

Biomanufacturing Kit Module 3 Syllabus

Please Note: These labs are designed to be flexible. All documents are provided as '.doc' or '.ppt' so that teachers can download them and modify them to suit their curriculum, classroom, student population etc

Downstream Process

1. Preparation of Bacterial Lysate : Module 3, Lesson 1
 - a. Review Downstream Process: Downstream Process slide deck
 - b. Each team prepares a bacterial lysate sample from their harvested bacterial culture: Bacterial Lysis Protocol
 - c. Each team fills out the appropriate parts of the Downstream Process Batch Record.
2. Protein Purification: Module 3, Lesson 2
 - a. Prepare the Column: Column Purification Protocol
 - b. Prepare the bacterial lysate to be loaded on the column
 - c. Purify RFP or GFP from the bacterial lysate using column chromatography
 - d. Each team fills out the appropriate parts of the Downstream Process Batch Record document
3. Protein Concentration Standard Curve: Module 3, Lesson 3
 - a. Bradford Protein Assay slide deck
 - b. Process Engineers prepare albumin standard curve samples: Bradford Protein Assay Standard Curve Protocol
 - c. The Process Engineers prepare the spectrophotometer for use
 - d. The Process Engineers take OD595 readings of the standard curve samples
 - e. The Process Engineers record the data in the Protein Concentration Standard Curve Report
 - f. The Protein Concentration Standard Curve Report is made available to all teams.

NOTE: It may work well to have the members of each team work on Module 3, Lesson 4 while the Process Engineers are preparing the spectrophotometer and creating the standard curve samples.
4. Measurement of Protein Concentration of Purified Protein: Module 3, Lesson 4
 - a. Each team heat denatures an aliquot of their purified protein
 - b. The QC Technician prepares an aliquot of the team's heat denatured purified protein for the Bradford assay
 - c. The QC Technician reads the OD595 of the sample
 - d. Each team fills out the appropriate part of the Downstream Process Batch Record.
5. Calculation of Protein Concentration and Yield: Module 3, Lesson 5
 - a. Each team plots a standard curve and finds the equation of the best fit line

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- b. Each team uses the equation of the line to calculate the concentration of their purified protein.
 - c. Each team calculates their protein yield.
 - d. Each team fills out the appropriate part of the Downstream Process Batch Record.
- 6. Creation of a product label
 - a. Teams create a product name
 - b. Teams create a product label