



ABSTRACT

“CUL4-DDB1 is required to maintain epigenetic gene repression via its interaction with the Arabidopsis PRC2 complex”

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Protein ubiquitylation regulates a broad variety of biological processes in all eukaryotes. Recent work identified a novel class of cullin-RING ligase (CRL) composed of CUL4, DDB1, and one substrate receptor also called DCAF (DDB1 and CUL4-associated factors). DCAFs are WD40 proteins containing WDxR motifs that are required for efficient binding to DDB1. In both human and Arabidopsis, about 90 different DCAFs have been predicted, but for most of them their function or substrates remain still unknown.

Among putative Arabidopsis DCAFs we identified MSI1, which belongs to an evolutionary conserved protein family. MSI1-like proteins contribute to different protein complexes, including the epigenetic regulatory *Polycomb* Repressive Complex2 (PRC2). Here we will present evidence that *Arabidopsis* MSI1 physically interacts with DDB1 and is part of a multimeric CRL4-type E3 complex. Interestingly the CUL4-DDB1^{MSI1} complex is required to maintain parental imprinting of *MEA*, a target gene of the *Arabidopsis* PRC2 complex. Moreover, we extended these studies to another MSI1-like protein, called MSI4/FVE, which is involved in the regulation of flowering time. Overall, we will discuss the mechanism by which CRL4s are required to maintain *Polycomb*-mediated gene repression.