

## CHARACTERISATION OF HORDEUM VULGARE CELLULOSE SYNTHASE-LIKE F6 PROMOTER VIA TRANSGENE EXPRESSION IN RICE

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**ABSTRACT** Beta-glucan in cereal crops is known as a functional food, which can reduce cardiovascular diseases by lowering blood cholesterol levels. However, beta-glucan content is relatively low in rice grains, despite being relatively abundant in barley and oat grains. Taking advantage of rice as the staple food for Asians, increasing beta-glucan content in rice for their consumption may help to reduce cardiovascular-related diseases among them. Previous attempts in increasing beta-glucan content in rice via transgene expression of beta-glucan synthase genes from barley into rice were unsuccessful due to the use of non-tissue specific as well as constitutively expressing promoter. The current transgenic expression study was performed to characterise the promoter of beta-glucan synthase gene in barley using beta-glucuronidase (GUS) reporter gene. Two fragments of *HvCslF6* promoter (2771 bp and 1257 bp) were successfully fused with GUS reporter gene and integrated into rice plants, demonstrated that the promoter was functional in the heterologous plant system. The presence of blue GUS staining was observed on the leaf, root, stem, and grain of the transgenic rice regardless of the promoter length used and stayed functional up to the next generation. GUS qualitative analysis confirmed that the shorter promoter length generated a stronger GUS activity in comparison to the longer one. This indicated that the presence of repressor elements in between the -2771 bp and -1257 bp regions. The preliminary results shed light on the strong promoter activity in the rice endosperm tissue. It can become an alternative to the collection of plant promoters that can be used for grain quality improvement and biofortification.