ARTÍCULO DEL MES DE AGOSTO

Título: A molecular framework for light and gibberellin control of cell elongation.

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Resumen:
Las plantas, como organismos sésiles, deben optimizar su crecimiento y desarrollo en función de las condiciones ambientales. En el artículo se muestra cómo los factores de transcripción PIFs son piezas fundamentales en ésta adaptación, ya que coordinan el crecimiento de la planta en respuesta a la luz y las hormonas giberelinas.

Abstract:
Cell elongation during seedling development is antagonistically regulated by light and gibberellins (GAs). Light induces photomorphogenesis, leading to inhibition of hypocotyl growth, whereas GAs promote etiolated growth, characterized by increased hypocotyl elongation. The mechanism underlying this antagonistic interaction remains unclear. Here we report on the central role of the Arabidopsis thaliana nuclear transcription factor PIF4 (encoded by PHYTOCHROME INTERACTING FACTOR 4) in the positive control of genes mediating cell elongation and show that this factor is negatively regulated by the light photoreceptor phyB (ref. 4) and by DELLA proteins that have a key repressor function in GA signalling. Our results demonstrate that PIF4 is destabilized by phyB in the light and that DELLAs block PIF4 transcriptional activity by binding the DNA-recognition domain of this factor. We show that GAs abrogate such repression by promoting DELLA destabilization, and therefore cause a concomitant accumulation of free PIF4 in the nucleus. Consistent with this model, intermediate hypocotyl lengths were observed in transgenic plants over-accumulating both DELLAs and PIF4. Destabilization of this factor by phyB, together with its inactivation by DELLAs, constitutes a protein interaction framework that explains how plants integrate both light and GA signals to optimize growth and development in response to changing environments.

Miguel de Lucas (el quinto desde la izquierda) es estudiante de doctorado en el laboratorio de Salomé Prat en el CNB-CSIC-, su investigación se centra en la descripción de los mecanismos que regulan el crecimiento vegetal en respuesta diferentes hormonas.