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.

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