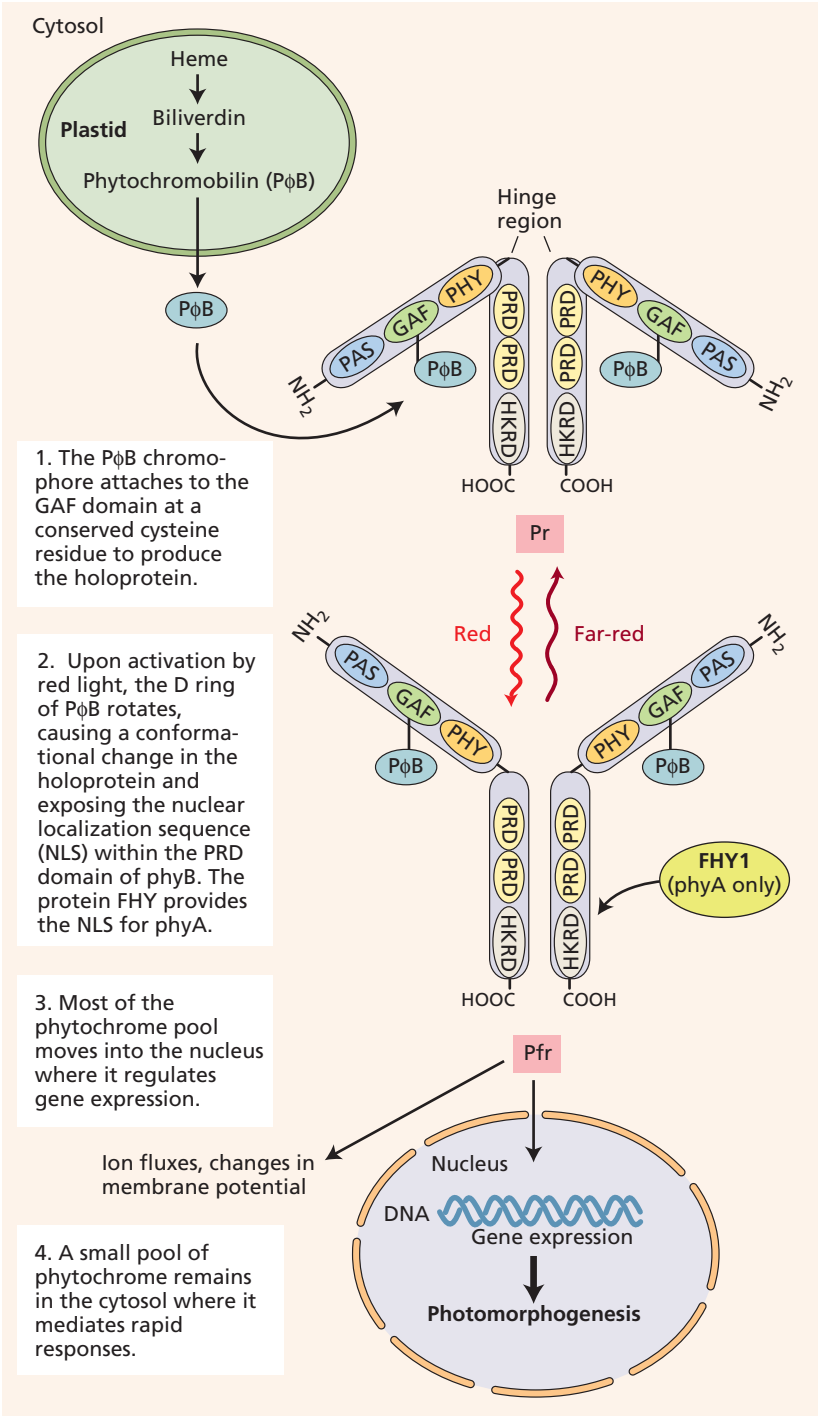
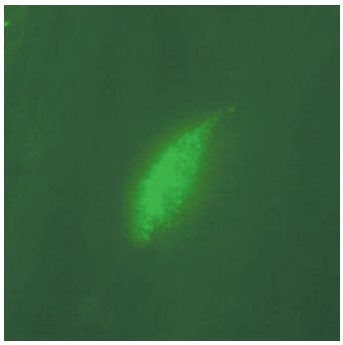


Figure 16.10 After synthesis of phytochromobilin in the plastid and assembly with the apoprotein (1), phytochrome is activated by red light (2) and moves into the nucleus (3) to modulate gene expression. A small pool of phytochrome remains in the cytosol, where it may regulate rapid biochemical changes (4). Whereas phyB has its own nuclear localization signal, phyA requires the protein FHY1 to enter the nucleus. Several conserved domains of phytochrome are shown: PAS, GAF (contains bilin-lyase domain), PHY, PRD (PAS-related domain), and HKRD (histidine kinase–related domain). PϕB, phytochromobilin. (After Montgomery and Lagarias 2002.)

(A) phyA–GFP



(B) phyB–GFP

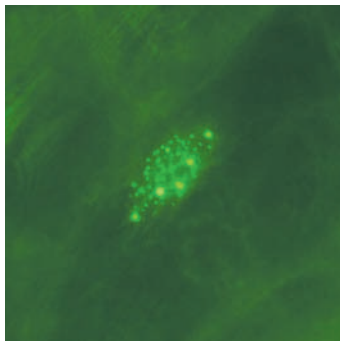


Figure 16.11 Nuclear localization of phy–GFP fusion proteins in epidermal cells of Arabidopsis hypocotyls. Transgenic Arabidopsis plants expressing phyA–GFP (A) or phyB–GFP (B) were exposed to either continuous far-red light (A) or continuous white or red light (B) and observed under a fluorescence microscope. Only nuclei are visible, demonstrating that the light treatments induced nuclear accumulation of the phy–GFP fusion proteins. In darkness, phy is absent from the nucleus. These results indicate a role for nuclear–cytoplasmic partitioning in controlling phytochrome signaling. The smaller bright green dots inside the nucleus in (B) are called "speckles." The number and size of these speckles have been correlated with light responsiveness. (From Yamaguchi et al. 1999, courtesy of A. Nagatani.)