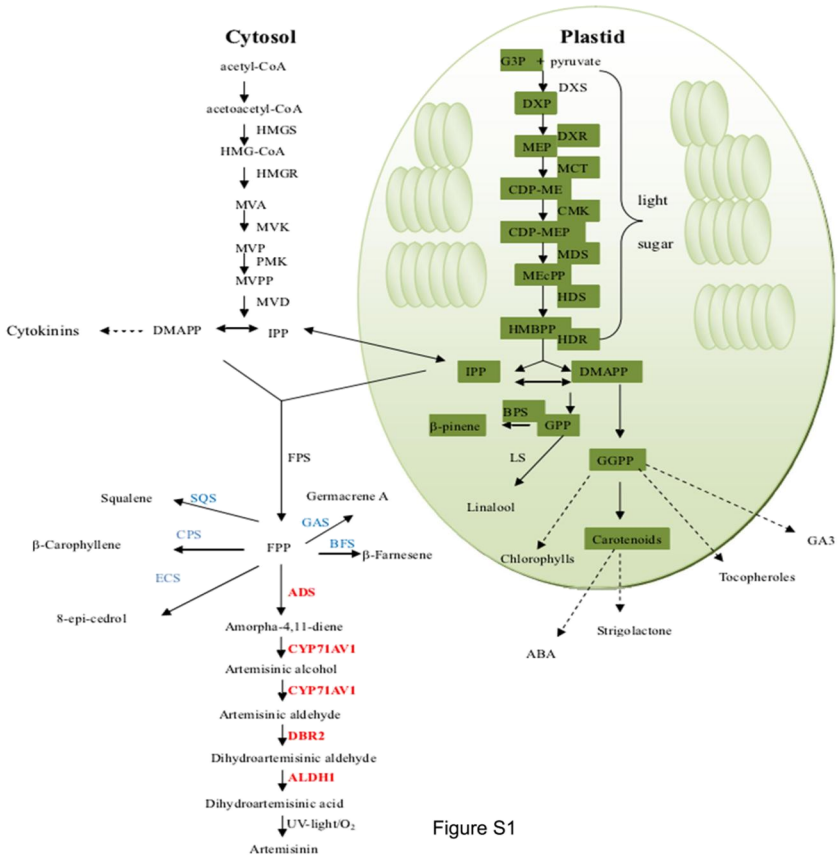

Figure S1

Figure S1 The artemisinin biosynthesis pathway in *A. annua*. Branch pathway genes are marked in blue, and artemisinin biosynthesis genes are marked in red. ADS, amorpha-4,11-diene synthase; ALDH1, aldehyde dehydrogenase 1; BFS, β-farnesene synthase; CPS, β-caryophyllene synthase; CYP71AV1, amorphadiene-12-hydroxylase; DBR2, artemisinic aldehyde Δ11(13) reductase; FDS, farnesyl diphosphate synthase; GAS, germacrene A synthase; HMGR, 3-hydroxy-3-methyl-glutaryl coenzyme A reductase; HMGS, 3-hydroxy-3-methyl-glutaryl coenzyme A synthase; SQS, squalene synthase; DXR, 1-deoxy-D-xylulose-5-phosphate reductoisomerase; DXS, 1-deoxy-D-xylulose-5-phosphate synthase.

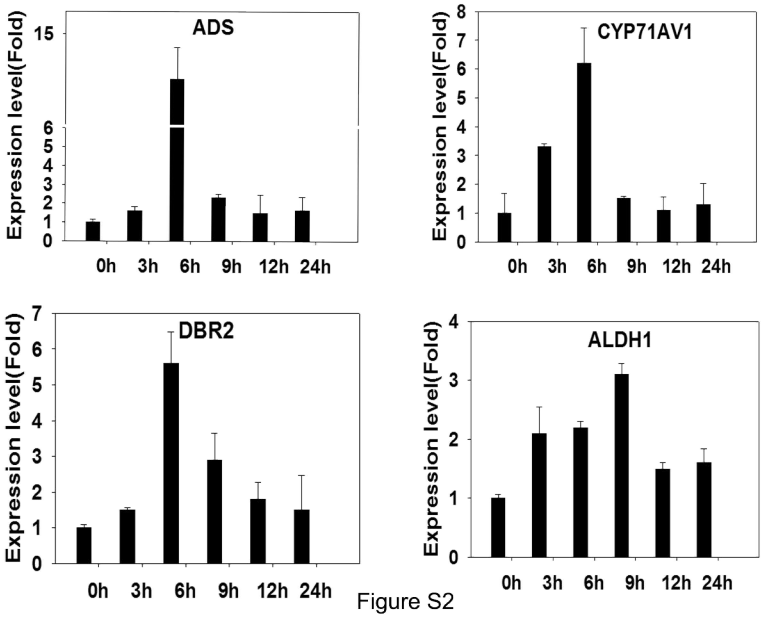

Figure S2

Figure S2 Expression levels of *ADS*, *CYP71AV1*, *DBR2* and *ALDH1* under SA treatment. *β-ACTIN* was used as an endogenous reference gene. Error bars indicate SE (n = 3).

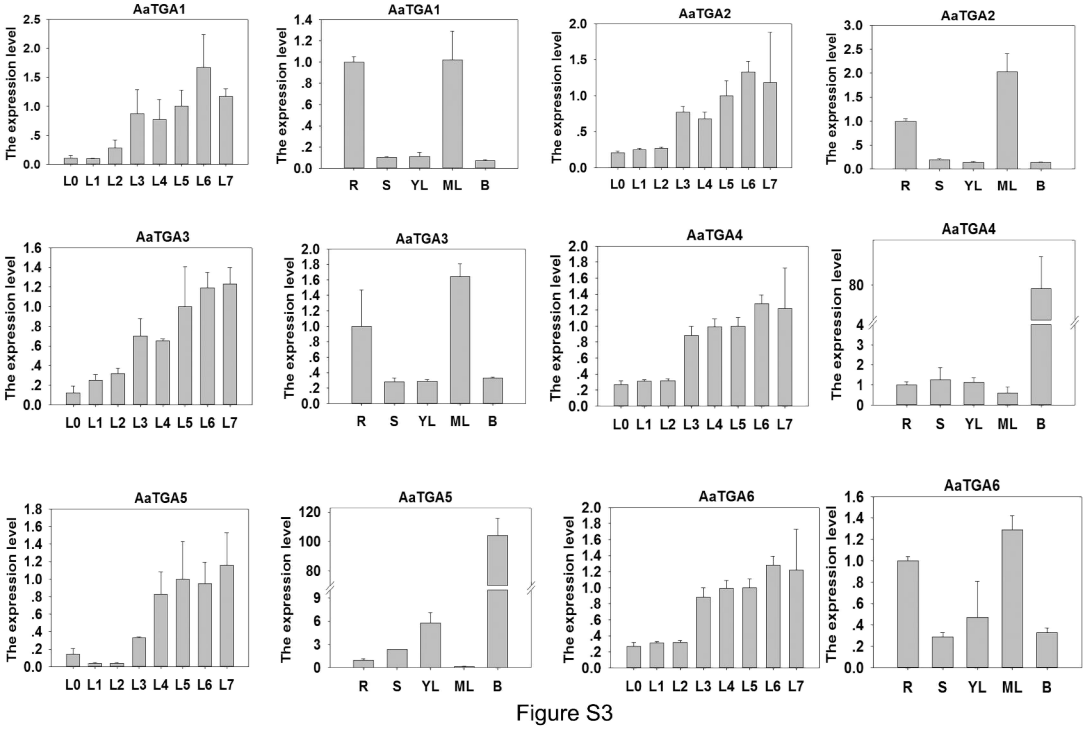

Figure S3

Figure S3 The expression levels of *AaTGA1*～*AaTGA6* in the leaf0～leaf7(L0～L7) and roots (R), stems (S), leaves (L) and buds (B). *β-ACTIN* was used as endogenous reference gene. Error bars indicate SE (n = 3).

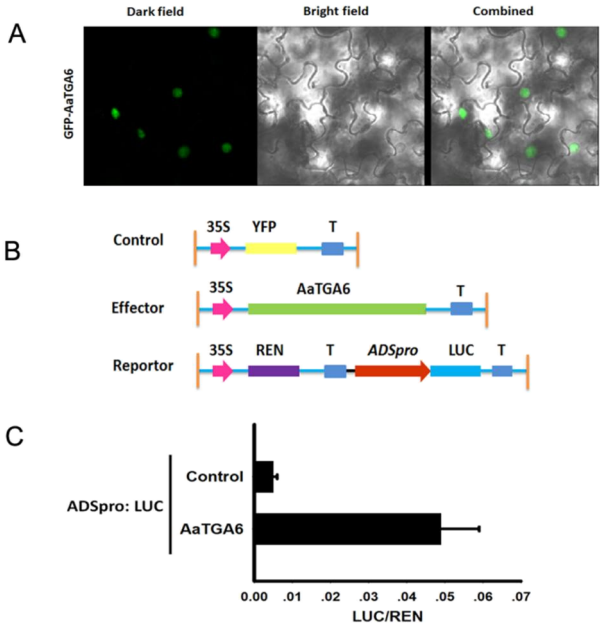

Figure S4

Figure S4 Subcelluar location and transient dual-LUC assay of AaTGA6.

(A) Subcelluar location assay indicates that AaTGA6 is located in the nuclear. AaTGA6 localizes to the nucleus. The ORF of AaTGA6 was fused with the C-terminal of YFP in YFP-PHB vector, and the AaTGA6 was driven by 2×35S promoter. The plasmids were delivered into tobacco leaves by *A. tumefaciens* infiltration. (B) Schematic illustration of the reporter and effector constructs used in the transient dual-LUC assays. (C) Transient dual-LUC analysis shows AaTGA6 activation of the transcription level of *ADS*. LUC/REN represents luciferase/Renilla ratio, n = 3 independent experiments.

>pro-AaERF1

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Figure S5 The promoter sequences of *AaERF1*, *AaERF2* and *AaORA*.

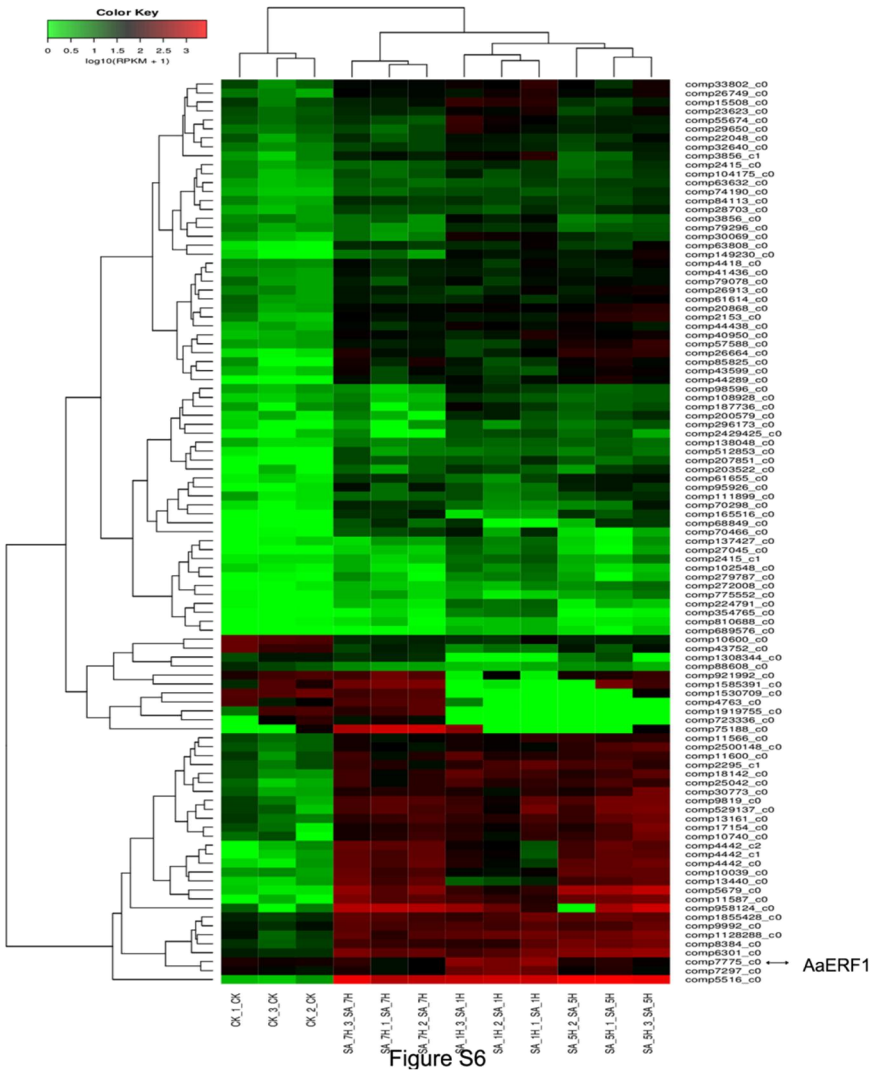

Figure S6

Figure S6 Expression heat map of SA-related genes in *A. annua*. The heat map shows the RPKM change of 101 genes expressed in 30-day-old *A. annua* under the treatment of SA (100μM) at the time points of 1 h, 5 h and 7 h. The color scale at the top represents the value of RPKM (red represents high expression and green represents low expression).

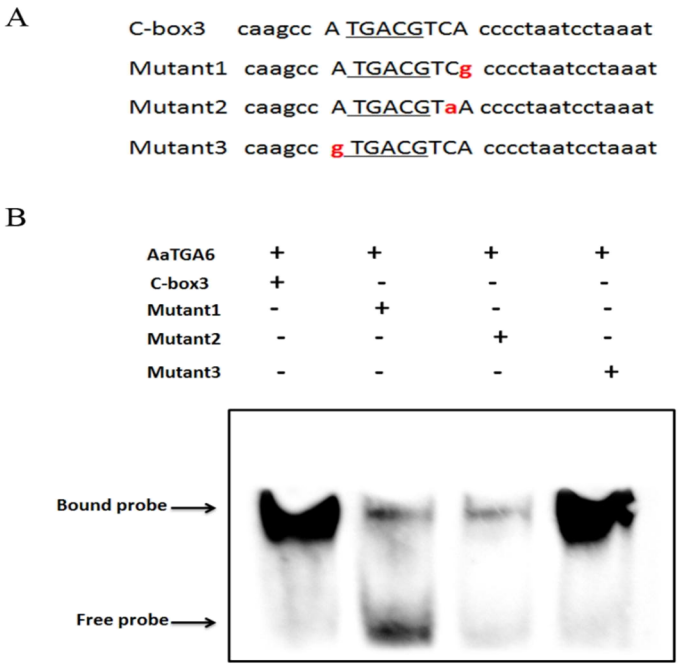

Figure S7

Figure S7 EMSA assay to test the binding of AaTGA6-His to the mutant "TGACG" motifs in the promoter of the *AaERF1* gene. (A) The mutant "TGACG" sequences. (B) The binding of AaTGA6-His to the mutant "TGACG" sequenes.

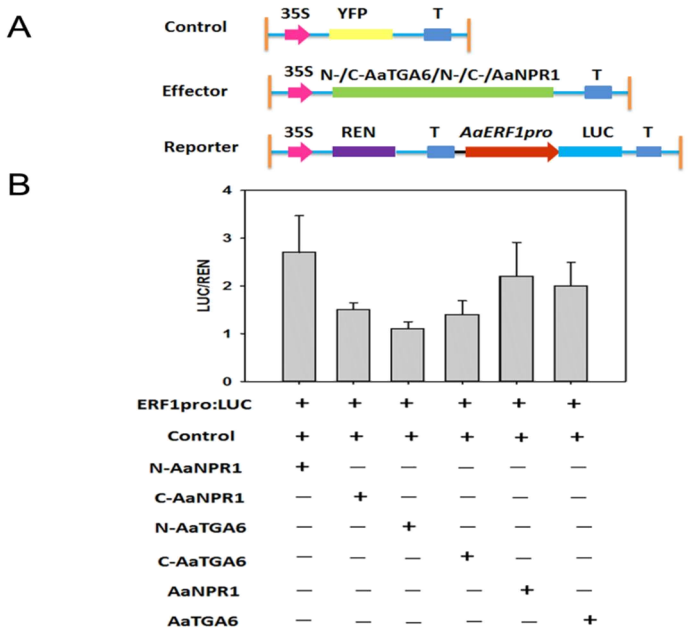

Figure S8

Figure S8 N-AaNPR1 can activate the promoter of *AaERF1*.

(A) Schematic illustration of the reporter and effector constructs used in the transient

dual-LUC assays. (B) Transient dual-LUC analysis showed that N-AaNPR1 can activate the promoter of *AaERF1*. LUC/REN represents the luciferase/Renilla ratio, n=4 independent experiments. *P<0.05.

Figure S9

Figure S9 The phenotype of *A. annua* transgenic plants. The phenotype of three-month-old seedlings of wild type (WT), RNAi (AaTGA6-phellsgate) and overexpression (2×35S::AaTGA6) *A. annua* plants.

Table S1 Sequence of primers

primers	Primers sequence(5'-3')
AaTAG1-F	atggatactagatcatttggt
AaTGA1-R	ttattgtatttgtttatctctctgc
AaTAG2-F	atgaattcatcgtccactcag
AaTGA2-R	tcacaaagccggttcac
AaTAG3-F	atggcatcaacatctacacaa
AaTGA3-R	ctagctcatgcgttcacgag
AaTAG4-F	atgacaggcacaactagtgtt
AaTGA4-R	ctaagtagcgtccctttttg
AaTAG5-F	atgaccaccaacaacaataat
AaTGA5-R	ctataaagttaaaatgtttgc
AaTAG6-F	atgggtagcaaaagcttgaag
AaTGA6-R	ttactcttgtgggcgagcaag
AaNPR1-F	atggatgttagaaatgggttt
AaNPR1-R	ctattttgggattgggaactg

AaNPR2-F	atgttaaaaatgcagcgacgc
AaNPR2-R	tcacgagtatttccgagatctg
AaNPR3-F	atgtcacttgaagattcattg
AaNPR3-R	ctaatactcatgatgagaatg
AaNPR4-F	cttgaaaattgttatgatttg
AaNPR4-R	ctagagagtctaataggccaa
AaNPR5-F	atggaatacttagccatggaa
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AaNPR1-BD-F	tggccatggaggccgaattc atggatgttagaaatgggttt
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AaTGA6-42AD-R	agctcgag ttactcttgtgggcgagcaag
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PAaERF1-R	ttttaaaatatgggtttttatgtt
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Q-AaTGA1-R	accagaagcccataaa
Q-AaTAG2-F	tctggctgacgctgtg
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Q-AaTAG6-F	aacttgggaggattga
Q-AaTGA6-R	ttgaaggttggtggaa
ox-**Aa**TGA6- BamH1-f	cgcggatccatgggtagcaaaagcttgaag
ox-**Aa**TGA6-**xba1-r**	tgctctagattactcttgtgggcgagcaag
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Q-AaNPR2-PF	CCAACTGAAGCGAAAC

Q-AaNPR2-PR	AATGAGGGAAGAAACG
Q-AaNPR3-PF	CAGACCCTAATGTTCG
Q-AaNPR3-PR	GAGTTCAAGGCAAAGC
Q-AaNPR4-pF	ATAAGTGGTTGTGGGAGT
Q-AaNPR4-pR	CATCTGTGGGTTCTGC
Q-AaNPR5-PF	GCCCAAACAACCTCCG
Q-AaNPR5-PR	CGCCTACCCATCTCCA
EMSA-F	aatgatgcgtcaagccaTGACGtcacccctaatcctaaat
EMSA-R	atttaggattaggggtgacgtcatggcttgacgcatcatt