

THE *LOTUS JAPONICUS* PII PROTEIN IS INVOLVED IN A DROUGHT RESPONSE SIGNALLING PATHWAY CONTROLLING THE STOMATA MOVEMENT

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PII in prokaryotic organisms is a crucial integrator of cellular carbon, nitrogen and energy levels. In higher plants, however, its role remains significantly less clear. Previous findings indicate that PII–N-acetylglutamate kinase (NAGK) complex formation controls l-arginine biosynthesis, whereas other work implicates PII in regulating chloroplastic nitrite uptake. Furthermore, a recent report reveals a seed tissue-specific expression of PII in higher plants, associated to a role in the tuning of fatty acid biosynthesis and partitioning in seeds. Together, these findings indicate that PII has evolved from a central metabolic role in prokaryotes towards a more specialized role in eukaryotes. Here we report the molecular characterization of the *L. japonicus* PII protein with an exhaustive analysis of the gene expression and protein localization in different tissues and organs, in response to different plant treatments. Furthermore we provide evidences that PII may play a role in the plant response to drought conditions by regulating the stomata movement in *L. japonicus* leaves. Lotus transgenic plants over-expressing the PII protein show a reduction of the stomata aperture in epidermal peels in hydric stress conditions with a consequent lower rate of water loss in detached leaves. Possible mechanisms and signalling pathways underlying this type of response will be discussed.