Sandra Correia

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Sandra Correia is a researcher at the Centre for Functional Ecology (University of Coimbra, Portugal). With a PhD in Biology – Plant Physiology and a Master Degree in Plant Biotechnology, obtained in the University of Coimbra, Sandra Correia was a post-doctoral fellow (FCT grant 2013/2018) at the same institution, in collaboration with Instituto Gulbenkian de Ciência (Oeiras, Portugal), and a Fulbright scholar in 2017/2018 at the University of Maryland (MD, USA). Also worked as researcher for the plant biotechnology company Klón - Innovative Technologies from Cloning (Portugal) and as an invited assistant professor at the Department of Life Sciences in the University of Coimbra. Her main research activity concerns plant development studies by means of in vitro induced morphogenic processes, such as somatic embryogenesis, as tools to understand the molecular basis of totipotency competence acquisition by plant cells and to the large-scale cloning of high-value woody trees. Guest associate editor for Frontiers in Plant Science topic on “Somatic Embryogenesis: 60 Years of Research Applied to Plant Cloning to Unravel Plant Totipotency”. Member of the scientific and organizing committees of several international meetings, including the 5th 2.09.02 Working Party Conference (IUFRO 2018) and the VIII International Symposium on Production and Establishment of Micropropagated Plants (ISHS 2020).

Proteomic and transcriptomic profiling of embryogenic competence acquisition in tamarillo somatic embryogenesis

Plant somatic embryogenesis (SE) is a developmental pathway in which a somatic cell acquires totipotency and evolves into an embryo. Our group has developed effective protocols for SE in the solanaceous tree tamarillo (*Solanum betaceum*). Tamarillo SE induction is achieved through a two-step process, by exposing leaf segments or mature zygotic embryos to MS media with an auxin and high concentrations of sucrose and by transferring the induced embryogenic cells (EC) to auxin-free medium to allow somatic embryos development. Tamarillo’s SE is also an efficient system for molecular analyses and experimental embryology approaches. Based on this system, comparative proteomic and transcriptomic profiles were obtained for tamarillo’s EC and non-EC cells. The results obtained reveal a better ability of EC to regulate the effects of stress conditions through an increased expression of heat-shock and energy metabolism-related proteins. The differential expression of several transcripton factors and specific families of miRNAs in EC and NEC also reveals a strong epigenetic regulation of cell commitment to embryogenic competence. These results allow the formulation and test of various novel fundamental hypotheses regarding the induction of SE.