Systems approach towards efficient production of therapeutic proteins by recombinant *Escherichia coli*

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Escherichia coli has been the workhorse for the production of various recombinant proteins and metabolites because of the availability of well established technologies for genetic manipulation and cultivation. Various strategies have been employed for the development of *E. coli* strains which are able to efficiently produce recombinant proteins. Once a recombinant host strain is developed, a high level production of recombinant proteins is generally achieved by high cell density fed-batch cultivation. However, the production of small therapeutic proteins or peptides in *E. coli* has several problems: complex purification, proteolysis of target peptides in the cell and N-terminal authenticity, which are reduce the productivity of target proteins or peptides. We present the development of an optimal host-vector system and a cultivation strategy for the high-level production of small therapeutic proteins in *E. coli*. [This paper was supported by the Korean Systems Biology Research Grant (M10309020000-03B5002-00000) from the Ministry of Science and Technology. Supports from IBM through the IBM-SUR program are greatly appreciated.].