

Protein-Free Suspension Culture of rCHO Cells and Interferon β -1a Production Under Different Temperature Conditions

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Abstract

The maintenance of most mammalian cell lines in culture requires the addition of serum to the culture medium. The elimination of serum from mammalian cell culture is desirable since serum is expensive and a source of contaminants, e.g. viruses, mycoplasma or prions.¹⁾ In this work a rCHO cell line producing IFN β -1a was adapted directly to eight different chemically defined media (CDM) and to a protein-free medium (PFM) without gradual adaptation. Cell growth and metabolic activities in these media were monitored and compared during a long term adaptation process up to about 100 days. It has been reported that the reduced temperature in the CHO cell cultures is beneficial for the production of recombinant protein and the maintenance of cell viability.²⁾ To evaluate the effect of low culture temperature on production of IFN β -1a and cell growth, rCHO cells were cultivated at 30, 33, and 37°C. When the culture temperature was lower than 37°C from the beginning of culture, maximum cell densities were suppressed, while cell viability maintained high for long culture period. When the culture temperature was lowered from 37°C to 33°C, final concentration of IFN β -1a was about 35% higher compared with that obtained with normal condition(37°C, no temperature shift). The specific productivities of IFN β -1a at 33°C and 30°C were 2.5 times and 4 times higher than that at 37°C, respectively.

References

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2. Moore, A.; Mercer, J.; Dutina, G., Effects of temperature shift on cell cycle, apoptosis and nucleotide pools in CHO cell batch cultures, 1997, *Cytotechnology*, 23, 47-54.