THE IMPORTANCE OF 3'-PHOSPHOADENOSINE 5'-PHOSPHOSULFATE TRANSPORT IN THE PLANT CELL

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3'-phosphoadenosine 5'-phosphosulfate (PAPS) is the high energy sulfate donor, which is required for sulfation reactions in eucariotic cells. Plants produce PAPS mainly in plastids. Accordingly, PAPS has to be provided in the cytosol to serve as substrate for sulfotransferase reaction sand the Golgi apparatus. Intriguingly, the corresponding PAPS transporters in the plant cell were unknown till recently.

We were able to identify the first chloroplastidic PAPS transporter (PAPST1) in Arabidopsis. Its functional characterization and the analysis of corresponding mutants demonstrate that PAPST1 connects plastidic PAPS synthesis and cytosolic sulfation reactions. In contrast to the known animal PAPS antiporters which are members of the nucleotide-sugar transporter family, PAPST1 belongs to the mitochondrial carrier family.

Transport studies using the PAPST1 recombinant protein revealed that it favors PAPS, 3'-phosphoadenosine 5'-phosphate (PAP) and ATP as substrates. The protein could be detected both in the plastid envelope membrane and in thylakoids and it is present in plastids of autotrophic and heterotrophic tissues. Physiological analyses of *papst1* mutant plants additionally indicate that PAPST1 is involved in sulfur metabolism including the biosynthesis of thiols, secondary metabolites and, importantly, phytosulfokines.