

The CXXC domain of DEMETER Is Important for DME's Demethylation Function *in vivo*.

The Arabidopsis DEMETER (DME) is a plant DNA glycosylase that demethylates the maternal genome in the central cell and is essential for seed viability. DME specifically demethylates around ten thousand target sites, which contains gene flanking small TEs in euchromatic regions, intergenic sequences, and heterochromatic targets. The C-terminal half of DME, which consists of three conserved regions (Region A, G, B), has been shown to retain both catalytic glycosylase activity as well as targeting function. The region B of DME contains an RRM (RNA Recognition Motif) and a CXXC domain and is critical for DME function *in vitro* and *in vivo*. Our results show that while DME with an impaired CXXC domain has a mild effect on the 5mC excision enzymatic activity *in vitro*, the CXXC domain is required for a robust and consistent DME function to rescue *dme*-induced seed abortion *in vivo*. Whole genome methylome analysis of *dme* mutant endosperm complemented with a CXXC-mutated DME transgene revealed that the canonical DME target sites are largely demethylated, indicating that the CXXC domain is needed to ensure efficient demethylation but might be dispensable for DME localization to its target sites.