

Enhanced protein productivity of r-CHO-S cells by additives under hyperosmotic stress

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Elevated osmolality is one of methods that can increase specific productivity in recombinant Chinese Hamster Ovary (rCHO) cell culture. And sodium butyrate (NaBu) is known for the material, which can enhance the expression of genes from some of the mammalian promoters including cytomegalovirus (CMV). To maximize specific protein productivity, NaBu (1, 2, 5 mM) was added in hyperosmolar medium (435 mOsm/kg, 470 mOsm/kg) at the exponential cell growth phase. And the effects on the kinetics and productivity of rCHO cells, producing recombinant human erythropoietin (rhEPO) were studied. But both elevated osmolality and NaBu induce cellular apoptosis. Thus the antiapoptotic material was added in NaBu-treated hyperosmolar media as a strategy to inhibit cellular apoptosis and extend culture span. To elucidate the synergy effect of additives, not only the cellular kinetics and specific productivity but also EPO mRNA expression and the activation of caspase-3 were investigated.