ROLE OF NFU1 AND HCF101 IN THE INSERTION OF [4FE-4S] CLUSTERS IN PLASTIDIAL PROTEINS OF THE GREEN MICROALGA *CHLAMYDOMONAS REINHARDTII*

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Iron-sulfur (Fe-S) proteins are required for various chloroplastic processes such as photosynthesis or pigment and amino acid biosynthesis [1]. The plastidial sulfur mobilization (SUF) machinery is composed of approx. 15-20 proteins, needed for the *de novo* synthesis of Fe-S clusters and their insertion into target apo-proteins. The final Fe-S cluster transfer step relies on several Fe-S cluster transfer proteins, including high chlorophyll fluorescence 101 (HCF101) and NIFU-like (NFU) proteins, which are specialized for the insertion of [4Fe-4S] clusters. The roles of these maturation factors have been investigated in the terrestrial plant *Arabidopsis thaliana* [1] but never in algae, despite NFU1 and HCF101 from *Chlamydomonas reinhardtii* differ from the plant orthologs in terms of domain organization and/or conservation of Fe-S cysteine ligands [2,3]. The analysis of the corresponding mutants in *Chlamydomonas* showed that NFU1 plays a role in dedicated pathways, not conserved in terrestrial plants (chlorophyll synthesis in the dark and fermentative metabolism), while HCF101 is required for photosystem I biogenesis. Analysis of the biochemical and Fe-S cluster binding properties of these proteins and of some client proteins is underway to dissect the molecular mechanisms and specificities of the Fe-S cluster transfer step.

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[3] Kairis A et al., (2024) BBA - Molecular Cell Research 1871, 119797