

[P4] Crop Genetics and Physiology

2021年9月9日(木) 12:15 ~ 14:00 Room 4 (Poster) (Crop Genetics and Physiology)

12:15 ~ 13:00

[P4-05] Regulation of the Expression of *OsRBCS3*, a Rubisco Small Subunit Gene, by Histone Deacetylase *HDA713* under Nitrogen Deficiency in Rice

*Nominated for Presentation Awards

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Histone modifications represent key epigenetic mechanisms that regulate gene expression. The expression of Rubisco genes is enhanced in response to nitrogen supply. However, histone modification events regulating the expression of Rubisco genes are not well understood. In the study, we investigated the relationship between the expression of *HDA713*, a RPD3/HAD1-type histone deacetylase gene, and the expression of *OsRBCS3*, a Rubisco small subunit gene, in rice. The mRNA level of *HDA713* was decreased and that of *OsRBCS3* was increased by nitrogen supply. To examine whether *HDA713* regulates the expression of *OsRBCS3*, we produced overexpression transformants of *HDA713* under the control of the maize ubiquitin promoter and CaMV 35S promoter, and knockdown transformants of *HDA713* by RNAi. There was no correlation between the expression of *HDA713* and *OsRBCS3* under nitrogen sufficiency. Surprisingly, a significant positive correlation was found between the expression of *GCN5*, a GNAT-type histone acetyltransferase gene, and *OsRBCS3*. Under nitrogen deficiency, there was a significant positive correlation between the expression of *HDA713* and *OsRBCS3*, whereas there was no correlation between the expression of *GCN5* and *OsRBCS3*. These results indicate that the expression of *OsRBCS3* is regulated by *GCN5* under nitrogen sufficiency and by *HDA713* under nitrogen deficiency.