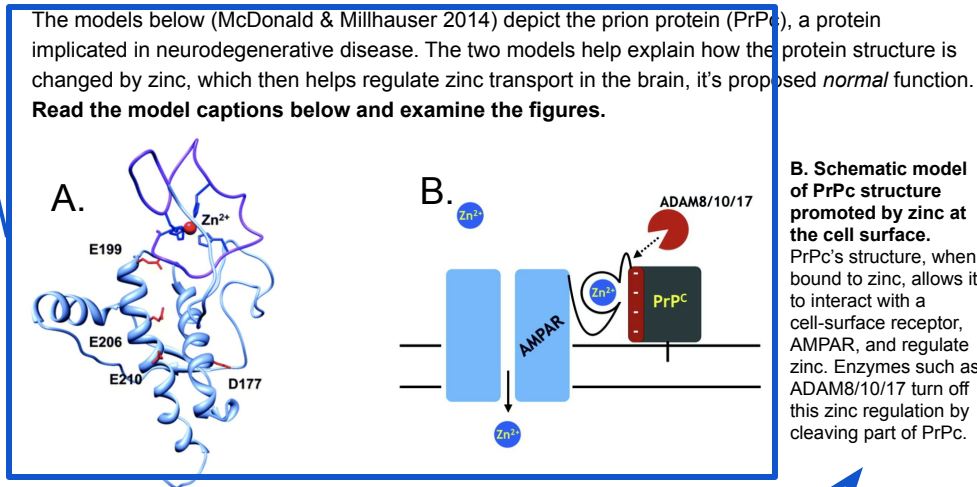


Models selected and information provided ensured that:

1. Multiple aspects of the protein system could be explained using the models
2. Models were valid at the same time, no one "correct" model
3. Models developed by UCSC researchers - authenticity



**A. Model of PrPc's structure when binding zinc.** Zinc is bound by amino acids in purple region, and makes contact with two of PrPc's alpha helices near a cluster of negatively charged amino acids, shown in red.

*Captions provided enough information to combat students being overwhelmed by content related to protein structure and function. Goal was that using the models would actually help them understand better*

Scientific models are used to help us explain complex phenomena. Scientists often must consider their choice in using a model(s) by:

- Evaluating the models available based on their ability to account for key features of the phenomena they are trying to explain and understand
- Comparing available models to each other towards supporting an explanation
- Considering the short-hand, assumptions and/or limitations of models compared to the phenomena they represent.

**Addressing the bullet points above, describe how one or both of these models** help you understand some aspect of the prion protein structure or function, highlighting the characteristics of aspects of the model(s) that interest you and that support that your understanding.

### Teaching intervention

*The goal of this project was to develop a backward design, assessment driven approach to integrating science practices into lecture courses. Because of that goal, we did not focus on large teaching interventions. The course instructor had been emphasizing models in the class, but these bullets laid out the general expectations and starting point for students to use.*

### Prompt to elicit engagement in science practice

We wanted to surface students using models to explain phenomena authentically, *not to tell us how they would use a model to explain*. An early iteration of this prompt asked students, given two models that explain a biological phenomena, to:

**Describe the extent to which the model represents the actual phenomena, explain why there are multiple models for the phenomena, and describe how the model can be tested.**

The version we settled on, in the blue box above, is more about prompting students to engage in the practice. This prompt can be used in lots of settings with different assignments to elicit students' understanding about using models to explain. We also wanted to allow students to have freedom in how they used models, as opposed to being overly directive in the prompt.