Supplementary Figure S1

A

ERF012 protein

Chromosome 1
At1g27440, At1g51680

Chromosome 2
At2g20610, At2g25450,
At2g30490, At2g34710

Chromosome 3
At3g18660, At3g49680

Chromosome 5
At5g07700, At5g15630,
At5g17420, At5g60690

B

Col-0   OE #4

AtGUT2(At1g27440)
At4CL1(At1g51680)
AtSUR1(At2g20610)
AtGSOH(At2g25450)
AtC4H(At2g30490)
AtHB14(At2g34710)
AtGUX1(At3g18660)
AtBCAT-3(At3g49680)
AtCOBL4(At5g15630)
AtCcsA7(At5g17420)
AtREV(At5g60690)

1.0
0.8
0.6
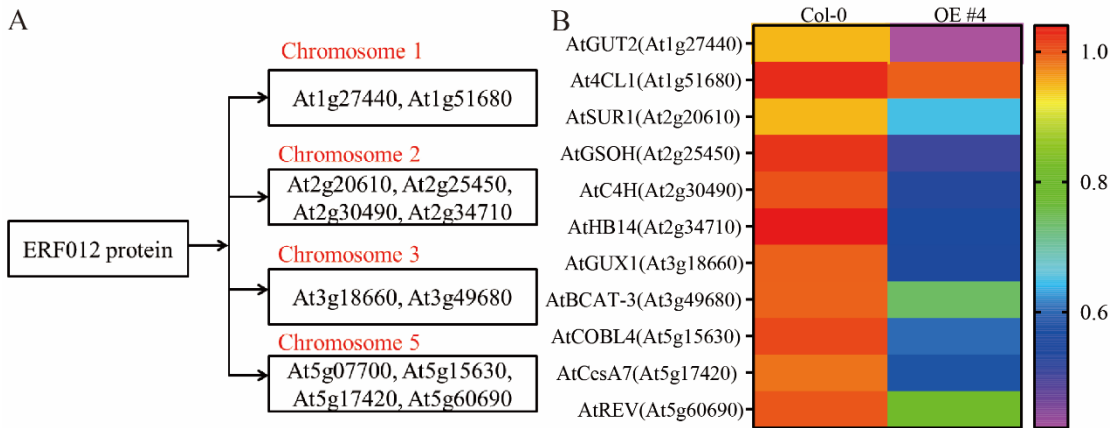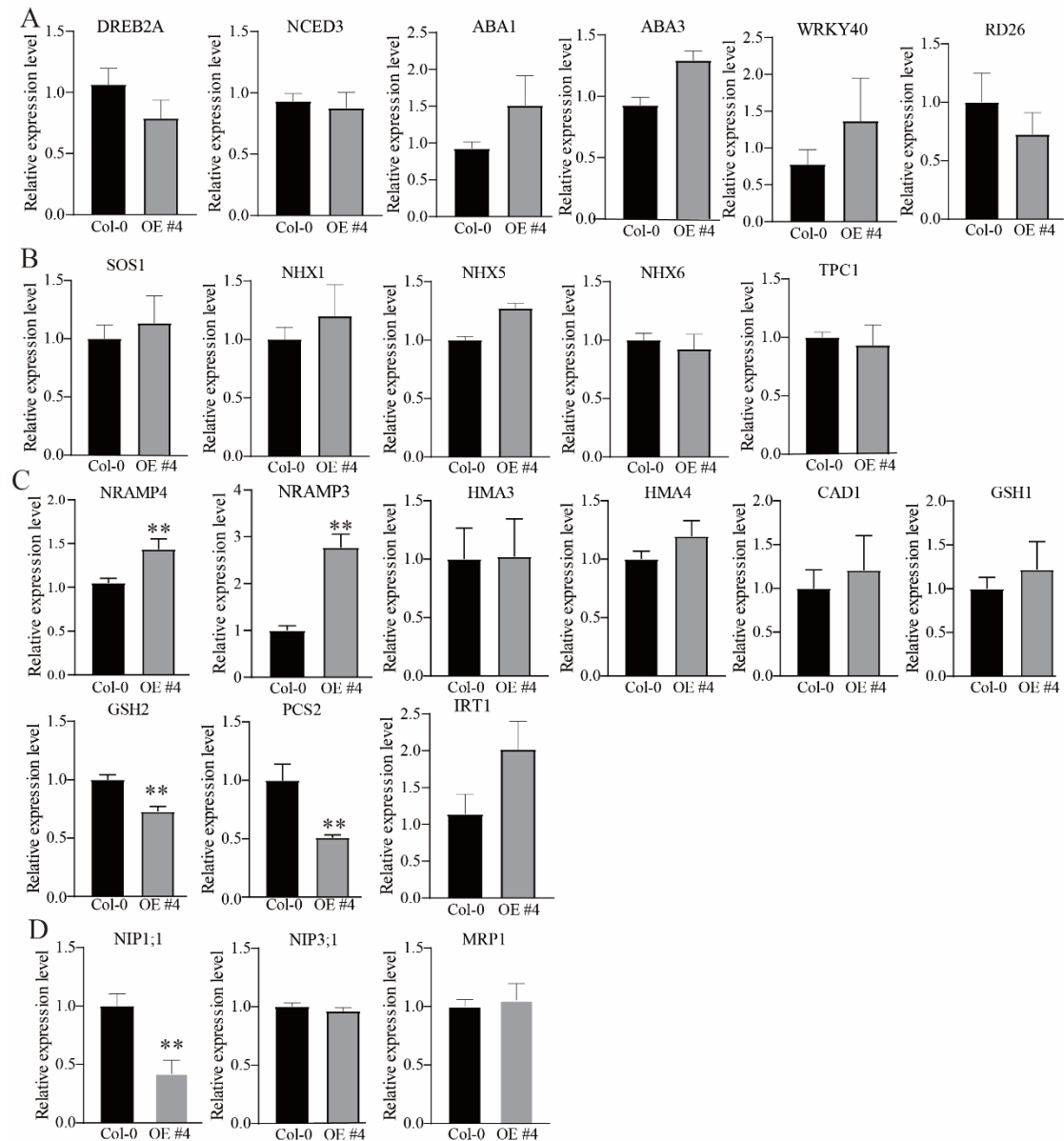
Supplementary Figure S1. ERF012 regulates the the genes involved cell wall formation. (A) The genes were were predicted to be the targets of ERF012 in the website (https://bar.utoronto.ca/eplant/). (B) The heatmap shows the expression of the ERF012 target genes in 12-day-old Col-0 and overexpression *ERF012* line (OE #4). Values represent means ± SD, n=3 pools, with about 20 plant roots per pool.

Supplementary Figure S2. ERF012 regulates the expression of the genes involved in drought, NaCl, Cd, As. (A-D) The expression of the genes involved in drought, NaCl, Cd, As stress in 12-day-old Col-0 and overexpression *ERF012* line. Values represent means ± SD, n=3 pools, with about 20 plant roots per pool. Asterisks indicate significant differences between different treatments: Student's *t*-test: **, P < 0.01.
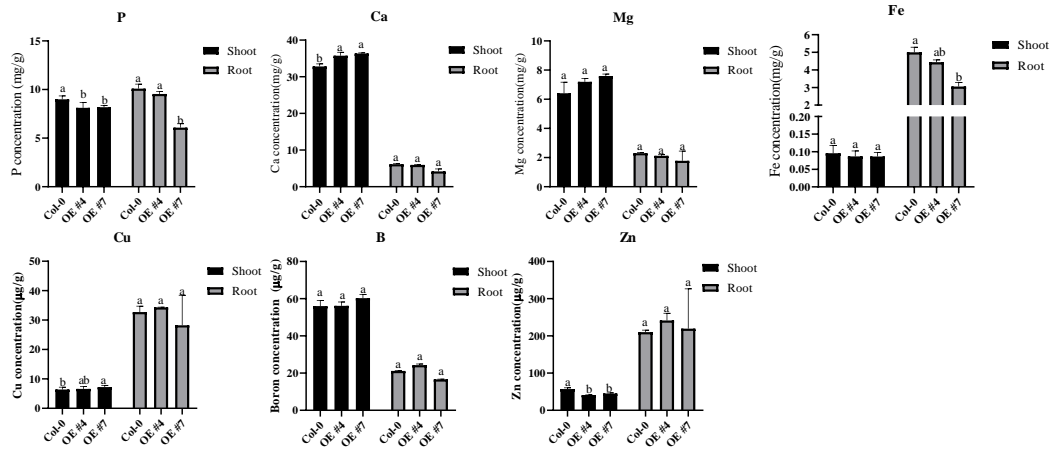
Supplement Figure S3: The nutrition in Col-0 and *ERF012* OE lines. The Col-0 and *ERF012* OE lines were grown in hydropic solution for 35 d. The shoots and roots were harvested and dried for nutrition detection. Values represent means ± SD, n=3. Letters indicate significant differences between different plants: Ducan's test (*p*<0.05).

Supplement Table S1. The specific primers were used in the paper.

Use	Primers (5'->3')
RT-qAtERF012-F	GTCGGCGTTGATGGATTTGGAGT
RT-qAtERF012-R	CTTGCTCTGAGCTGTTCTTGAGTATAGATC
RT-qAtACS7-F	GCTCGAACCATTTCCAGATAAC
RT-qAtACS7-R	AAGTGAATATTCTTGCGTACGC
RT-qAtACS11-F	CAGTTGTTTGAAGAGTAACGCA
RT-qAtACS11-R	
RT-qAtCYCB1:1-F	CATCGTTTGGTCCGACATATTC CGAGACGCCCCCACTACTTAGACTT
RT-qAtCYCB1:1-R	CGGGTTTAGCTCGAATCGGACATGC
RT-qAtUBQ5-F	GTGGTGCTAAGAAGAGGAAGA
RT-qAtUBQ5-R	TCAAGCTTCAACTCCTTCTT
RT-qAtACTIN-F	ACAGTGTCTGGATCGGTGGTTC
RT-qAtACTIN-R	TGCCTCATCATACTCAGCCTTG TGATCCAGAGGTGTAAAGTGAC
RT-qAT1G51680 -F	AAGTTCTTTACCAAGAGGAGCA GAAGTCTTTAATCGCCGTCTTC
RT-qAT1G51680 -R	TGAGATCATCTCCGACTTGAAG TCCAGTTATCATAGCAGACGAC
RT-qAT2G30490 -F	TGGTATTGAGGTTAGGATCGTG GAGATCTTCCGCACAAGTTAAC
RT-qAT2G30490 -R	CAATGGCTTCGATACCTTCAAG CATAACCCGCATGTTAACGTAG
RT-q AT1G27440 -F	TTAACCTTCGCAACTACACTCT TGTCCGATTCTCTCTAACATCG
RT-q AT1G27440 -R	GGCATTGAGTTTTCTGTTCACT CAAAATCATTTTCATCGACGCG
RT-q	CATCAGAAGCTGAAACGTACAG

AT2G20610 -F RT-q	TATGAGAAATGGTGCTGAGAGG CCAACGTTTGTTTGCTAGTACA
AT2G20610-R RT-q	GCTGGAACTACAAACAAGACTG GCAGGTAACATTCCATGTCATC
AT2G25450 -F RT-q	GACCTATCTAGATCGGCTTTCC ACTGACAAAGACATCTACAGGG
AT2G25450 -R	TAAGGCTATCTGTTCGGACTTC
RT-qAT2G3471 0 -F	GCAACAGCTTGTTCATAACTCA CATGTTTGATGTCGATGAGCTT
RT-qAT2G3471 0 -R	ATTCCGTAGTTGAGGCTTTGTA GATGAATTTGTTCCAGAGAGCG
RT-q AT3G18660 -F	AACACTAGGATCAGCCGTTTTA TTGCTGAACAAGTTATGGAAGC
RT-q AT3G18660 -R	CTGCTGCAGAGTCATTCTACTA AATATGCATTAGCTCAAGGTGC
RT-q AT3G49680 -F	GCACGATGCTTTACCTTGATAG GTTGCAGCAAACAGAAGAAGTA
RT-q AT3G49680 -R	AAAATCGATTCTTGACGTTGGG TGTTTCACATTTGTAGGGGAGT
RT-q AT5G15630 -F	ATTTCCGATCTCTTGGGCTAAA ATTTTGATGCAGTCAGTGGATG
RT-q AT5G15630 -R	GCAAGCAGATTCTAGTCTTTCG GTTGCCCTTATGATGCTTATGG
RT-qAT5G1742 0 -F	TTCTTGAGCTCTCCGTTACATT CGCTTCTCATTGGTTTAATCGT
RT-q AT5G17420 -R	CAGTAACAACTGAAGCGACAAA GGATATTTGGTCAATCTGGCAC
RT-q AT5G60690 -F	TCTAGCATTGTACCAGTCGATC TATCACAACAACTGAGAGCCTT
RT-q AT5G60690-R	GCTTCTTCGATATCAAGCGTT CTTGCATTTGCTTGGATGTTTG
RT-qAtDREB2A -F	CCAACAGCTTGTTTGATAGTCC AAGAAACAGCGTACGATGAAAC
RT-qAtDREB2A -R	GATTCCCTGGATCTAAAAACGC ATGGTCTCGGATTTTAGGTCTC
RT-qAtNCED3- F	AGAAACTGATCTTGCGTAGTCA TGAAAACAACTTCTTTAGCGGG
RT-qAtNCED3- R	GACAACCACTGACTAACACAAC GTTACATCTGATGTTCGGCTTC
RT-qAtABA1-F	CGTGAACAGTCAATATCAGCAG
RT-qAt ABA1-R	CTTGTGCTGAAGTCAATTCACA
RT-qAt ABA3-F	TTGGCATGATGGGTATATCCTC
RT-qAt ABA3-R	GAGGACATTCGTTTGGGTTTAC
RT-qAtWRKY4 0-F	GAAGCAATGACTGATGTAGCTG TCACTTCCAGCAAATTTCAACC
RT-qAtWRKY4 0-R	CGTACACAGAGGAGAGAAACTT GCTTCAAATTCAGCACTTCTCA
RT-qAt RD26-F	GTTGAAGTTGCTGGAGAGATTG
RT-qAt RD26-R	GACTTGATCACGACGTTTGTAG
RT-qAt SOS1-F	GATAAACTCCATCGTAAACGCC
RT-qAt SOS1-R	TTCCATCTAGACGACGATGTTT
RT-qAt NHX1-F	GAGGTCGTATTTGAGTTTGACG
RT-qAt NHX1-R	CAAGCATATGCATCTACGATGG
RT-qAt NHX5-F	AACTATTCTCAGCTAGACTCGC
RT-qAt NHX5-R	ATCCCCCGGGCTGCAGGAATTCATGGTGAAACAA
RT-qAt NHX6-F	GAACGCA
RT-qAt NHX6-R	CGATAAGCTTGATATCGAATTCTTAATTGAAACTC
RT-qAt TPC1-F	CAAAGCGGAATG
RT-qAt TPC1-R RT-qAt	

Primer	Sequence
NRAMP4-F RT-qAt	
NRAMP4-R RT-qAt	
NRAMP3-F RT-qAt	
NRAMP3-R RT-qAt HMA3-F	
RT-qAt HMA3-R	
RT-qAt HMA4-F	
RT-qAt HMA4-R	
RT-qAt CAD1-F	
RT-qAt CAD1-R	
RT-qAt GSH1-F	
RT-qAt GSH1-R	
RT-qAt GSH2-F	
RT-qAt GSH2-R	
RT-qAt PCS2-F	
RT-qAtPCS2-R	
RT-qAt IRT1-F	
RT-qAt IRT1-R	
RT-qAt NIP1;1-F	
RT-qAt NIP1;1-R	
RT-qAt NIP3;1-F	
RT-qAt NIP3;1-R	
RT-qAt MRP1-F	
RT-qAt MRP1-R	
GAL4DB-ERF012-F	
GAL4DB-ERF012-R	
OE-ERF012-F	TCCCCCCGGGATGGTGAAACAAGAACGCAAGATCC
OE-ERF012-R	CCGCTCGAGTTAATTGAAACTCCAAAGCGGAATGT
pERF012-F	ggtcgacggatccccGTCATTTGTTGGGAACTGGTACGGA
pERF012-R	AGGGACTGACCACCCTGTGTACGTACAGGCTTTGTAGAGTG
AT1G51680-his2-F	atagggcgaattcccGTTGAAGGATGAGTTTGGTGAAGGCT
AT1G51680-his2-R	acgcgtgagctccccAGGCTTTGGCCTGAAGGAAACA
AT2G30490-his2-F	atagggcgaattcccGACCAACGAAATTCGGCATACGTG
AT2G30490-his2-R	acgcgtgagctccccGAAATGAGGACCAACGGCAAAAG
ERF012-rec2-F	TCCCCCCGGGATGGTGAAACAAGAACGCAAGATCC
ERF012-rec2-R	CCGCTCGAGTTAATTGAAACTCCAAAGCGGAATGT
ERF012-DT2-R0	ATATATGGTCTCGATTGGTTGAGGAGAGTAATTGAAGTT
ERF012-DT1-F0	TGGTTGAGGAGAGTAATTGAAGTTTTAGAGCTAGAAATAGC
ERF012-DT2-R0	AACCGTCTTCGTCTTCGTGTAACAATCTCTTAGTCGACTCTAC
ERF012-DT2-BsR	AACCGTCTTCGTCTTCGTGTAACAATCTCTTAGTC

GACTCTAC

Use	Primers (5'->3')	
	ERF18-F	TCCCCCCGGGATGGTGAAGCAAGCGATGAAG GAAGA
	ERF18-R	CCGCTCGAGCGCGCTCAAAAATCCCAAAGAAT CAAAGA
Transgenic plants	ERF12-F	TCCCCCCGGGATGGTGAAACAAGAACGCAAG ATCC
	ERF12-R	CCGCTCGAGTTAATTGAAACTCCAAAGCGGAA TGT
	ERF18-F	TCCCCCCGGGATGGTGAAGCAAGCGATGAAG GAAGA
	ERF18-R	CCGCTCGAGCGCGCTCAAAAATCCCAAAGAAT CAAAGA
	A-AOCX3-F	TCCCCCCGGGAGTTGCTGATAAAAAAAAAAA GAGTGG
	A-AOC3-R	CCGCTCGAGCTTGGTCGGTTCGGTTGTGTCAA TTTG
	C-AOC1-F	TCCCCCCGGGTTCATCTAACAAAACTATTATC
	C-AOC1-R	CCGCTCGAG GAGTTTTACGAAATGTCTATGTG
Yeast One Hybrid	ERF12-F	TCCCCCCGGGATGGTGAAACAAGAACGCAAG ATCC
	ERF12-R	CCGCTCGAGTTAATTGAAACTCCAAAGCGGAA TGT
	ERF18-F	CCGGAATTCATGGTGAAGCAAGCGATGAAGG AAGA
	X2-ERF18-R	GCTCTAGAAAAATCCCAAAGAATCAAAGA
	121-AOC1-F	CTCAAGATCAGAAGTATGTGGCAATGAGGTTT AGAATGG
	121-AOC1-R	AGGGACTGACCACCCAGATGGGACTTTGGTTT TATGTGG
Transient Expression Assays	121-OPR3-F	CTCAAGATCAGAAGTAGTAACTCAGGGCTCAC AAATGG
	121-OPR3-R	AGGGACTGACCACCCGTTGTGTGGTCGTGGA AATGGA
	121-AOS-F	CTCAAGATCAGAAGTACGAACGCTTGGGACGT GTTTT
	121-AOS-R	AGGGACTGACCACCCACAGTGGCGAGTGTTG TGATTG
	121-AOC3-F	CTCAAGATCAGAAGTTCGTTTGGACGTTGGTA

| 121-AOC3-R | CAC AGGGACTGACCACCCCCACTCGGTTTCGAATT GTCT |