

## The Effect of Dissolved Oxygen in Depth Filter Perfusion System for recombinant Therapeutic Antibody Production in a Recombinant CHO Cell Line

Joon-Chul Lee, Woo-Jong Lee, Jong-Dae Lee, Do-Yun Kim<sup>1</sup>,  
Ho-Nam Chang<sup>1,\*</sup> and Duk-Jae Oh<sup>2,\*</sup>

Process Development Team, Korea Biotechnology Commercialization Center, Korea Institute of Industrial Technology, 406-130, 7th floor, Get-Pearl Tower, 994 Dongchoon-Dong, Yeonsu-Gu, Incheon

<sup>1</sup>Department of Chemical and Biomolecular Engineering, Korea Advanced Institute of Science and Technology, 373-1, Guseong-dong, Yuseong-gu, Daejeon

<sup>2</sup>Department of Bioscience and Biotechnology, Sejong University, 98 Gunja-dong, Gwangjin-gu, Seoul

TEL: +82-2-3408-3764, FAX: +82-2-3408-4764

### Abstract

The increasing needs for therapeutic proteins derived from mammalian cells such as recombinant antibody has led to many developments in the area of animal cell technology. Among various perfusion systems, a depth filter perfusion (DFPS) was developed and have applied successfully for the cultivation of various cell lines, such as hybridoma, rCHO, and Vero cells[1].

For the development of optimal perfusion culture, the effect of dissolved oxygen (DO) on cell growth and recombinant antibody productivity was important in bioreactor process[2].

In this study, the effect of DO in the DFPS was investigated as process optimization. Two perfusion cultures in the DFPS were performed with installation of DO electrode at outlet tubing between depth filter part and medium control part. As a result, in the cultures of rCHO cells which produce chimeric recombinant antibody for the post-exposure prophylaxis of hepatitis B virus (HBV) infection, it was found difference between DO levels at depth filter part and at medium control part. As an aspect of cell characteristics, sufficient oxygen supply has a positive effect on productivity of recombinant antibody. Furthermore, several process and cultural parameters will be presented.

### References

1. Joon Chul Lee, Ho Nam Chang, and Duk Jae Oh, Recombinant Antibody Production by Perfusion Cultures of rCHO Cells in a Depth Filter Perfusion System(2005), *Biotechnol. Prog.*, 21, 134-139.
2. Laurent Simon and M. Nazmul Karim, Identification and Control of Dissolved Oxygen in Hybridoma Cell Culture in a Shear Sensitive Environment(2001), *Biotechnol. Prog.*, 17, 634-642.