ASSIGNMENT#1
BT604: INDUSTRIAL BIOTECHNOLOGY

Spring 2022

Opening Date:20/5/2022 (12:00 AM)

Closing Date:26/5/2022 (11:59 PM)

Total Marks: 10

Due Date: 26/5/2022 (11:59 PM)

VU Medical Zone Effort By Amaan Khan

Question No. 1

a) Define Fermentation. How can you outline a fermentation process depicting up streaming and down streaming processing?

Fermentation can be defined as there is an incomplete oxidation or reduction of carbohydrates with the microbes which produces Alcohol or Lactic acid. This process is carried out in the absence of air.

Down steaming process:

Downstream handling alludes to the recuperation and the cleaning of biosynthetic items, especially drugs, from regular sources, for example, creature or plant tissue or aging stock, including the reusing of salvageable parts and the legitimate treatment and removal of waste.

Steps for the down streaming

i. Harvest and Filtration

Harvest is the first step to separate product from bulk debris while optimizing retention of the product yield and quality.

ii. Primary Capture

Capture refers to holding onto the desired product while minimizing retention of impurities and by-products. It differs from 'Harvest' in that essentially all bulk debris will have already been removed.

iii. Buffer Exchange and Up-concentration

Ultrafiltration (UF) concentrates a dilute product stream and separates molecules in solution based on the membrane pore size or molecular weight cutoff. Diafiltration (DF) exchanges

Effort By Amaan Khan

products from an existing buffer into a new buffer for a following process or a final formulation buffer. Ultrafiltration (UF) and diafiltration (DF) together are the steps of buffer exchange.

iv. Purification

Purification removes residual impurities with each successive method employed, while also retaining as much product as possible. The goal is to achieve product purity while minimizing potential yield loss. This step is very critical for the down streaming process.

v. Bioconjugation (Molecule Dependent)

Bioconjugate molecules are a new class or generation of biologic molecules which are designed to have an increased efficacy enabled by the combined function of two or more different therapeutic types of molecules. Antibody-Drug Conjugates (ADC) are one of the more common bioconjugates and are synthesized by biochemically modifying an antibody and covalently linking it to another active pharmaceutical ingredient (API).

vi. Formulation

Formulation is the process that transitions a drug substance (DS) into a formulated drug product (DP). Formulation brings the product molecule from an environment, solvent or other physical state into a form suitable for clinical administration.

VU Medical Zone Effort By Amaan Khan

Effort By Amaan Khan