PB-43

Genetic Engineering Based on CRISPR/Cas9 in Rice for Functional Identification of *OsIAA17q5*

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[Introduction]
Rice is one of the most important food crops and a source of nutrients worldwide. Various rice breeding studies are being conducted to increase food supply in response to population growth. Tiller number is one of the most important traits among several traits that play an important role in rice growth and determine yield. *OsIAA17q5*, a gene in the RM18130-RM3381 region of chromosome 5, has been reported contributes to the regulation of rice tiller number in previous study. In this study, CRISPR/Cas9 was used for genome editing to identification of the function of *OsIAA17q5*.

[Materials and Methods]
Three sgRNAs were designed by CRISPR RGEN Tools. Three sgRNAs were ligated with pRGEB32, a CRISPR/Cas9 vector containing hygromycin and kanamycin resistance. The ligated plasmids were transformed into *Escherichia coli* competent cells to multiply and extracted. The plasmids were confirmed by sanger sequencing. Confirmed plasmids were transformed into ilmi through inoculation of *Agrobacterium tumefaciens* EHA105 and co-cultured for 3 days. After co-culture, the inoculated calli were washed and transferred to regeneration medium containing antibiotics. The regenerated plants were transferred to soil after water culture for rooting and acclimatization.

[Results and Discussion]
Regenerated plants from the inoculated calli were transplanted into soil. Genome edited plant by using CRISPR/Cas9 may be used to identification of the function of *OsIAA17q5* gene. Identification of the function of *OsIAA17q5* can be an important source of rice breeding and contribution of improving rice yield for food supply in response to population growth population growth.

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