Effect of Bcl-2 overexpression on cell cycle and antibody productivity in chemostat cultures of myeloma NS0 cells

Abstract

Chemostat cultures of NS0 cell lines were carried out at dilution rates ranging from 0.8 d\(^{-1}\) to 0.2 d\(^{-1}\). Compared with the control, the viable cell density of the Bcl-2 cell line was approximately 10% higher at 0.8 d\(^{-1}\) and increased to 55% when the dilution rate was reduced to 0.2 d\(^{-1}\). As the dilution rate was reduced, the viability of the two cultures diverged reaching a difference of 43% at 0.2 d\(^{-1}\). The specific growth rate of the control cells was the same as the dilution rate down to a value of 0.6 d\(^{-1}\). By contrast, the specific growth rate of Bcl-2 cells was parallel to the dilution rate down to a value as low as 0.3 d\(^{-1}\). For both NS0 cell lines, the G1 cell population decreased, while the S and G2/M cell populations increased as the dilution rate was reduced. The antibody titer of the control cells increased from 7 to 21 μg·ml\(^{-1}\) as the dilution rate was reduced from 0.8 to 0.2 d\(^{-1}\). With an initial increase from 2 to 15 μg·ml\(^{-1}\) as the dilution rate was reduced from 0.8 to 0.4 d\(^{-1}\), the antibody titer of the Bcl-2 cells remained constant as the dilution rate was further reduced to 0.2 d\(^{-1}\). A good correlation between specific antibody production rate and the percentage of G2/M cells was observed. © 2005, The Society for Biotechnology.

Keyword: Apoptosis; bcl-2; Bioreactor; Chemostat culture; NS0 myeloma cells