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Title:	Threshold-dependent transcriptional discrimination underlies stem cell homeostasis
Authors:	Yadav, R.K. (/jspui/browse?type=author&value=Yadav%2C+R.K.)
Keywords:	Dependent Transcriptional Mechanisms
Issue Date:	2016
Publisher:	PNAS
Citation:	Proceedings of the National Academy of Sciences of the United States of America, 113(41), E6298-E6306.
Abstract:	Transcriptional mechanisms that underlie the dose-dependent regulation of gene expression in animal development have been studied extensively. However, the mechanisms of dose-dependent transcriptional regulation in plant development have not been understood. In Arabidopsis shoot apical meristems, WUSCHEL (WUS), a stem cell-promoting transcription factor, accumulates at a higher level in the rib meristem and at a lower level in the central zone where it activates its own negative regulator, CLAVATA3 (CLV3). How WUS regulates CLV3 levels has not been understood. Here we show that WUS binds a group of cis-elements, cis-regulatory module, in the CLV3-regulatory region, with different affinities and conformations, consisting of monomers at lower concentration and as dimers at a higher level. By deleting cis elements, manipulating the WUS-binding affinity and the homodimerization threshold of cis elements, and manipulating WUS levels, we show that the same cis elements mediate both the activation and repression of CLV3 at lower and higher WUS levels, respectively. The concentration-dependent transcriptional discrimination provides a mechanistic framework to explain the regulation of CLV3 levels that is critical for stem cell homeostasis.
Description:	Only IISERM authors are available in the record.
URI:	https://www.pnas.org/content/113/41/E6298 (https://www.pnas.org/content/113/41/E6298) http://hdl.handle.net/123456789/2442 (http://hdl.handle.net/123456789/2442)
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