Supplemental Data

Analysis of Arabidopsis *glucose insensitive growth* Mutants Reveals Involvement of the Plastidial Copper Transporter PAA1 in Glucose-induced Intracellular Signaling

Lee et al.

Supplemental Figure S1. Analysis of the stem cell niche in Col-0 and *gig* roots. Cell type-specific markers were used to monitor defects in and around the stem cell niche. A, *pSHR::SHR-GFP*. B, *pSCR::GFP-SCR*. C, *QC25::GUS*. D, *pWOX5::GFP*.

Supplemental Figure S2. Comparative analysis of Col-0 and gig adult plants. A, Top view. B, Side view. Rosette leaves of gig are smaller and inflorescence stems of gig are shorter than those of Col-0. F_1 progeny of crosses between Col-0 and gig (Col-0 x gig) are indistinguishably similar to Col-0.

Supplemental Figure S3. Complementation of *gig* with Cu supplementation. A, DIC image of root meristem size of Col-0 and *gig* at 8 DAG in the presence of 10 μ M CuSO₄. Black arrowheads indicate the QC, whereas blue arrowheads demarcate the upper border of the MZ. Measurements of meristem cortex cell number (B) and meristem length (C) from 2 to 10 DAG in the presence of 10 μ M CuSO₄.

Supplemental Figure S4. Root growth assay in the absence or presence of Cu with increasing Glc concentrations. Twelve-day-old seedlings of Col-0 (blue) and *gig* (red) were grown on MS agar plates without (A) and with 10μM CuSO₄(B). Error bars indicate the SE of mean from biological triplicates.

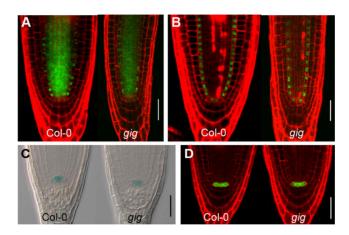
Supplemental Figure S5. Expression analysis of Glc-responsive genes with the addition of Cu. qRT-PCR in Col-0 and *gig* in the presence of 1% (blue) and 6% (red) Glc with 10 μ M CuSO₄. A, *APL3*. B, *HXK1*. C, *ABI4*. Statistical significance of differences was determined by Student's *t*-test (asterisk for *P*<0.05). Error bars indicate the SE of mean from biological triplicates.

Supplemental Figure S6. Prediction of an ABRE sequence in the *GIG* promoter. The combination of a CCAC/ACGT core element that is known for both ABI4 binding and retrograde signaling is underlined.

Supplemental Table S1. Sequence information of PCR primers used in this study

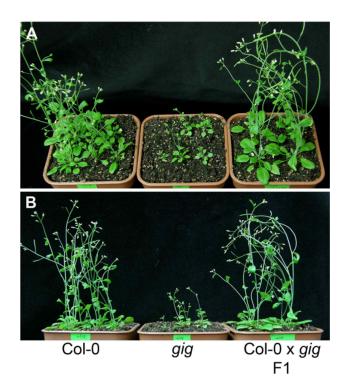
AD2	Purpose	Name		Sequence (5'-3')
ADS				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	TAIL-PCR	AD5		SSTGGSTANATWATWCT
LB150		LB50		ATAATAACGCTGCGGACATCT
Genotyping Genoty		LB100		CCTATAAATACGACGGATCGT
Genotyping		LB150		CACGTCGAAATAAAGATTTCCGA
Genotyping PSKI015 RBI CTAGATCCGAAACTATCAGTG gig-2 RP AACCCTCTCAAGACCAAGAGC RP ATTGGGCTGTAGGCATAAACC SALK LB GGCAATCAGAATCGG SALK LB GGCAATCAGCTGTTGCCCGTCTCACTGGTG abi4-1 R GGAATCAGACCAAGAGC pGIG::GUS pGIG F GGACCCTTTAGCTTCCCAAC pGIG::GIG-GFP GIG R GAAAGTGGGTGCTCCGTA Transient expression assay ABI4 F TCACAAATGAGAACAAGAAAATACTTATCCGAGC ACT2 F TCGCTGACCGTATGCACCCCAACACAAGAAAAATACTTATCCGAGC ACT4 R GAGCTTTAGAACAAGAAAATACTTATCCGAGC ACT5 F TCGCTGACCGTATGCCCCAAC GAGCTCTTAATAGAAATACTTATCCG ACT6 F TCACAAAAGAAAAATACTTATCCG ACT7 F TCTAGAAATGGGACCCCTTAGCTCCCCAAC ACT8 F TCTAGAAATGGACCCTTTAGCTTCCCAAC ACT9 F TCGCTGACCGTATGAGCAAAGAA ACT9 F TCGCTGACCGTATGAGCAAAGAA ACT9 F TCGCTGACCGTATGAGCAAAGAA ACT9 F TCGCTGACCGTATGAGCAAAGAA ACT9 F TCGCTCATGGGTGTAGCCC ACT9 ACT9 ACT9 ACT9 ACT9 ACCCACACACACACACACACACACACACACACACACA	Genotyping	gig-1	LP	ACCTTGTCAACCAACTGCTG
Genotyping Big-2			RP	GGTATGTAGTAGCTGCGTCT
Genotyping SALK_070739		pSKI015	RB1	CTAGATCCGAAACTATCAGTG
Genotyping SALK_070739 LP TGTTTTTGATACCAAATCGG RP TCATCAAATGAGGAGAATCG SALK LB GGCAATCAGCTGTTGCCCGTCTCACTGGTG abi4-1 F GGACCCTTTAGCTTCCCAAC CGGATCCAGACCCATAGAAC pGIG::GUS pGIG F CACCAGAACAAGAAAATACTTATCCGAGC GGAGGGTGGCTCCGTA pGIG::GIG-GFP GIG R GAAGTTGGGTGGCTCCGTA Transient expression assay ABI4 F TCTAGAATGAGTGGTGCTCCCAAC ACT2 F TCGCTGACCCTTAGCTTCCCAAC GIG F GAAGCTTTGCTTCCTTCCCACC R TCTAGAATGAGACACAGAAAATACTTATCCG TGGG R TCTAGAATGAGTTCCCCAAC GGG T TCTAGAATGAGACACAGAAAATACTTATCCG TTAGAATGACAAGAAAATACTTATCCG TTAGAATGACAAGAAAATACTTATCCG TTAGAATGACACAGAAAAATACTTATCCG TCTAGAAATGAACAAGAAAATACTTATCCG TCTAGAAATGACACCTTTAGCTTCCCAAC GAGCTCTTAAATAGAAATACCTCCCAAC GAGCTCTTAAATAGAATTCCCCCCAAGAGAA ACT2 F TCGCTGACCGTATGAGCAAAGAA ACT2 F TCGCTGACCGTATGAGCAAGAA TGGAATGTGCTGAGGGAAGCA APL3 F CCAAACCGAATCTGAGATCGC CHS F TGATGGTGCCATACAGC APL3 F CCAAACCGAATCTGAGATCGC CHS R AGGATCGCTGAACCACACACACACACACACACACACACAC		gig-2	LP	AACCCTCTCAAGACCAAGAGC
SALK_070739 RP TGATTAGAATCGG SALK LB GGCAATCAGATGAGAGGAGATCG SALK LB GGCAATCAGCTGTTGCCCGTCTCACTGGTG abi4-1 F GGACCCTTTAGCTTCCCAAC CGGATCCAGACCAATAGAAC PGIG::GUS PGIG F CACCAGAACAAGAAAATACTTATCCGAGC GIG R GAAAGTGGGTGGCTCCGTA Transient expression assay ABI4 F TCTAGAAACAAGAAAATACTTATCCCAC ACT2 R TGAGAACAAGAAAATACTTATCCGAGC R GAAAGTGGATGGCTCCGTA ACT2 R TCTAGAACAAGAAAATACTTATCCG R TCTAGAGAAAGTGGGTGGCTCCGTA ACT2 R TCGCTGACCGTATAGACTTCCCAAC GGACCTTTAATAGAATTCCCCCAAC R TGGAATGTGCTCCAAC ACT2 R TGGAATGTCCCCCAAGAACAAGAA GGGCTCTTAATAGAATTCCCCCAACAGAAAAA ACT2 R TGGAATGTCCTGAGGGAAGAA GGGTCTCTATGGGTGTAAGCTC APL3 F CCAAACCGAATCTAGACTCC CHS R TCCTTCTTTGGTTCCGGTTTG APL3 R TCCTTCCTTGGCCTATCAGC CHS R AGGATCGCTGAACACACACACACACACACACACACACACA			RP	ATTGGGCTGTAGGCATAAACC
SALK LB GGCAATCAGATGAGAGGAATCG abi4-1 F GGACCCTTTAGCTTCCCAAC R CGGATCCAGACCAATGAAC pGIG::GUS pGIG F CACCAGAACAAGAAAATACTTATCCGAGC pGIG::GIG-GFP GIG F CACCAGAACAAGAAAATACTTATCCGAGC GIG R AGAGCTTTGCTTCCATCTTGTG Transient expression assay ABI4 F TCTAGAATGAGACCCTTAGCTTCCAAC R GAAGCTCTTAGAACAGAAAATACTTATCCGAGC R TCTAGAAGAAAAATACTTATCCGAGC R TCTAGAACAAGAAAATACTTATCCGAGC R TCTAGAACAAGAAAATACTTATCCG R TCTAGAACAAGAAAATACTTATCCG ABI4 F TCTAGAACAAGAAAATACTTATCCG R TCTAGAACAAGAAAATACTTATCCG R TCTAGAACAAGAAAATACTTATCCG A AGACTTTAGAACAGAAAATACTTATCCG R TCTAGAACAAGAAAATACTTATCCG A AGACTTAGAACAGAAAATACTTATCCG A AGACTTAGAACAGAAAATACTTATCCG A AGACTTAGAACAGAAAATACTTATCCG A AGACTTAGAACAGAAAATACTTATCCG A AGACTTAGAACAGAAAATACTTATCCGACAC A GAGCTCTTAATAGAAATACCTCCCAAC A GAGCTCTTAATAGAATTCCCCCAACAAGAGG A TCCTTCATGAGAAGAAAAATACTTATCCG A ACT2 F TCGCTGACCGTATGAGCAAAAAAAAAAAAAAAAAAAAAA			LP	TTGTTTTTGATTCCAAATCGG
abi4-1 F GGACCCTTTAGCTTCCCAAC CGGATCCAGACCATAGAAC pGIG::GUS pGIG F CACCAGACCAAGAAATACTTATCCGAGC R GAAAGTGGGTGGCTCCGTA pGIG::GIG-GFP GIG F CACCAGAACAAGAAAATACTTATCCGAGC GIG R AGAGCTTTGCTTCCATCTTGTG Transient expression assay ABI4 F TCTAGAGAAAAGTGGTGGCTCCGTA ACT2 F TCGCTGACCGTATGACCCAAGAAAATACTTATCCG R TCTAGAATGGACCCTTTAGCTTCCCAAC R GAGCTCTTAATAGAATTCCCCAAGACGAACGACAAGAAAATACTTATCCG ACT2 F TCGCTGACCGTATGACCAACAGAAAATACTTATCCG R TCCAGACCGTATGAGCAAAGAA ACT2 F TCGCTGACCGTATGAGCAAAGAA ACT2 R TCCCTCTTTTGGTTCCGGTTTG APL3 F CCAAACCGAATCTGAGATCGC APL3 F TCCAGACCGAATCTAGAC CHS F TGATGGTGCCATAGACGAC AGGATCCCTCAGG HXKI F AGTGAGTGTATGAGAGCGC ABI4 F TCGTTCATCATGAGGTGCCG ABI4 R CGGATCCAAGAACCGAACCC ABI4 R CGGATCCAAGAACCGCAAGAACC ABI5 F TGATCAAGAACCGCAGGTCTGC			RP	TCATCAAATGAGGAGGAATCG
pGIG::GUS pGIG pGIG::GUS pGIG pGIG pGIG::GIG-GFP pGIG Transient expression assay qRT-PCR qRT-PCR pGIG qRT-PCR pGIG pGIG::GUS pGIG::GUS pGIG		SALK		
pGIG::GUS pGIG pGIG::GUS pGIG pGIG::GIG-GFP pGIG pGIG pGIG::GIG-GFP pGIG pG		abi4-1		GGACCCTTTAGCTTCCCAAC
pGIG::GUS pGIG R GAAAGTGGGTGCTCCGTA pGIG::GIG-GFP GIG F CACCAGAACAAGAAATACTTATCCGAGC GIG R AGAGCTTTGCTTCCATCTTGTG Transient expression assay ABI4 F TCTAGAATGGACCCTTAGCTTCCAAC GAGCTTTAGATGCAACAAGAAAATACTTATCCG R TCTAGAATGGACCCTTTAGCTTCCCAAC GAGCTCTTAATAGAATTCCCCAAC GAGCTCTTAATAGAATTCCCCCAAGATGG ACT2 F TCGCTGACCGTATGAGCAAAGAA TCCCCCAAGATGG F GGGCTCTCATGGGTGTAAGCT C R TCCCTCTTTTGGTTCCGGTTTG APL3 F CCAAACCGAATCTGGGTGTACGC CAAACCGAATCTGGCCTTTGGCCTATCAGC C CAACCGAATCTGGCCTATCAGC C CAACCGAATCTGGCCTATCAGC C CAACCGAATCTGGCCTATCAGC C CAACCGAATCTGGCCTCCAGG AGGATCCCAGG AGGATCCCAGG AGGATCCCAGG AGGATCTCAC AGGATCGCTGAGACCCAAGAAGCG ACTAGAACCGAACAAGAAGCG ACTAGAACCGAACC				CGGATCCAGACCCATAGAAC
pGIG::GIG-GFP pGIG F CACCAGAACAAGAAATACTTATCCGAGC GIG R AGAGCTTTGCTTCCATCTTGTG Transient expression assay ABI4 F TCTAGAACAGAACAAGAAATACTTATCCCAAC R GAGCTCTTAATGAGCAAGAAATACTTATCCGAGC R TCTAGAAAGAACAAGAAAATACTTATCCG TCTAGAGAAAGTGGGTGGCTCCCAAC R GAGCTCTTAATGAGCAAAGAA ATACTTATCCG TCTAGAGAAAGTGGGTTGGCTCCGTA TCTAGAGAAAGTGGGTTAGCCTTCCCAAC R GAGCTCTTAATAGAATTCCCCCAAGATGG ACT2 R TGGAATGTGCTGAGGAAAGAA TCGCCTATGAGCAAAGAA TCGCTCTTTTGGTTCCCAAC R TCCCTCTTTTGGTTCCGATTG APL3 F CCAAACCGAATCTGAGATCGC TCCAGGAACCAAGAACCG R TCCTTCCTCTGGCCTATCAGC CCHS R AGGATCGCTGGACCTCCAGG R AGGATCGCTGGACCTCCAGG R AGGATCGCTGGACCTCCAGG R AGGATCGCTGGACCTCCAGG R AGGATCGCTGGACGACCAAGAAGCG AAGAAGCG AAGAAGCAGCAAGAAGCG AAGAAGCG AAGAAGCG AAGAAGCG AAGAAGCG AAGAAGCG AAGAAGCAGCAGAAGAAGCG AAGAAGCG AAGAACCGCAGAACACACAAGAAGCAGCAGAAGAAGCG AAGAAGCGAGCAAGAAGCG AAGAAGCGAGCAAGAAGCAGCAAGAAGCAGCAAGAAGCAGC	pGIG::GUS	pGIG	F	CACCAGAACAAGAAAATACTTATCCGAGC
Transient expression assay ABI4 F AAGCTTTAGAACAAGAAAATACTTATCCG R TCTAGAAGAAAGTGGGTGGCTCCGTA ABI4 F TCTAGAATGGACCCTTTAGCTTCCCAAC R GAGCTCTTAATAGAATTCCCCCAAGATGG ACT2 F TCGCTGACCGTATGAGCAAAGAA ACT2 F TCGCTGACCGTATGAGCAAAGAA ACT2 F GGGCTCTCATGGGGAAGCA GIG F GGGCTCTCATGGGTGTAAGCTC R TCCCTCTTTTGGTTCCGGTTTG APL3 F CCAAACCGAATCTGAGATCGC CHS F TGATGGTGCCATAGACGAC AGATCGCTGACCGTATCAGC CHS F TGATGGTGCCATAGACGAC AGATCGCTGGACCTCCAGG HXK1 F AGTGAGTGTATGGAGAGCTCAC AGAGGATCCAGAAGAAGAA ABI4 F TCGTTTCATCATGAGGTGGCG CGGATCCAGACCCATAGAAC ABI3 F CAATGGCTCCAAGAAGGTG ABI5 F TGATCAAGAACCGCGAGTCTGC ABI5 F TGATCAAGAACCGCGAGTCTGC			R	GAAAGTGGGTGGCTCCGTA
Transient expression assay PGIG F AAGCTTAGAACAAGAAAATACTTATCCG R TCTAGAGAAAAGTGGGTGGCTCCGTA ABI4 F TCTAGAATGGACCCTTTAGCTTCCCAAC R GAGCTCTTAATAGAATTCCCCCAAGATGG ACT2 F TCGCTGACCGTATGAGCAAAGAA GIG F GGGCTCTCATGGGTAGCAAAGAA GIG F GGGCTCTCATGGGTAGCCAAGAA APL3 F CCAAACCGAATCTGAGATCGC APL3 F CCAAACCGAATCTGAGATCGC CHS F TGATGGTGCCATACAGC CHS R AGGATCGCTGAGCGAC AGGATCGCTGAGCGACCTCCAGG HXK1 F AGTGAGTGTATGGAGACCTCAC ABI4 F TCGTTTCATCATGAGAGCG ABI4 F TCGTTTCATCATGAGACCG ABI5 F TGATCAAGAACCGCAGTCTGC ABI5 F TGATCAAGAACCGCGAGTCTGC ABI5 F TGATCAAGAACCGCGAGTCTGC ABI5 F TGATCAAGAACCGCGAGTCTGC	pGIG::GIG-GFP	pGIG	F	CACCAGAACAAGAAAATACTTATCCGAGC
Transient expression assay ABI4 R TCTAGAGAAAGTGGGTGGCTCCGTA R GAGCTCTTAATAGAATTCCCCCAAC R GAGCTCTTAATAGAATTCCCCCAAGATGG ACT2 R TGGAATGTGCTGAGGGAAGCA GIG F GGGCTCTCATGGGTGAGCAAGAA TCCCTCTTTTGGTTCCGGTTTG APL3 R TCCTTCCTTTGGTTCAGC R TCCTTCCTCTGGCCTATCAGC CHS F TGATGGTGCCATAGACGGAC AGATCGCTGACCGCATAGACGC TCCTTCCTCTGGCCTATCAGC TCCTTCCTCTGGCCTATCAGC AGAGCTGCATAGACGGAC AGAGTCGCTGGACCTCCAGG HXK1 F AGAGTGAGAAGCAGCAAGAAGCG ABI4 F TCGTTTCATCATGAGGTGGCG ABI4 R CGGATCCAGACCCATAGAAC ABI3 F CAATGGGCTCCAAGAAGGTG ABI5 F TGATCAAGAACCGCAGTCTGC ABI5		GIG	R	AGAGCTTTGCTTCCATCTTGTG
ABI4 QRT-PCR ABI4 R TCTAGAAAGTGGGTGGCTCCGTA R GAGCTCTTAGCTTCCCAAC R GAGCTCTTAATAGAATTCCCCCAAGATGG ACT2 F TCGCTGACCGTATGAGCAAAGAA R TGGAATGTGCTGAGGGAAGCA R TGGAATGTGCTGAGGGAAGCA GIG F GGGCTCTCATGGGTGTAAGCTC R TCCCTCTTTTGGTTCCGGTTTG APL3 F CCAAACCGAATCTGAGATCGC R TCCTTCCTCTGGCCTATCAGC CHS R AGGATCGCTGACCCCAGG HXK1 F AGTGAGTGTATGGAGACCCCAGG ABI4 F TCGTTTCATCATGAGAGCGC ABI4 F CGGATCCAGACCCATAGAAC ABI3 F CAATGGGCTCCAAGAAGGTG R TCTCTTCGTAGCTGCC ABI5 F TGATCAAGAACCGAGTCTCC ABI5 F TGATCAAGAACCGCGAGTCTCC		pGIG	F	AAGCTTAGAACAAGAAAATACTTATCCG
ABI4 R GAGCTCTTAATAGAATTCCCCCAAGATGG ACT2 F TCGCTGACCGTATGAGCAAAGAA R TGGAATGTGCTGAGGGAAGCA GIG F GGGCTCTCATGGGTGTAAGCTC R TCCCTCTTTTGGTTCCGGTTTG APL3 F CCAAACCGAATCTGAGATCGC R TCCTTCCTCTGGCCTATCAGC CHS F TGATGGTGCCATAGACGAC R AGGATCGCTGGACCTCCAGG HXK1 F AGTGAGTGTATGGAGACCCAC AGAGTGAGAAGCAGAAGAGCG ABI4 F TCGTTTCATCATGAGGTGGCG CGGATCCAGAACCCATAGAAC ABI3 F CAATGGGCTCCAAGAAGGTG ABI5 F TGATCAAGAACCGCGAGTCTGC ABI5 F TGATCAAGAACCGCGAGTCTGC			R	TCTAGAGAAAGTGGGTGGCTCCGTA
ACT2 F TCGCTGACCGTATGAGCAAAGAA R TGGAATGTGCTGAGGGAAGCA GIG F GGGCTCTCATGGGTGTAAGCTC R TCCCTCTTTTGGTTCCGGTTTG APL3 F CCAAACCGAATCTGAGATCGC CHS F TGATGGTGCAAGACCA AGGATCGCTGACGGAC CHS F TGATGGTGCCATAGACGAC AGGATCGCTGGACCTCCAGG HXK1 F AGTGAGTGTATGGAGACCCAC R AGAGTGAGAAGCAGCAAGAAGCG ABI4 F TCGTTTCATCATGAGGTGGCG ABI4 R CGGATCCAGAACCCATAGAAC ABI3 F CAATGGGCTCCAAGAAGGTG R TCTCTTCGTAGCTGCTGACC ABI5 F TGATCAAGAACCGCGAGTCTGC		ABI4	F	TCTAGAATGGACCCTTTAGCTTCCCAAC
$qRT-PCR \begin{tabular}{l lllllllllllllllllllllllllllllllllll$			R	GAGCTCTTAATAGAATTCCCCCAAGATGG
$qRT-PCR \begin{tabular}{l lllllllllllllllllllllllllllllllllll$	qRT-PCR	ACT2	F	TCGCTGACCGTATGAGCAAAGAA
$qRT-PCR \begin{tabular}{lllllllllllllllllllllllllllllllllll$			R	TGGAATGTGCTGAGGGAAGCA
APL3 F CCAAACCGAATCTGAGATCGC R TCCTTCCTCTGGCCTATCAGC CHS F TGATGGTGCCATAGACGGAC R AGGATCGCTGGACCTCCAGG HXK1 F AGTGAGTGTATGGAGAGCTCAC R AGAGTGAGAAGCAGCAAGAAGCG ABI4 F TCGTTTCATCATGAGGTGCG R CGGATCCAGACCCATAGAAC ABI3 F CAATGGGCTCCAAGAAGGTG R TCTCTTCGTAGCTGCTGACG ABI5 F TGATCAAGAACCGCGAGTCTGC		GIG	F	GGGCTCTCATGGGTGTAAGCTC
QRT-PCR R TCCTTCCTCTGGCCTATCAGC CHS F TGATGGTGCCATAGACGGAC R AGGATCGCTGGACCTCCAGG HXK1 F AGTGAGTGTATGGAGAGCTCAC R AGAGTGAGAAGCAGCAAGAAGCG ABI4 F TCGTTTCATCATGAGGTGGCG R CGGATCCAGACCCATAGAAC ABI3 F CAATGGGCTCCAAGAAGGTG R TCTCTTCGTAGCTGCTGACG ABI5 F TGATCAAGAACCGCGAGTCTGC			R	TCCCTCTTTTGGTTCCGGTTTG
$qRT-PCR \begin{tabular}{llll} \hline R & TCCTTCCTCTGGCCTATCAGC \\ \hline CHS & F & TGATGGTGCCATAGACGGAC \\ R & AGGATCGCTGGACCTCCAGG \\ \hline HXK1 & F & AGTGAGTGTATGGAGAGCTCAC \\ R & AGAGTGAGAAGCAGCAAGAAGCG \\ \hline ABI4 & F & TCGTTTCATCATGAGGTGGCG \\ R & CGGATCCAGACCCATAGAAC \\ \hline ABI3 & F & CAATGGGCTCCAAGAAGGTG \\ R & TCTCTTCGTAGCTGCTGACG \\ \hline ABI5 & F & TGATCAAGAACCGCGAGTCTGC \\ \hline \end{tabular}$		APL3	F	CCAAACCGAATCTGAGATCGC
qRT-PCR R AGGATCGCTGGACCTCCAGG HXK1 F AGTGAGTGTATGGAGAGCTCAC R AGAGTGAGAAGCAGCAAGAAGCG ABI4 F TCGTTTCATCATGAGGTGGCG R CGGATCCAGACCCATAGAAC ABI3 F CAATGGGCTCCAAGAAGGTG R TCTCTTCGTAGCTGCTGACG ABI5 F TGATCAAGAACCGCGAGTCTGC			R	TCCTTCCTCTGGCCTATCAGC
qRT-PCR HXK1 F AGTGAGTGTATGGAGAGCTCAC R AGAGTGAGAAGCAGCAAGAAGCG ABI4 F TCGTTTCATCATGAGGTGGCG R CGGATCCAGACCCATAGAAC ABI3 F CAATGGGCTCCAAGAAGGTG R TCTCTTCGTAGCTGCTGACG F TGATCAAGAACCGCGAGTCTGC		CHS		TGATGGTGCCATAGACGGAC
HXK1 F AGTGAGTGTATGGAGAGCTCAC R AGAGTGAGAAGCAGCAAGAAGCG ABI4 F TCGTTTCATCATGAGGTGGCG R CGGATCCAGACCCATAGAAC ABI3 F CAATGGGCTCCAAGAAGGTG R TCTCTTCGTAGCTGCTGACG F TGATCAAGAACCGCGAGTCTGC			R	AGGATCGCTGGACCTCCAGG
ABI4 R AGAGTGAGAAGCAGCAAGAAGCG F TCGTTTCATCATGAGGTGGCG R CGGATCCAGACCCATAGAAC ABI3 F CAATGGGCTCCAAGAAGGTG R TCTCTTCGTAGCTGCTGACG F TGATCAAGAACCGCGAGTCTGC		HXK1		AGTGAGTGTATGGAGAGCTCAC
ABI4 F TCGTTTCATCATGAGGTGGCG R CGGATCCAGACCCATAGAAC ABI3 F CAATGGGCTCCAAGAAGGTG R TCTCTTCGTAGCTGCTGACG F TGATCAAGAACCGCGAGTCTGC			R	AGAGTGAGAAGCAGCAAGAAGCG
ABI4 R CGGATCCAGACCCATAGAAC ABI3 F CAATGGGCTCCAAGAAGGTG R TCTCTTCGTAGCTGCTGACG F TGATCAAGAACCGCGAGTCTGC		ABI4		
ABI3 F CAATGGGCTCCAAGAAGGTG R TCTCTTCGTAGCTGCTGACG F TGATCAAGAACCGCGAGTCTGC				
R TCTCTTCGTAGCTGCTGACG ABIS F TGATCAAGAACCGCGAGTCTGC		ABI3		CAATGGGCTCCAAGAAGGTG
ARIS F TGATCAAGAACCGCGAGTCTGC				TCTCTTCGTAGCTGCTGACG
ABIS R TGTGCCCTTGACTTCAAACTCTC		ABI5		TGATCAAGAACCGCGAGTCTGC
			R	TGTGCCCTTGACTTCAAACTCTC

Supplemental Figure S1.



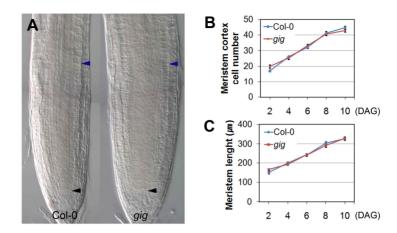
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Supplemental Figure S2.



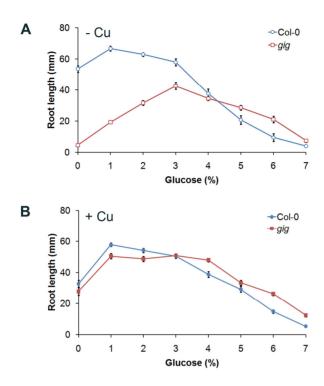
Supplemental Figure S2. Comparative analysis of Col-0 and gig adult plants. A, Top view. B, Side view. Rosette leaves of gig are smaller and inflorescence stems of gig are shorter than those of Col-0. F_1 progeny of crosses between Col-0 and gig (Col-0 x gig) are indistinguishably similar to Col-0.

Supplemental Figure S3.



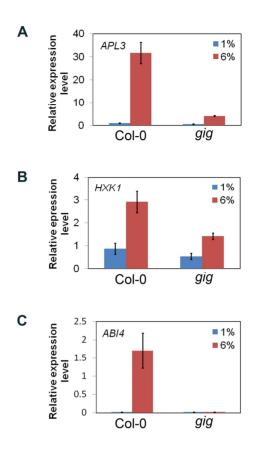
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Supplemental Figure S4.



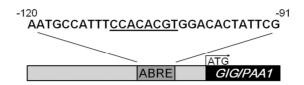
Supplemental Figure S4. Root growth assay in the absence or presence of Cu with increasing Glc concentrations. Twelve-day-old seedlings of Col-0 (blue) and gig (red) were grown on MS agar plates without (A) and with $10\mu M$ CuSO₄(B). Error bars indicate the SE of mean from biological triplicates.

Supplemental Figure S5.



Supplemental Figure S5. Expression analysis of Glc-responsive genes with the addition of Cu. qRT-PCR in Col-0 and gig in the presence of 1% (blue) and 6% (red) Glc with 10 μ M CuSO₄. A, APL3. B, HXK1. C, ABI4. Statistical significance of differences was determined by Student's t-test (asterisk for P<0.05). Error bars indicate the SE of mean from biological triplicates.

Supplemental Figure S6.



Supplemental Figure S6. Prediction of an ABRE sequence in the *GIG* promoter. The combination of a CCAC/ACGT core element that is known for both ABI4 binding and retrograde signaling is underlined.