance of the comparison will be established.	T7	Indicates what results must be compared to and what would be consistent with or would falsify the hypothesis. Understands that experimental results must be repeated		
Provides a logical flow of the experiments proposed and indicates how the results will explore the hypothesis. Clearly indicates any collaborations that will be used	T7	Documents collaborative arrangements that have been made to obtain certain experimental data necessary to address the hypothesis and some of its predictions. Can answer or think through all questions asked		
<i>Proposes a reasonable timeline for the project</i>	T8			
<i>Appropriately Revises in response to Peer Review</i>	T9			

