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PRL1 modulates root stem cell niche activity and meristem size through WOX5 and PLTs in Arabidopsis

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The stem cell niche in the root meristem maintains pluripotent stem cells to ensure a constant supply of cells for root growth. Despite extensive progress, the molecular mechanisms through which root stem cell fates and stem cell niche activity are determined remain largely unknown. In *Arabidopsis thaliana*, the Pleiotropic Regulatory Locus 1 (PRL1) encodes a WD40-repeat protein subunit of the spliceosome-activating Nineteen Complex (NTC) that plays a role in multiple stress, hormone and developmental signaling pathways. In this study, we show that PRL1 is involved in the control of root meristem size and root stem cell niche activity. PRL1 is strongly expressed in the root meristem and its loss of function mutation results in disorganization of the quiescent center (QC), premature stem cell differentiation, aberrant cell division and reduced root meristem size. Our genetic studies indicate that PRL1 is required for confined expression of the homeodomain transcription factor WOX5 in the QC and acts upstream of the transcription factor PLETHORA (PLT) in modulating stem cell niche activity and root meristem size. These findings define a role for PRL1 as an important determinant of PLT signaling that modulates maintenance of the stem cell niche and root meristem size.

Biography

Xia Li has received her PhD from Purdue University in the United States and then joined in the Vector Tobacco Inc., as a Research Scientist from 2001-2004. In 2004, she was selected as one of the "One Hundred Talents" of Chinese Academy of Sciences (CAS) and became a Principal Investigator in the Institute of Genetics and Developmental Biology, CAS. She has moved to Huazhong Agricultural University as Professor since September, 2015. She has published more than 50 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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