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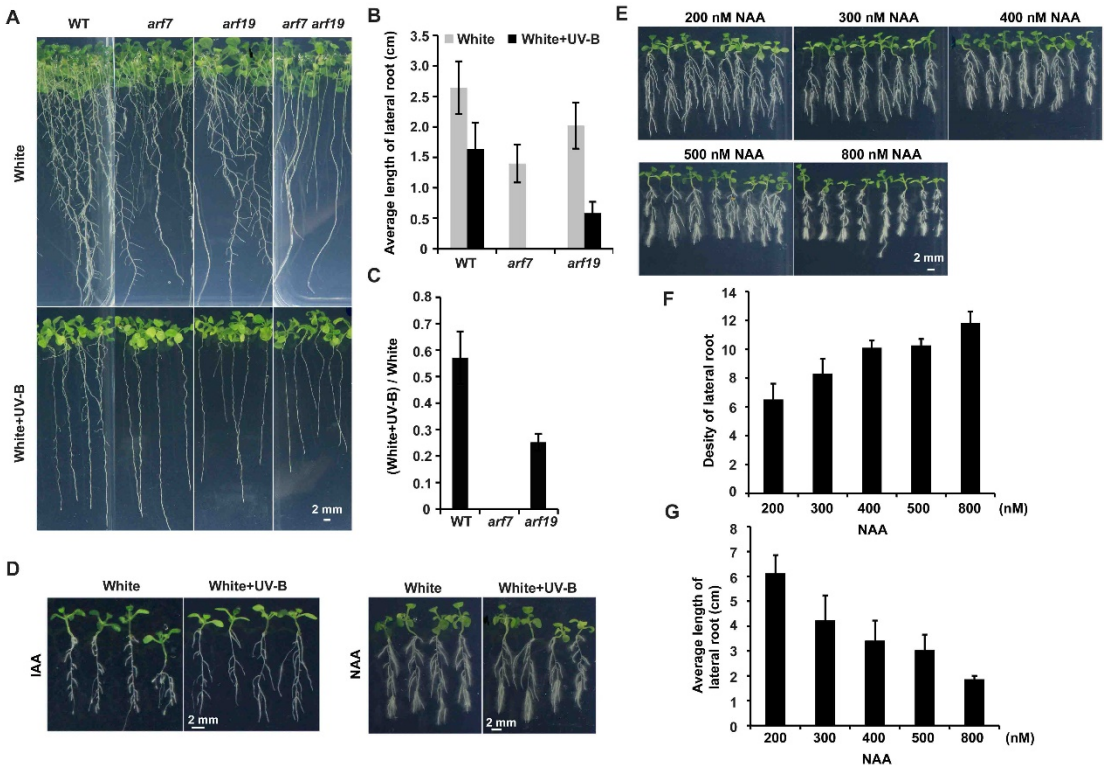
Appendix Figures



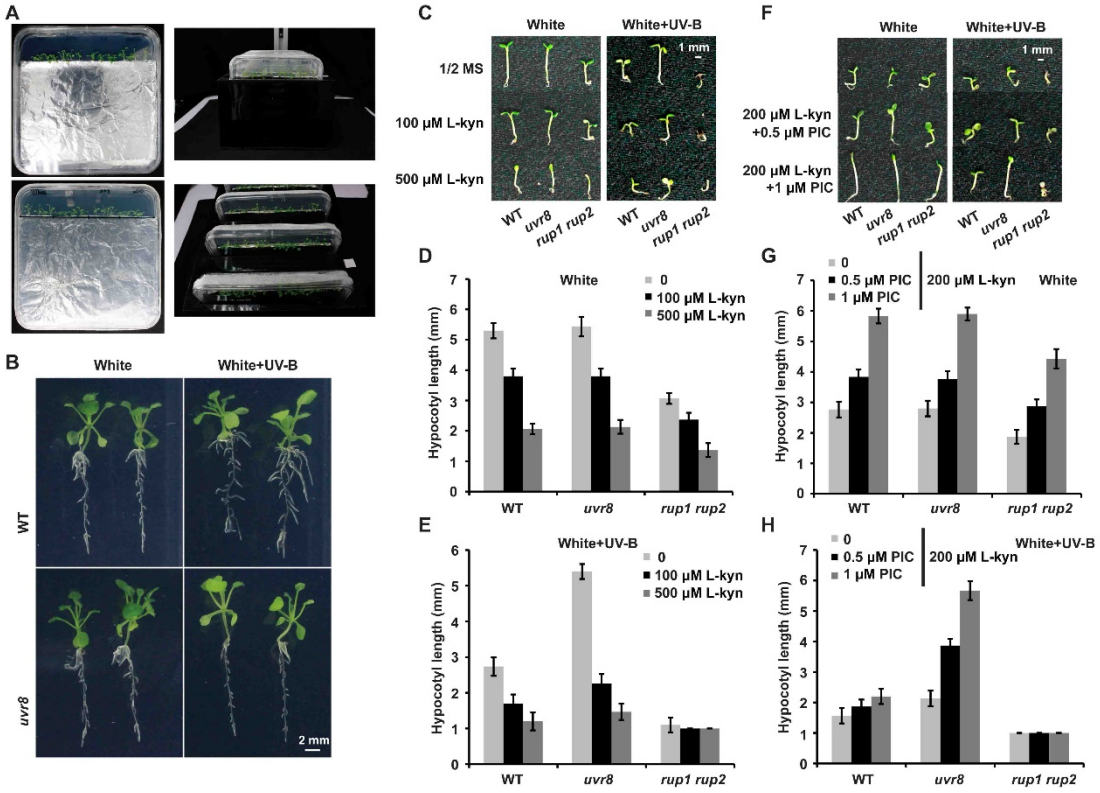
Appendix Figure S1. UV-B inhibits the growth of lateral root.

A-C. Phenotypic analysis. Seedlings of indicated genotype were grown in 1/2 MS with or without UV-B (1 W/m^2) for 2 weeks. Images are shown in (A); scale bar = 2 mm, and average length of lateral roots of the indicated genotypes were measured and shown in (B). SDs (n > 8) are indicated. (C) Average lateral root length ratios (White+UV-B/White) of the quantified lateral root length in (B).

D. UV-B treatment breaks the function of IAA but not NAA. WT Seedlings were grown in LD for 5 days, then transferred to new plates containing 1 μM IAA (left) or 0.4 μM NAA (right) that were pre-irradiated by white light with or without UV-B for 7 days and kept in continuous white light for 7days. Scale bars = 2 mm.

E-G. High concentration of auxin inhibits the lateral root growth. Seedlings of WT were grown in LD condition for 5 days, then transplanted to new medium with the addition of a series of concentrations of NAA and kept in continuous white condition for 7 days. Images are shown in (E); scale bar = 2 mm. The lateral root density (number of lateral roots/length of primary root) (F) and average length of lateral roots (G) of the indicated genotypes were

measured and shown in F, G. SDs (n > 8) are indicated.



Appendix Figure S2. UV-B represses the auxin responses to inhibit the hypocotyl elongation in a UVR8-dependent manner.

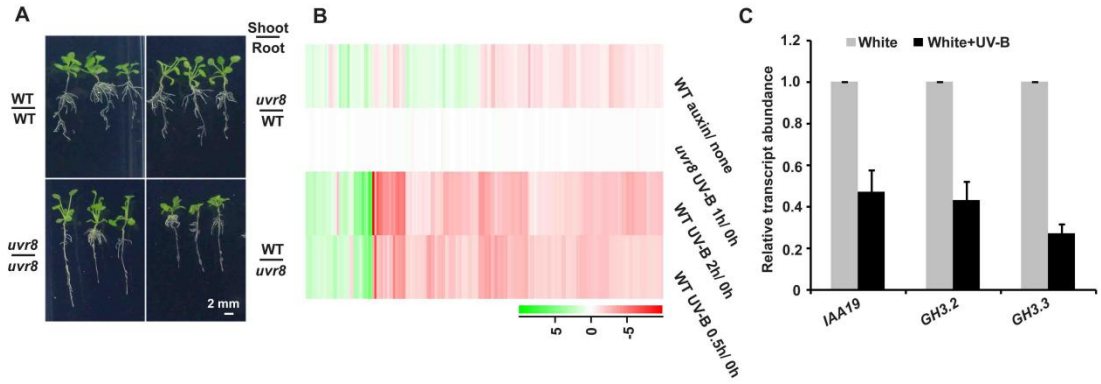
A. Images showing details of the covering root experiment.

B. Phenotypic analysis. Seedlings of WT and *uvr8* were grown in LD condition for 5 days, then transplanted to new medium containing 0.4 μM NAA and roots were covered, then kept in white or white plus UV-B light condition (1 W/m^2) for 10 days. Scale bar = 2 mm.

C-E**.** Phenotypic analysis. Seedlings of the indicated genotypes were grown in 1/2 MS with or without L-kyn (the inhibitor of auxin synthesis) in continuous white light condition and white plus UV-B (2 W/m^2) light condition. Images of the representative seedlings are shown in (C); scale bar = 1 mm. And the hypocotyl lengths of the indicated genotypes were measured and are shown in (D) and (E). Standard deviations (n > 15) are indicated.

F-H. *uvr8* mutant is hypersensitive but *rup1 rup2* is insensitive to PIC (auxin analogous) under UV-B condition. WT, *uvr8* and *rup1 rup2* were grown in 1/2 MS with 200 μM L-kyn,

and with the addition of a series of concentrations of PIC in the continuous white light condition or white plus UV-B (2 W/m^2) light condition for 6 d. Images of the representative seedlings are shown in (F); scale bar = 1 mm. The hypocotyl lengths of the indicated genotypes were measured and are shown in (G) and (H). Standard deviations (n > 15) are indicated.

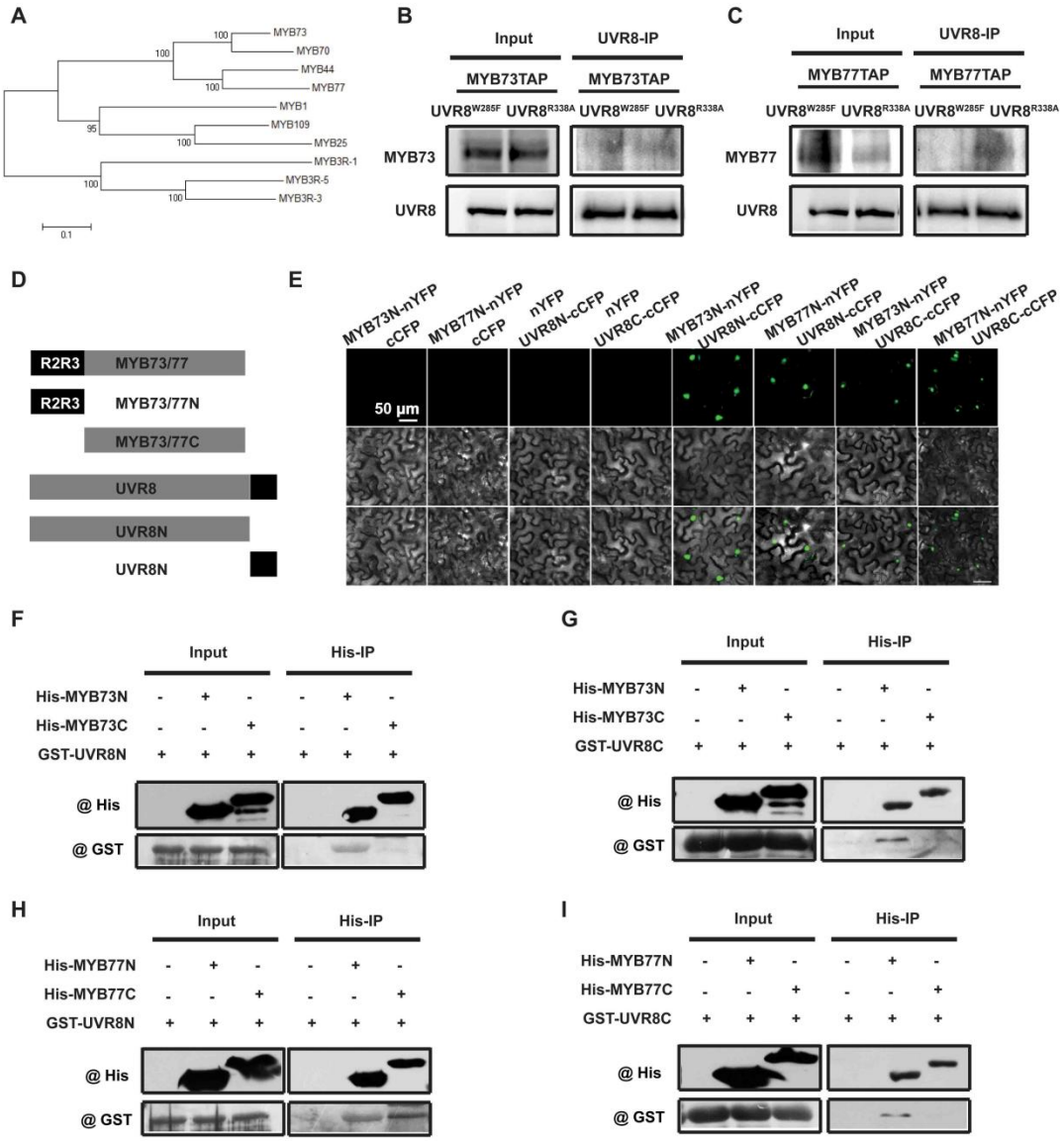


Appendix Figure S3. UVR8 inhibits auxin responses in a tissue-autonomic manner.

A. UVR8 inhibited auxin responses under UV-B in a root-autonomous way. WT and *uvr8* seedlings grown in LD for 5 days were used for reciprocal grafting. Seedlings were kept in LD for 7 days after grafting, then transplanted to new medium containing 0.4 μM NAA and covered the roots and kept in white plus UV-B light for 10 days. Scale bar=2 mm.

B. Transcriptome analysis of genes expression regulated by auxin, UV-B and UVR8. WT/ UV-B 0.5 h and WT/ UV-B 2 h showed the transcriptome of roots and only one biological replicate was analyzed. The *uvr8*/ UV-B 1 h and WT auxin/ none showed the transcriptome of seedlings and three biological replicates were analyzed. The parameter measured by color key shows the Log-fold change.

C. qPCR assay showing that UV-B inhibits the expression of auxin-signaling genes. WT protoplast were kept in white light condition or white light plus UV-B condition for 16h. The *ACT7* gene was analyzed as an internal control. Error bars are SD of three biological replicates.



Appendix Figure S4. UVR8 physically interacts with the R2R3 DNA-binding domain of MYB73/MYB77.

A. Neighbor-joining phylogenetic analysis and alignment of amino acid sequence showing possible relationship between MYB73 and other MYB proteins. The bootstrap values are indicated. The scale bar indicates substitution per site.

B and C. Co-IP assays showing that the interaction between UVR8^{R338A} and MYB73 (B)/MYB77(C) is stronger than that between GR-UVR8^{W285F} and MYB73/MYB77. 14-day-old transgenic seedlings expressing *35S::MYB73-TAP/GR-UVR8*^{W285F}, *35S::MYB77-TAP/GR-UVR8*^{W285F}, *35S::MYB73-TAP/GR-UVR8*^{R338A}, and

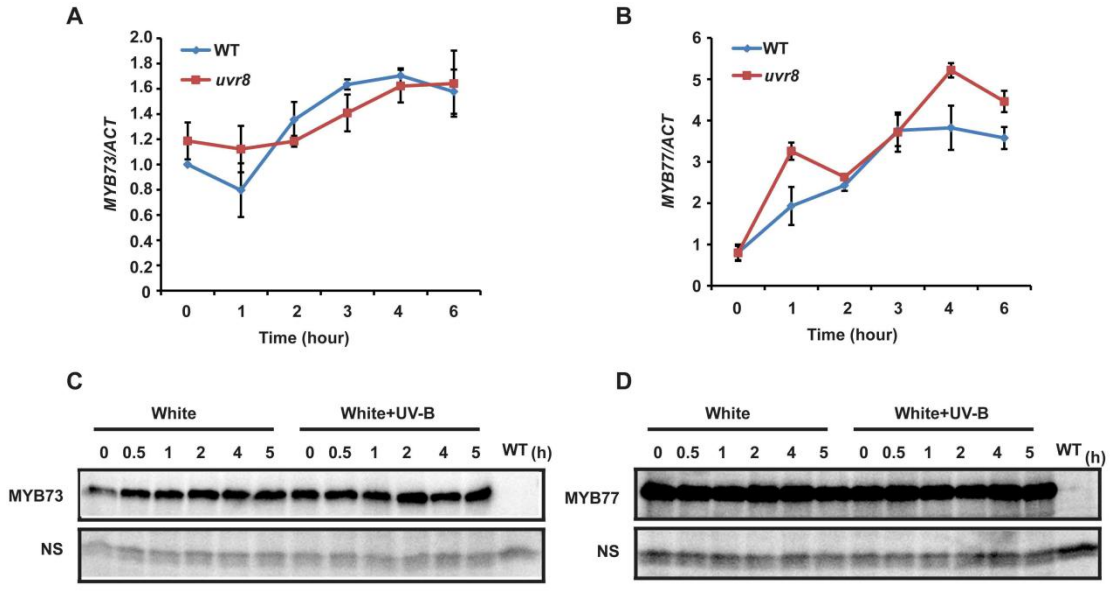
35S::MYB73-TAP/GR-UVR8^{R338A} grown in 1/2 MS with 20 μM DEX in long day condition were moved to UV-B (1 W/m^2) for 20 min. Total proteins were extracted and used in the co-IP assay. Input: immunoblots showing the levels of UVR8, MYB73-TAP/MYB77-TAP in the total protein extract. UVR8-IP: the IP products precipitated by the anti-UVR8 antibody. Total proteins (Input) or IP products were probed, in immunoblots with antibodies to UVR8 or Myc.

D. Schematic representation of MYB73/MYB77 and UVR8 used in this work. MYB73/MYB77 contains a R2R3 domain and a C terminal. UVR8 contains seven repeats of a β-propeller fragment and a C terminal (including C27 domain).

E. BiFC assays showing that both of UVR8N and UVR8C interact with the R2R3 DNA-binding domain of MYB73/MYB77.

F and G. pull-down assays showing that R2R3 domain of MYB73 could bind the N terminal (F) and C terminal (G) of UVR8.

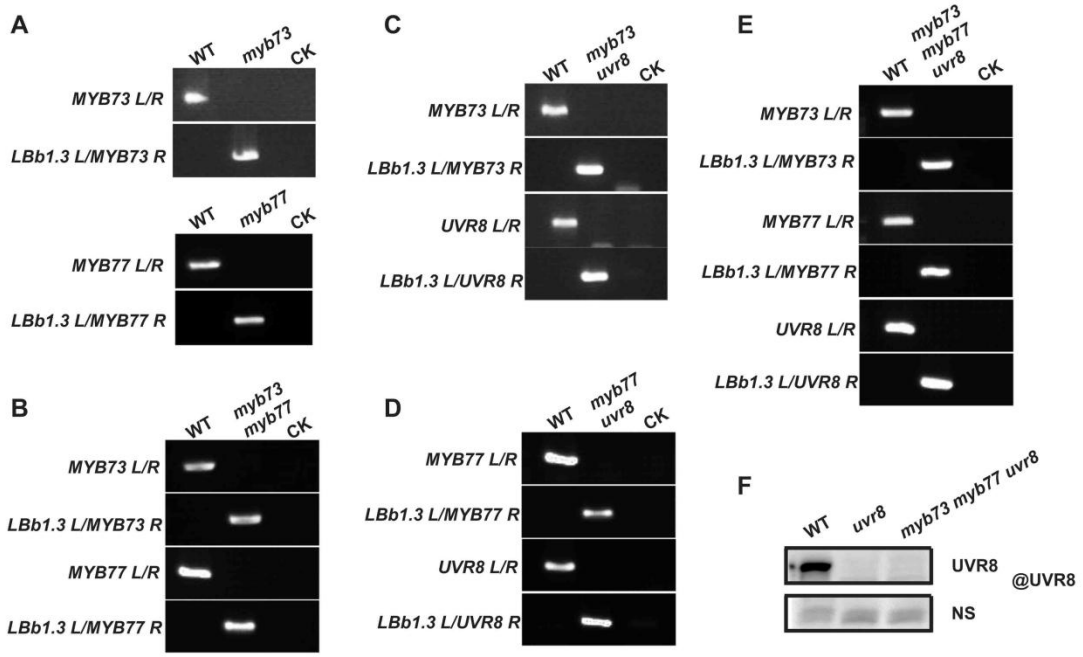
H and I. Pull-down assays showing that both the R2R3 domain and the C terminal of MYB77 could interact with the N terminal of UVR8 (H), but only the R2R3 domain of MYB77 could bind the C terminal of UVR8 (I).



Appendix Figure S5. UV-B slightly induces the transcription of *MYB73/MYB77* but does not affect their protein stability.

A and B. qPCR assays showing that UV-B slightly induces the expression of *MYB73* (A) and *MYB77* (B) in a UVR8-independent manner. 6-d-old seedlings grown in constant white light were transferred to UV-B for the indicated time. The *ACT7* gene was analyzed as an internal control. Error bars are SD of three biological replicates.

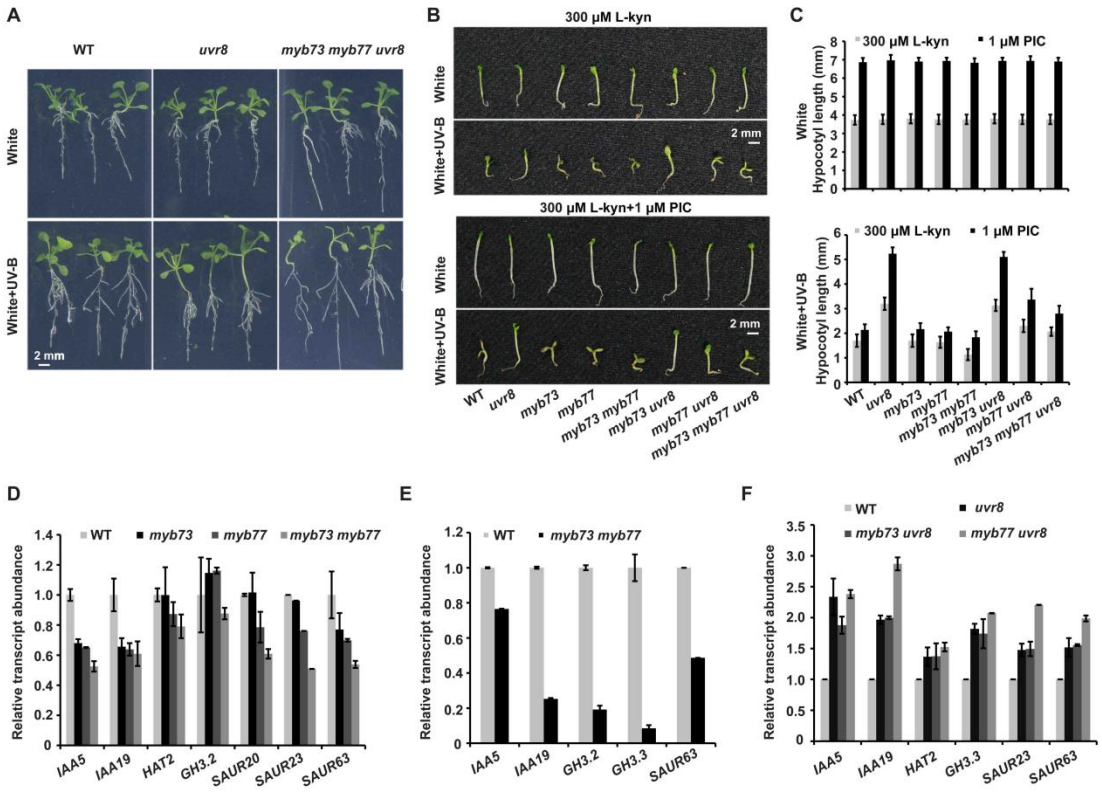
C and D. Immunoblots showing that the lack of UV-B effects on the abundance of the MYB73(C) /MYB77(D) protein. Transgenic plants expressing *35S:MYB73-TAP or 35S::MYB77-TAP* plants were grown in 22°C continuous white light condition for 6 days, and kept in white light or transferred to white plus UV-B light for a 5-h time course. Samples were fractionated by 10% SDS-PAGE, blotted, and probed with the anti-MYC antibody. NS (non-specific band).



Appendix Figure S6. Genotyping of mutants

A-E. PCR results show the genotyping of the indicated mutants. Primers used in the PCR reaction are labeled in the left. CK (control: without DNA template).

F. Immunoblots show UVR8 in indicated genotypes. Samples were fractionated by 10% SDS-PAGE, blotted, and probed with the anti-UVR8 antibody. NS (non-specific band).



Appendix Figure S7. MYB73/MYB77 work redundantly to mediate UVR8-controlled auxin responses.

A. m*yb73 myb77 uvr8* can partially rescue the phenotype of *uvr8*. Seedlings of indicated genotypes were grown in LD condition for 5 days, then transplanted to new medium containing 0.4 μM NAA and roots were covered, then kept in continuous white or white light plus UV-B condition for 10 days; scale bar = 2 mm.

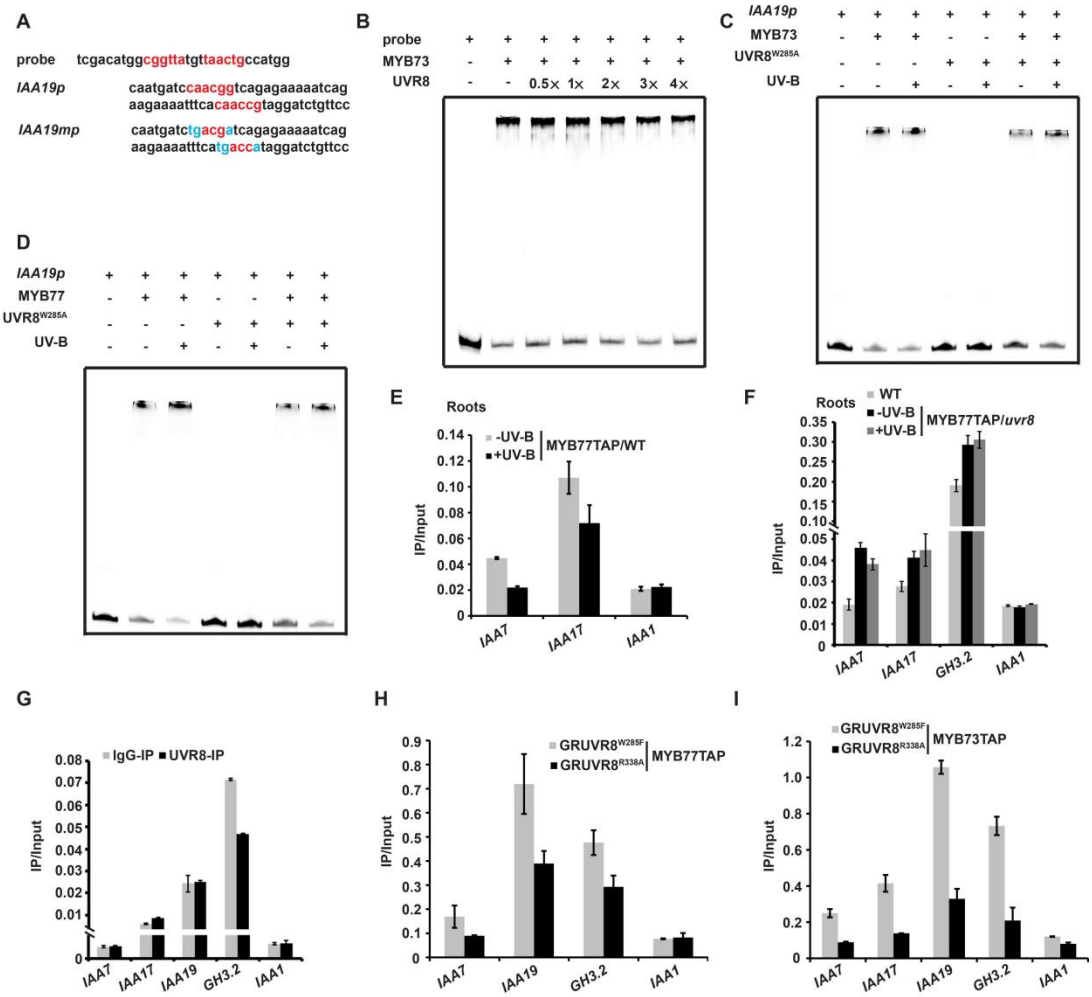
B and C. MYB73/MYB77 acts downstream of UVR8 to mediate UV-B signaling. Seedlings of the indicated genotypes were grown in continuous white light or white plus UV-B light for 6d, Images of representative seedlings are shown in (B); scale bars = 2 mm. The hypocotyl lengths of the indicated genotypes were measured and shown in (C). Standard deviations (n > 15) are indicated.

D. Quantitative RT-PCR analyses of auxin-signaling genes expression in wild type (Col-0),

myb73, *myb77* and *myb73myb77*. Seedlings were grown in continuous white light for 5 days, then transferred to UV-B for 1 day with addition of 1 μM IAA. Error bars are SD of three biological replicates.

E. qPCR assay analyses the expression of indicated genes in WT and *myb73myb77*. WT and *myb73 myb77* protoplasts were kept in white plus UV-B light condition for 16 h. *ACT7* gene was analyzed as an internal control. Error bars are SD of three biological replicates.

F. Quantitative RT-PCR analyses of genes expression of *MYB73/MYB77* target genes. 5-d-old seedlings grown in continuous white light were transferred to UV-B and treated with 1 μM IAA for 1d. Error bars are SD of three biological replicates.



Appendix Figure S8. UV-B inhibits the DNA-binding activity of MYB73/MYB77 in a

UVR8-dependent manner.

A. DNA sequences of the probe including the MBSI motif. The *IAA19p* is the wild-type *IAA19* promoter contained MBSI (*IAA19p*) and mutated MBSI (*IAA19mp*) was used as competitor. Red represents the MBSI and the blue represents the mutated nucleotides.

B. EMSA showing that UVR8 has a strong effect on inhibiting MYB73 to bind DNA under UV-B. MYB73 and UVR8 protein were expressed and purified from *E.coli*. The reaction mixture was treated with UV-B light for 30 min.

C and D. EMSA results showing that $UVR8^{W285A}$ inhibits the MYB73 (C) and MYB77 (D) to bind the promoter of *IAA19* in vitro.

E and F. ChIP-qPCR showing that UV-B inhibits the DNA-binding activity of MYB77 (E) in roots in a UVR8-dependent manner (F). ChIP-qPCR assays were performed using transgenic seedlings expressing *35S::MYB77-TAP/WT* or *35S::MYB77-TAP/uvr8*, which were treated with or without UV-B for 5 hours before harvesting samples. Chromatin fragments (~500bp) were immunoprecipitated by anti-Myc antibody, and the precipitated DNA was analyzed by qPCR using the primer pairs indicated. The IP/Input ratios are shown with SDs (n=3).

G. ChIP-qPCR showing that UVR8 cannot bind the promoters of MYB73/MYB77 target genes. The IP/Input ratios are shown with SDs (n=3).

H and I. ChIP-qPCR results show monomeric UVR8 ($UVR8^{R338A}$) can strongly inhibit the DNA-binding activity of MYB77(H)/MYB73(I). The IP/Input ratios are shown with SDs (n=3).

Table S1. Primer list

myb73-F	AGAGAGTGGAAGAAACGCTCC
myb73-R	CCTCCGGAGATAGCTGGTTAC
myb77-F	GATGAGCAGCTACGAAGGATG
myb77-R	TGGTTATGAATCACCAAAACAAG
MYB73q-F	GAGGAGTTACATGGCGGATT
MYB73q-R	CTTTGTGGCATACACGAACC
MYB77q-F	TAAGGCGGAAGTGAGGAGTT
MYB77q-R	TCCAATTTGACTCATCGGAA

MYB73nYFP/nLUC-F	GGGGACAAGTTTGTACAAAAAAGCAGGCTTC ATGTCAAACCCGACCCGTAAG
MYB73nYFP/nLUC-R	GGGGACCACTTTGTACAAGAAAGCTGGGTCCTCCATCTTC CCAATTCCGAT
MYB77nYFP/nLUC-F	GGGGACAAGTTTGTACAAAAAAGCAGGCTTCATGGCGGA TCGTGTTAAAGGT
MYB77nYFP/nLUC-R	GGGGACCACTTTGTACAAGAAAGCTGG GTCCTCAACCTTAGGTGTTATTACTCCA
MYB70-nLUC-F	GGGGACAAGTTTGTACAAAAAAGCAGGCTTCATGTCTGG TTCGACCCGGA
MYB70-nLUC-R	GGGGACCACTTTGTACAAGAAAGCTGGGTCCTCGATCCTA CCTAATCCAATAAA
MYB44-nLUC-F	GGGGACAAGTTTGTACAAAAAAGCAGGCTTCATGGCTGA TAGGATCAAAGGTCC
MYB44-nLUC-R	GGGGACCACTTTGTACAAGAAAGCTGGGTCCTCGATTCTC CCAACTCCAAT
MYB73pCold-F	CCGCTCGAGATGTCAAACCCGACCCGTAAG
MYB73pCold-R	GGAATTCCTACTCCATCTTCCCAATTCCG
MYB77pCold-F	CCGCTCGAGATGGCGGATCGTGTTAAAGGT
MYB77pCold-R	GGAATTCCTACTCAACCTTAGGTGTTATTACTCCA
MYB73N-nYFP-F	GGGGACAAGTTTGTACAAAAAAGCAGGCTTC ATGTCAAACCCGACCCGTAAG
MYB73N-nYFP-R	GGGGACCACTTTGTACAAGAAAGCTGGGTCACTTTGCCCT TCGACGCTG
MYB73C-nYFP-F	GGGGACAAGTTTGTACAAAAAAGCAGGCTTCATGTGTGA TTTTGGTGGTAATGGAGG
MYB73C-nYFP-R	GGGGACCACTTTGTACAAGAAAGCTGGGTCCTCCATCTTC CCAATTCCGAT
MYB77N-nYFP-F	GGGGACAAGTTTGTACAAAAAAGCAGGCTTCATGGCGGA TCGTGTTAAAGGT
MYB77N-nYFP-R	GGGGACCACTTTGTACAAGAAAGCTGGGTCCTCCGTCTCC GTCACCGTC
MYB77C-nYFP-F	GGGGACAAGTTTGTACAAAAAAGCAGGCTTC ATGGAAGATCAGGATCGGCCGA
MYB77C-nYFP-R	GGGGACCACTTTGTACAAGAAAGCTGG GTCCTCAACCTTAGGTGTTATTACTCCA
MYB73N-pCold-F	CCGCTCGAGATGTCAAACCCGACCCGTAAG
MYB73N-pColdR	GGAATTCCTAACTTTGCCCTTCGACGCTG
MYB73C-pCold-F	CCGCTCGAGATGTGTGATTTTGGTGGTAATGGAGG
MYB73C-pCold-R	GGAATTCCTACTCCATCTTCCCAATTCCG
MYB77N-pCold-F	CCGCTCGAGATGGCGGATCGTGTTAAAGGT

MYB77N-pCold-R	GGAATTCCTACTCCGTCTCCGTCACCGTC
MYB77C-pCold-F	CCGCTCGAGATGGAAGATCAGGATCGGCCGA
MYB77C-pCold-R	GGAATTCCTACTCAACCTTAGGTGTTATTACTCCA
MYB73-TAP-F	TAGTTAATTAAATGTCAAACCCGACCCGTAA
MYB73-TAP-R	CGAGGCGCGCCACTCCATCTTCCCAATTCCGAT
MYB77-TAP-F	TAGTTAATTAAATGGCGGATCGTGTTAAAGG
MYB77-TAP-R	CGAGGCGCGCCACTCAACCTTAGGTGTTATTACTCCACA
IAA5q-F	AGAAAGAACAGTCTCGAACGGAC
IAA5q-R	AGAATTTGCAGAGCGGAAGC
SAUR20q-F	CTTGAATCTTTTCATACATCTTCAGAAG
SAUR20q-R	TAACTAGGAAGAAAAATGTTGGCTCA
SAUR23q-F	ATTCAAACTTTCAGACAAAAGAAATGG
SAUR23q-R	ACAAGGAAACAACTCTATCTCTAACT
SAUR63q-F	GTGTCTTTACTAGCAGCTCTTCTACTGT
SAUR63q-R	GTGATTGGTCCTTCCGTTGG
HAT2q-F	AACCATCACCACAATCACAGGC
HAT2q-R	CATCCAAAATTACAATGACCCCA
IAA19q-F	GATAAGCTCTTCGGTTTCCG
IAA19q-R	TCGCAGTTGTCACCATCTTT
GH3.2q-F	CCTCTTCAATCTCGGATGGT
GH3.2q-R	GTCAGGGTTCCGAGTCATTT
GH3.3q-F	TTGTCCAGACTCATCCCAAA
GH3.3q-R	CTTCGTGACGCATAAGGAGA
MBSI-F	TCGACATGGCGGTTATGTTAACTGCCATGG
MBSI-R	CCATGGCAGTTAACATAACCGCCATGTCGA
IAA19p-EMSA-F	CAATGATCCAACGGTCAGAGAAAAATCAGAAGAAAATTT CACAACCGTAGGATCTGTTCC
IAA19p-EMSA-R	GGAACAGATCCTACGGTTGTGAAATTTTCTTCTGATTTTTC TCTGACCGTTGGATCATTG
IAA19pm-EMSA-F	CAATGATCTGACGATCAGAGAAAAATCAGAAGAAAATTT CATGACCATAGGATCTGTTCC
IAA19pm-EMSA-R	GGAACAGATCCTATGGTCATGAAATTTTCTTCTGATTTTTC TCTGATCGTCAGATCATTG
IAA1ChIP-F	TAGAAGGACGAAGGTCGAGAAGTT
IAA1ChIP-R	TACTTTAACGGAGAAGCTCTCTTCC
IAA7ChIP-F	AAACATCACTACCACGTAACTGTTG
IAA7ChIP-R	TTTTCTTCATTGGTGGGGTTTAT
IAA17ChIP-F	GCTTCGAATGTGTTTCATAATTCAC
IAA17ChIP-R	AGCCCTTTGATTAAGTCATCATCC
IAA19ChIP-F	CATGGGATGTTAGGAGAAGGAGAT

IAA19ChIP-R	TGTTATTCAGTTTGTGTGGGGAG
GH3.2ChIP-F	CGTTGATTAACTTAAAGTCACTCCG
GH3.2ChIP-R	TGTCACAGGGTTGTAGCCGAG

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