Problem Set 4: Proteins

Answer the following questions related to performing the requested tasks and then include your answers in an electronic file, save as a pdf, and merge together as a single pdf. Upload your PDF file to the Blackboard Assignment page for Problem Set 4 by 5 pm on the due date.

Using your multiple sequence alignment of amino acid sequences from **Lab 3** (feel free to make any changes necessary), perform the following:

1. Identify secondary structural elements in your alignment. How did you identify these structural elements (what software did you use?)? How does the software actually make the inferences of secondary structure? What assumptions are you making in this analysis? What structural elements did you predict from your data? Do your results make sense, why or why not? Show the output of the structural analysis.

2. Identify tertiary structural elements in your alignment. How did you identify these structural elements (what software did you use?)? How does the software actually make the inferences of tertiary structure? What assumptions are you making in this analysis? What structural elements did you predict from your data? Do your results make sense, why or why not? Show the output of the structural analysis.

3. **For Graduate Students:** Find a 3-D model that is close to your protein of interest and map key variants in your alignment on the 3-D structure. Show your result. Isn't that the coolest thing ever?!