BT5441 – Elements of Biopharmaceutical Manufacturing

Assignment 2

You are provided with a CHO cell batch culture dataset. Spent media analysis data from two CHO cell clones CHO-TZ and CHO-S7 which were grown in 2 different media, A and B, is provided. Analyse the data and draw your insights regarding the performance of clones and media, and provide a report (not exceeding 3 pages, excluding annexe/supplement tables or figures) with the insights obtained. You may follow the following steps sequentially to obtain insights about clone and media:

1. Plot the data and understand the performance of clone and media in terms of nutrient consumption, by product secretion and titer increase over culture – discuss the key points about it. (30 marks)
2. Identify the exponential growth phase and stationary phase of the culture and calculate the specific rates of all the substrates (glucose, amino acids, etc.), product (IgG), by-products (Lac and NH3) and cell growth. (30 marks)
3. Use the specific rates calculated from the exponential phase and perform PCA to identify patterns across clones and/or media, if any. Use scores plot and biplot to interpret your results (30 marks)
4. Formatting adherence (10 marks)

Submit your completed assignment report and supplementary files (if any) to the by 19 October 2024 23:59:59 hrs.

Things to note:

1. Its good practice to calculate specific growth rate in units of (1/day), specific product rate in units of (pg/cell/day) and other specific rates in units of (pmol/cell/day).
2. Total report cannot exceed three pages. Use arial as font in your assignment. Font size has to be minimum of 10. Margins on all four sides of the page cannot be less than 1 inch. Three page limit is not applicable for references and annexes. The three page limit does not include your references and any annexe/supplementary items such as table, figure, writeup, etc.10 marks is allocated for adherence of mentioned formatting.
3. Please clearly state all the assumptions of the assignment, if any.