P015 Domain swapping of phototropin 1 to assess photoreceptor function

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Phototropin 1 (phot1) is a blue-light receptor kinase regulating phototropism, chloroplast movement, stomatal opening and leaf expansion in Arabidopsis.Phot1 contains two flavin-binding, light-sensing domains called LOV1 and LOV2. Although these domains are structurally identical, they exhibit different photochemical properties. Indeed, LOV2 appears to function as the principle light-sensor for phot1
action, whereas as the role of LOV1 is unclear at present.
To further assess the individual roles of LOV1 and LOV2, we have generated domain replacements whereby LOV1 is replaced by LOV2, and vice versa, too determine whether these domains are functionally interchangeable. The effects of these domain replacements on phot1 photochemistry, structure and kinase activity have been examined. Our initial findings indicate the LOV1 can replace, at least in
part, LOV2 function and mediate light-induced phot1kinase activity when expressed in insect cells and restore leaf expansion in the phot1phot2 double mutant.