

## **Effects of human growth factors TGF- $\beta$ 1 and PDGF-BB stable heterologous expression and exogenous addition over the growth performance of CHO and HEK cell lines in adherent culture**

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Peptide growth factors (GF) are multifunctional proteins with a wide array of clinical and research applications, notably in regenerative medicine and tissue engineering. The mammalian cell lines that produce most commercially available GF are susceptible to signaling and regulation by these molecules which are, in fact, common components of cell culture media, providing crucial mitogenic stimuli. Even so, there are few reports on the effects of heterologous GF expression on the growth performance of mammalian host cells, and there is evidence to support that these genetic manipulations hold the potential to leverage cell proliferation and decrease animal serum dependence in cultivation processes. In the present study, parental CHO-DG44 and HEK293 cells were cultivated along with sublineages featuring the stable expression of human GFs TGF- $\beta$ 1 and PDGF-BB, in Alpha-MEM and DMEM basal media, respectively. The growth curves and kinetic parameters of 24-well plate adherent cultures were assessed and compared between GF producing and parental cells cultivated with three different concentrations of fetal bovine serum (FBS), which naturally contain GF, and with three conditions of exogenous GF application. No stimulatory effect was observed with HEK cells, but the heterologous expression of TGF- $\beta$ 1 by CHO cells led to maximum specific growth rate increases in an inversely proportional linear relation to FBS concentration in media and 2-5 times higher maximum cell concentrations. The effect observed here indicates a good direction of research for the development of serum-free media formulas and bioprocess optimization strategies.

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