

The PRC2 complex mediates light perception during flowering in *Arabidopsis thaliana*

Alessio Baldini * ¹, Giorgio Perrella[†] ¹

¹ Università degli Studi di Milano = University of Milan – Italy

Trimethylation of lysine 27 of histone H3 (H3K27me3) is a widely conserved repressive epigenetic mark deposited by the multimeric Polycomb Repressive Complex 2 (PRC2). In plants, the PRC2 changes its composition to regulate different processes. During post-embryonic growth and phase transitions, it employs as catalytic subunits CURLY LEAF (CLF) or SWINGER (SWN), which are partially redundant, with the former displaying more pleiotropic functions. The PRC2 is also known to be induced by environmental stimuli, thereby tuning the expression of stress-induced genes. Its response towards light is regulated by accessory subunits like VERNALIZATION INDEPENDENT-LIKE 1 (VIL1) and VIL2, which control hypocotyl elongation in red light and flowering induction in short day conditions, respectively. It is still unclear, however, whether the catalytic subunits CLF and SWN are directly influenced by light-mediated signalling cascades. Here, we aim at characterising their function during flowering in response to monochromatic light conditions. Flowering time of *Arabidopsis* mutants for PRC2 components suggests that both CLF and SWN are required for light sensitivity. In addition, H3K27me3 levels on flowering-promoting genes indicate that the two catalytic subunits work in an opposite manner. Furthermore, also VIL1 appears to modulate red light-specific flowering time control. Taken together, our results suggest a novel interaction between PRC2-mediated epigenetic regulation and light-mediated photoperiodic flowering.

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*Speaker

[†]Corresponding author: giorgio.perrella@unimi.it