UVR8 acts with BIM1, BES1 and WRKY36 to regulate transcription and photomorphogenesis in *Arabidopsis*

With the support by the National Natural Science Foundation of China, the research team led by Prof Liu HongTao (刘宏涛) at the National Key Laboratory of Plant Molecular Genetics (NKLPMG), CAS Center for Excellence in Molecular Plant Sciences, Institute of Plant Physiology and Ecology (SIPPE), Chinese Academy of Sciences, uncovered novel UV-B signal transduction pathways, which were published in *Developmental Cell* (2018, 44: 1—12) and *Nature Plants* (2018, 4: 98—107).

Ultraviolet-B light (UV-B) is an inherent part of sunlight, which has significant biological effects on plants. Low level, non-damaging UV-B serves as a photomorphogenic signal to regulate photomorphogenesis. UVR8 (UV RESISTANCE LOCUS 8) is a UV-B photoreceptor that mediates light responses in plants. The mechanism by which UVR8 triggers UV-B photomophogenic responses in the nucleus and whether or not UVR8 interacts with transcription factors to directly regulate transcription is still unknown.

They show evidence that *Arabidopsis* UVR8 physically interacts with BIM1 and BES1, which are transcription factors of plant steroid hormone brassinosteroid (BR) signaling, and also a function unknown transcription factor WRKY36 to regulate photomorphogeneis in response to UV-B light. UV-B activated and nucleus localized UVR8 inhibited the DNA-binding activities of BES1/BIM1 and WRKY36. Their results demonstrate that UV-B could inhibit plant growth by repressing plant steroid hormone brassinosteroid (BR)-promoted plant growth via repressing BIM1, BES1, and also by promoting *HY5* transcription via repressing WRKY36, which is a transcription repressor of *HY5*. Their results therefore establish that UVR8-BES1/BIM1 and UVR8-WRKY36 interactions represent early photoreceptor signaling mechanisms in plants, and UVR8-BES1/BIM1 serves as important module integrating light and BR signaling. These discoveries expand our understanding of the mechanisms of photoreceptors and the crosstalk between light and hormonal signal transductions in plants

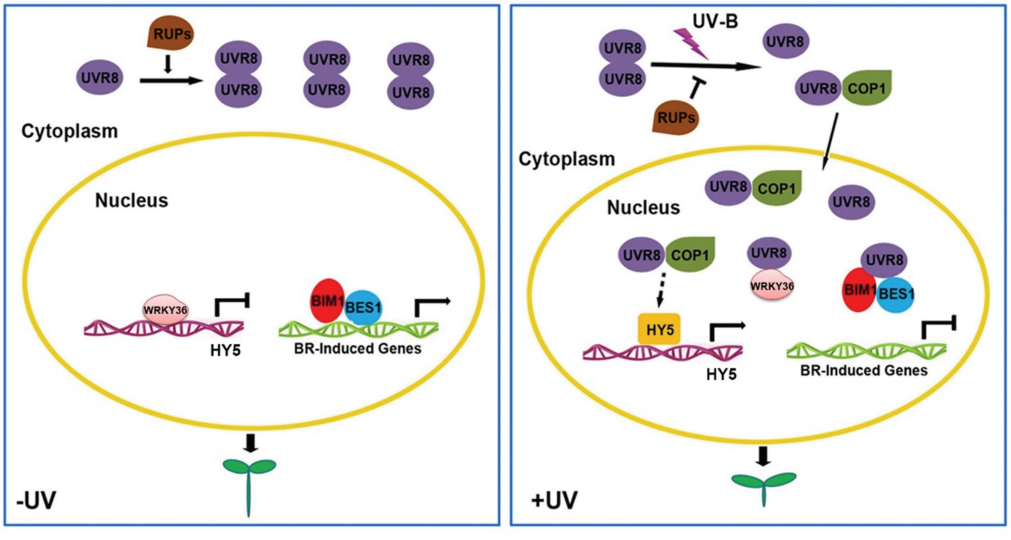

Figure A hypothetical model depicting how UVR8 acts with BIM1, BES1 and WRKY36 to regulate transcription and photomorphogenesis in *Arabidopsis*.