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Poster Presentation

Addition of Repressor in inducible promoter system improves soluble expression of recombinant protein in *E. coli*

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Background

Insoluble protein aggregate (inclusion body) is frequently accumulated during the heterologous protein expression by the bacterial inducible promoter system. In this study, although many reports have proposed the methodology to circumvent the aggregate formation [1-3], we tried to control the transcription rate by an addition of the repressor for inducible promoter. The addition of repressor was

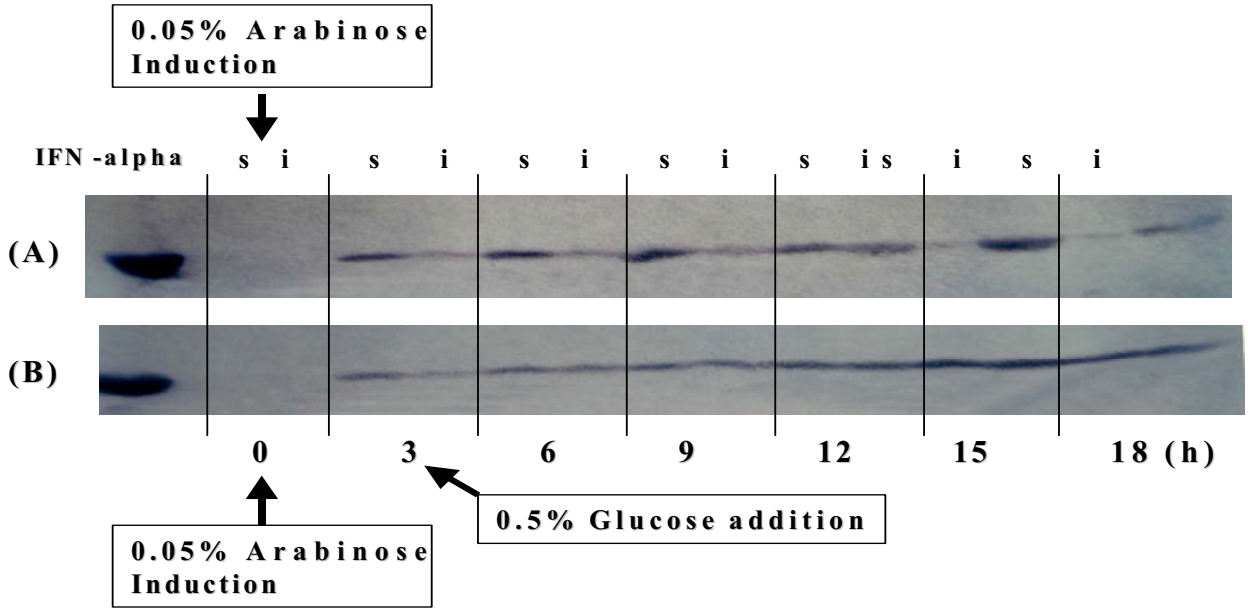

Figure 1
Western blot analysis; (A) Soluble and insoluble expression of recombinant interferon-alpha by arabinose induction (0.05%), (B) Soluble and insoluble expression of recombinant interferon-alpha by arabinose induction (0.05%) and 0.5% glucose addition after induction.

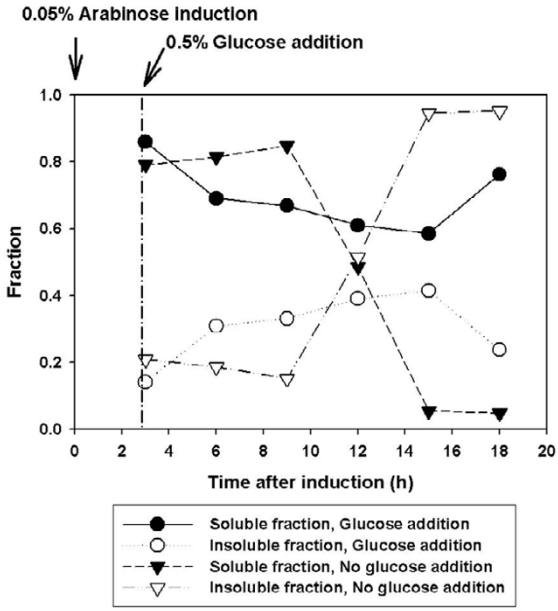

Figure 2
The change of soluble and insoluble fraction after arabinose induction. Glucose (repressor) was added after induction (●,○). In other two cases (▼,□), glucose was not added. Fraction was obtained from image analysis of Figure 1.

tried just after the inducer was added, in order to increase the soluble expression level.

Results

To improve the soluble expression level of recombinant interferon-alpha (IFN-alpha) in *E. coli*, repressor (glucose) was added after induction. In this system, arabinose-inducible promoter (pBAD) controlled the transcription of IFN-alpha gene. The fractionation of soluble and insoluble part of the induced *E. coli* by B-PERII solution (Pierce) showed that glucose addition after induction resulted in improvement of the soluble expression, otherwise IFN-alpha was expressed mostly in insoluble portion (see Figure 1). Finally, over 60% of the total protein expression was found in the soluble fraction of total cell lysate. Probably this principle might be able to apply to other heterologous protein expression which is prone to a protein aggregate formation in the cytoplasm.

Conclusion

The glucose (repressor) addition improved the soluble expression level in arabinose-inducible promoter system in *E. coli*.

This principle might be able to apply to a heterologous protein expression which is prone to a protein aggregate formation in the cytoplasm.

References

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