College of the Canyons: Introduction to Biotechnology

Protein Extraction and Concentration Determination Post Lab

1. Referencing the textbook, describe four different techniques to rupture a cell.

2. Describe the roles of the following solutions:
   a. Phosphate buffer saline:

   b. Triton X-100 solution:

   c. Sodium Dodecyl Sulfate:

3. Consider the two protein standard curves previosly prepared in lab. Which one is most appropriate for this type of study: unknown in unknown range or unknown in a known range. Defend your answer.

4. Given a protein concentration of 0.18mg per 1ml, and a cell count of 1.97×10^7 cells per ml, determine the protein concentration in mg protein per cell. Use dimensional analysis and show all your work.

5. Two different types of cells may make identical amounts of proteins, but the concentrations determined using this protocol turn out to be very different. Provide 2 explanations as to these results and do not cite a vague principle (i.e. experimental error).

6. Review the answers to question number 5, how may some of this "missing protein" may be recovered or otherwise identified? Provide at least one idea relating to this notion.

7. The test for proteins we used in lab react with a amino (NH2 /NH3+) and amide groups (N---H). Review the organic macromolecules seen in cells and list three molecues that the test may react with that are NOT proteins.