

***Arabidopsis thaliana* has three highly identical PUF proteins related to developmental processes.**

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PUF family is a group of highly conserved proteins that bind to mRNAs regulating its stability and translation in key developmental processes. The regulation is achieved through binding of a PUF domain to 3'-UTR of target transcripts. Among the twenty five *Arabidopsis thaliana* proteins with PUF repeats (APUM), we have found that three, APUM-1, APUM-2 and APUM-3, show 90% of identity and co-localize spatially and temporally in the shoot and root apical meristems, lateral root and shoot axillaries meristems, stamens and pollens. RT-PCR assays showed that the relation of expression among them is the same in all organs analyzed. Moreover, plant knockouts *apum-1* and *apum-2* have no altered phenotype, suggesting a functional redundancy between APUMs. Plants affected in the APUM-1, APUM-2 and APUM-3 expression through antisense RNA, showed clorotic and reduced leaves, shorter and less ramificated roots and low fertility, a phenotype identical to plants superexpressing *KRP-2* gene, a CDK inhibitor. An AraPum binding element at 3'-UTR of the *KRP-2* transcript suggests a possible target for APUM. In addition, antisense plants have increased *KRP-2* transcripts compared to wild type. The interaction is being evaluated in three-hybrid assays. We proposed that APUM proteins act coordinating leaves and roots formation influencing *KRP-2* translation. So, the ancestral function of Puf proteins, maintain the cell cycle in detriment of differentiation, seem to be conserved in plants.

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