



Plant Biology

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Society of Plant Physiology

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During my scientific career I have the opportunity to in different areas of plant biology, ranging from phosphate starvation (J. Paz Ares, CNB), cell division (C. Gutierrez, CBM), auxin signaling (M. Estelle, Indiana University), ubiquitin-mediated proteomics, lateral root development or alternative polyadenylation during plant development or in response to abiotic stresses. This vast experience in different area has contributed very positively to my view of Science and the possibility to deal with complicated biological questions. Currently, in my lab at the CBGP (UPM-INIA), we are trying to address exciting, but really challenging questions such as the function of a novel metabolite, BiAux. This metabolite regulates lateral root formation and seems to function as a natural anti-auxin. Using docking models and ligand interaction, we are determining the BiAux binding site in the auxin receptors. In addition, we have developed a novel device (D-Root) to cultivate plants with the root system in darkness and shoots in presence of light. Using the D-Root we have demonstrated that that flavonols integrate hormonal and ROS signaling in the root meristem to control and balance cell division and cell differentiation. In addition, flavonols also control root light avoidance. Currently, using this system we are discovering novel biological pathways that control root responses to phosphate deprivation and also to identify novel QTL/ecotypes that are more efficient when growing in low phosphate (Pi) environments.