

Construction of the On/Off switch of EF-G control of growth rate in *Escherichia coli*

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Translation, process that synthesizes the protein, is related with the cell growth because proteins which synthesized through translation play the major role in the biological system. The modulation of translation elongation rate could affect protein synthesis rate and change the growth rate. Among the translation elongation factors, EF-G is a key factor in translation elongation because it determines how fast translocation of ribosome occurs. To modulate the growth rate, a genetic circuit was constructed and applied to on/off switch. *fusA* gene coding EF-G is regulated by lambda promoter which is repressed by *cI* repressor which is expressed by IPTG induction. The regulation system of *fusA* by *cI* repressor was validated by measuring the growth rate of BL21 (DE3) deleted chromosomal *fusA* in the various IPTG induction time and concentration. In this research, growth rate was decreased after 2hr from IPTG induction generally and more decreased as IPTG concentration was increased. It is shown that this genetic circuit could control the growth of cell.