

Supplementary data

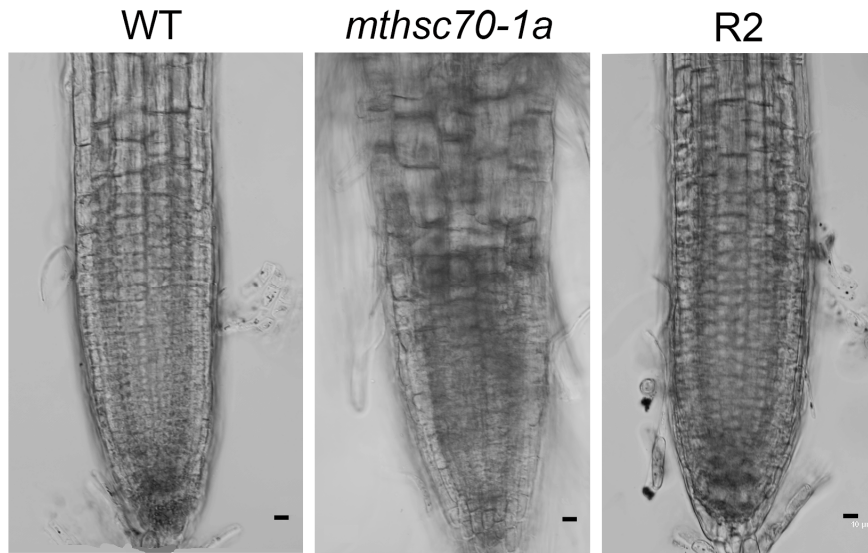


Figure S1. Comparison of root tip structure among wild type, *mthsc70-1a* and a complementary *mthsc70-1a* line. The roots of seven days old seedlings grown on $0.5 \times$ MS medium supplemented with 1% sucrose were observed using a LSCM. Representative images are shown. Scale bar = 10 μ m.

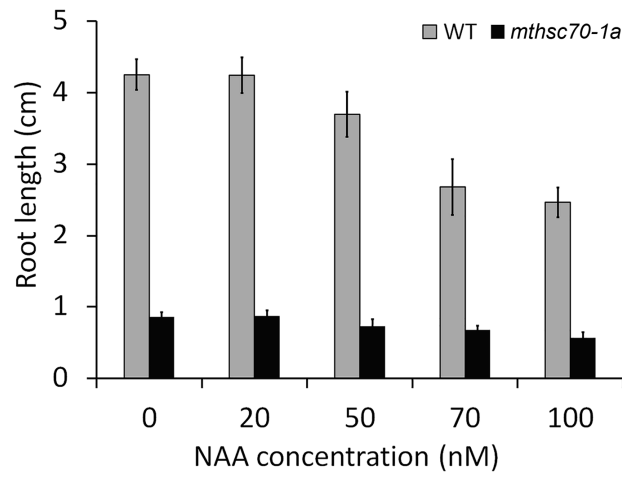


Figure S2. The effects of NAA treatment on primary root elongation in WT and *mtHSC70-1* mutant seedlings. Comparison of primary root length between 10-day-old WT and *mthsc70-1a* seedlings grown on 0.5 × MS medium supplemented with different concentrations of NAA. The data are the means ± SD of 30 seedlings. The experiments were repeated three times with similar results. WT, wild-type; *mthsc70-1a*, a *mtHSC70-1* mutant line.

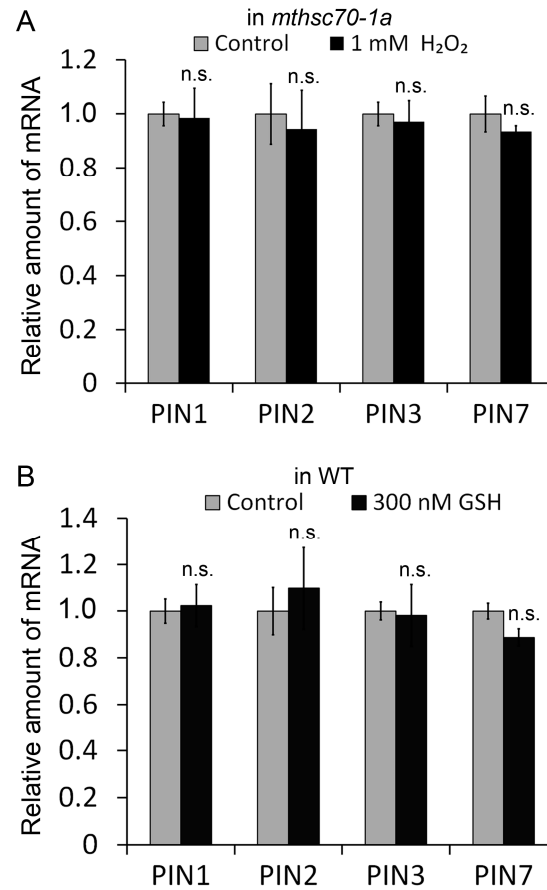


Figure S3. Effects of exogenous redox reagents on the expression of *PIN* genes in *mtHSC70-1* mutant and WT seedlings by Q-PCR. (A) The *mthsc70-1a* seedlings were grown on 0.5 × MS medium with or without 1 mM H₂O₂ for 10 d. (B) The WT seedlings were grown on 0.5 × MS medium with or without 300 nM GSH for 10 d. The data are the means ± SD of three biological replicates. n.s., no significant differences from control group; WT, wild-type; *mthsc70-1a*, a *mtHSC70-1* mutant line.

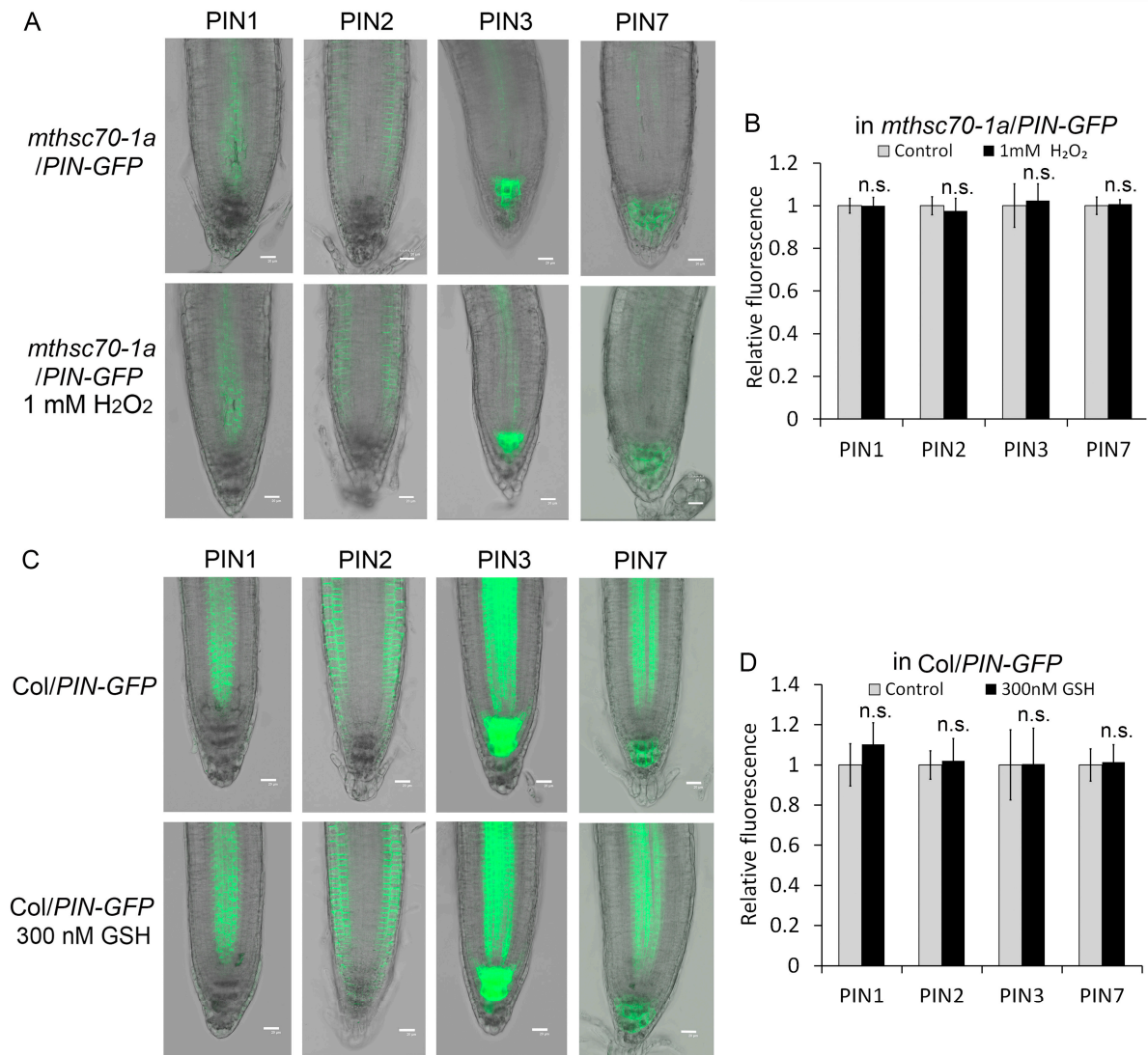


Figure S4. Effects of exogenous redox reagents on PIN protein levels in *mtshc70-1a*/PIN-GFP and Col/PIN-GFP root tips. (A, B) Root tips of five days old *mtshc70-1a*/PIN-GFP seedlings grown on 0.5 × MS medium with or without 1 mM H₂O₂ were observed using a LSCM (A); the GFP fluorescence intensities were visualized with ImageJ 1.42q software (National Institutes of Health, Bethesda, MD, USA) (B). (C, D) Root tips of five days old Col/PIN-GFP seedlings grown on 0.5 × MS medium with or without 300 nM GSH were observed using a LSCM (C); the GFP fluorescence intensities were visualized with ImageJ 1.42q software (D). Thirty seedlings from each genotype and treatment were analyzed; representative images are shown. Scale bar = 20 μm. n.s., no significant differences from control group; Col/PIN-GFP, Col/PIN1-, 2-, 3- or 7-GFP plants; *mtshc70-1a*/PIN-GFP, *mtshc70-1a*/PIN1-, 2-, 3- or 7-GFP plants.

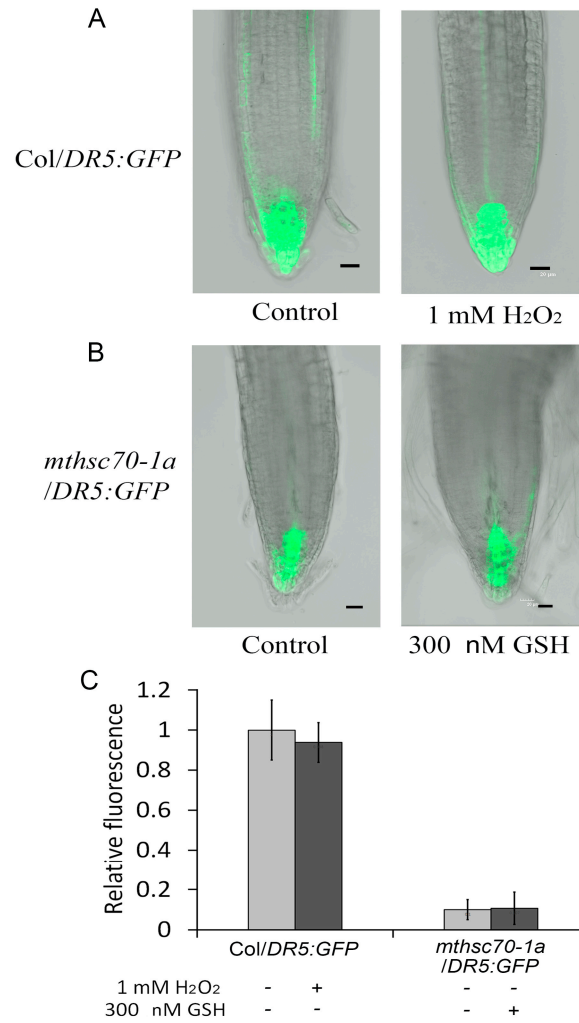


Figure S5. Effects of exogenous redox reagents on the auxin response. (A) Root tips of five days old *Col/DR5:GFP* seedlings grown on 0.5 × MS medium with or without 1 mM H₂O₂ were observed using a LSCM. (B) Root tips of five days old *mthsc70-1a/DR5:GFP* seedlings grown on 0.5 × MS medium with or without 300 nM GSH were observed using a LSCM. (C) The GFP fluorescence intensities were visualized with ImageJ 1.42q software (National Institutes of Health, Bethesda, MD, USA). Thirty seedlings from each genotype and treatment were analyzed; representative images are shown. Scale bar = 20 μm. *Col/DR5:GFP*, *Col* plants harboring *DR5:GFP*; *mthsc70-1a/DR5:GFP*, *mthsc70-1a* plants harboring *DR5:GFP*.

Table S1. List of primers used in this study

| Locus number | Gene | Primer sequences (5' to 3') |
|--------------|-------------------|------------------------------|
| At1g73590 | <i>PIN1</i> | F: CTGGTCCCTCATTTTCCTTCAAGTG |
| | | R: TGAACAACCCAAGACTGAACATAGC |
| At5g57090 | <i>PIN2</i> | F: TCCTCCATATCGCCATCGTTCAG |
| | | R: AGCATTCCTGAATATAACCGCAGTG |
| At1g70940 | <i>PIN3</i> | F: ATGGCGGTTAGGTTTCCTTACGG |
| | | R: GCAAACACAAAGGGCACAATTCC |
| At1g23080 | <i>PIN7</i> | F: AGTGTGATGACTCGGCTGATATTG |
| | | R: ATCCACCTGAAAGCAACAAGAG |
| At2g38120 | <i>AUX1</i> | F: TGCCTCCGCTCGTCAG AATG |
| | | R: CACCGAACCCAAATCCGACTATAAG |
| At2g37620 | <i>ACTIN1</i> | F: GGTAACATTGTGCTCAGTGGTGG |
| | | R: AACGACCTTAATCTTCATGCTGC |
| SALK_081383 | <i>mtshc70-la</i> | L: AACACTGCAATGACACCTTCC |
| | | R: AGGATTGAAATTACCCATCGG |
| SALK_081385 | <i>mtshc70-lb</i> | L: AACACTGCAATGACACCTTCC |
| | | R: AGGATTGAAATTACCCATCGG |
| | LBb1.3 | ATTTTGCCGATTTCGGAAC |

Table S2. Genotypes of the transgenic lines used in this study

| Name of transgenic plant | Genetic background | | Transgenic construct | | | | | | |
|--|--------------------|-------------------|--|-----------------------------------|-----------------------------------|----------------|----------------|----------------------------------|----------------------------------|
| | Col | <i>mtHSC70-1a</i> | <i>mtHSC70-1</i> : <i>mtHSC70-1</i> | <i>mtHSC70-1</i> : <i>MSD1</i> | <i>mtHSC70-1</i> : <i>CAT1</i> | <i>DR5:GUS</i> | <i>DR5:GFP</i> | <i>PINx:PINx</i> - <i>GFP</i> | <i>AUX1:AUX1</i> - <i>YFP</i> |
| R2, R3 | | Y | Y | | | | | | |
| Col/ <i>DR5:GUS</i> | Y | | | | | Y | | | |
| <i>mtHSC70-1a</i> / <i>DR5:GUS</i> | | Y | | | | Y | | | |
| Col/ <i>DR5:GFP</i> | Y | | | | | | Y | | |
| <i>mtHSC70-1a</i> / <i>DR5:GFP</i> | | Y | | | | | Y | | |
| Col/ <i>PIN-GFP</i> | Y | | | | | | | Y | |
| <i>mtHSC70-1a</i> / <i>PIN-GFP</i> | | Y | | | | | | Y | |
| Col / <i>AUX1-YFP</i> | Y | | | | | | | | Y |
| <i>mtHSC70-1a</i> / <i>AUX1-YFP</i> | | Y | | | | | | | Y |
| MSD1-R2, MSD1-R3 | | Y | | Y | | | | | |
| CAT1-R2, CAT1-R3 | | Y | | | Y | | | | |
| R2/ <i>PIN-GFP</i> | | Y | Y | | | | | Y | |
| MSD1-R2 / <i>PIN-GFP</i> | | Y | | Y | | | | Y | |
| CAT1-R2 / <i>PIN-GFP</i> | | Y | | | Y | | | Y | |
| R2/ <i>DR5:GFP</i> | | Y | Y | | | | Y | | |
| MSD1-R2 / <i>DR5:GFP</i> | | Y | | Y | | | Y | | |
| CAT1-R2 / <i>DR5:GFP</i> | | Y | | | Y | | Y | | |

Note: Col, *Arabidopsis thaliana* (Columbia-0); *mtHSC70-1a*, T-DNA insertion *mtHSC70-1* knockout plants; *PINx*, *PIN1*, *PIN2*, *PIN3* or *PIN7*; Y, yes.