PB I -2

LIGHT ACTIVATES THE DEGRAGATION OF PIL5 PROTEIN TO PROMOTE SEED GERMINATION THROUGH GIBBERELLIN IN ARABIDOPSIS

Eunkyoo Oh, Gabyong Bae, Won-Il Chung, and Giltsu Choi1

Department of Biological Sciences, KAIST, Daejeon 305-701, Korea
1Corresponding Author

Angiosperm seeds integrate various environmental signals such as water availability and light conditions to make a proper decision to germinate. Once the optimal conditions are sensed, gibberellin (GA) is synthesized, triggering germination. Among environmental signals, light conditions are perceived by phytochromes. However, it is not well understood how phytochromes regulate GA biosynthesis. Here, we investigated whether phytochromes regulateGA biosynthesis through PIL5, a phytochrome-interacting bHLH protein, in Arabidopsis. We found that *pil5* seed germination was inhibited by paclobutrazol, the *ga1* mutation was epistatic to the *pil5* mutation, and the inhibitory effect of *PIL5* overexpression on seed germination could be rescued by exogenous GA, collectively indicating that *PIL5* negatively regulates seed germination through GA. Expression analysis revealed that PIL5 repressed the expression of GA biosynthetic genes (*GA4* and *GA4H*) and activated the expression of a GA catabolic gene (*GA2OX*) in both PHYA- and PHYB-dependent germination assays. Lastly, we showed that red and far-red light signals trigger PIL5 protein degradation thoughthe 26S proteasome, thus releasing the inhibition of bioactive GA biosynthesis by PIL5. Taken together, our data indicatethat phytochromes promote seed germination by degrading PIL5, which leads to increased GA biosynthesis and decreased GA degradation.