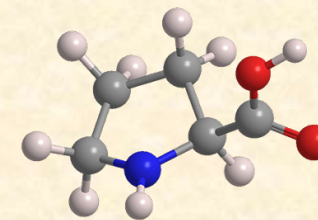
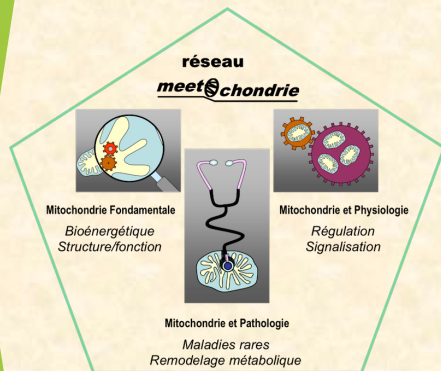




Nouveaux rôles du catabolisme mitochondrial de la proline

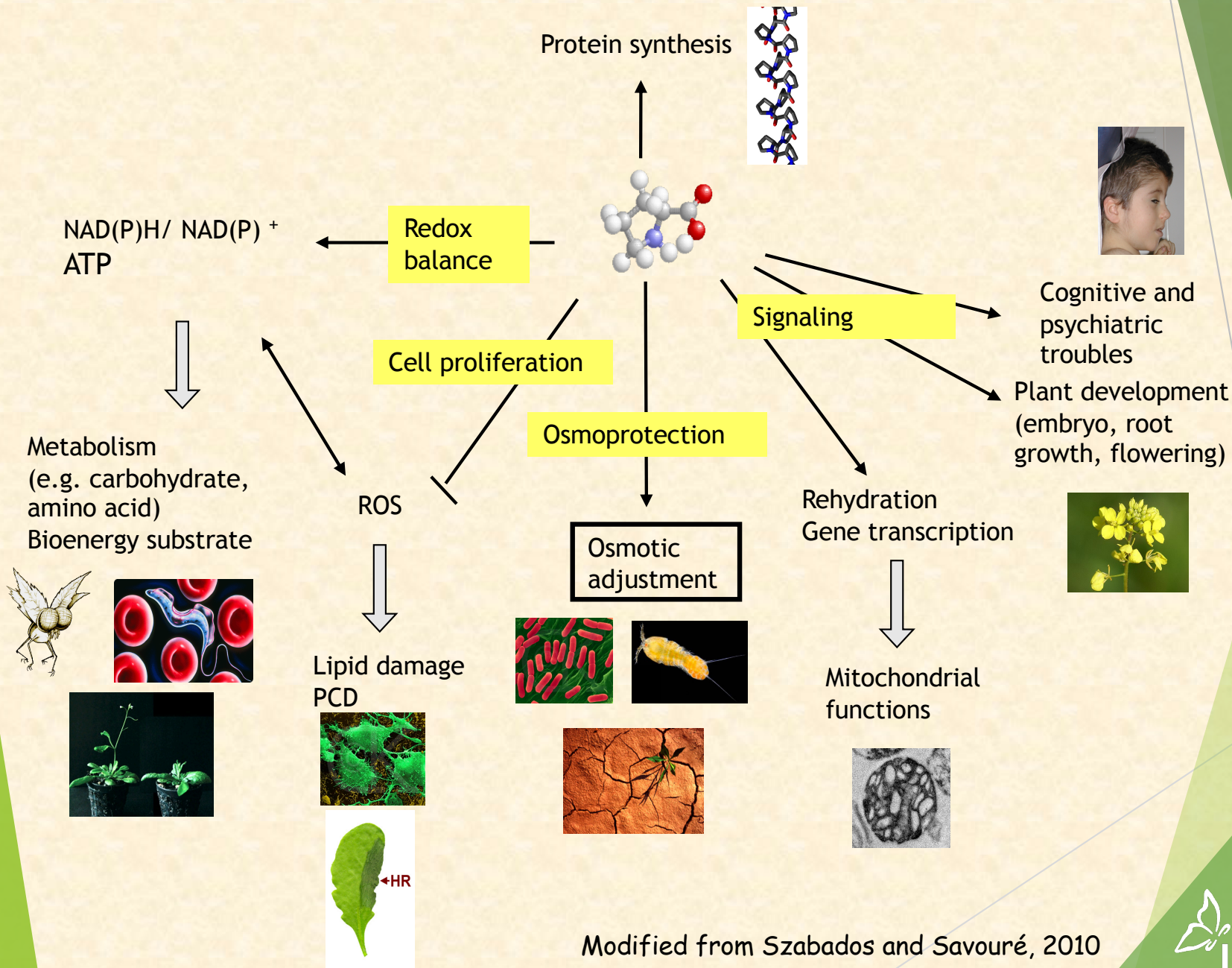


Arnould Savouré



Webinaires Réseau Meetochondrie
mai-juin 2021

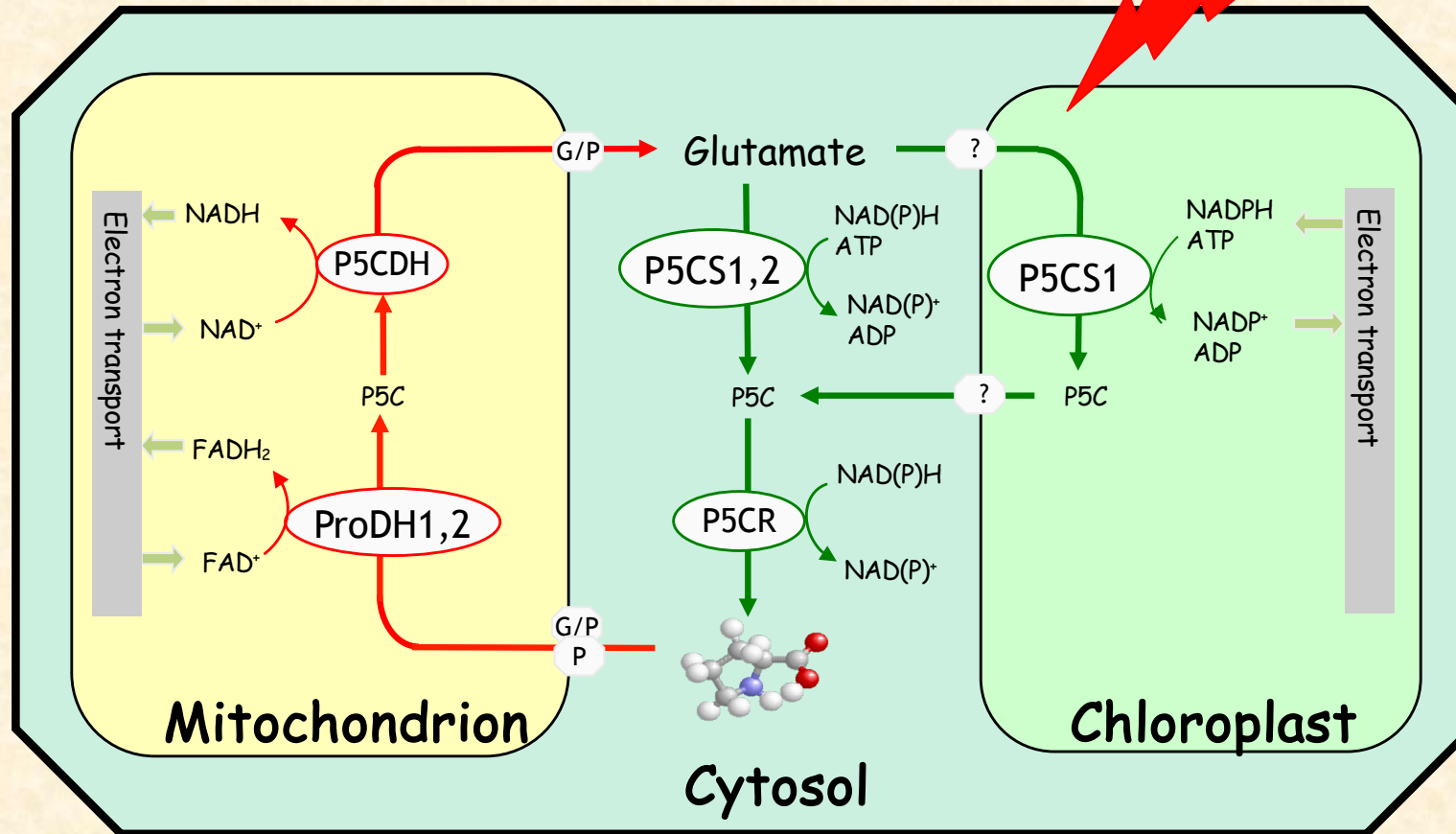
Proline: a multifunctional amino acid



Modified from Szabados and Savouré, 2010

Proline metabolism in plants

Water stress



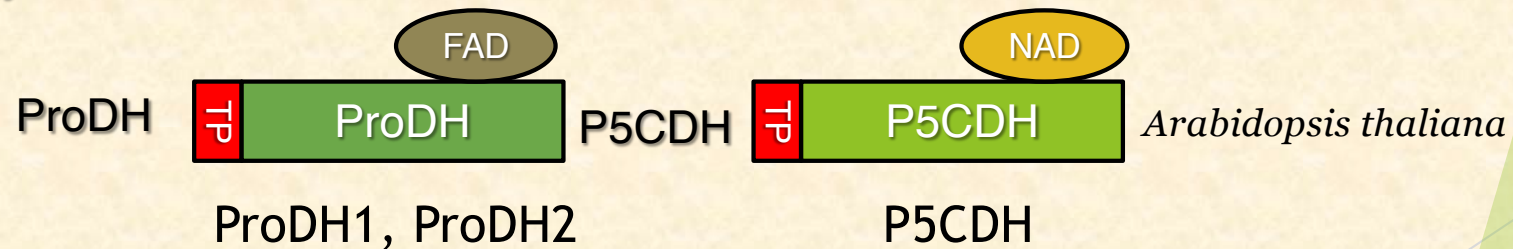
Proline metabolism in plants is compartmentalized

Simplified Model of Proline Catabolic Enzymes

Prokaryotes



Eukaryotes

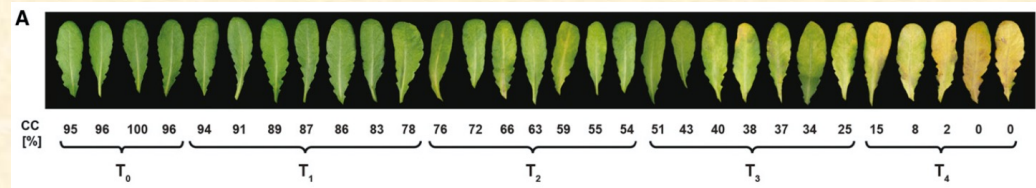


(modified from Servet *et al.* , 2012)

Plant senescence

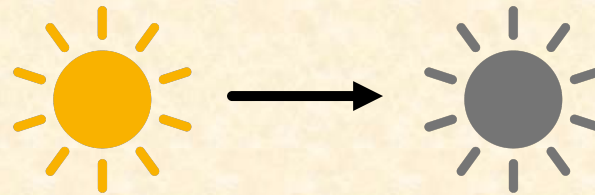


Developmentally senescing Arabidopsis leaves

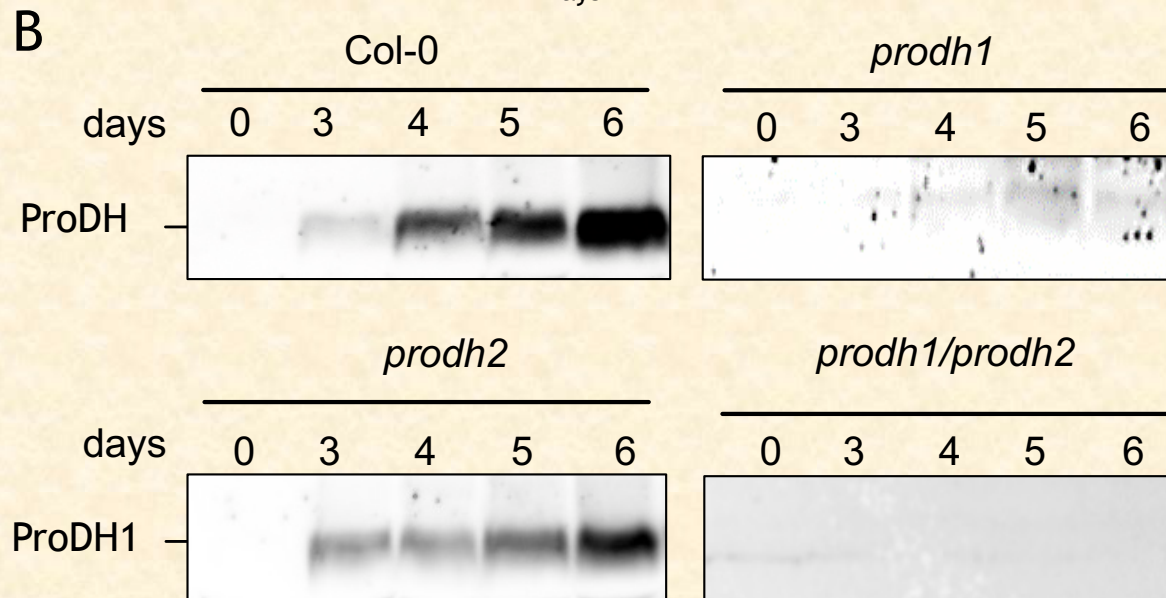
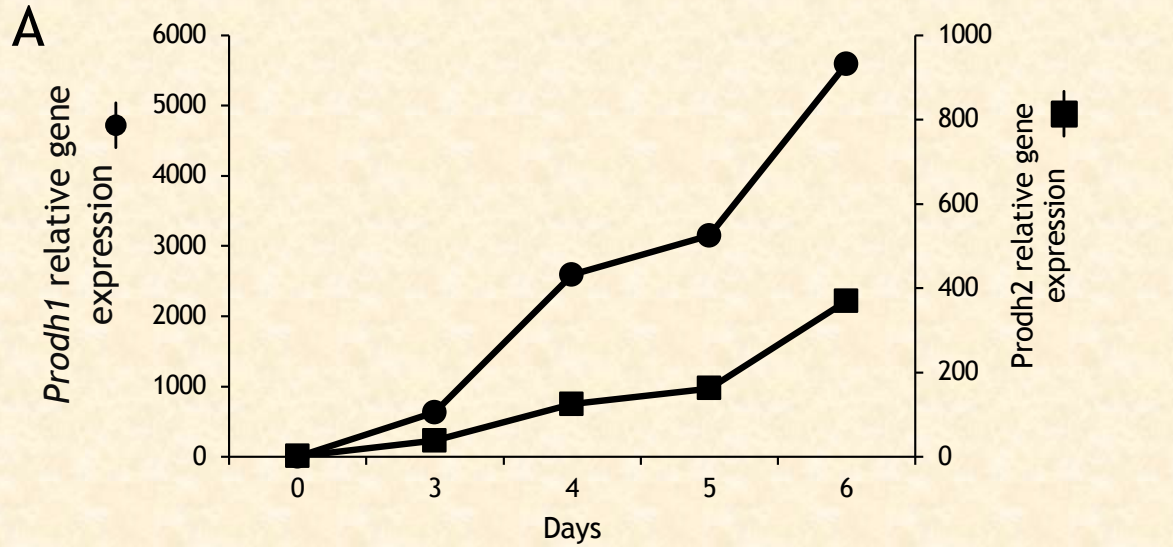


Chrobok et al., 2016

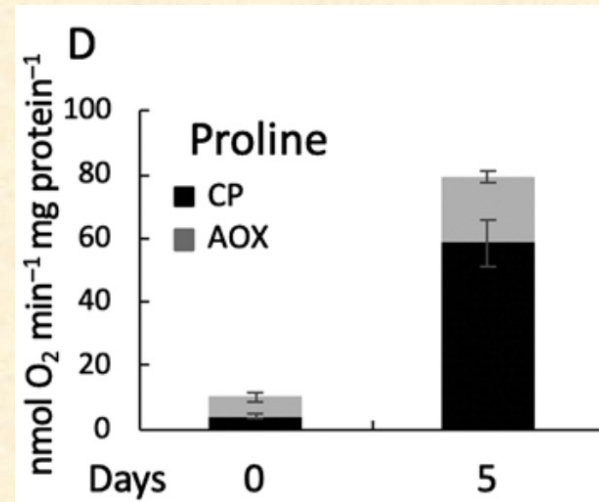
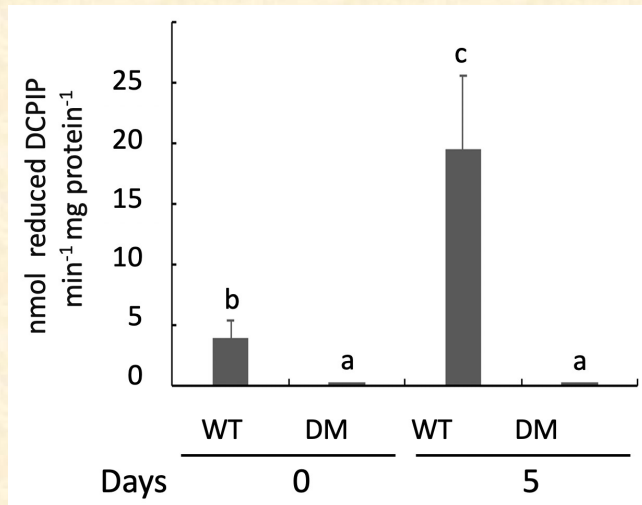
Dark-induced leaf senescence (DIS)



ProDH expression is triggered during DIS



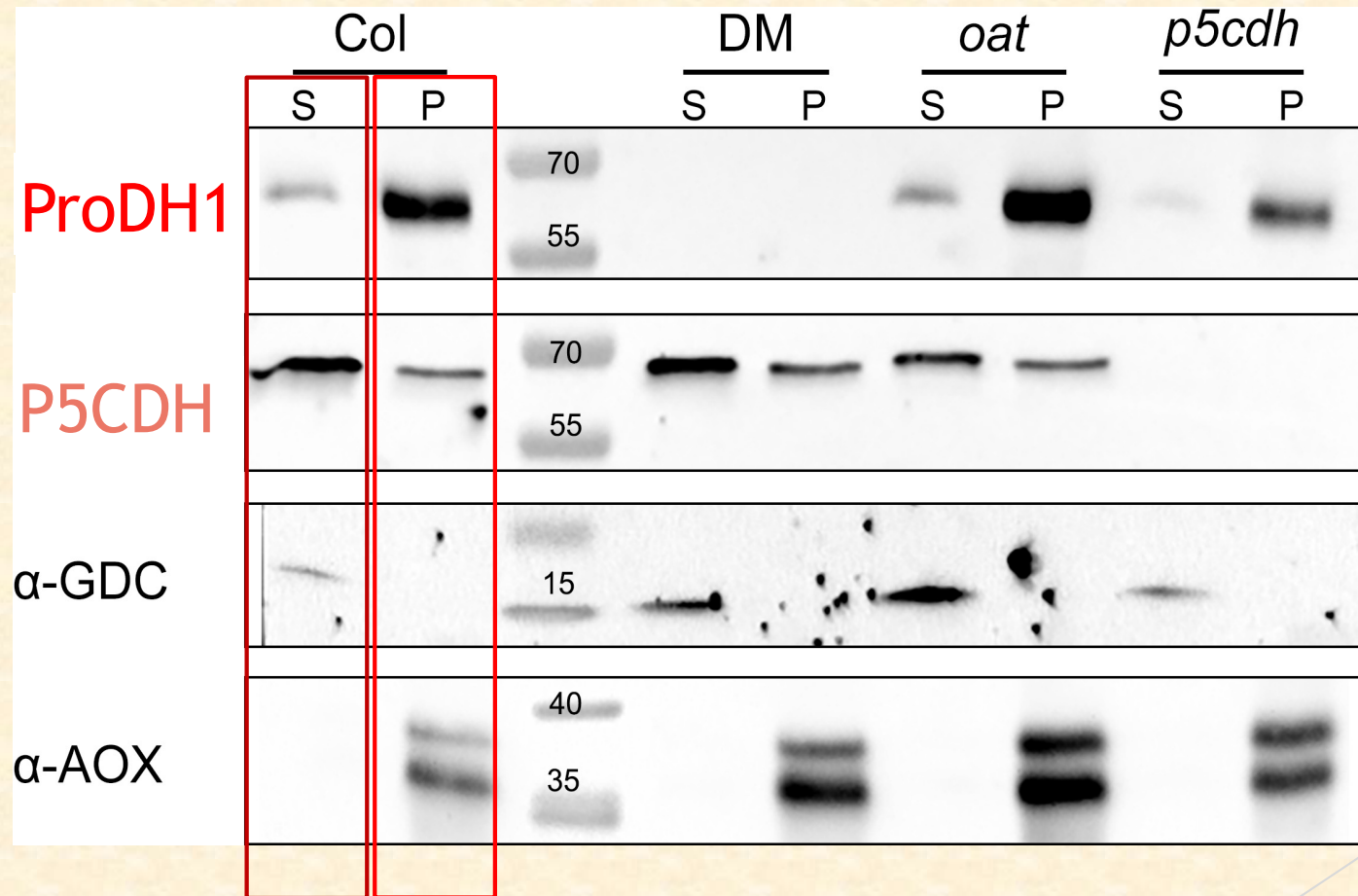
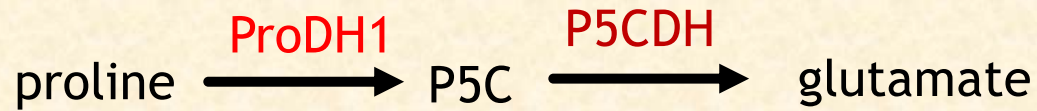
Proline oxidation in Arabidopsis leaves in response to DIS



- ProDH activity is enhanced during DIS
- Strong increase in proline respiration during DIS

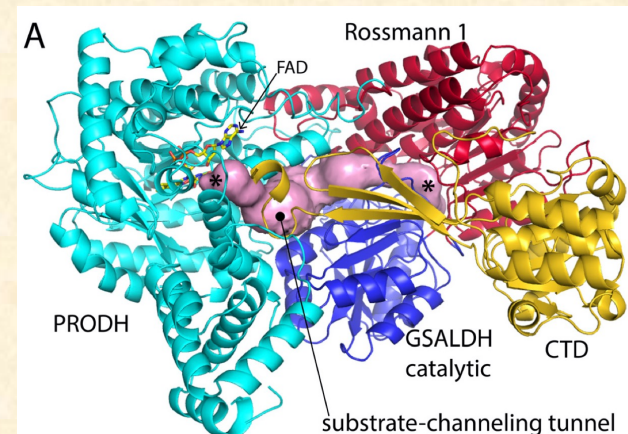
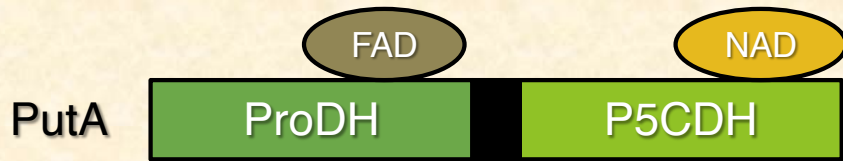
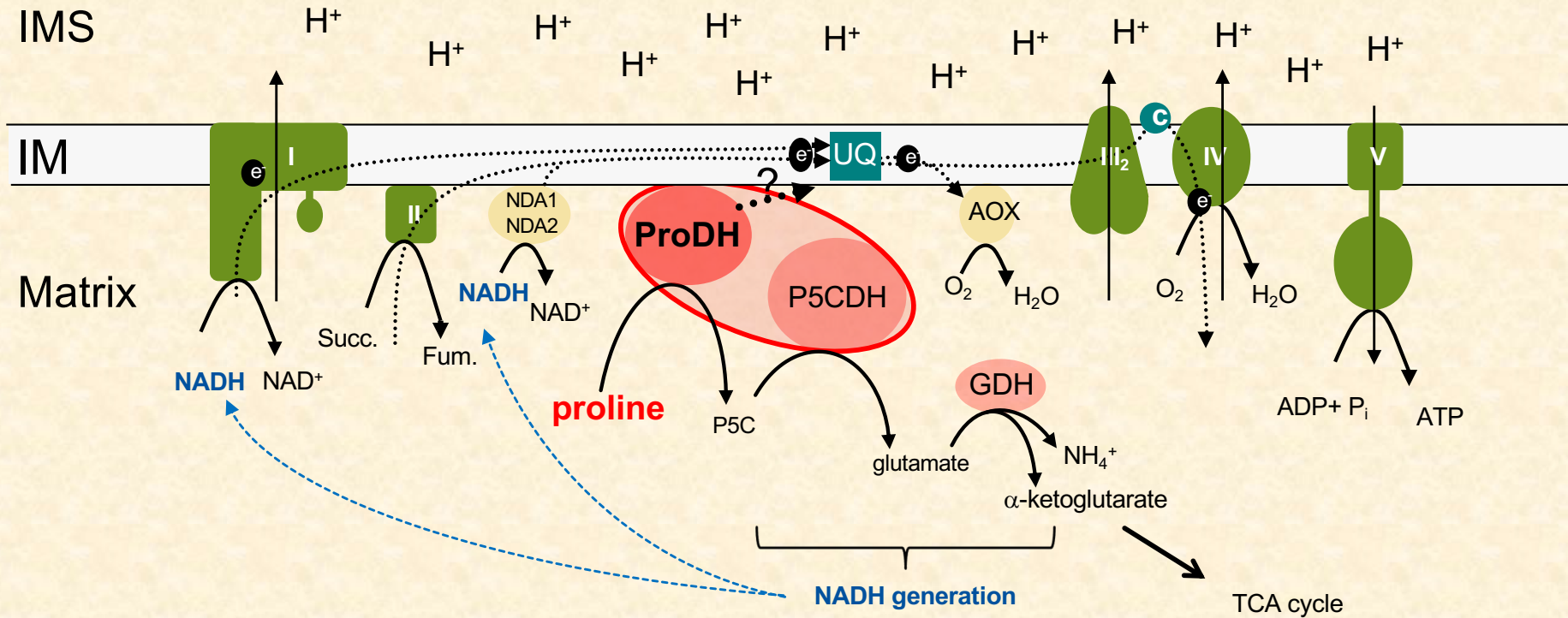
Proline is an alternative respiratory substrate during senescence

Subcellular localization of proline catabolism enzymes



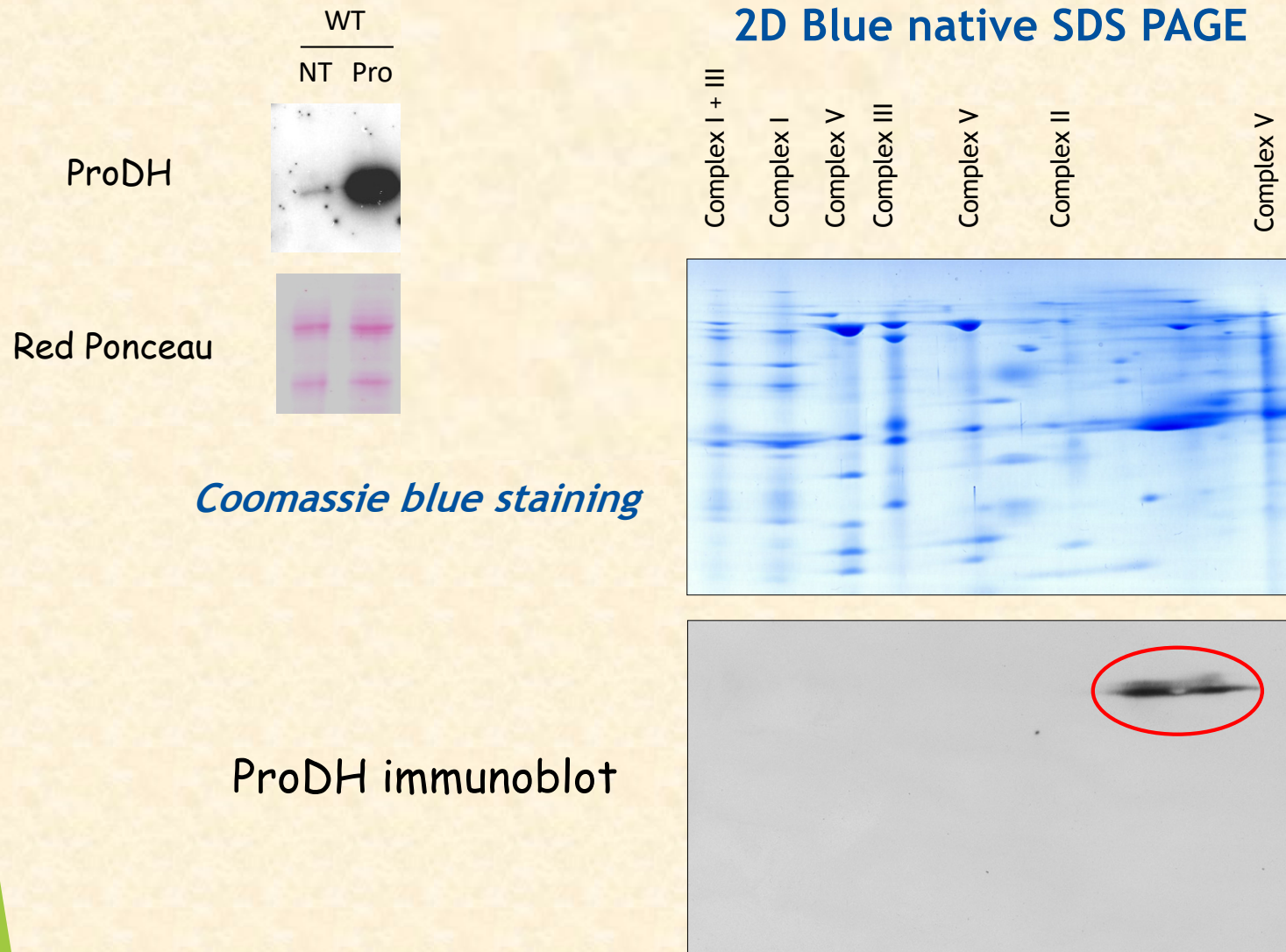
→ ProDH1 and P5CDH have distinct preferential submitochondrial localization

Integration of ProDH into mitochondrial respiration



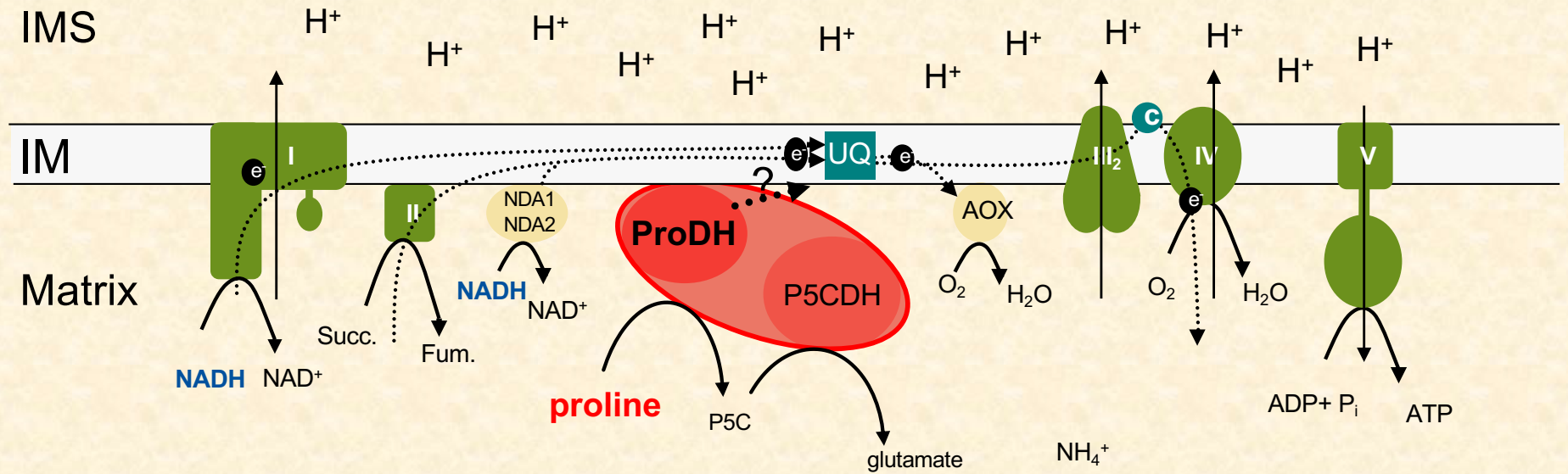
Luo et al., 2016

Analysis of mitochondrial fractions of proline-treated Arabidopsis cells

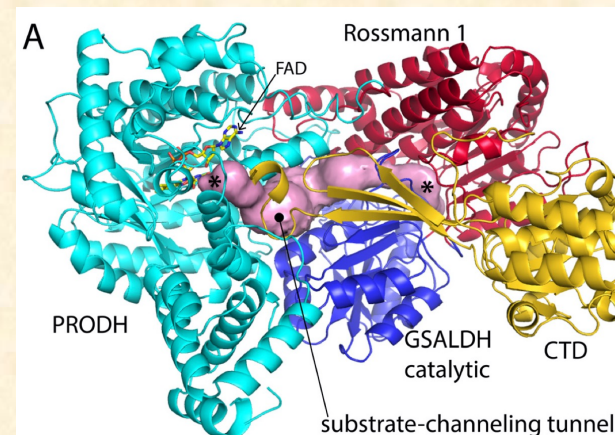
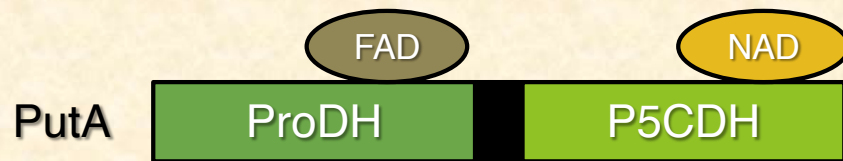


→ ProDH forms part of low-molecular-mass complexes in mitochondria

Integration of ProDH into mitochondrial respiration



Zheng *et al.*, unpublished



Luo *et al.*, 2016



APCE team

Marianne Bordenave
Cécile Cabassa
Pierre Carol
Emilie Crilat
Sandrine Lanfranchi
Anne Guivarc'h
Séverine Planchais
Luc Richard
Arnould Savouré

PhD students
Yao Zheng
Corentin Dourmap

In collaboration with :

Alain Bouchereau (U. of Rennes I)
Céline Masclaux-Daubresse (IJPB, INRAE)
Hans-Peter Braun (U. of Hannover, Germany)

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