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Developmentally Regulated Tissue-Specific Expression of Wounding Inducible RCaM-2 Promoter in Transgenic Tobacco Plants

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To study calmodulin (CaM) gene expression and its regulation, rice CaM promoter (RCaM-2) was isolated and fused to reporter genes CAT and introduced into tobacco cells. The expression of chimeric RCaM-2 promoter-cat gene in transgenic tobacco plants showed that the RCaM-2 promoters are expressed in all tissues tested, including reproductive organs. The expression of RCaM-2 promoter was remarkably induced with sucrose or salicylic acid treatment but not ethephon. X-Gluc staining patterns revealed that GUS localization is high in meristemic tissues such as the stem apex, stolen tip, and vascular regions. GUS staining in the transverse sections of stem and petiole was restricted to the inside of the vascular system, and cortex and epidermis located outside of the vascular system usually did not show GUS staining even a plant that expressed strong activity.

GUS activity was found to be tissue specific expressed and exhibited a dramatic transient increase in response to wounding. These results suggest that the 5'-flanking region of RCaM gene regulates wound-inducible expression.

keywords: calmodulin promoter, wounding, histochemical localization