

Biomanufacturing Module 3

Lesson 5 – Graphing a protein concentration standard curve in Excel

Lesson objectives:

Students will understand:

- How to graph a standard curve.

Essential Question

- How is a standard curve used to determine the protein concentration of a sample of unknown concentration?

Materials:

- Downstream Process - Measuring Purified Protein Concentration Protocol
- Computer or Tablet that can run Excel
- Standard curve data from Module 3, Lesson 3 - found in the Protein Concentration Standard Curve Report Document
- Downstream Process Batch Record Document (1/team)

What Students Will Do

- Team members will each use Excel to graph the protein concentration standard curve data generated in Module 3, Lesson 3
- Follow the Graphing a Protein Concentration Standard Curve in Excel protocol
- Each team fills out the appropriate parts of the Downstream Process Batch Record Document

Teacher Preparation

- Prior to class make copies of
 - Graphing a Protein Concentration Standard Curve in Excel Protocol (one per team)
 - A copy of the Standard Curve Data (Module 3, Lesson 3)
 - Downstream Process Batch Record Document (one per team)
- Provide each team
 - A computer or tablet that can run Excel

Organizer

Time	Activity	Materials
10 minutes	Brief introduction to Excel or Google Sheets	
20 minutes	Team members create a graph of the standard curve data generated in Module 3, Lesson 3	Graphing a Protein Standard Curve Protocol, Protein Concentration Standard Curve Report Document

10 minutes	Teams use the equation of the line from the standard curve and the OD595 reading of their purified protein sample to calculate the concentration of their purified protein.	Graphing a Protein Standard Curve Protocol, Downstream Process Batch Record Document
10 minutes	Teams fill out the Downstream Process Batch Record Document and file it	Downstream Process Batch Record Document, Team File Folder

Procedure

Graphing of Protein Concentration Standard Curve Sample Data and calculation of the concentration of the purified protein sample.

1. Introduce the Excel or Google Sheets graphing program.

Graphing the standard curve data and calculation of the concentration of the purified protein.

2. Members of each team follow the Graphing a Protein Standard Curve Protocol to create a standard curve and get the equation of the best fit line.
3. Each team uses the equation of the line and their purified protein sample OD595 reading to calculate the concentration of their purified protein sample.
4. Each team fills out the appropriate section of the Downstream Process Batch Report and files it in their team file.