Virtual Learning

Medical Interventions
Protein Purification

May 6, 2020

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Lesson: May 6, 2020

Objective/Learning Target:

Recognize that chromatography is a technique used to separate components of a mixture and can be used to separate proteins based on the properties of their side chains. (4.1.3)
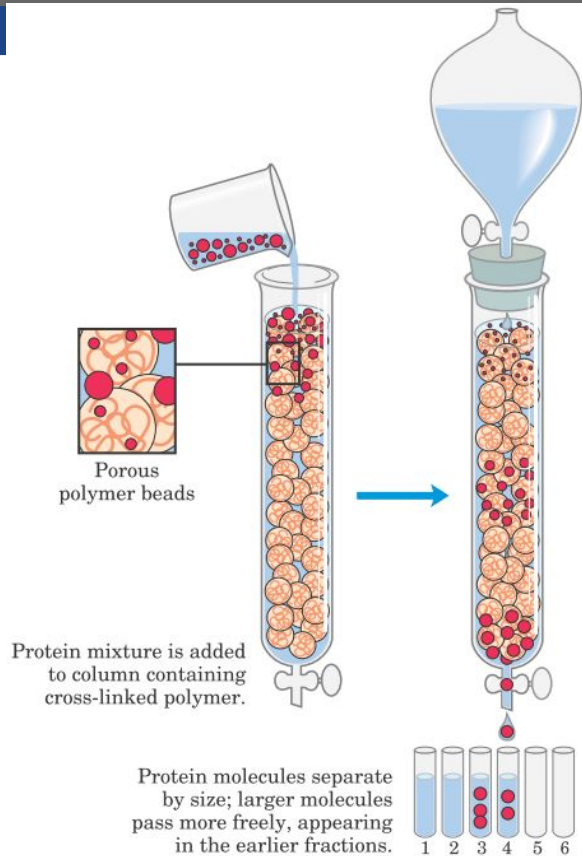
1. Review the structure of proteins by watching this video.
2. Read about how proteins fold by viewing this article.
3. What are some of the properties that influence protein structure?
   a. hydrophobic/hydrophilic interactions, hydrogen bonds, etc.

Read this background information and watch this video on how we can purify proteins using a process called size-exclusion chromatography. Describe this method in your notebooks.

Porous polymer beads

Protein mixture is added to column containing cross-linked polymer.

Protein molecules separate by size; larger molecules pass more freely, appearing in the earlier fractions.

1 2 3 4 5 6

Answer the following questions based on your answer to the lesson activity:

1. What is size-exclusion chromatography?
2. What is the matrix and what happens here?
3. What is the role of the elution buffer?
4. Larger proteins will pass through the matrix _____ than smaller proteins.
5. Smaller proteins will pass through the matrix _____ than larger proteins.

Answer the following questions based on your answer to the lesson activity:

1. Lab technique that separates molecules by differences in size as they pass through a resin packed in a column
2. Spherical particles (beads) that lack reactivity and adsorptive properties are placed into a column
3. Washes the protein mix to pass through the matrix
4. Faster
5. Slower

1. Check your understanding by reviewing with these [flashcards](#).
2. Want to try out a chromatography lab at home with pens or candy? Check out the lab and worksheets [here](#).
3. In the next lesson we will learn how the insulin and other proteins can be verified as being pure. Think about how this could be achieved.