

Assignment 1 (due March 3rd by 5 pm):

The paper by Chong and colleagues describes the purification and characterization of an archaeobacterial protein (MtMcm) that is related to the eukaryotic Mcm proteins. The experiments in figure 1 indicate that MtMcm has a binding site for both ssDNA and dsDNA. It is possible that these DNAs bind the same site in the protein or that they bind separate sites. Propose an experiment to distinguish between these two possibilities and describe the results you would expect if dsDNA and ssDNA share the same binding site. If ssDNA and dsDNA share the same binding site, what part of the DNA is most likely involved in the interaction that stimulates the ATPase?

To address the ability of MtMcm protein to displace large DNA fragments, the authors created a DNA helicase substrate with variable length ssDNAs (25 to 500 bases) annealed to a large ssDNA circle and find that MtMcm can displace ssDNAs as long as 500 bases. Is this an assay for MtMcm processivity? Explain why or why not.

Directions:

The answers to the questions should be in the form of a **2 page essay with Title , double spaced, using #12 font size with one inch margins on top, bottom, left, and right. All papers should be left justified. No excuses!**

The essay should synopsise the important points of the paper that pertain to the question (no more than two paragraphs) and propose an answer to the questions posed. The quality of the answer will depend on the **quality of the supporting arguments** as well as the **quality of the presentation**.

Criteria for evaluation:

1. □ The student introduced the paper's topic effectively through a concise and clear summary of the key conclusions that can be made based on the experiments presented in the reading assignment.
2. □ The paper demonstrated a clear understanding of the experiments presented in the reading assignment.
3. □ The paper presented an insightful perspective to the study question(s). Answers were well supported with logical arguments based on the data in the paper.
4. □ The study question(s) were answered in the space allowed.
5. □ The paper:
 - a. was well organized with informative topic sentences, effective transitions, and clear expression of ideas;
 - b. had a logical flow; and
 - c. demonstrated correct grammar and mechanics.