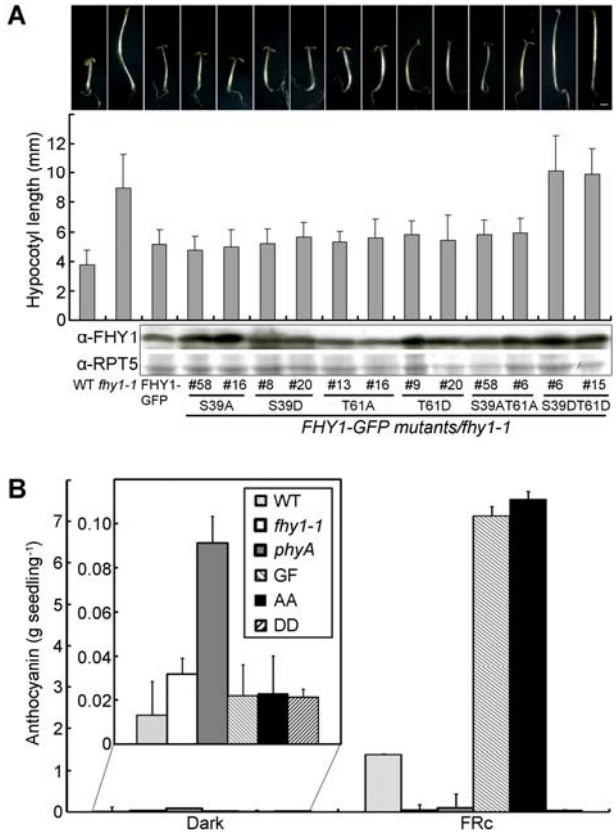
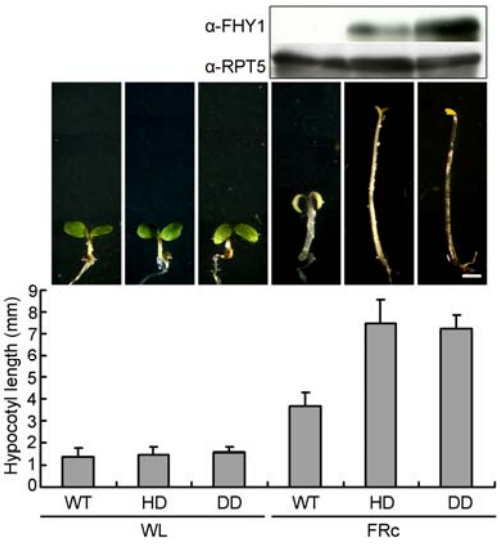


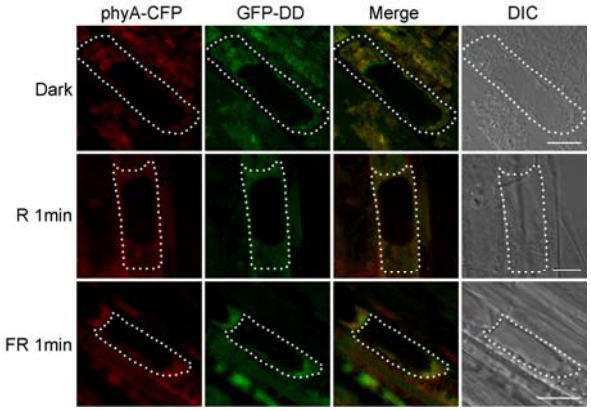
Supplemental Figure 1. Phosphorylation on S39 and T61 Inactivates FHY1.

(A) Morphology of 5-day-old FR grown *fhy1-1* seedlings expressing mutant FHY1-GFP. All FHY1 mutations are as same as described in Figure 1D except that GFP is fused with C terminal of FHY1. Top, typical images of wild-type, *fhy1-1*, *FHY1-GFP/fhy1* and two independent lines for each mutation (Bar=1mm); Middle, measurements of hypocotyl lengths corresponding to the top panel, all measurements were biologically repeated at least three times, error bars represent ± SD (n=20); Bottom, immunoblots showing accumulation of mutant FHY1-GFP in corresponding transgenic seedlings, RPT5 was used as loading control.

(B) FHY1 phosphorylation impairs anthocyanin accumulation. Seedlings indicated were grown in dark or FR for 5 days. GF, *GFP-FHY1/fhy1-1*; AA, *GFP-FHY*^{S39AT61A}*/fhy1-1*; DD, *GFP-FHY1*^{S39DT61D}*/fhy1-1*. Mean ± SD (n=3).

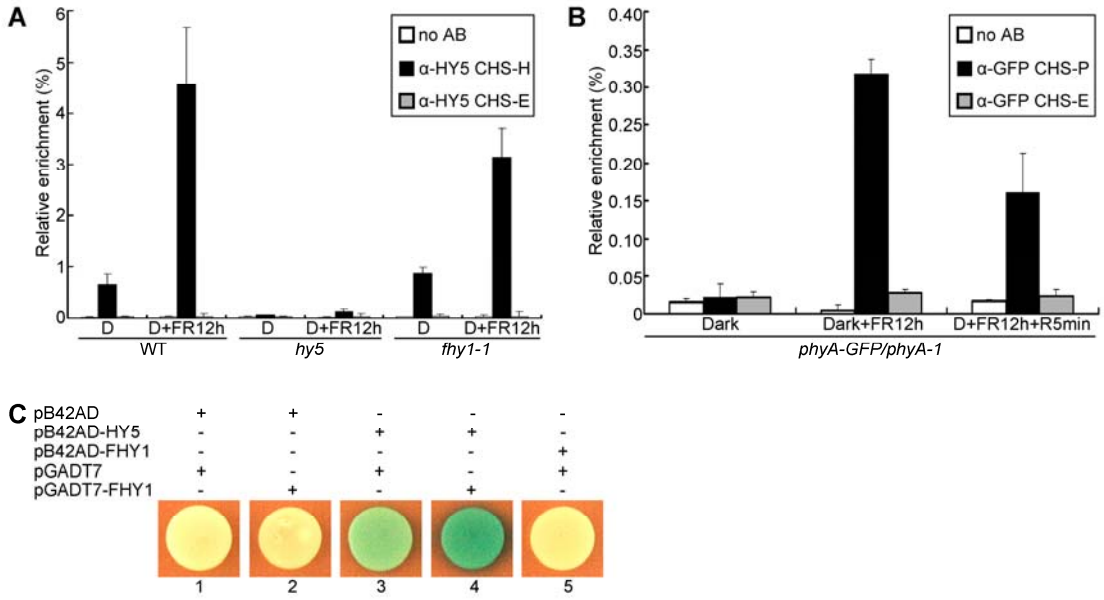


Supplemental Figure 2. Transgenic GFP-FHY1^{S39DT61D} Exhibits Dominant Traits over Wild-type FHY1 in F1 Heterozygous Seedlings.
Seedlings were grown in white light (WL) or continuous far-red light (FRc) for five days. WT, wild-type seedlings (Ler); DD, homozygous transgene GFP-FHY1^{S39DT61D} in *fhy1-1* mutant background; HD, heterozygous F1 seedlings of WT×DD. Upper, western blot shows the protein level of GFP-FHY1^{S39DT61D} in WT, HD and DD seedlings. Middle, phenotype of corresponding seedlings grown in WL or FRc. Bottom, Statistic analysis of hypocotyl lengths. mean±SD (n>50).



Supplemental Figure 3. P-mimic FHY1 and phyA Co-localize in the Cytosol.

GFP-FHY^{S39DT61D}*/fhy1-1* (GFP-DD) was crossed into *phyA-CFP/phyA-201*. Four day etiolated F1 seedlings were irradiated with R or FR for 1 min before microscope imaging. A hypocotyl cell is outlined by dotted line. Bar=20μm.



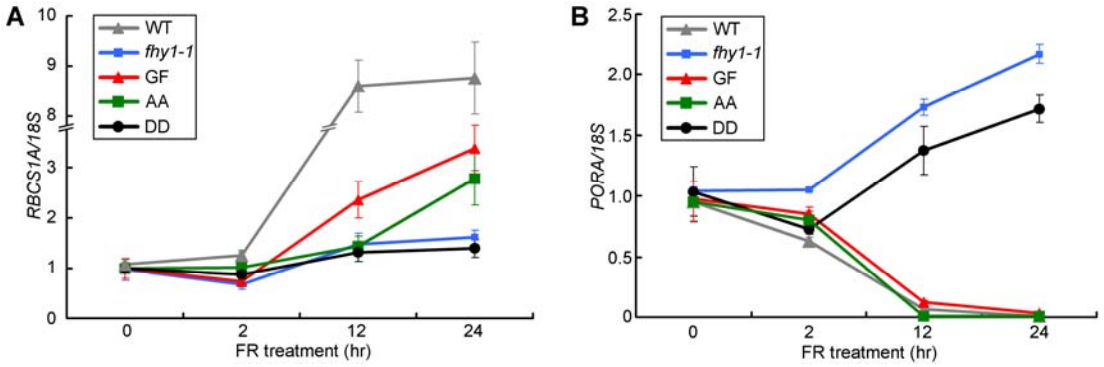
Supplemental Figure 4. FHY1 and phyA Associate with the *CHS* Promoter.

(A) HY5 associates with *CHS* promoter independently of FHY1. Four day etiolated wild-type, *hy5* and *fhy1* seedlings were irradiated with (D+FR12h) or without (D) FR for 12h and examined by anti-HY5 ChIP-qPCR. AB, antibody; CHS-H, HY5 binding region on *CHS* promoter; CHS-E, *CHS* exon region.

(B) Both Pr and Pfr form of phyA associate with *CHS* promoter. Four day etiolated *phyA-GFP/phyA-1* seedlings were irradiated with 12h FR (Pr phyA) or with 12h FR followed by 5min R (Pfr phyA) before they were analyzed by anti-GFP ChIP-qPCR. CHS-P, PIF3 binding region on *CHS* promoter.

(C) FHY1 enhances HY5 transcriptional activity in yeast. Lane 1, two AD vectors are co-expressed in yeast harboring *CHSp::LacZ* report construct; lane 2 and 5, FHY1 alone can not induce β-galactosidase activity in yeast; lane 3, HY5 alone induces β-galactosidase activity at a lower level; lane 4, co-expression of HY5 and FHY1 induces β-galactosidase activity at a higher level.

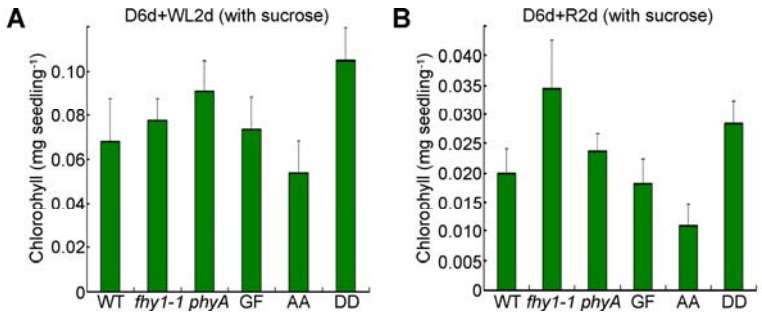
All error bars represent ±SD of triplicate experiments.



Supplemental Figure 5. Phosphorylation of FHY1 Affects the Expression of *RBCS1A* and *PORA*.

(A) Expression of light-induced gene *RBCS1A* is suppressed in P-mimic FHY1 background. Four day etiolated wild-type, *fhy1-1*, *GFPFHY1/fhy1* (GF), $GFP^{S39AT61A}$*/fhy1* (AA) and $GFP^{S39DT61D}$*/fhy1* (DD) seedlings were irradiated with FR for 0, 2, 12 or 24 hours. All data were normalized by *18S* in the RT-qPCR.

(B) Expression of light-repressed gene *PORA* is induced in P-mimic FHY1 background. Same batch of samples in **(A)** was used to examine *RBCS1A* expression. All error bars represent ±SD of triplicate experiments.



Supplemental Figure 6. FHY1 Phosphorylation Benefits the Greening Process of Etiolated Seedlings.

(A) Chlorophyll concentration in seedlings upon dark to white-light switch. Seedlings of indicated genotype (as described in Figure 6A) were grown on MS medium with 1% sucrose in dark for 6 days and transferred to white-light (WL) for 2 days before chlorophyll measurement.

(B) Chlorophyll concentration in seedlings upon dark to R switch. Seedlings as described in **(A)** were grown on MS medium with 1% sucrose in dark for 6 days and transferred to R for 2 days before chlorophyll measurement.

All error bars represent ±SD of triplicate experiments.

Supplemental Table 1. A List of primers used in this study.

Plasmid Constructs	Gene	Name	Sequence (5'- to -3')
pUC18-mFHY1	FHY1^{S39A}	F	AAGTTGAGGTGGCCAAGAAGAGG
		R	CCTCTTCTTGGCCACCTCAACTT
	FHY1^{S39D}	F	AAGTTGAGGTGGACAAGAAGAGG
		R	CCTCTTCTTGTCCACCTCAACTT
	FHY1^{T61A}	F	TGTCAAAGCACGCTTGTTTTGC
		R	GCAAAACAAGCGTGCTTTGACA
	FHY1^{T61D}	F	TGTCAAAGCACGATTGTTTTGC
		R	GCAAAACAATCGTGCTTTGACA
	FHY1$^{\Delta nls}$	F	AGCGCAGCAGCAGCATTTCAGACAGATCAATC
		R	AAATGCTGCTGCTGCGCTCACCTCAACTTCTTC
	FHY1$^{\Delta nes}$	F	TCGGCAGCAGCTGCGTCAAAGCACACTTGTTTTG
		R	TGACGCAGCTGCTGCCGATAACTCATCAGATTG
pSY738-FHY1	FHY1	F	AAGTCGACAATGCCTGAAGTGGAAG
		R	TACGCGGCCGCTACAGCATTAGCGTTGAG
pSY735-FHY1		F	AAGTCGACAATGCCTGAAGTGGAAG
		R	TACGGATCCCTTACAGCATTAGCGTTGAG
pGADT7-FHY1		F	AGCGGTACCATGCCTGAAGTGGAAG
		R	GACTCGAGATTACAGCATTAGCGTT
pB42AD-FHY1		F	CGGAATTCCGGATGCCTGAAGTGGAA
		R	GACTCGAGTTACAGCATTAGCGTT
pSY736-HY5	HY5	F	TCAGTCGACAATGCAGGAACAAGCG
		R	TGCGGATCCTTCAAAGGCTTGCATC
pB42AD-HY5		F	CGGAATTCATGCAGGAACAAGCG
		R	GACTCGAGTCAAAGGCTTGCATC
pSY728-PIF3	PIF3	F	TCAGTCGACGATGCCTCTGTTTGAG

		R	TACGCGGCCGCCACGACGATCCACA
pGreenII0800 -LUC-CHSp	CHSp (-1000~-1)	F	TGGCGGTTTTGGTACCCCGGGTCAAC
		R	CCATCACCATGGTAGTATACACCAAC
pLacZ2μ-CHSp	CHSp (-250~-50)	F	AGTGGTACCCACCATTCAATCTTG
		R	TCACTCGAGACTAAACAAGTTAGG