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The function of N-terminal acetylation of plastid precursor proteins

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Chloroplast functionality requires the post-translational import of plastid-destined nuclear-encoded proteins. Chloroplast precursor protein availability in the cytosol and import into the plastid is tightly regulated to maintain chloroplast biogenesis and functionality, respectively. One of these regulatory mechanisms is the co-translational modification of the precursor proteins by N-terminal acetylation (NTA). NTA is a common protein modification and associated with the coordination of proteome stability. Thus, NTA is suggested to determine the half-life of chloroplast precursor proteins in the cytosol. We aim to further investigate and unravel the role of NTA and search for potential new players in the fate of chloroplast precursors. We therefore use Arabidopsis thaliana mutants with reduced N-terminal acetyltransferase A (NatA) complex function, to perform protein import analysis with native and non-acetylated chloroplast precursor substrates. Furthermore, the effects of precursor stability on the biogenesis of chloroplasts and their photosynthetic performance in plastid protein import-deficient plant lines will be investigated.

Primary authors: MÖLLENBECK, Pia (Plant biochemistry, Baginsky Group, Ruhr-Universität-Bochum); Dr STOLLE, Dominique Sebastian (Plant biochemistry, Baginsky Group, Ruhr-Universität-Bochum); Dr GRIMMER, Julia (Martin-Luther University Halle-Wittenberg); Prof. BAGINSKY, Sacha (Plant biochemistry, Baginsky Group, Ruhr-Universität-Bochum)

Presenter: MÖLLENBECK, Pia (Plant biochemistry, Baginsky Group, Ruhr-Universität-Bochum)

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