

## Multiple Protein Expression Platform For *Drosophila* S2 Cells Using Baculovirus System

Kyoung Ro Kim, Yeon Kyu Kim, and Hyung Joon Cha\*

Department of Chemical Engineering, Pohang University of Science and Technology  
(POSTECH), Pohang 790-784, Korea. hjcha@postech.ac.kr

\*Corresponding authors: hjcha@postech.ac.kr

We sought to develop a platform for simultaneous, regulatable expression of multiple foreign protein types in cell culture. *Drosophila melanogaster* Schneider line 2 (S2) insect cells that stably express human erythropoietin (hEPO) were infected with several recombinant baculoviruses containing each fluorescent protein type (green, yellow, and cyan). Since baculovirus cannot replicate in nonpermissive S2 cells, baculovirus infection did not affect cell growth or viability. Expression of each foreign protein was under the control of the inducible metallothionein (MT) promoter. Addition of copper sulfate to infected, stably transfected cells resulted in simultaneous expression of hEPO and fluorescent proteins. Induced hEPO expression profile and levels were similar in both control and infected cells, indicating that baculovirus infection also did not affect expression of stably introduced foreign gene. Fluorescent protein levels were regulated by the infection dose of recombinant baculovirus, while hEPO expression remained constant. Such a system appears to be very attractive as a multiple protein expression platform for engineering metabolic pathways in cell culture.

### References

1. Cho, H. S., Kim, Y. K., and Cha, H. J. (2004), Expression of Double Foreign Protein Types following Recombinant Baculovirus Infection of Stably Transfected *Drosophila*S2 Cells, *Enzyme and Microbial Technology*, 35(6-7), 525-531.
2. Kim, Y.K., Shin, H.S., Tomiya, N., Lee, Y.C., Betenbaugh, M.J., Cha, H.J. (2005), Production and N-glycan analysis of secreted human erythropoietin glycoprotein in stably transfected *Drosophila* S2 cells, *Biotechnology and Bioengineering*, in press (online published).