

Figure S1. qRT-PCR analysis in *Arabidopsis*. **(A)** *OsHIPP43* expressed in *Arabidopsis* lines OsHIPP43-a and OsHIPP43-b. **(B)** *Atabcg34* T-DNA knockout line (SALK_082843) lacks the PCR product found in WT (arrow), but instead a lower MW band from the T-DNA insertion to one end of the *AtABCG34* gene. **(C)** *AtABCG34* expressed in WT but not in *Atabcg34* knockout line SALK_082843. **(D)** *OsABCG48* is expressed in *Arabidopsis* lines OsABCG48-a and OsABCG48-b. qRT-PCR normalized to *AtUBQ5*; Data shown as mean \pm SD ($n = 3$); statistical analysis by unpaired Student's *t*-test compared to WT (* $p < 0.05$, ** $p < 0.01$).

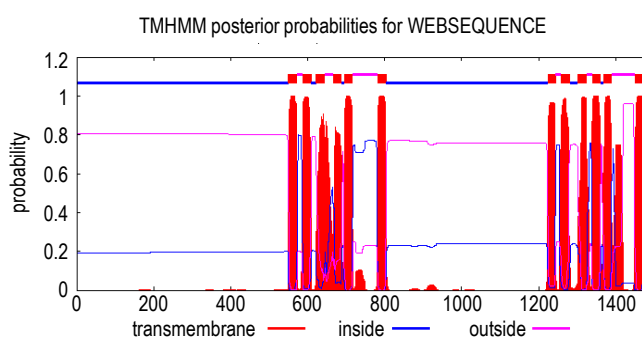
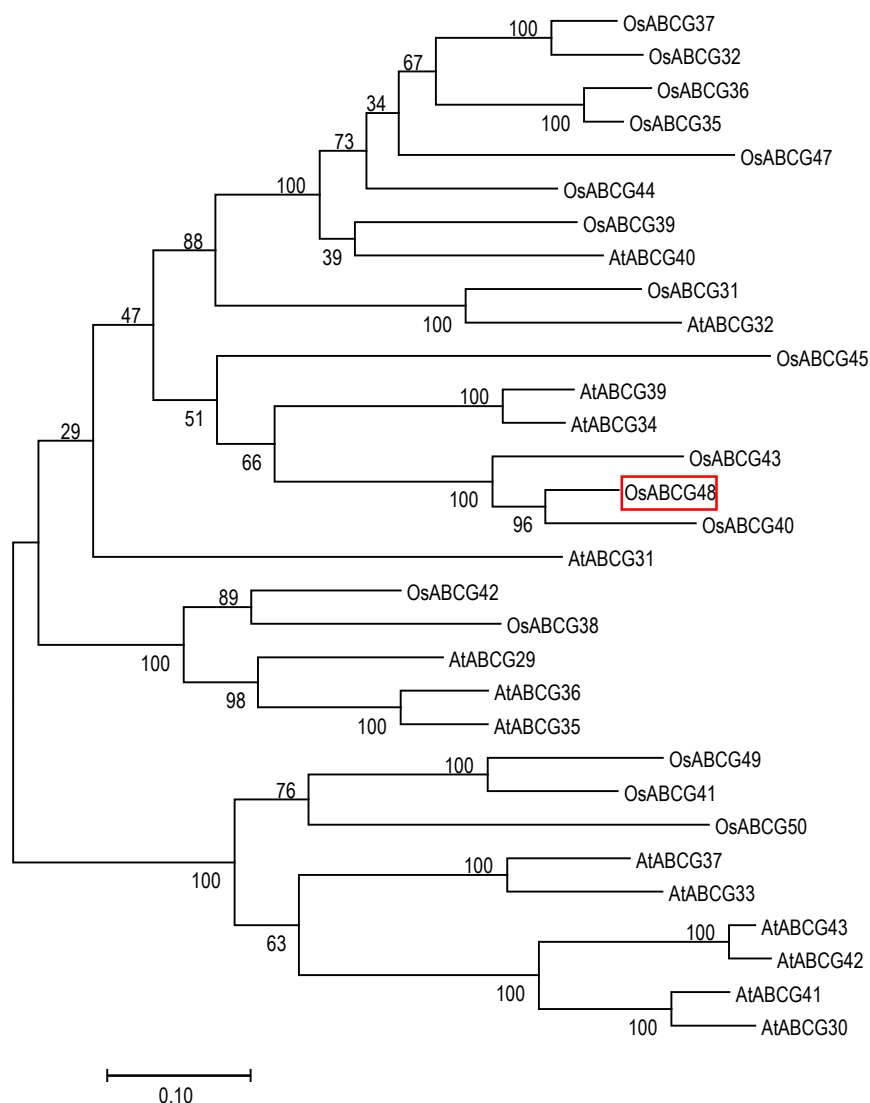


Figure S2. Phylogenetic analysis of G subfamily of ABC proteins from Arabidopsis and rice and transmembrane analysis of OsABCG48. A neighbor-joining method was used with MEGA7 software. Bootstrap = 1000. OsABCG48 marked with red rectangle. Like other transport proteins with membrane spanning domains, bottom panel shows transmembrane analysis of OsABCG48 protein with two transmembrane domains as conducted by TMHMM Server v. 2.0 (<http://www.cbs.dtu.dk/services/TMHMM/>).

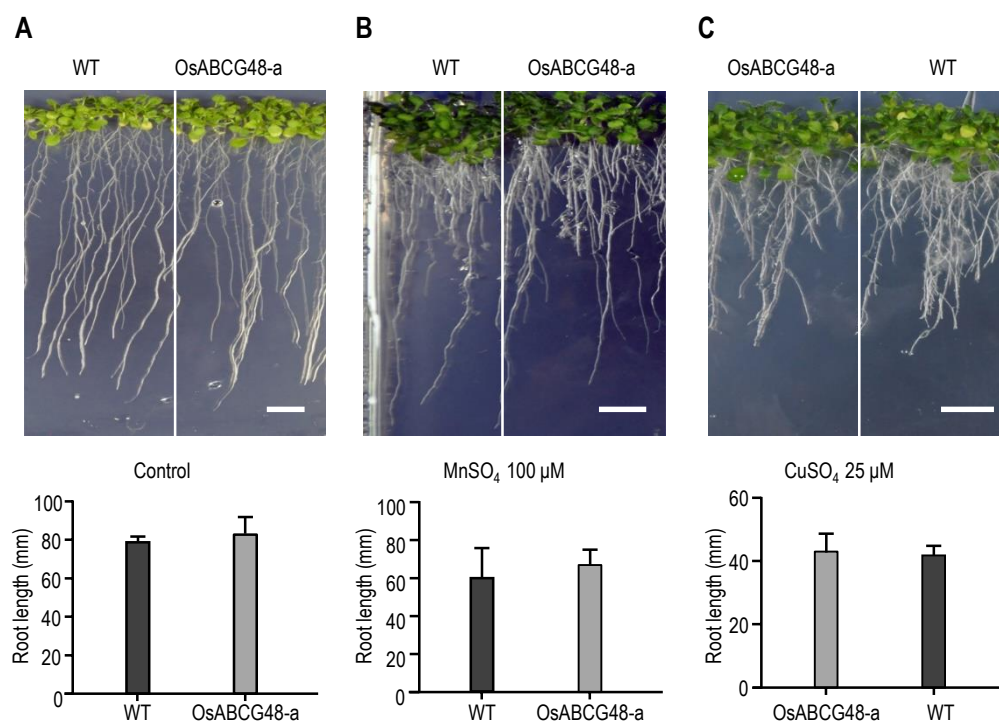


Figure S3. *OsABCG48* expression lines tested for Mn or Cu tolerance in *Arabidopsis*. 21 day-old T3 seedlings germinated and grown on plates supplemented without (A) or with 100 μM MnSO_4 (B) or 25 μM CuSO_4 (C). Root length plots under each photograph. Data shown as means \pm SD ($n = 3$ for gene expression, and 10 to 15 for root length); statistical analysis by unpaired Student's *t*-test compared to WT. Similar results were found for other concentrations of MnSO_4 (25, 50, 75 and 125 μM) and CuSO_4 (12.5, 37.5, 50 μM).

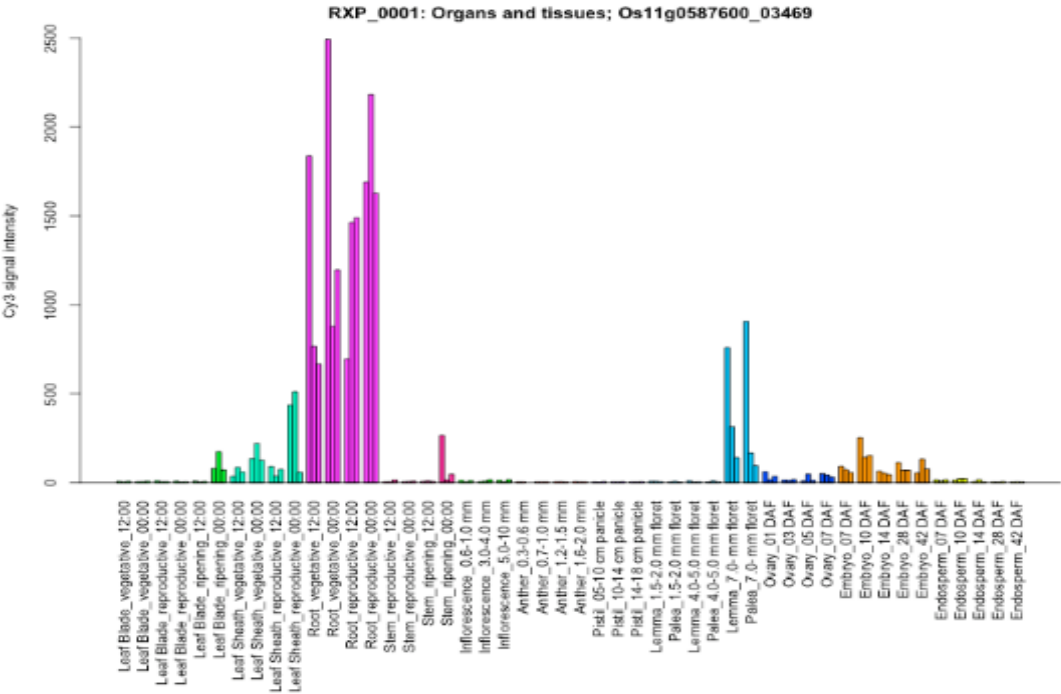


Figure S4. Relative expression of *OsABCG48* in rice organs/tissues. Organ/tissue specific expression data extracted from RiceXPro (<http://ricexpro.dna.affrc.go.jp/>).

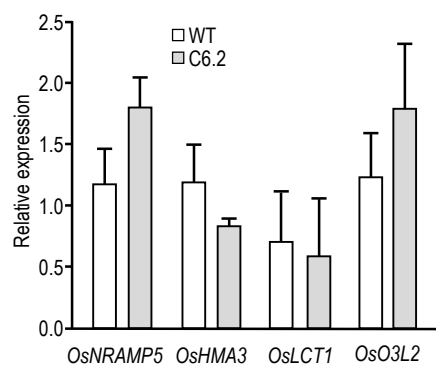


Figure S5. Expression of *OsNRAMP5*, *OsHMA3*, *OsLCT1* and *OsO3L2* in *OsABCG48* overexpression line C6.2. Seven-day old T2 seedlings germinated and grown in 1/2 Kimura B solution (pH 5.6). Expression normalized to *OsActin-1*. Data shown as mean \pm SD ($n = 3$); statistical analysis by unpaired Student's *t*-test compared to WT.