Engineering of CHO Cell to Maximize Recombinant Protein Production

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In our previous study, the apoptosis-inhibiting component of silkworm hemolymph was isolated and characterized. A database searching using N-terminal amino acids sequences of this component as templates resulted in a 95% homology with one of the so-called '30K proteins'. In this study, *30Kc6*, cDNA of one of the 30K proteins, was introduced into a mammalian expression vector to apply *30Kc6* gene to the commercial Chinese hamster ovary (CHO) cell culture. CHO cells producing human erythropoietin (EPO) were cultured by the means of two-phase culture (phase 1: serum-containing, phase 2: serum-free). The expression of 30Kc6 elevated cell growth, inhibited cellular apoptosis which was induced by serum deprivation, extended cell survival, and resulted in higher productivity of EPO. Stable expression of 30Kc6 significantly promoted the terminal sialylation of glycans of EPO and reduced the heterogeneity of the glycoforms as shown by a decreased pI range. ATP generation and mitochondrial membrane potential were measured and these results could explain the effect of 30Kc6 protein on the cell growth and EPO glycosylation. *30Kc6* gene has a great potential in various fields of the animal cell culture engineering.