

CHEM 301 UNIT 9 LEARNING OBJECTIVES (lesson 1- lesson 5 trial exam questions and answers) ATHABASCA UNIVERSITY

Unit 9 Learning Objectives

1. Discuss biochemical techniques and their applications.
2. Demonstrate an understanding of the methodology behind cell disruption and fractionation.
3. Demonstrate an understanding of the general methods of chromatography.
4. Demonstrate an understanding of the different forms of electrophoresis.
5. Differentiate between Southern, Northern, and Western blotting.
6. Outline the methods of microarrays, polymerase chain reaction (PCR), cloning, and reverse transcription.

Lesson 1 Learning Objectives

1. Define the term "cell lysis."
Cell lysis: breaking open of cells by disrupting the membrane.
2. Describe methods of cell disruption.
 - Lowering the ionic strength of the medium cells are kept in @ lowering of ions causes imbalance of ions between the inside and outside of the cell @ to balance this, water rushes into the cell, causing cell to burst open @ may also use mild surfactantsBacteria, yeast, and plant cells have rigid cell walls; need to use other techniques:
 - Use of enzymes to degrade cell walls
 - Mechanical agitation (tiny beads that are shaken with a suspension of cells)
 - Sonication: using high powered sound waves to break the membrane
 - Use of cell bomb @ cells placed under very high pressure
 - Cryopulverization: tissues are flash frozen in liquid nitrogen and the ground to a power @ useful for cells with a strong extracellular matrix such as connective tissue or seeds
3. Outline how cells are fractionated.
 - Starts with centrifugation @ remove cell debris to fractionate organelles and cytoplasm
 - Divide by density, get different layers/fractions and each one will contain a subset of the molecules in the cell
4. Define the term "centrifugation."
Centrifugation: to spin samples at a high speed, allowing cell components to separate based on density
5. Demonstrate an understanding of the purpose for cell disruption and fractionation to study cellular functions and processes.
It is necessary to be able to isolate molecules in order to study them individually because of all the processes that occur in a cell. Cell disruption (first step; break open cells and release contents) and fractionation (separate the cell contents into subsets) allow scientists to separate and isolate the components they are interested in studying.

Lesson 1 Study Questions

1. Explain the principle behind causing cell lysis by lowering the ionic strength of the media.

Answers For Learntci Lesson 5

Victoria Burrill



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