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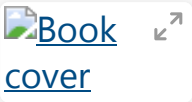

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Targeted Gene Replacement in Plants Using CRISPR-Cas Technology

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Abstract

The CRISPR-Cas based genome editing systems have been widely used in plant functional genomics research and crop improvement due to its simplicity, high efficiency and specificity. For example, the CRISPR-Cas9 system has been extensively used to generate gene knock-out and knock-in mutants of various plant species, because this system can efficiently recognize the targeted site and cause double strand breaks (DSBs), which can be repaired by the error-prone non-homologous end joining (NHEJ) pathway or the precisely homologous recombination (HR) pathway. Compared to the broadly applied error-prone small insertion or deletion (InDel) mutations of targeted site by NHEJ