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Modulation of growth and stress response through genome editing by CRISPR/CAS9 system

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Jasmonic acid (JA) is an important hormone mediating stress response in plant. JA response has been widely studied for the purpose of developing stress-resistant transgenic crops. Increasing numbers of studies reported that enhanced JA response improves resistance against stresses, but also induces negative effects on plant growth and productivity. Understanding of JA inhibition mechanism against growth is essential to develop transgenic plants carrying both stress-resistance and enhanced growth. To understand the JA-mediated growth inhibition mechanism, function of *OsJAZ9* responsible for JA signaling was studied through genome editing by CRISPR/CAS9 system. We traced temporal and spatial expression pattern of *OsJAZ9*, and also analyzed its mutant *Osjaz9* generated by CRISPR/Cas9 system that can modify response of target genes with high accuracy. Through Agrobacterium-mediated callus transformation and selection, we collected 30 individual transgenic plants. Among them 8 individual plants (around 30%) carried mutated *OsJAZ9* gene in their genome. From this study we found that expression pattern of *OsJAZ9* changes along developmental stages, predominant expression in leaf at early developmental stage but in roots at late developmental stage. Further characterization of *Osjaz9* mutants will expand our understanding how JA allows plants to coordinate dynamics of stress response and growth.

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