



ABSTRACT

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

Pascal Genschik
Institut de Biologie Moléculaire
des Plants du CNRS
IBMP-CNRS – UPR2357
Strasbourg
FRANCE

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.