

Enhanced interferon- α 2b production in periplasmic space of Escherichia coli through medium optimization using response surface method

ABSTRACT

The influence of different carbon and nitrogen sources on growth of recombinant Escherichia coli and human interferon- 2b (IFN- 2b) production in periplasmic space was studied in shake flask culture. A statistical method based on Plackett-Burman design was used to screen the main medium components that greatly influenced the performance of the fermentation process. The optimization of medium was performed using response surface methodology (RSM) where three critical factors (glucose, yeast extract and peptone) were optimized using central composite design. The highest yield of periplasmic recombinant human interferon- 2b (PrIFN- 2b) (335.8 g/L) was predicted to be obtained in optimized medium containing 5.47 g/L glucose, 55.24 g/L yeast extract and 42.27 g/L peptone. The production of IFN- 2b in periplasmic space in optimized medium was about 2.5, 11.7 and 124.4 times higher than Terrific broth (TB), Luria-Bertani (LB), and minimal medium (M9), respectively.

Keyword: Escherichia coli; Human interferon- 2b; Plackett-Burman; Optimization; Response surface methodology