

Gene Editing of the Dormancy – Specific Loci in Arabidopsis: TALEN Design, Assembly and *In Vitro* Evaluation

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Pre-harvest sprouting (PHS) is one of a major problems in cereal production, when wet and cool weather during harvest period might cause dormancy break and yield losses. In our study we focused on two dormancy-related genes for TALEN-mediated silencing in Arabidopsis, hoping for a better characterization of possible targets for PHS improvement in Triticale. TALENs are able to induce site-specific double-strand breaks (DSB) leading to indel-type mutations via non-homologous end joining repair mechanism. Seed dormancy regulation is not fully understood, but there are two possibly independent pathways involved in sprouting time regulation. Hormonal-dependent pathway involves abscisic acid (ABA) – gibberellic acid (GA) cross-talk. Second pathway is regulated by integrator gene activity DELAY OF GERMINATION1 (DOG1). We designed and assembled TALENs specific for negative dormancy regulators present in both pathways. Our targets were CYP707A2 gene which product is known for ABA degradation in seed and PDF1, coding protein phosphatase subunit responsible for DOG1 protein inactivation. Here we report construct design and assembly as well as activity test based on protoplast transfection.