

TIGHTLY CONTROLLED GENE EXPRESSION IN BACTERIA CELLS USING THE FIM INVERSION RECOMBINATION SYSTEM

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ABSTRACT

Currently, many induced gene expression systems (pTet, pBAD, pTrc, etc) are used commercially for variety of applications that require some control of gene expression. These systems are chosen over other expression systems for their ability to give the user control over the timing and the level of expression after induction. All of the existing systems, though, have the following limitation: the stronger the expression after induction, the leakier (less tight) the control during un-induced state.

There have been many attempts to overcome this limitation to give both very tight un-induced expression and strong induced expression, many of them commercialized. This invention solves the problem completely.

The invention is a gene expression system using two promoters, one located within an invertible segment recognized by the Fim invertases, and another that is located elsewhere. By utilizing these two promoters and the Fim interase mechanism, this gene expression system allows a complete shutoff of the expressed gene and achieves a high level of expression by using a strong promoter.

This invention will be invaluable to those who desire controlled all-or-none expression. It has many applications in research settings (easy gene complimentation studies, functional studies, toxicity studies), as well as industrial (protein/drug production, metabolic engineering, bio-sensor) applications.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

KEYWORDS

gene, expression, invertase, control

CATEGORIZED AS

» **Biotechnology**

» Genomics

» Proteomics

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