

## **PUF RNA-binding proteins in *Arabidopsis thaliana*: Regulation of translation through binding to 3'UTR.**

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In plants, translational control through binding to 3'UTR regions has been described only for microRNAs. PUF proteins are sequence-specific RNA-binding proteins that regulate mRNA translation binding to the 3'UTR of target transcripts through a conserved PUF domain containing eight repeats of ~36 amino acids. This family has PUMILIO of *Drosophila* and the NRE sequence in the 3' UTR of its target *HUNCHBACK* as a classical model of interaction. PUF proteins have as ancestral function the regulation of mRNA related to stem cell maintenance. We did a Pfam analysis of the twenty five *Arabidopsis* proteins with PUF repeats (APUM) and found that twelve (APUM-1 to APUM-12) have a classic PUF domain. Through three-hybrid assays, we show that APUM-1 to APUM-6 can bind specifically to the NRE sequence recognized by *Drosophila* PUMILIO. Using an *Arabidopsis* RNA library in a three-hybrid screen, we have identified an AraPum binding consensus to APUM-1 to APUM-6. Additional computational analysis have found the AraPum binding element in 3' UTR of important transcripts related to plant shoot stem cell maintenance. Using three-hybrid assays, we found that APUM-1 to APUM-6 can bind specifically to *WUSCHEL*, *CLAVATA-1*, *PINHEAD/ZWILLE* and *FASCIATA-2* transcripts. Our results show that APUM proteins are molecular conserved PUF homologs and suggest an important biological function like in animals.

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