Semester Week	Course Meeting Topic	Assignment	Assessment
1	**Introduction to mechanisms canonical and noncanonical translation initiation.** Seminar on the role of IRES and CITE RNAs and introduction to proposed secondary structure. **Introduction to major research questions & figure 1 design.**	Read translation reviews & create rough draft figure of translation initiation.	Credit for initial draft figure.
2	**How to read primary literature.** Intro to literature search engines (e.g. PubMed). **Annotated Bibliography #1** (RNA structure papers). Intro to reference manager (Mendeley/Zotero). Propose mutants based off of wild type secondary structure, **formulate an *initial* hypothesis**.	Annotated bibliography about RNA structure & virus.	Credit for annotated bibliography. Credit for hypothesis and proposed mutants.
3	**Refine figure 1** (mechanisms of translation initiation) using PowerPoint for figure design. **Experimentation**: thermodynamic folding software, ViennaRNA, to measure stability of designed mutants. Refine proposed mutants based off of ViennRNA fold predictions.	Create final figure 1 with captions in PowerPoint. Refined hypothesis.	Credit for clear figure 1 and unambiguous figure caption. Credit for refined mutants and hypothesis.
4	**Research plan outline**, list of reagents to order. **Predict binding interaction** using RPISeq. Reformulate hypothesis if necessary. **Experimentation**: primer design & intro to primer software. **Protocol versus Materials & Methods.** Intro to Benchling.	Primer design using various software. RPISeq search. Lab notebook entry.	Credit for primer design. Credit for notebook entry.
5	**Design figure 2** (predicted RNA structure & binding interactions) using result of ViennaRNA Fold & RPISeq. **Experimentation**: mutPCR (instructor DpnI & transforms prior to next course meeting.)	Create a draft figure 2. Lab notebook entry	Credit for draft figure 2. Credit for notebook entry.
6	**Annotated Bibliography #2** (translation mechanism papers). **Refine figure 2** (predicted RNA structure & binding interactions) using PowerPoint for figure design. **Experimentation**: miniprep, quant (instructor submits for sequencing)	Annotated bibliography about viral translation regulation. Create final figure 1 with captions in PowerPoint. Lab notebook entry.	Credit for annotated bibliography. Credit for clear figure 1 and unambiguous figure caption. Credit for notebook entry.
7	**Lay summary intro: effectively using figures of speech.** **Experimentation**: *in vitro* transcription and translation of mutant and wild type luciferase plasmids.	Lab notebook entry. Developing figures of speech for project (goal or methods).	Credit for notebook entry. Credit for examples of figures of speech.
8	**Lay summary intro: using plain English.** **Experimentation**: analysis of luciferase assay via chemiluminescence.	Lab notebook entry. Draft #1 of Lay Summary.	Credit for notebook entry. Credit for draft.
9	**Draft #1 Lay Summary peer review.** **Extra day for experimentation.**	Lab notebook entry. Draft #2 Lay Summary.	Credit for notebook entry. Credit for peer review sheet.
10	**Draft #2 Lay Summary peer review.** **Extra day for experimentation.**	Lab notebook entry. Lay summary draft for peer review.	Credit for notebook entry. Credit for peer review sheet.

11	**Intro to Research Presentations** How to tell a scientific story. **Data analysis day!** Analyzing data via Excel.	Lab notebook entry WITH data analyzed in Excel.	Credit for notebook entry.
12	**Example research presentation** (PowerPoint presentation tool) **Data analysis day!** Graphing data via Excel and creating a figure of results in PowerPoint (or other software).	Lab notebook entry WITH data analyzed in Excel. Presentation draft #1.	Credit for notebook entry. Credit for graph and figure.
13	**Practice presentations.** **Results vs. Conclusions review**	Write the results of your data analysis and then draft a conclusion. Presentation draft #2.	Written results (including graph of data) and conclusions. Credit for peer review sheet.
14	Fall Break		
15	**Practice presentations.**		LAY SUMMARY DUE! Credit for peer review sheet.
16	Student presentations to faculty		
FINAL	ACS D.U.C.K. Exam		