

**Joint Seminar  
CIBSS and Molecular Plant Sciences**

**SUMOylation modulates light signalling in  
Arabidopsis**

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**Abstract:**

The red/far red light absorbing phytochrome B (phyB) photoreceptor changes its conformation between the red light absorbing Pr and the far-red absorbing biologically active Pfr conformation and functions as a light sensor in Arabidopsis. phyB governs photomorphogenic development and for this, it interacts with downstream regulator proteins, like the PHYTOCHROME INTERACTING FACTOR (PIF) transcription factors. The phyB-dependent modulation of PIF abundance and activity and the co-degradation of PIFs and phyB are key regulatory steps in photomorphogenesis. We found that the Small Ubiquitin-like Modifier (SUMO) is conjugated (SUMOylation) to a certain lysine residue of phyB and accumulation of SUMOylated phyB is enhanced by red light. This modification impairs the binding of phyB to PIF5 and negatively regulates phyB-dependent light signalling. We found that PIF3 is also SUMOylated and SUMOylated PIF3 (i) has lower binding capacity to the target promoters, (ii) induces weaker photomorphogenic responses, and (iii) maintains higher phyB levels than the non-SUMOylated counterparts. Conclusively we summarize that SUMOylation of phyB and PIF3 decreases the activity of these proteins resulting in opposite effects (negative or positive, respectively) on light signalling.

Guests are welcome!

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