## PROJECT TITLE

Evaluation of Augmented PSI Sink capacity to increase Photosynthetic Yield

## CONSORTIUM

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# SUMMARY OF THE REPORT

The main objective of the E.A.S.Y. project (the Transnational Access Project ID.509; EPPN2020) is to determine the degree of photo-tolerance that can be achieved by augmenting PSI acceptor-side capacity without compromising plant growth. Our goal through this project is to challenge the “photosynthesis/stress tolerance” trade-off paradigm by our novel strategy that aims to increase simultaneously both photoprotective capacity and activity of PSI via expressing a Ferredoxin (Fd) isoform.

Previously, we have observed that a higher availability of electron acceptor (Fd) provokes an augmented non-photochemical quenching (NPQ) in detriment of growth rate and redox poise of the photosynthetic electron transport chain. One of the proxies of this alternative redox scenario was the occurrence of variegation in leaves of plants growing under low or moderate light conditions. Initial photosynthetic characterization of this scenario indicated that the growth penalties associated with the augmented level of the soluble acceptor electron carrier Ferredoxin (Fd) were ameliorated by increasing the growth light intensity.

The Phenotyping resources and growth facilities at Dynapheno (Aarhus University, Denmark) offer an excellent platform to study the photosynthetic performance and physiological impact of different plant models including our system in *Nicotiana tabacum*. By using different growth conditions, including growth light intensities peaking 1400 umol $m^{-2}$ $s^{-1}$ with natural light spectra, and a cutting-edge equipment to measure photosynthetic processes, we pursue to understand novel aspects of the regulation of photosynthesis. Our long-term goal is to apply this knowledge to improve the growth conditions of crops and vegetables as well as to design new plants to tackle the adverse scenario that climate change imposes in agricultural activities and biodiversity.