ABSTRACT

Antibiotic resistant has become a long concern in medical world for decades. To address this concern, new drug targets are needed. One promising drug target is *glmS* riboswitch, a RNA regulatory element, which is activated upon binding to glucosamine-6-phosphate (GlcN6P) and catalyzes self-cleavage. However, finding *glmS* riboswitch activating compounds requires reliable screening system. Herein we established *Escherichia coli* cell screening system to identify compounds that can activate *glmS* riboswitch activity. To establish the system, we incorporated RNaseJ1, a ribonuclease that digest 5' hydroxyl cleaved *glmS* riboswitch fragment, to *E. coli*. RNaseJ1 activity to digest 5' hydroxyl fragment was tested by utilizing hammerhead riboswitch, a constitutive self-cleaving riboswitch, based on trimethoprim (TMP) selection and reporter protein production. Lastly, we validated the established *E. coli* system containing RNaseJ1 and *glmS* riboswitch in presence of glucosamine (GlcN), to activate *glmS* riboswitch, based on TMP selection and reporter protein production. The results demonstrated RNaseJ1 can be produced in *E. coli*. Activity of RNaseJ1 and *glmS* riboswitch system in *E. coli* was not found and requires further investigation. It is recommended to study further at RNA level, optimize RNaseJ1 production in the established system, and change *E. coli* strain from BL21(DE3) to *yhbj* mutant.

Keywords: Escherichia coli, RNaseJ1, *glmS* riboswitch, glucosamine (GlcN)