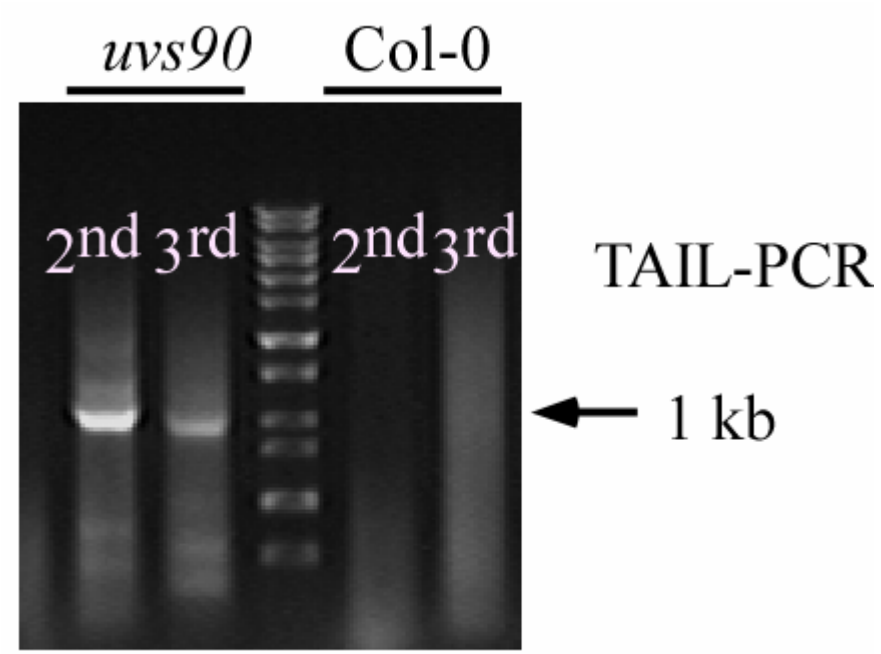
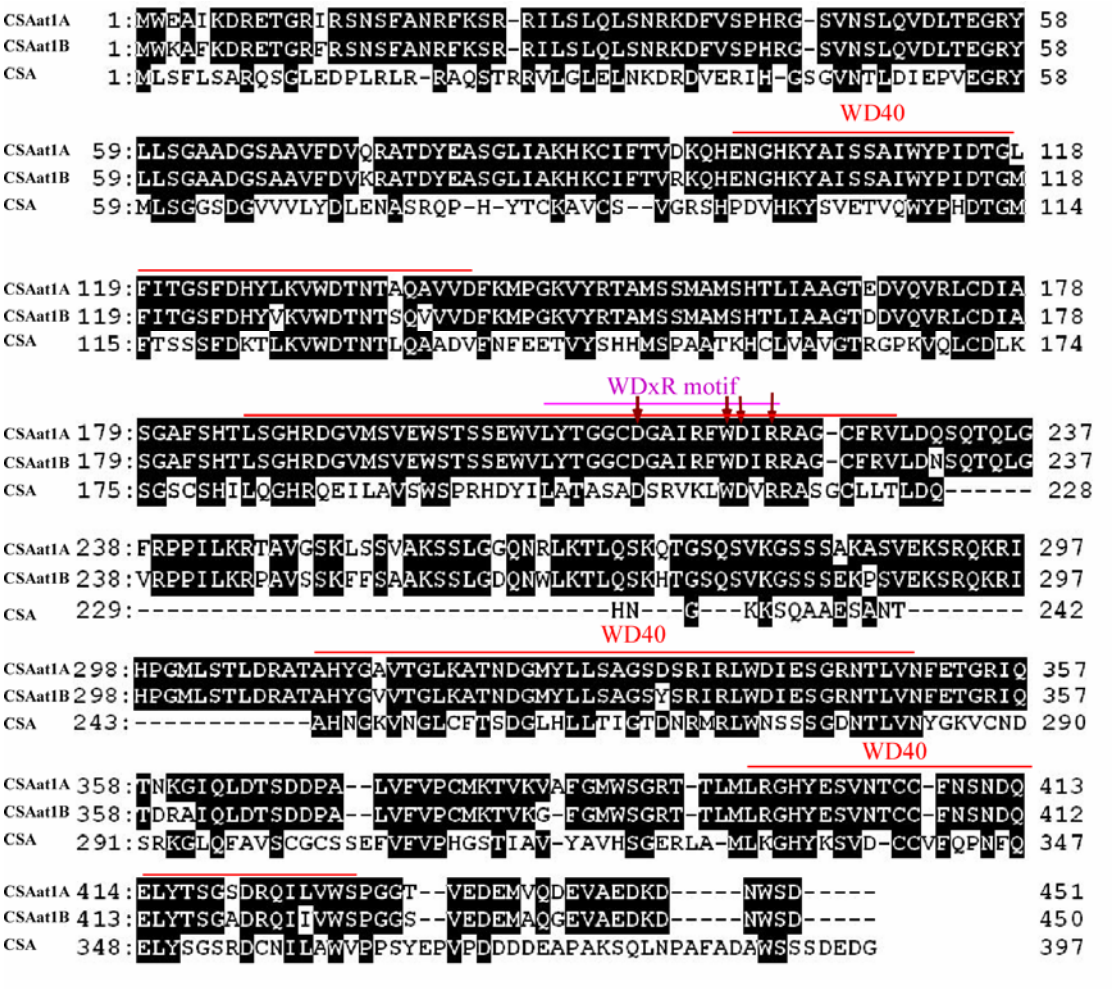


Supplemental Figure 1. *uvs90* gene cloning

The T-DNA insertion in *uvs90* was identified using thermal asymmetric interlaced (TAIL)-PCR. Three rounds of amplification were performed; the second (2^{nd}) and third (3^{rd}) round products were analyzed using agarose electrophoresis. Amplification in wild type (Col-0) was included as a control.

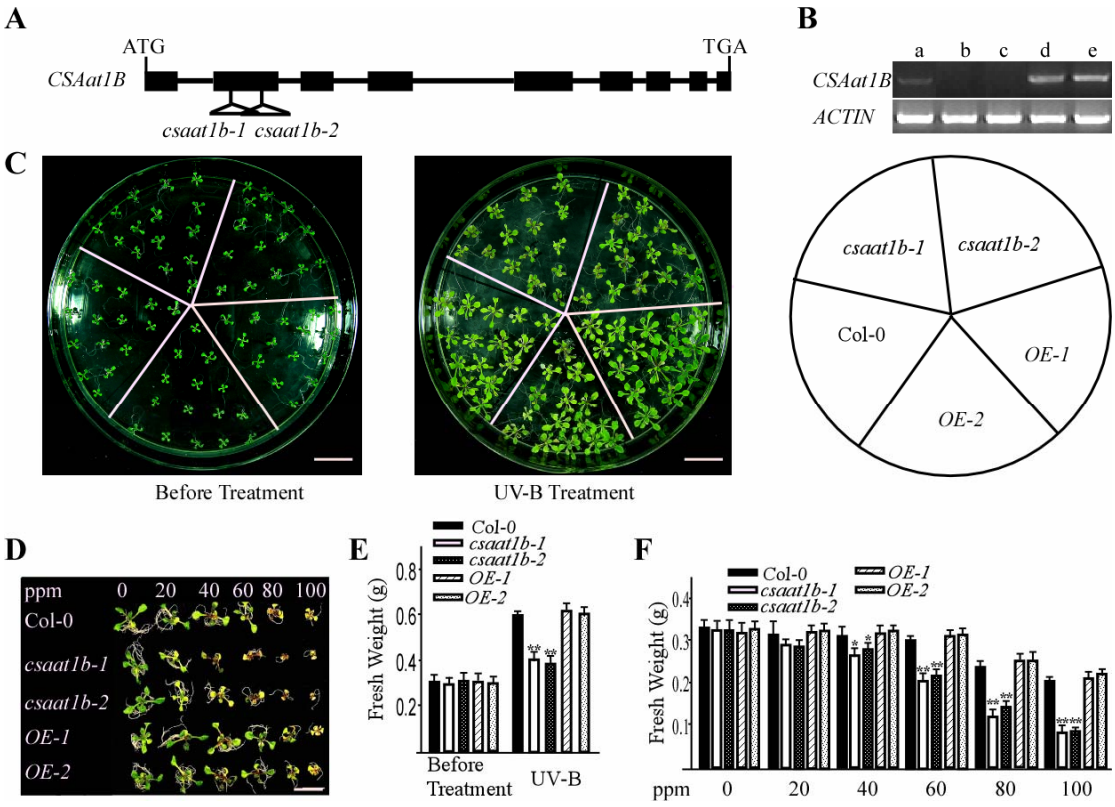
1



Supplemental Figure 2. Sequence alignment of CSA, CSAat1A and CSAat1B

The WD40 domain, red line; the WDxR motif in the WD40 domain, purple line; "x", an undefined amino acid; the D212, W218, D219 and R221 amino acids within the WDxR motif, arrows. CSA, human Cockayne syndrome gene A; CSAat1A and CSAat1B, *Arabidopsis* CSA-like proteins.

2



Supplemental Figure 3. ***csaat1b*** **knockout mutants are sensitive to UV-B and MMS**

(A) Gene structure of *CSAat1B* with T-DNA insertion sites found in *csaat1b* mutants. Exons, filled black rectangles; introns, solid lines.

(B) Expression of *CSAat1B* in wild-type and *csaat1b* mutant seedlings, and mutant seedlings over-expressing (OE) *CSAat1B*; RT-PCR products after 30 cycles with gene-specific primers and *ACTIN* as a loading control. a, Col-0; b, *csaat1b-1*; c, *csaat1b-2*; d, *35Spro-CSAat1B-Flag* in *csaat1b-1* (*OE-1*); e, *35Spro-CSAat1B-Flag* in *csaat1b-2* (*OE-2*).

(C) Twelve-day-old wild-type, *csaat1b* mutants and *CSAat1B* OE seedlings were treated with UV-B (130 μmol m^{-2} s^{-1}) for 30 min. After treatment, plants were transferred to a growth chamber for 5 d and then photographed. Bars=1 cm.

(D) Six-day-old wild-type, *csaat1b* mutant and *CSAat1B* OE seedlings were treated with the indicated concentrations of MMS. Photographs were taken 10 d after treatment. Bar=1 cm.

(E) The fresh weight of 20 seedlings from each group shown in C was measured. All

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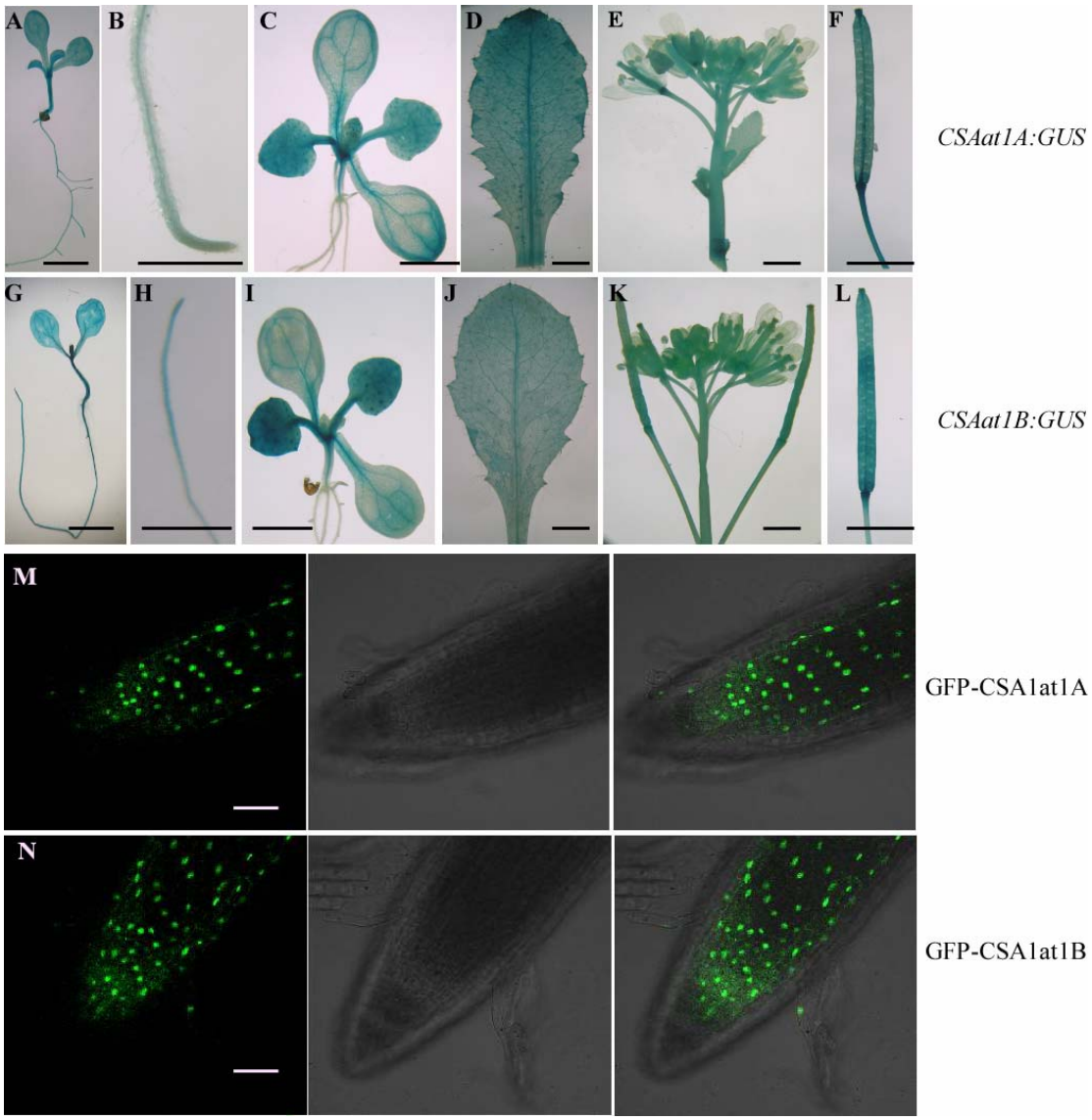
data represent means ± SE of at least five replicate experiments (Student’ s t test, **P<0.01).

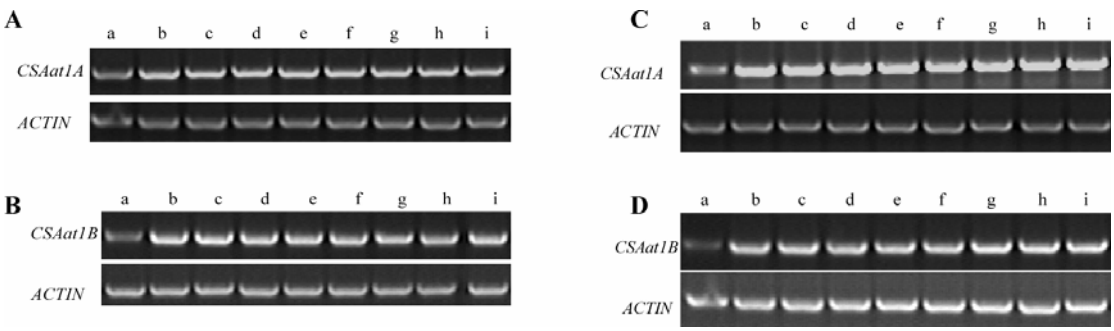
(F) The fresh weight of 10 seedlings from each group shown in D was measured. All data represent means ± SE of at least five replicate experiments (Student’s t test, *P < 0.05 and **P<0.01).



Supplemental Figure 4. Tissue-specific expression and subcellular localization of CSAat1A and B

Expression patterns of the *GUS* reporter gene in *CSAat1A:* and *B:GUS* transgenic *Arabidopsis*. GUS activity was examined in eight-day-old seedlings **(A, G)**, the roots and **(B, H)**, shoots of fifteen-day-old seedlings **(C, I)**, forty-day-old rosette leaves **(D, J)**, fifty-day-old flowers **(E, K)**, fifty-day-old siliques **(F, L)**. Bars=0.3 cm.

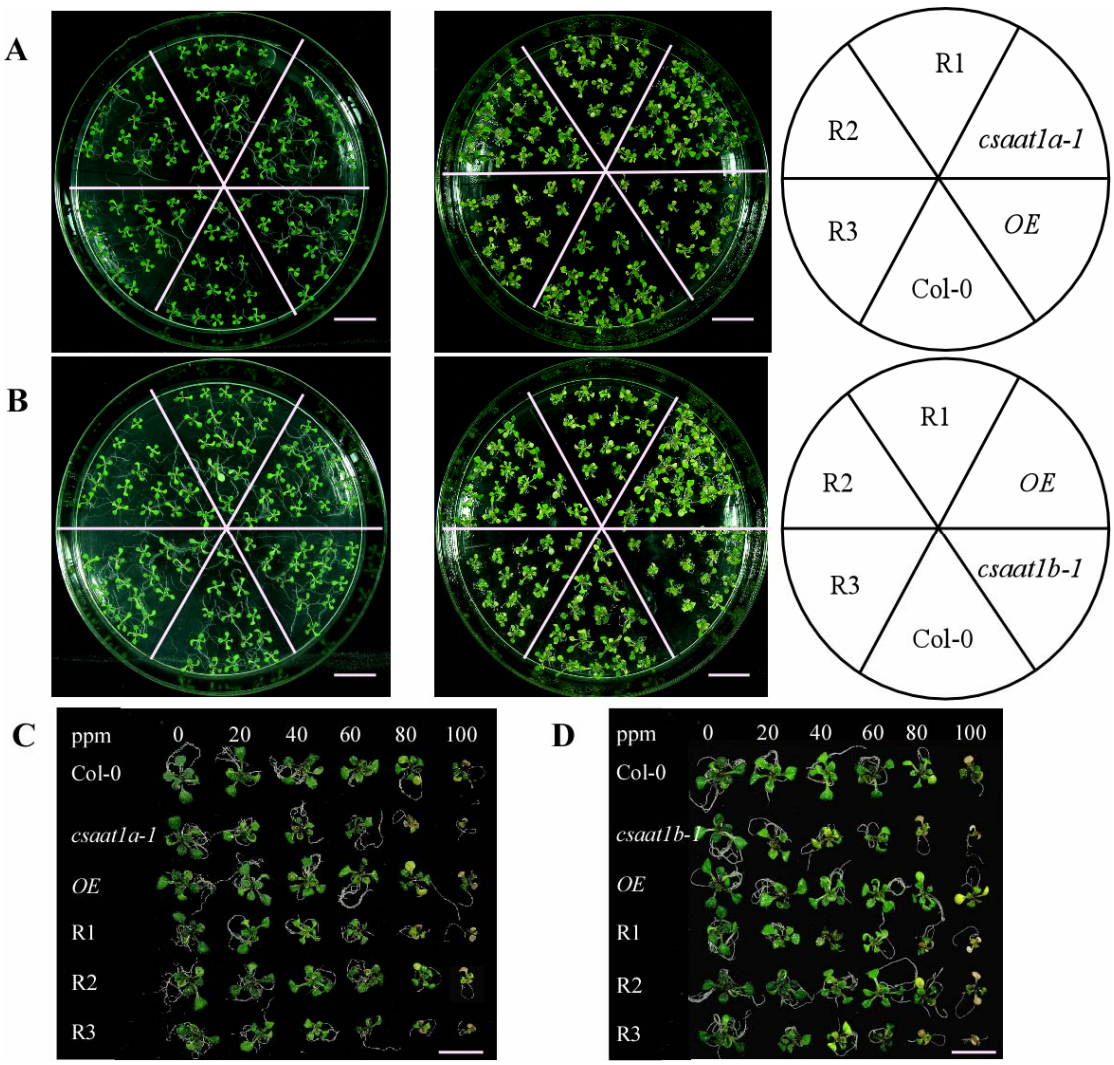
(M-N) GFP-CSAat1A and B localization. Seven-day-old transgenic *35Spro-GFP-CSAat1A* (M) and *35Spro-GFP-CSAat1B* (N) seedlings were examined. Left panels, confocal GFP images; middle panels, bright-field images; right panels, combined bright-field and GFP images. Bars=20 μm.



Supplemental Figure 5. Expression of CSAat1A and B point mutations in transgenic *Arabidopsis* plants

(A-B) a, expression of *CSAat1A* or *B* in wild type; b, expression of *35Spro-CSAat1A*- or *B-Flag*; c, *35Spro-CSAat1A*^{D212}- or *B*^{D212}*-Flag*; d, *35Spro-CSAat1A*^{W218A}- or *B*^{W218A}*-Flag*; e, *35Spro-CSAat1A*^{D219A}- or *B*^{D219A}*-Flag*; f, *35Spro-CSAat1A*^{R221A}- or *B*^{R221A}*-Flag*; g, *35Spro-CSAat1A*^{L206A}- or *B*^{L206A}*-Flag*; h, *35Spro-CSAat1A*^{T208A}- or *B*^{T208A}*-Flag* and i, *35Spro-CSAat1A*^{R216A}- or *B*^{R216A}*-Flag* in their corresponding mutants. RT-PCR products after 30 cycles with gene-specific primers and *ACTIN* as a loading control. Three replicate experiments were performed.

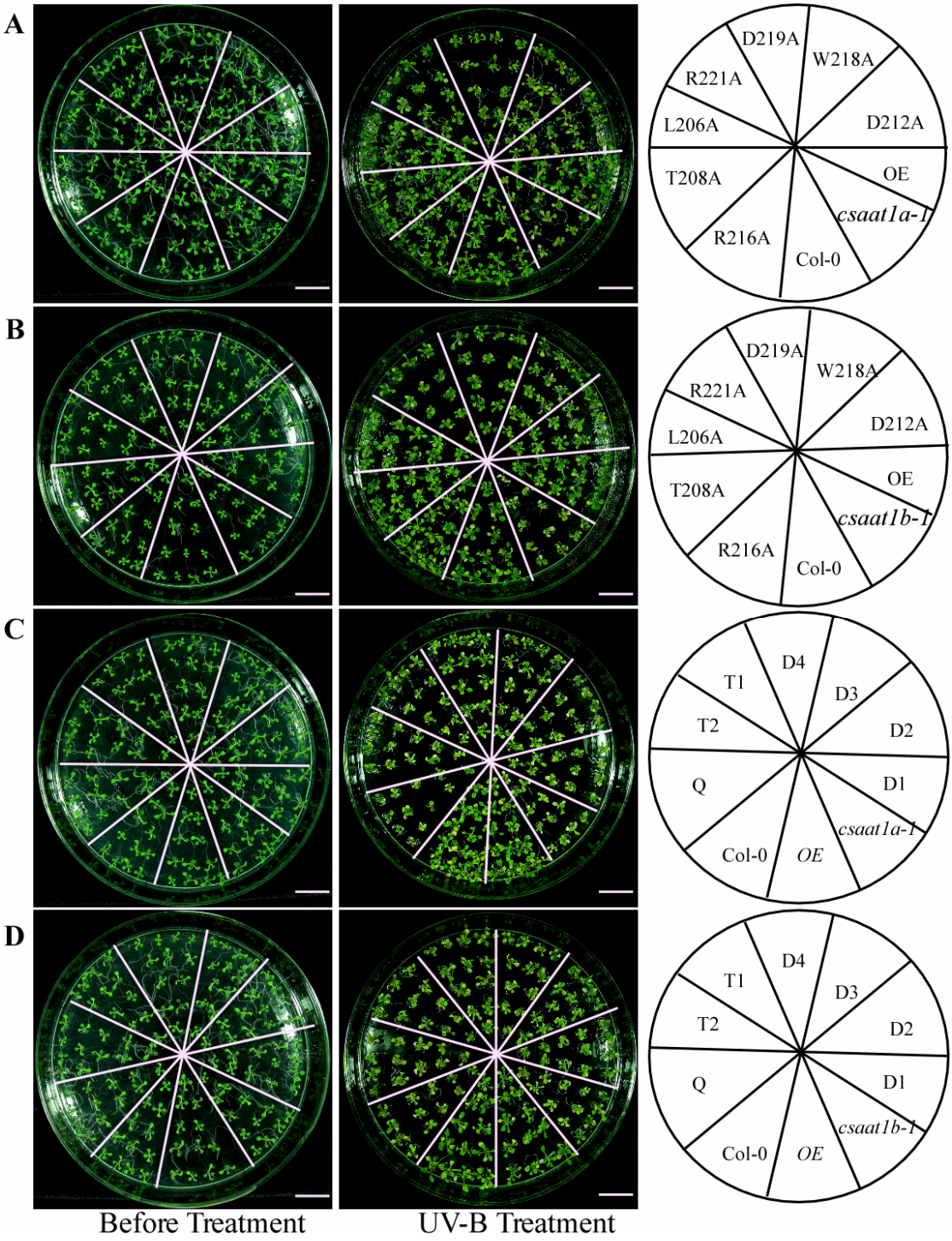
(C-D) a, expression of *CSAat1A* or *B* in wild type; b, expression of *35Spro-CSAat1A* or *B-Flag*; c, *35Spro-CSAat1A*^{D212AW218A}- or *B*^{D212AW218A}*-Flag*; d, *35Spro-CSAat1A*^{D212AD219A}- or *B*^{D212AD219A}*-Flag*; e, *35Spro-CSAat1A*^{D212AR221A}- or *B*^{D212AR221A}*-Flag*; f, *35Spro-CSAat1A*^{D212AL206A}- or *B*^{D212AL206A}*-Flag*; g, *35Spro-CSAat1A*^{D212AW218AD219A}- or *B*^{D212AW218AD219A}*-Flag*; h, *35Spro-CSAat1A*^{W218AD219AR221A}- or *B*^{W218AD219AR221A}*-Flag*, and i, *35Spro-CSAat1A*^{D212AW218AD219AR221A}- or *B*^{D212AW218AD219AR221A}*-Flag* in their corresponding mutants. RT-PCR products after 30 cycles with gene-specific primers and *ACTIN* as a loading control. Three replicate experiments were performed.



Supplemental Figure 6. Expression of the R2 region of *CSAat1A* or *B* in *csaat1a* or *b* mutants partially rescues their UV-B- and MMS-sensitive phenotypes

(A-B) UV-B sensitivity of transgenic plants harboring different fragments of *CSAat1A* (A) and *CSAat1B* (B). Col-0, twelve-day-old; *csaat1a*- or *b*-; OE, *35Spro-CSAat1A*- or *B-Flag*; R1, *35Spro-CSAat1A*- or *B-R1-Flag*; R2, *35Spro-CSAat1A*- or *B-R2-Flag*; R3, *35Spro-CSAat1A*- or *B-R3-Flag* in the *csaat1a* or *b* backgrounds were treated with UV-B (130 μmol m^{-2} s^{-1}) for 30 min. After treatment, plants were transferred to a growth chamber for 5 d and then photographed. Bars=1 cm.

(C-D) Six-day-old transgenic plants as in A and B were treated with the indicated concentrations of MMS. Photographs were taken 10 d after treatment. Bars=1 cm.

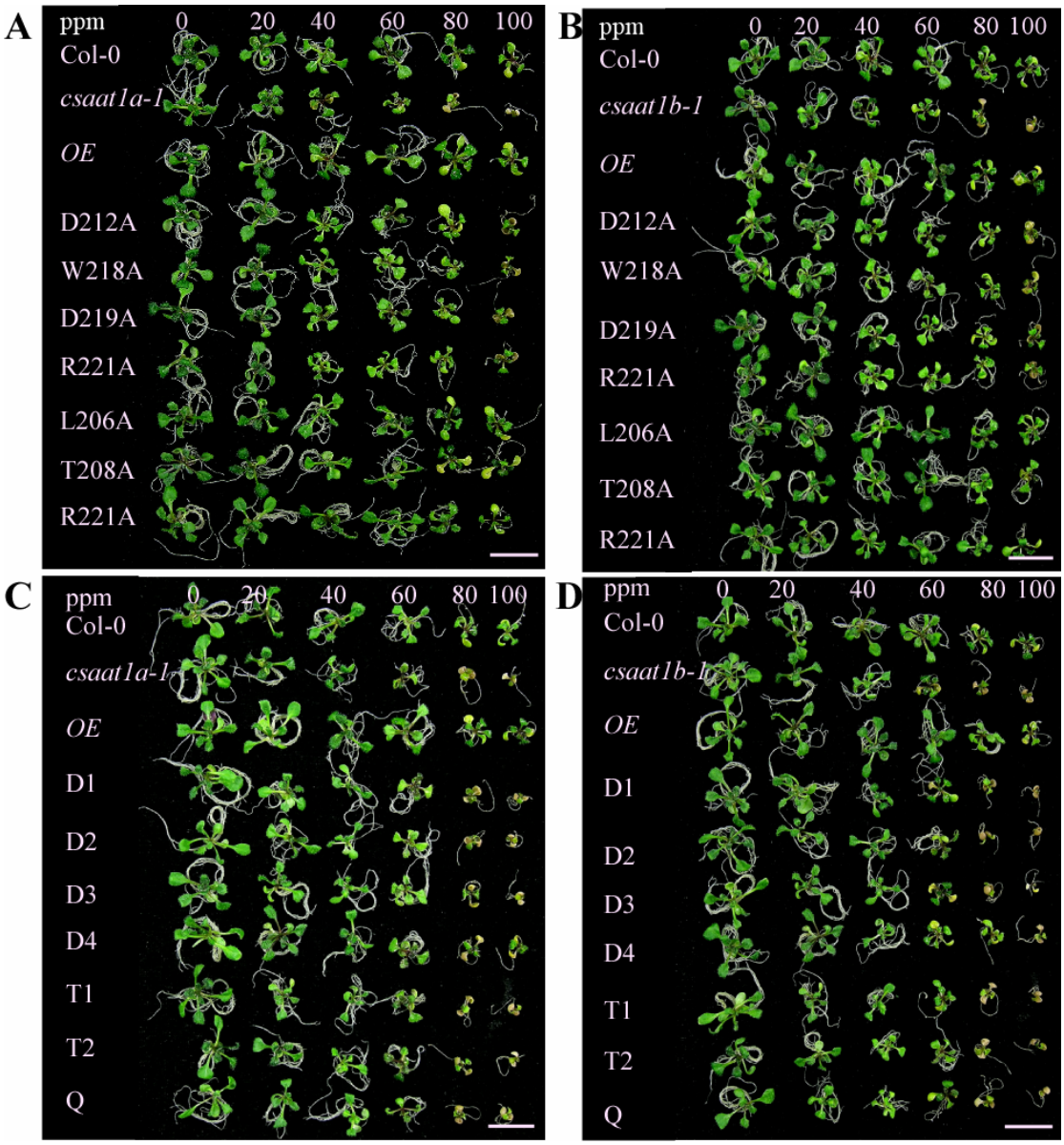


Supplemental Figure 7. Mutations in the WDxR motif of *CSAat1A* and *B* impair UV-B tolerance in *Arabidopsis*

(A-B) Effect of single amino-acid mutations on *csaat1a* (A) and *csaat1b* (B) UV-B sensitivity. Col-0, wild type; *csaat1a* or *b*; OE, *35Spro-CSAat1A*- or *B-Flag*; D212A, *35Spro-CSAat1A*^{D212A}- or *B*^{D212A}*-Flag*; W218A, 35S*pro-CSAat1A*^{W218A}- or *B*^{W218A}*-Flag*; D219A, *35Spro-CSAat1A*^{D219A}*- or B*^{D219A}*-Flag*; R221A,

35Spro-CSAat1A^{R221A}- or *B*^{R221A}*-Flag*; L206A, *35Spro-CSAat1A*^{L206A}- or *B*^{L206A}*-Flag*; T208A, *35Spro-CSAat1A*^{T208A}- or *B*^{T208A}*-Flag*; R216A, *35Spro-CSAat1A*^{R216A}- or *B*^{R216A}*-Flag* transgenic plants in the *csaat1a* or *b* backgrounds were treated with UV-B as described in Figure 7. Bars=1 cm.

(C-D) Effect of multiple amino-acid mutations on *csaat1a* (C) and *csaat1b* (D) UV-B sensitivity. Col-0, wild type; OE, *35Spro-CSAat1A* or *B-Flag*; *csaat1a* or *b*; D1, *35Spro-CSAat1A*^{D212AW218A}- or *B*^{D212AW218A}*-Flag*; D2, *35Spro-CSAat1A*^{D212AD219A} - or *B*^{D212AD219A} *–Flag*; D3, *35Spro-CSAat1A*^{D212AR221A}- or *B*^{D212AR221A}*-Flag*; D4, *35Spro-CSAat1A*^{D212AL206A}- or *B*^{D212AL206A}*-Flag*; T1, *35Spro-CSAat1A*^{D212AW218AD219A}- or *B*^{D212AW218AD219A}*-Flag*; T2, *35Spro-CSAat1A*^{W218AD219AR221A}- or *B*^{W218AD219AR221A}*-Flag* and Q, *35Spro-CSAat1A*^{D212AW218AD219AR221A}- or *B*^{D212AW218AD219AR221A}*-Flag* were treated with UV-B as described in Figure 7. Bars=1 cm.



Supplemental Figure 8. Mutations in the WDxR motif impair MMS tolerance in *Arabidopsis*

(A-B) Effect of single amino-acid mutation on *csaat1a* (A) and *csaat1b* (B) MMS sensitivity. Col-0, six-day-old wild type; *csaat1a* or *b*; OE, *35Spro-CSAat1A*- or *B-Flag*; D212A, *35Spro-CSAat1A*^{D212A}- or *B*^{D212A}*-Flag*; W218A, *35Spro-CSAat1A*^{W218A}- or *B*^{W218A}*-Flag*; D219A, *35Spro-CSAat1A*^{D219A}- or *B*^{D219A}*-Flag*; R221A, *35Spro-CSAat1A*^{R221A}- or *B*^{R221A}*-Flag*; L206A, *35Spro-CSAat1A*^{L206A}- or *B*^{L206A}*-Flag*; T208A, *35Spro-CSAat1A*^{T208A}- or *B*^{T208A}*-Flag*; R216A, *35Spro-CSAat1A*^{R216A}- or *B*^{R216A}*-Flag* transgenic plants in *csaat1a* or *b* background were treated with the indicated concentrations of MMS. Bars=1 cm.

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(C-D) Effect of multiple amino-acid mutations on *csaat1a* (C) and *csaat1a* (D) MMS sensitivity. Col-0, six-day-old wild type; *csaat1a* or *b*; OE, 35S*pro-CSAat1A*- or *B-Flag*; D1, *35Spro-CSAat1A*^{D212AW218A}- or *B*^{D212AW218A}*-Flag*; D2, *35Spro-CSAat1A*^{D212AD219A}- or *B*^{D212AD219A}*-Flag*; D3, *35Spro-CSAat1A*^{D212AR221A}- or *B*^{D212AR221A}*-Flag*; D4, *35Spro-CSAat1A*^{L206AD212A}- or *B*^{AL206AD212A}*-Flag*; T1, *35Spro-CSAat1A*^{D212AW218AD219A}- or *B*^{D212AW218AD219A}*-Flag*; T2, *35Spro-CSAat1A*^{W218AD219AR221A}- or *B*^{W218AD219AR221A}*-Flag* and Q, *35Spro-CSAat1A*^{D212AW218AD219AR221A}- or *B*^{D212AW218AD219AR221A}*-Flag* transgenic plants in the *csaat1a* or *b* background were treated with the indicated concentrations of MMS. Bars=1 cm**.**

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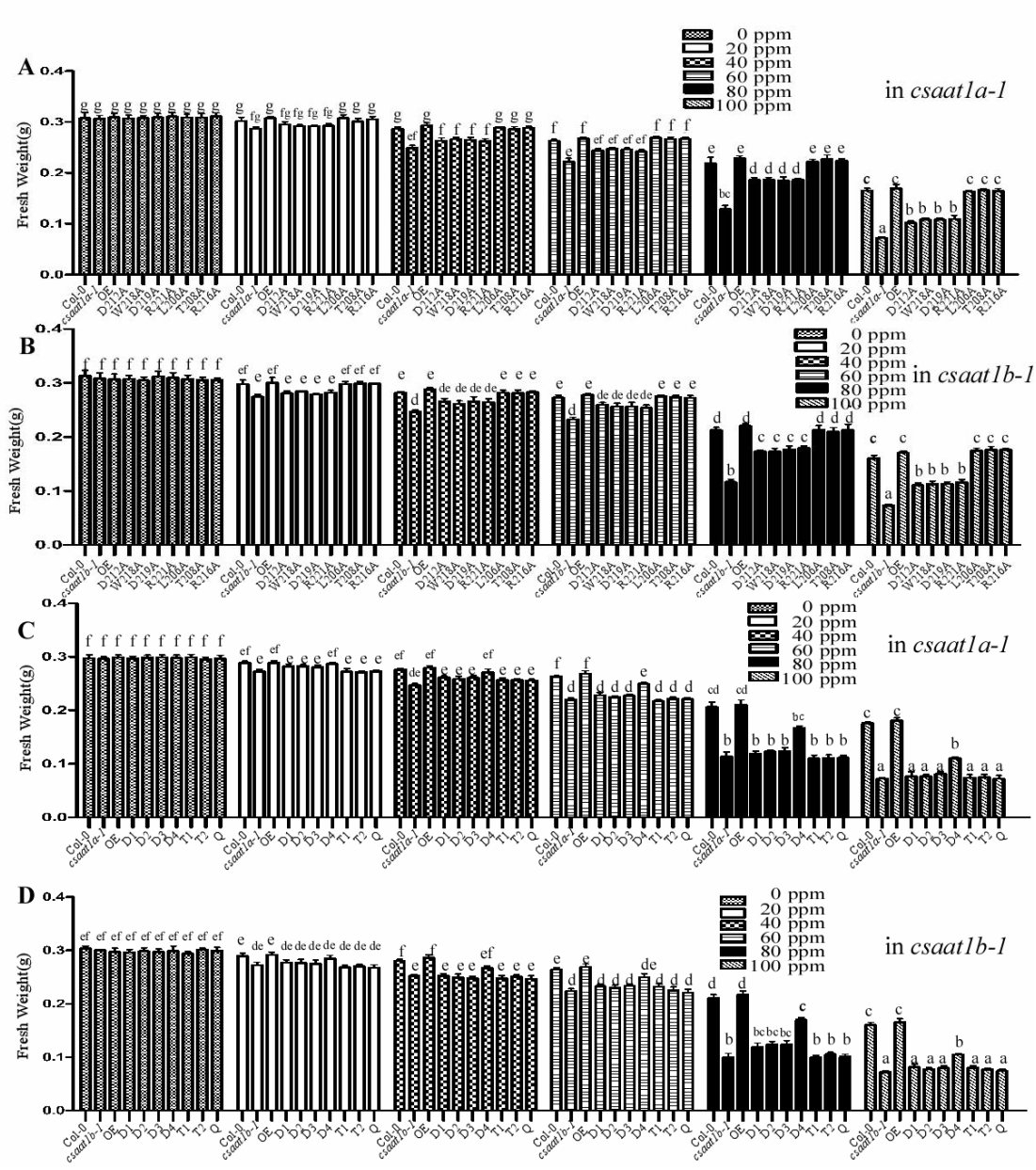

Supplemental Figure 9. Fresh weight of transgenic plants expressing different point mutations in the WDxR motif of CSAat1A or B after MMS treatment

(A-B) Col-0, wild type; *csaat1a* or *b*; OE, *35Spro-CSAat1A*- or *B-Flag*; D212A, *35Spro-CSAat1A*^{D212A}- or *B*^{D212A}*-Flag*; W218A, *35Spro-CSAat1A*^{W218A}- or *B*^{W218A}*-Flag;* D219A, *35Spro-CSAat1A*^{D219A}- or *B*^{D219A}*-Flag*; R221A, *35Spro-CSAat1A*^{R221A}- or *B*^{R221A}*-Flag*; L206A, *35Spro-CSAat1A*^{L206A}- or *B*^{L206A}*-Flag*; T208A, *35Spro-CSAat1A*^{T208A}- or *B*^{T208A}*-Flag*; R216A, *35Spro-CSAat1A*^{R216}- or *B*^{R216}*-Flag* transgenic plants in the *csaat1a* or *b* background were treated with the indicated concentrations of MMS. The fresh weight of 10 seedlings in each group was measured. All data represent means ± SE of at least five replicate experiments.

Significant differences (P≤0.05, Student's t test) are indicated by different lowercase letters.

(C-D) Col-0, wild type; *csaat1a* or *b*; OE, *35Spro-CSAat1A*- or *B-Flag*; D1, *35Spro-CSAat1A*^{D212AW218A}- or *B*^{D212AW218A}*-Flag*; D2, *35Spro-CSAat1A*^{D212AD219A}- or *B*^{D212AD219A}*-Flag*; D3, *35Spro-CSAat1A*^{D212AR221A}- or *B*^{D212AR221A}*-Flag*; D4, *35Spro-CSAat1A*^{L206AD212A}- or *B*^{L206AD212A}*-Flag*; T1, *35Spro-CSAat1A*^{D212AW218AD219A}- or *B*^{D212AW218AD219A}*-Flag*; T2, *35Spro-CSAat1A*^{W218AD219AR221A}- or *B*^{W218AD219AR221A}*-Flag*; and Q, 35S*pro-CSAat1A*^{D212AW218AD219AR221A}- or *B*^{D212AW218AD219AR221A}*-Flag* transgenic plants in the *csaat1a* or *b* background were treated with the indicated concentrations of MMS. The fresh weight of 10 seedlings in each group was measured. All data represent means ± SE of at least five replicate experiments. Significant differences (P ≤0.05, Student's t test) are indicated by different lowercase letters.

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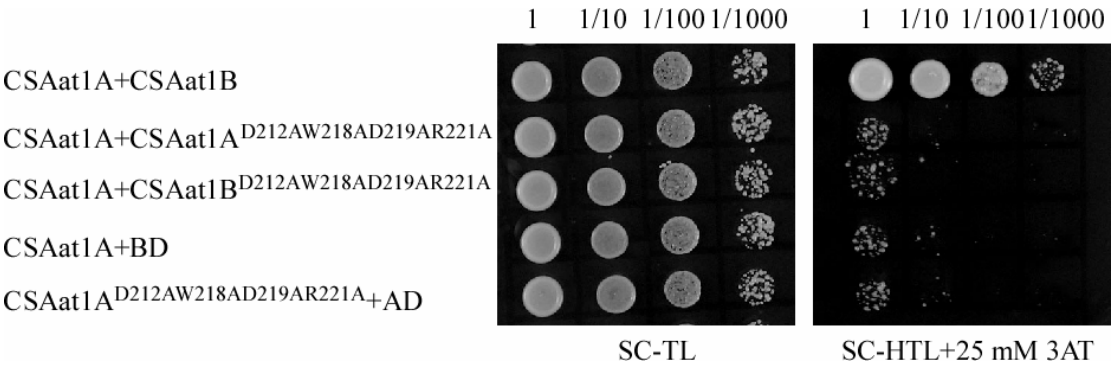

Supplemental Figure 10. CSAat1A^{D212AW218AD219AR221A} does not interact with CSAat1A or CSAat1B

The *pGADT7-CSA1at1A* was co-transformed with *pGBKT7-CSAat1A/B^{D212AW218AD219AR221A}* into yeast. Growth of the transformed yeast was assayed on media minus Trp and Leu (left panel) or minus Trp, Leu, and His (right panel) with 25 mM 3-amino-1, 2, 4-triazole. Interaction of CSAat1A and CSAat1B was included as a control. Columns in each panel represent serial decimal dilutions. BD, binding domain.

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Supplemental Table 1. Primers used for RT-PCR and homozygous mutant identification

Primer name	Sequence
LB1	5’-ATACGACGGATCGTAATTTGTC-3’
LB2	5’-TAATAACGCTGCGGACATCTAC-3’
LB3	5’-TTGACCATCATACTCATTGCTG-3’
AD	5’-NGTCGASWGANAWGAA-3’
uvs90 T-DNAF	5’-TTGGCGAAGGAATTGGAACG-3’
uvs90 T-DNAR	5’-CCAGAGTTGTCCTCCCAATC-3’
salk_024816LP	5’-CCACGAAAATCAGAAGACGAG-3’
salk_024816RP	5’-TATACAAAACCCACTCGCTGG-3’
Salk_151258LP	5’-GCTGCTGGAACTGAAGATGTC-3’
Salk_151258RP	5’-CCAGCAGATGCTGCCTATAAC-3’
Salk_152568LP	5’-CCGGAAAATAAATCCAAAGATG-3’
Salk_152568RP	5’-TAATGTGTGAGAGAATGCCCC-3’
Salk_144623LP	5’-TGGTTTGGTTTTGTTCTTTCG-3’
Salk_144623RP	5’-CATGACAATTTGGTAGCCTGG-3’
LBa1	5’-TGGTTCACGTAGTGGGCCATCG-3’
LBb1	5’-GCGTGGACCGCTTGCTGCAACT-3’
DDB1A T-DNAF	5’- AAAAGCTTCCTTGAGCTGTCC-3’
DDB1A T-DNAR	5’-ATTTGCTTACCCCACAAGGAC-3’
CSAat1A cDNAF	5’-CGGGATCCATGTGGGAGGCTATCAAAGAC-3’,
CSAat1A cDNAR	5’-GGGGTACCTCAGTCGCTCCAATTGTCTTT
CSAat1B cDNAF	5’-CGGGATCCATGTGGAAGGCTTTTAA-3’
CSAat1B cDNAR	5’-GGGGTACCTCAGTCGCTCCAGTTGTCT-3’
CSAat1A PF	5’-AACTGCAGATGATTGGAACATACATTTGTC-3’
CSAat1A PR	5’-CCGGAATTCACTAATTTTGCTATATTGT-3’
CSAat1B PF	5’-CCGGAATTCTATTCGGATCAATGCCAGAC-3’
CSAat1B PR	5’-ACGCGTCGACAAGCCTTCCACATTCTCCTA-3’
CSAat1A ADF	5’-CGCGGATCCATGTGGGAGGCTATCAAAGAC-3’
CSAat1A ADR	5’-CGAGCTCTCAGTCGCTCCAATTGTCTTTATC-3’
CSAat1B ADF	5’-TCCCCCGGGATGTGGAAGGCTTTTAAAGAC-3’
CSAat1B ADR	5’-CGAGCTCTCAGTCGCTCCAGTTGTCTTTAT
DDB1A BDF	5’-CCGGAATTCATGAGCTCATGGAACTACGTTG-3’
DDB1A BDR	5’-CGCGGATCCTCAGTGAAGCCTAGTGAGTTC-3’
CSAat1A RTF	5’-TAGGGCTTTGGAGATTCGAG-3’
CSAat1A RTR	5’-GGTCTTCGCCGAATAAAGAG-3’
CSAat1B RTF	5’-GCTGGACAAGGGAGATTCGAGC-3’
CSAat1B RTR	5’-TGGCTGCGATGGGAACACATCT-3’
ACTIN F	5’-GTCGTACAACCGGTATTGTG-3’
ACTIN R	5’-GAGCTGGTCTTTGAGGTTTC-3’

At1g29230T	5’-ATGGCTCAAGCCTTGGCTCAACCA-3’
At1g29230N	5’-TGTAATCCGAGTATCCGGATTCGT-3’
At2g30360T	5’-ATGCCAGAGATCGAGATTGCCGCC-3’
At2g30360N	5’-CACAGCTTCTAGTGACGATTCCAC-3’
At3g23000T	5’-GTCCCTGAAACCTCTCTTCAGAAAA-3’
At3g23000N	5’-AAACTCAGAAGTCTCTAGAGACTT-3’
At4g14580T	5’-ATGGAATCTCCATATCCAAAATCA-3’
At4g14580N	5’-AGACTGAAACTCCGAAATCTCTAG-3’
At5g10930T	5’-ATTTGCACACTTCTTCTTCTTCTT-3’
At5g10930N	5’-TCCGCTCTGAAAATCTTCCGATAC-3’

Supplemental Table 2. Primers used for plasmid constructions

Plasmids	Forward Primers	Reverse Primers
pCAMBIA1307-CSAat1A-flag	5’-CGAGCTCATGTGGGAGGCTATCAAAGAC-3’	5’-CGCGGATCCGTCGCTCCAATTGTCTTTATC-3’
pCAMBIA1307-CSAat1A^{L206A}-flag	5’-TCCAGCGAGTGGGTTGCGTATACTGGGGGTTG-3’	5’-CAACCCCCAGTATACGCAACCCACTCGCTGGA-3’
pCAMBIA1307-CSAat1A^{T208A}-flag	5’-GGGTTTTGTATGCTGGGGGTTGTGATGGTGCA-3’	5’-TGCACCATCACAACCCCCAGCATACAAAACCC-3’
pCAMBIA1307-CSAat1A^{D212A}-flag	5’-ACTGGGGGTTGTGCTGGTGCAATACGTTTCTG-3’	5’-CAGAAACGTATTGCACCAGCACAACCCCCAGT-3’
pCAMBIA1307-CSAat1A^{R216A}-flag	5’-TGTGATGGTGCAATAGCATTCTGGGACATT-3’	5’-AATGTCCCAGAATGCTATTGCACCATCACA-3’
pCAMBIA1307-CSAat1A^{W218A}-flag	5’-CAATACGTTTCGCGGACATTAGACGGGCTGGT-3’	5’-ACCAGCCCGTCTAATGTCCGCGAAACGTATTG-3’
pCAMBIA1307-CSAat1A^{D219A}-flag	5’-CAATACGTTTCTGGGCCATTAGACGGGCTGGT-3’	5’-ACCAGCCCGTCTAATGGCCCAGAAACGTATTG-3’
pCAMBIA1307-CSAat1A^{R221A}-flag	5’-CTGGGACATTGCACGGGCTGGTTGTTTCCGTG-3’	5’-CACGGAAACAACCAGCCCGTGCAATGTCCCAG-3’
pCAMBIA1307-CSAat1A^{L206AD212A}-flag	5’-TGGGTTGCGTATACTGGGGGTTGTGCTGGTGCAATACGT-3’	5’-ACGTATTGCACCAGCACAACCCCCAGTATACGCAACCCA-3’
pCAMBIA1307-CSAat1A^{D212AW218A}-flag	5’-GGTTGTGCTGGTGCAATACGTTTCGCGGACATTAGACG-3’	5’-CGTCTAATGTCCGCGAAACGTATTGCACCAGCACAACC-3’
pCAMBIA1307-CSAat1A^{D212AD219A}-flag	5’-GTTGTGCTGGTGCAATACGTTTCTGGGCCATTAGACGG-3’	5’-CCGTCTAATGGCCCAGAAACGTATTGCACCAGCACAAC-3’
pCAMBIA1307-CSAat1A^{D212AR221A}-flag	5’-GTTGTGCTGGTGCAATACGTTTCTGGGACATTGCACGGGC-3’	5’-GCCCGTGCAATGTCCCAGAAACGTATTGCACCAGCACAAC-3’
pCAMBIA1307-CSAat1A^{D212AW218AD219A}-flag	5’-GGTTGTGCAGGTGCAATACGTTTCGCGGCCATTAGACGG-3’	5’-CCGTCTAATGGCCGCGAAACGTATTGCACCTGCACAACC-3’
pCAMBIA1307-CSAat1A^{W218AD219AR221A}-flag	5’-GCAATACGTTTCGCGGCCATTGCACGGGCTGGTTGT-3’	5’-ACAACCAGCCCGTGCAATGGCCGCGAAACGTATTGC-3’
pCAMBIA1307-CSAat1A^{D212AW218AD219AR221A}-flag	5’-TGTGCAGGTGCAATACGTTTCGCGGCCATTGCACGGGCT-3’	5’-AGCCCGTGCAATGGCCGCGAAACGTATTGCACCTGCACA-3’
pCAMBIA1307-CSAat1A-R1-flag	5’-CGAGCTCATGTGGGAGGCTATCAAAGAC-3’	5’-CGCGGATCCAGTAGACCATTCCACTGACA-3’
pCAMBIA1307-CSAat1A-R2-flag	5’-CGAGCTCATGTCCAGCGAGTGGGTTTTGTA-3’	5’-CGCGGATCCTCCAGGGTGAATTCTCTTCT-3’

pCAMBIA1307-CSAat1A-R3 -flag	5’-CGAGCTCATGATGTTATCTACTCTAGATCG-3’	5’-CGCGGATCCGTCGCTCCAATTGTCTTTATC-3’
pCAMBIA1307-CSAat1B-flag	5’-CGAGCTCATGTGGAAGGCTTTTAAAGACAG-3’	5’-ACGCGTCGACGTCGCTCCAGTTGTCTTTAT-3’
pCAMBIA1307-CSAat1B ^{L206A}-flag	5’-TCCAGCGAGTGGGTTGCGTATACTGGGGGGTG-3’	5’-CACCCCCCAGTATACGCAACCCACTCGCTGGA-3’
pCAMBIA1307-CSAat1B ^{T208A}-flag	5’-GGGTTTTGTATGCTGGGGGGTGTGATGGTGCA-3’	5’-TGCACCATCACACCCCCCAGCATACAAAACCC-3’
pCAMBIA1307-CSAat1B ^{D212A}-flag	5’-ACTGGGGGGTGTGCTGGTGCAATACGTTTCTG-3’	5’-CAGAAACGTATTGCACCAGCACACCCCCCAGT-3’
pCAMBIA1307-CSAat1B ^{R216A}-flag	5’-TGTGATGGTGCAATAGCATTCTGGGACATC-3’	5’-GATGTCCCAGAATGCTATTGCACCATCACA-3’
pCAMBIA1307-CSAat1B ^{W218A}-flag	5’-CAATACGTTTCGCGGACATCAGACGTGCTGGT-3’	5’-ACCAGCACGTCTGATGTCCGCGAAACGTATTG-3’
pCAMBIA1307-CSAat1B ^{D219A}-flag	5’-CAATACGTTTCTGGGCCATCAGACGTGCTGGA-3’	5’-TCCAGCACGTCTGATGGCCCAGAAACGTATTG-3’
pCAMBIA1307-CSAat1B ^{R221A}-flag	5’-CTGGGACATCGCACGTGCTGGATGTTTCCGTG-3’	5’-CACGGAAACATCCAGCACGTGCGATGTCCCAG-3’
pCAMBIA1307-CSAat1B^{L206AD212A}-flag	5’-TGGGTTGCGTATACTGGGGGGTGTGCTGGTGCAATACGT-3’	5’-ACGTATTGCACCAGCACACCCCCCAGTATACGCAACCCA-3’
pCAMBIA1307-CSAat1B^{D212AW218A}-flag	5’-GGTGTGCTGGTGCAATACGTTTCGCGGACATCAGACG-3’	5’-CGTCTGATGTCCGCGAAACGTATTGCACCAGCACACC-3’
pCAMBIA1307-CSAat1A^{D212AD219A}-flag	5’-GTGTGCTGGTGCAATACGTTTCTGGGCCATCAGACGTGC-3’	5’-GCACGTCTGATGGCCCAGAAACGTATTGCACCAGCACAC-3’
pCAMBIA1307-CSAat1B^{D212AR221A}-flag	5’-GTGTGCTGGTGCAATACGTTTCTGGGACATCGCACGTGCTG-3’	5’-CAGCACGTGCGATGTCCCAGAAACGTATTGCACCAGCACAC-3’
pCAMBIA1307-CSAat1B^{D212AW218AD219A}-flag	5’-GTGTGCTGGTGCAATACGTTTCGCGGCCATCAGACGTGCTG-3’	5’-CAGCACGTCTGATGGCCGCGAAACGTATTGCACCAGCACAC-3’
pCAMBIA1307-CSAat1B^{W218AD219AR221A}-flag	5’-GTGTGATGGTGCAATACGTTTCGCGGCCATCGCACGTGCTG-3’	5’-CAGCACGTGCGATGGCCGCGAAACGTATTGCACCATCACAC-3’
pCAMBIA1307-CSAat1B^{D212AW218AD219AR221A}-flag	5’-GTGTGCTGGTGCAATACGTTTCGCGGCCATCGCACGTGCTG-3’	5’-CAGCACGTGCGATGGCCGCGAAACGTATTGCACCAGCACAC-3’
pCAMBIA1307-CSAat1B-R1 -flag	5’-CGAGCTCATGTGGAAGGCTTTTAAAGACAG-3’	5’-ACGCGTCGACAGTAGACCATTCCACTGACA-3’
pCAMBIA1307-C	5’-CGAGCTCATGTCCAGCGAG	5’-ACGCGTCGACTCCAGGGTG

SAat1B-R2 -flag	TGGGTTTTGTA-3’	AATTCTCTTCT-3’
pCAMBIA1307-C SAat1B-R3 -flag	5’-CGAGCTCATGATGTTATCTA CTCTAGATCG-3’	5’-ACGCGTCGACGTCGCTCCA GTTGTCTTTAT-3’

Supplemental Table 3. Primers used for yeast two-hybrid assay

Plasmids	Forward Primers	Reverse Primers
pGADT7-CSAat1A-R1	5’-CGCGGATCCATGTGGGAGGCTATCAAAGAC-3’	5’-CGAGCTCTCAAGTAGACCATTCCACTGACA-3’
pGADT7-CSAat1A-R2	5’-CGCGGATCCATGTCCAGCGAGTGGGTTTTG-3’	5’-CGAGCTCTCATCCAGGGTGAATTCTCTTCT-3’
pGADT7-CSAat1A-R3	5’-CGCGGATCCATGATGTTATCTACTCTAGAT-3’	5’-CGAGCTCTCAGTCGCTCCAATTGTCTTTAT-3’
pGADT7-CSAat1B-R1	5’-TCCCCCGGGATGTGGAAGGCTTTTAAAGAC-3’	5’-CGAGCTCTCAAGTAGACCATTCCACTGACA-3’
pGADT7-CSAat1B-R2	5’-TCCCCCGGGATGTCCAGCGAGTGGGTTTTG-3’	5’-CGAGCTCTCATCCAGGGTGAATTCTCTTCT-3’
pGADT7-CSAat1B-R3	5’-TCCCCCGGGATGATGTTATCTACTCTAGAT-3’	5’-CGAGCTCATAAAGACAACTGGAGCGACTGA-3’