DELIGHT - DissEcting caLcium sIgnalinG in cHloroplasTs

Global climate change is leading to water scarcity in some areas of the world. As drought puts more stress on plants and challenges their ability to survive, enhancing our understanding of the mechanisms of adaptations and tolerance to drought stress becomes more urgent. The chloroplast is known to be critical to plant survival in conditions of stress, yet mechanisms are largely unknown. The EU-funded DELIGHT project is building on their recent discovery that chloroplast calcium transporters play a crucial role in the response to drought stress. Utilising genetic and other state-of-the-art tools, the team is studying the role of chloroplast calcium signalling events at subcellular levels in vivo. Outcomes will boost biotechnological advances aimed at enhancing the ability of plants to meet the increasing challenge of drought.

The proposed training-through research project is aimed to address fundamental scientific gaps concerning plant's stress responses to survive under nowadays-environmental cues (e.g., drought). This project will make myself as a major reference in Plant Physiology field opening up my career perspectives both in academic and non-academic realities devoted to biotechnological enhancement of plant performance and stress-tolerance. Being sessile, plants' survival depends on sensing of the environmental changes and on the prompt translation of the sensory information into mobile signaling events within the cell, to trigger an adaptive response throughout the entire organism. Inside the cell, the chloroplast is a pivotal environmental sensor, and chloroplast signaling is indispensable for plant survival of abiotic and biotic stress as well as for proper development through concerted signaling events whose combined picture is mainly unexplored. The host laboratory has recently importantly contributed to this field by identifying chloroplast calcium transporters playing a crucial role in the response to drought stress. I will combine my expertise on monitoring signaling events in vivo at subcellular levels, with genetic and state-of-the-art tools developed by the host. These combined approaches will lead myself to significantly advance our understanding of chloroplast signaling responsible for adaptation and tolerance to drought stress, that will serve as springboard for future biotechnological investigations (dissections of chloroplast signaling in crops) as well as for priming plants for environmental cues ultimately leading to plant tolerance.
Research breakthroughs together with complementary skills training will be extremely relevant for my career development, and the host laboratory, the host institution and eventually the whole research community will benefit. A tailored public engagement program will assure impact outside the scientific community.

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Find out more: **https://cordis.europa.eu/project/id/897449**