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.

- Describe methods of cell disruption.
 - Lowing 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 [2] may also use mild surfactants

Bacteria, yeast, and plant cells have rigid cell walls; need to use other techniques:

- Use of enzymes to degrade cell walls
- Mechanical agitation (timy 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 \(\mathbb{E}\) useful for cells with a strong extracellular matrix such as connective tissue or seeds
- 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 bases on density

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

Sarah Cooper

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Table of Contents Answers For Learntci Lesson 5

- 1. Understanding the eBook Answers For Learntci Lesson 5
 - The Rise of Digital Reading Answers For Learntci Lesson 5
 - Advantages of eBooks Over Traditional Books
- 2. Identifying Answers For Learntci Lesson 5
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
- 3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Answers For Learntci Lesson 5
 - User-Friendly Interface
- 4. Exploring eBook Recommendations from Answers For Learntci Lesson 5
 - Personalized Recommendations
 - Answers For Learntci Lesson 5 User Reviews and Ratings
 - Answers For Learntci Lesson 5 and Bestseller Lists.

- 5. Accessing Answers For Learntci Lesson 5 Free and Paid eBooks
 - o Answers For Learntci Lesson 5 Public Domain eBooks
 - Answers For Learntci Lesson 5 eBook Subscription Services
 - Answers For Learntci Lesson 5 Budget-Friendly Options
- 6. Navigating Answers For Learntci Lesson 5 eBook Formats
 - ∘ ePub, PDF, MOBI, and More
 - Answers For Learntci Lesson 5 Compatibility with Devices
 - Answers For Learntci Lesson 5 Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Answers For Learntci Lesson 5
 - Highlighting and Note-Taking Answers For Learntci Lesson 5
 - Interactive Elements Answers For Learntci Lesson 5
- 8. Staying Engaged with Answers For Learntci Lesson 5
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - o Following Authors and Publishers Answers For Learntci Lesson 5
- 9. Balancing eBooks and Physical Books Answers For Learntci Lesson 5
 - Benefits of a Digital Library
 - $\circ\,$ Creating a Diverse Reading Collection Answers For Learntci Lesson 5
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Answers For Learntci Lesson 5
 - Setting Reading Goals Answers For Learntci Lesson 5
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Answers For Learntci Lesson 5
 - Fact-Checking eBook Content of Answers For Learntci Lesson 5
 - Distinguishing Credible Sources
- 13. Promoting Lifelong Learning

- Utilizing eBooks for Skill Development
- Exploring Educational eBooks
- 14. Embracing eBook Trends
 - Integration of Multimedia Elements
 - Interactive and Gamified eBooks

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