

ECOLOGICAL FUNCTIONS OF PHYTOCHROME

A. Shade Avoidance

- Phytochrome enables plants to sense shading by other plants.
- Plants increase stem extension in response to shading → **shade avoidance response**
- Shading $\uparrow \rightarrow$ the R:FR ratio $\downarrow$ (FR $\uparrow$) $\rightarrow$ (Pfr/Ptotal) $\downarrow$ (Pfr $\rightarrow$ Pr) $\rightarrow$ Pr stimulate stem extension
- It finds in sun plants, but does not in shade plants

PHYTOCHROME SPECIALIZATION

- Phytochrome is encoded by a multigene family: *PHYA* through *PHYE*.
- Despite the great similarity in their structures, each of these phytochromes performs distinct roles in the life of the plant.

Phytochrome B Mediates Responses to Continuous Red or White Light

- Phytochrome B mediates shade avoidance by regulating hypocotyl length in response to continuous light
- Phytochrome B also appears to regulate photoreversible seed germination, the phenomenon that originally led to the discovery of phytochrome