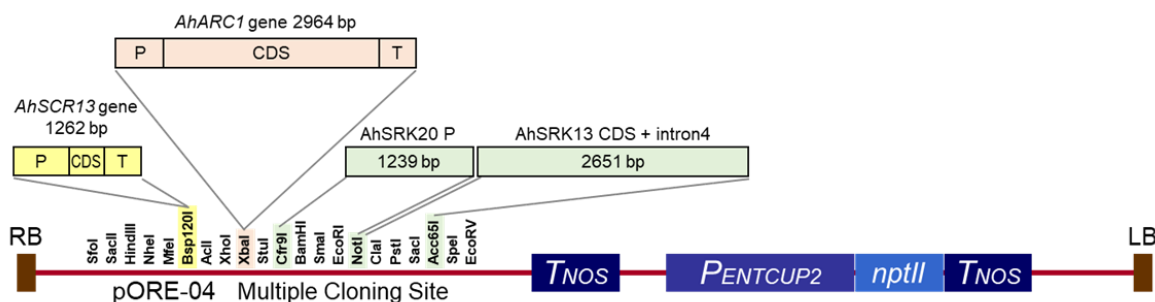


**Supplementary File S1. Map and sequences for AhSCR13-AhSRK13-AhARC1.**

pORE\_O4 vector: Coutu et al. pORE: a modular binary vector series suited for both monocot and dicot plant transformation. *Transgenic Research* 2007, 16: 771-781.

*A. halleri* ARC1 sequence: retrieved from Phytozome.

*A. halleri* S-haplotype sequences: retrieved from GenBank (Goubet et al. Contrasted patterns of molecular evolution in dominant and recessive self-incompatibility haplotypes in *Arabidopsis*. *PLoS Genet.* 2012, 8(3):e1002495).



***Arabidopsis halleri* ARC1 gene sequences retrieved from Phytozome: Araha.20846s0006**

>AhARC1 Promoter-CDS-terminator *XbaI-XbaI*

TCTAGAcaattttacagttttgaattcaaagcaattttatctgtagcatactttttttggataaatcctatcggtgatccggtcggtcagcctc  
 ggtaggaatgcaccgaagtgtacagagtggtacttctctcggttcaacgattcaacgtagcatactttgcatcagtggtttcaaattgcaata  
 tggttttgacaccaataaacatcaacggtacataattgatctcaactaccagctaatacagagaatggttaagtgtgactaattatgatccgttacaat  
 gttacatactttacttaaatgtcaacattcataacaacgaagaattttttcagattttgccaacgcggtttacaaatctcttcttcttcttgcacc  
 gcaaataaattgtgtcgttgttcttacagtcgaagtcttagcttcttatttgacaagccacactggtttggagccatccatcgtcaac**ATG**  
**GCCACCGAGGCGATATTCGCATCCTTACGACGGAGGAGCTCGCCGTCCTGGACGCATTTT**  
**TGACAACAACCGTTGATCTCTCCGGCGTCCCTCTCATTCAAACCCTAGCTTCAATTCAGCA**  
**GAAATCGTCTCGTGCTTCCGCGGCGTACGTTTCTCCTTCCAACGCAGAAACTCACGTTCTCT**  
**GATTCGGAAGATTGAGGTCTTGCTCGTCTTGTTTAAATACATCTCCGATGATTCAGGTTTGG**  
**ATTCGACGGCAGTACTTTGCTTTAAGGAGCTCTATCTCTCCTCCACCGTTCCAAATTCCTTC**  
**TCCATTACTGTGCTCAGTCCAGTAAACTATGGCTCTTATTACAAAACCCATCGCTTTCAGAT**  
**TTTTTCCATGTTTTGAATCGTAATATTTGTACCCTTTTGGATGTTTTACCCATCAACAGTCTTA**  
**ATCTAAGCGACGACATTAGAGAACAATCGAGCTTTTGCATCAACAATCCAGTAAATCGAC**  
**GACTGTTCGTTGATCACAACGACGACTTTCTACGGGACCAATTCTATTCGTTTCTCCACG**  
**GATTTGAGAAGGTCAGATACCCAATTCGGAAGAATTGAGATCTTCTTCGTAGAGAAATT**  
**GGAGATTAGGGATCCGAAAAGTTGCAGTGATGAAATCGAGTTTCTTGAAGAGCAGATAGT**  
**GAATCATGATTGTGATGATTTAGAGCCTACAAGGTCGTTGATTAACGGGTTTGTGGCTATCA**  
**CACGTTATTGCATGTTTTTGTGTTTGGGTTTGAAGATGATGGAGAGTGGAGTATCGAGAAC**  
**TTGAAGAAACAGAGGAAATGTTTTATTGCGGAGGAGATTGTGGACACGTTTATGACGCTAC**  
**CAAAGGATTTTGTGCTCTATCTCTTCTTAGTTTGAAGGATCCTGTGATTGTTTCCACTG**  
**GACAACTTATGATCGGAGCTCCATAGTTAGGTGGTTTGAAGAAGGTCACTCTACTTGTCCC**  
**AAAACAGGGCAAAGCTTGTGGACTCTTCGTGATTGTTTCTAATCTAGCTTTGAGAACTT**  
**GATAACACGTTGGTGGCAGCAATGGAGTTTGAAGGATTCACCAAACGAGTCTCCTGCTTTA**  
**GTTCTTCAAACAAGAGCTTCAATGGAAGCAACTAAAGCCACTGTGTGATTCTCATACAAA**

ATCTAGCTAGTGGGTCAGAATTAGCTCAGATAGTGGCGGCACGAGAAATTCGTCTTCTAGC  
 CAAAACAGTTAGGAAAAGAGGTCTATTGATCGCGGAAGCAGGTGCAGTCCCGCATTGTGT  
 AGACTTCTTAAATCCAAAAACGCTGTTGCGCAAGAGCATTCCGTTACAGCGATGCTTAATTT  
 GTCGTCTGCGAGGAAAACAGAAGCCTGATCATGGAGGAAAATGATTGCCTTGAGTCGATT  
 GTGAGCGTTGTCGCCCTCGGGTCTTACTTTGGAAGCTCAAGGAAACGCAGCAGCCACATTGT  
 ATAGTCTTTCCACAGTACATGAATATAAGAAACGGATCGCAAATGTAGATGGCTGCATCAA  
 ATCACTTGCATCGCTGTCGAGGAATGGAAAGCCGAGAGGGGAAAAAAGATGCACTCAACGC  
 TTTATATGGCATATGGTCACATCCGGATAATTGCAGCCAGATGATCAACTCGGGAGGAGTG  
 TCCGCTGTCGTGGGAGCTTTGGCGGATGAGGACGAGGCTGTGACGGAGAGAGCGGCAGTA  
 GTGTTGGGGGTAGTAGCGAATCATTCTTTAGGAGCAGAGACTATAGGGAGAGAGGAATCA  
 GCTGTGGCTGGACTCATTGAATTGATGAGATGTGGAACACCAAGAGGCAAAGAAAATGCG  
 GTTGCTACTTTGTTACATCTCTGCATAAACGGTGGAACGGTTGTGGTGGAGAAGGTGGTGAG  
 AGCACCGGCTCTTTCTGATTTAACCCAAAAGCTTTTGCTAACGGGTACAAATCGAGCTAAG  
 CGAAAGCGAGTTCATTCCTCGCTTTGGTTCGTAAGGGGTGCGAAAACACAGCGATGATGC  
 GGTCTGGTAATAGAGAAGGGAGTTTTAGAACCCATGTCTCCCTACCCATCTCTATACCTGTA  
 TCTGTGTTGTGA

tcttacatacatacatacgcacataagccttagagaataatgtaaatggggaagatataagagtttggtaagcagtggt  
 tatgtattgcctagaatattatgtgatgtaataagctataagtttattgatacaatcggtgtatagctgtttgtctgaatggaaacgcaagtgaca  
 attcggatcagattcagtcactctctgtaaaaaaaaattgatacaagacttttttaggtcgcatcaattgtacaatggtttgcatcaagtt  
 aggtaaaaaagtgtatcaagactttgaatattaatctaaggttttccatgttttacattacattacattagatcgTCTAGA

### ***Arabidopsis halleri* SCR<sub>13</sub> gene sequences retrieved from GenBank: FO203478**

>AhSCR<sub>13</sub> Promoter-CDS-terminator Bsp120I-Bsp120I

GGGCCCTtccgcccagcaccaaggagacatattgagtattgagggccgaattttattcttataaagaagaccgcaagctagtgcttcatcag  
 ctctccaagggccgtgtctgcctcagtcctccagctactgtttataaaaatttacacctgagcagatgatatactgatattttcatttgcttgta  
 gacgtagccaacacatggttgtaaacacgtaaaactgttattttgtctctattagttttacttttccgtcataacataatattgacatgttcaact  
 tgttaataactataaattagtacaaaagaacatgaaaagtgttttctgataagaactatcaaaaataaaggattgatccatcaatctgtt  
 gacttggcctcacccttatattcccctaatttaattgaacaatttattactgtcttggatcccctatatataacgaaatcaagacaacaatagatt  
 gtgaaagtaaaaaagacagctttaaactcatttttgaatcATGAGACGTGCTACATTGTTTCATAGTTTCTTTTCGTT  
 TTCATATCCCTTTTATTGAGTAATATTCAAGgtaatatattaacactttttgagttctgattggttggctgacggtatatt  
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 GTGCTTCGAGGCGAAAGTATTCCCAGCGGAAAATGTGGCAGAGACGGAAACTACAACCTG  
 CAAAAAGAGTATAAGAATAGTCGCGTGAAACCTACTAATTGCAAGTGCTTCAGTAATTT  
 GATGAAACACGTTTGTGCAATTGTACATTTTGCTAAgtttactatataactatcaaaaaattcttattaataatgaa  
 gggagaagcaataaatttagctgcaataagagagaaactgtgagattgtaaggtgtgcatgccgacaatatagtcataattagtgtagtgct  
 attcagatttaactactttgtttcgtgaaatcaataaattagatgttataaccacattaacttgattagtagtcttagtcacaactttttgtctcaact  
 atcgtcactaatgatatagtagtcttaaacactgtattcctggaatattagaaggcgtaaaataatcaatttgataaccgtaaaagggtgtgca  
 taaaccggacagctcGGGCC

### ***Arabidopsis halleri* SRK<sub>20</sub> promoter sequences retrieved from GenBank: KJ772396**

>AhSRK<sub>20</sub> Promoter + 5'UTR Cfr9I-NotI

CCCGGGttaacgacgattttttcgttgtaactgtgcaaaatatctcacgtacaacacatgatcatccctcgatgattcgttgtaataaact  
 agagacatatctagtcaggaacactaacgatgaatgtttgtagtagaaaagggtgattttatacatgtatattctacgtttatagcaaacat

tcaccaaatTTGacaatgtctactccgctgTtaaacgattgcaaaatcgcataaatatattgctatTTTgtagttataaacgaagttaaagttgaa  
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 acgaggacttgaggactatgtcaactactgaatgccatttgcagttctgcccggcttggTTTTgattagagttggTTtaagtgcaactttaa  
 ttcagaaaaataaaaatgTTTaaacataataatctataatcattTTTTcttagttaggTTTTgTTTTgtttacctgTTTcatataaattcgTTtaacagattga  
 ttatTTTgaaaatttagTTTaaacagatttactgaattcattTaaagTcaaaccaattaagttggactctctactatgtacgattctgaatcttataaaatt  
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 gTggaatgaatttattgaaaggacgaaaaagTcatggaatatggaacaacattTgcttGctgTtaggtccgtgataataatgtagttcagat  
 tttctTgcaacttaggattaagataaaatataTgcaattTaaaactgaaaccactTtactcgtTtaggtcaatcgtacgtgatTTTTcataaata  
 aaaaagaaaactgatcgaagaagaagaaaGCGGCCGC

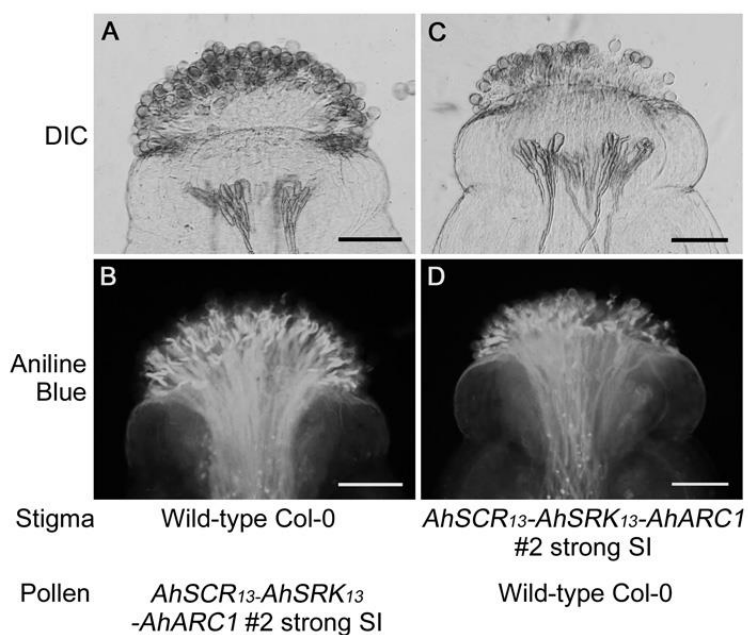
**Arabidopsis halleri SRK13 gene sequences retrieved from GenBank: FO203478**

>AhSRK13 CDS + intron4 NotI-Acc65I

GCGGCCGCgagagATGAGAGCTCTACCAAACAACCACCATTTTTACATCCTCGTTATCTTTTT  
 CTGCTTCGTTCTGCATTACCCATCAATGTCAATACTTTGTCGTCAACAGAATCCCTGACAAT  
 CTC AAGCAACCGAACCAATTGTGTCTCTTGGTGATGTCTTCGAGCTTGGTTTCTTCAACCCCAC  
 ACCAAGCTCTCGAGATGGTGATCGTTGGTATCTCGGGATTTGGTACAAGGAAATCCCTAAG  
 AGAACCTATGTATGGGTTGCCAACAGAGACAATCCGCTTTCAAATTCCACTGGAACCCTCA  
 AAATCTCTGATAATAATCTCGTCCTCGTCGATCAATTCAACACCCTTGTTTGGTCGACGAAT  
 GTGACTGGAGCTGTGAGATCTCTAGTGGTGGCAGAGCTTCTCGCTAACGGAAATTTGGTGCT  
 TAGAGACTCCAAAATCAACGAGACAGATGGATTCTTGTGGCAGAGTTTCGATTTCCCAACA  
 GATACTTTACTTCCGGAGATGAAACTTGGTTGGGATCTAAAAACAGGAGTCAATAAATTCC  
 TTAGATCCTGGAAAAGCCCATATGATCCCTCAAGTGGGGATTTCTCATACAAACCTTGAAC  
 TCGAGAGTTCCAGAGTTTTTCTATCGTGGAGCAACTCGCCAGTGTACCGTAGCGGTCCGT  
 GGGAGGGATTCCGGTTTAGTGGCATGCCAGAAATGCAACAATGGACAAACATCATTTC  
 ATTTACGGGAGAACAGAGAGGAGATCGCTTACACTTTCCGAGACACTGACCAAACATCT  
 ACTCAAGATTAACAATGAGTTCTCAGGGTATCTACAACGATTTAAGTGGATTTCGAATGG  
 AGAAGATTGGAACCAACATTGGTACGCACCAAAAGACAGATGTGATATGTATAAGAAGTG  
 TGGGCCCTACGGTATTTGTGACACGAACAGCTCACCGGAGTGTAAGTGTATTAAAGGTTT  
 CAACCGAGGAATCTGCAGGAGTGGTCGTTGAGAGATGGATCGAAAGGGTGTGTGAGGAAG  
 ACGCGACTGAGCTGCAGCGAGGATGCGTTTTTCTGGCTGAAAAATATGAAGTTGCCAGATA  
 CTACGACAGCGATCGTGGACAGGAGACTTGGTGTAAAAGAATGTAGAGAGAAGTGTCTTA  
 ATGATTGTAATTGTACAGCCTTTGCAAATGCGGATATCCGTGGTTCAGGTTGTGTGATTGG  
 ACGGGAGATCTCGTGGACATACGGAGCTACCCAATGGCGGTCAAGATCTTTGCGTCAGAC  
 TGGCTGCTGCTGAACTCGAGGAGAGAAACATAAGAGGAAAAATCATAGGTTTATGTGTTGG  
 AATCAGCCTCATCCTTTTTCTGAGTTTCTGCATGATCTGTTTTTGGAAAAGGAAACAGAAGC  
 GACTAATAGCCTTAGCAGCACCTATCGTGTACCATGAGAGAAATGCAGAGTTGTTAATGAA  
 CGGGATGGTAATATCAAGCCGGAGACGCTTGTCTGGAGAGAACATAACAGAGGATTGGGA  
 ACTTCCACTCGTTGAACTGGACGCTGTTGTCATGGCCACTGAAAATTTCTCCAATGCTAACA  
 AGGTTGGACAAGGTGGTTTTGGTATTGTTTACAAGGGAAGATTACTTGACGGGCAAGAGAT  
 CGCAGTGAAAAGGCTGTCTAAGACTTCACTTCAAGGGACCAATGAGTTCAAAAACGAAGT

GAGGCTAATTGCGAAGCTTCAACACATAAACCTTGTCCGACTTCTTGGCTGTTGTGTTGAGG  
 TGGACGAGAAGATGCTGATCTATGAGTATTTGGAGAATCTAAGTCTTGATTCTTATATTTTT  
 GgtagtacctcacctttaagaagctatgttctacaattaattgtctttaagaataatgtactaatctgtttgcgattggtttgtagACAAAAAT  
 AGAAGCTGGAAGTTAAATTGGCAAATGAGATTTAATATTACTAATGGTATTGCTCGAGGAC  
 TTTTATATCTTCACCAAGATTCACGATGTAGGATTATCCACAGAGACTTGAAAGCAAGCAA  
 TGTCTTGCTTGATAAAGATATGACTCCGAAAATATCAGATTTCCGGATGGCTAGGATCTTTG  
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 CAGAATATGCAATGGATGGAGTTTTCTCGATGAAGTCGGATGTTTTACGCTTTGGGGTCTTG  
 CTTCTCGAGATTATAAGTGGAAAGAGGAACAAAGGATTCTACAACCTTGACAATGACCTTA  
 ATCTTCTCGGTTGCGTGTGGAGGAATTGGACAGAAGGAAAAGGTCTAGAGATCGTAGATCC  
 GATAATCCTAGAGTCCTCATCATCAACGGTCATACTACAAGAAATATTAATAATGCATGCAA  
 ATCGGTCTCTTGTGTGTTCAAGAACGTGCAGAAGACAGACCAAGAATGTCTTCGGTGGTGG  
 CAATGCTCGGAAGCGAAACGGCAGTGGTTCCTCAGCCTAAACTACCTGGTTATTGCGTTGG  
 GAGAAGTCCTTTGAGACTGATTCATCGCGGAGTAAACAGCATGACGACGAATCGTGGACT  
 GTGAACGAAATCACCTATCGGTTCATCGACGCTCGATAAGGTACCC

### Supplementary Figures



**Figure S1.** Pollen tube germination and growth on stigmas of wild-type *A. thaliana* Col-0 and transgenic Col-0 plants following reciprocal crossings. (A) and (B) wild-type *A. thaliana* Col-0 stigma pollinated with pollen from transgenic strong self-incompatible Col-0 *AhSCR<sub>13</sub>-AhSRK<sub>13</sub>-AhARC1* line #2. (C) and (D) transgenic strong self-incompatible Col-0 *AhSCR<sub>13</sub>-AhSRK<sub>13</sub>-AhARC1* line #2 stigma pollinated with pollen from wild-type *A. thaliana* Col-0 plant. Differential interference contrast (DIC) and aniline blue-stained images are shown for each sample. SC: self-compatible; SI: self-incompatible. Bars = 100  $\mu$ m.



**Figure S2.** Flowers from wild-type *B. napus* 'Westar', *A. thaliana* Col-0 and C24, and transgenic *A. thaliana* Col-0 and C24 plants. (A), (B) and (H) flowers of wild-type *B. napus* 'Westar', *A. thaliana* Col-0 and C24 plants. (C) to (G) flowers of transgenic *A. thaliana* Col-0 lines: *BnSCR1-BnSRK1* #12, *BnSCR1-BnSRK1-BnARC1* #9, *AhSCR13-AhSRK13* #5, and *AhSCR13-AhSRK13-AhARC1* #2 and 21. (I) and (J) flowers of transgenic *A. thaliana* C24 lines: *BnSCR1-BnSRK1* #90, and *BnSCR1-BnSRK1-BnARC1* #16. SC: self-compatible; SI: self-incompatible. Bar = 1 mm in (A) and Bars = 200  $\mu$ m in (B) to (J).

## Supplementary Tables

**Table S1.** Primers used in vector construction.

Primer name	Sequence	Use	PCR product length
S1E1-Bsp120I	GGGCCCTACGACCTGCTGATATTCTCC	<i>BrS47-P + BnSCR1</i>	2160bp
S1E4-Bsp120I	GGGCCCCTAACACAATTTACATACACAAGAAT AA	<i>BrS47-P + BnSCR1</i>	
NOS-1-Psp1406I	AACGTTGTTTCTTAAGATTGAATCCTGTG	2301-NOS	231bp
NOS-2-Psp1406I	AACGTTCCCGATCTAA CATAGATGACA	2301-NOS	
SLR-PR1-KpnI	GGTACCGGATCCCTGGGTCATTGCT	<i>SLR1-P</i>	1511bp
SLR-PR2-XbaI	TCTAGACTCTCTTCCACCCTTAATTTTC	<i>SLR1-P</i>	
SRK1-CDS-1-XbaI	TCTAGAATGAAAGGTGTACGAAACATCTATG	<i>BnSRK1</i> CDS	2556bp
SRK1-CDS-2-BstEII	GGTTACCTTACCG GGCATCGATTACTGAGC	<i>BnSRK1</i> CDS	
SLR-PR1-Ctf9I	CCCGGGGATCCCTGGGTCATTGCT	<i>SLR1P+BnSRK1</i> CDS	4067bp
SRK1-CDS-2-NotI	GCGCCGCTTACCG GGCATCGATTACTGAGC	<i>SLR1P+BnSRK1</i> CDS	

SRK <sub>1</sub> -TL-NotI	GCGGCCGCTATGAAAGCTGTGAGAATGTTTCAT TT	<i>BnSRK<sub>1</sub></i> Terminator	988bp
SRK <sub>1</sub> -TR-NotI	GCGGCCGCTAATAATGCTAAGGACTTAATTTG GGT	<i>BnSRK<sub>1</sub></i> Terminator	
ARC1-CDS-L-SalI	GTCGACATGGCCACTGATTCAGCAATG	<i>BnARC1</i> CDS	1986bp
ARC1-CDS-R-KpnI	GGTACCTTATCTCTGTGTGTTCTGGTCGC	<i>BnARC1</i> CDS	
SLR-PR1-HindIII	AACGTTGGATCCCTGGGTCATTGCT	<i>SLR1-P</i>	1511bp
SLR-PR2-SalI	GTCGACCTCTCTTCCACTTTAATTTTC	<i>SLR1-P</i>	
SLR-PR1-KpnI	GGTACCGGATCCCTGGGTCATTGCT	<i>SLR1-P+BnARC1</i> CDS	3497bp
ARC1-CDS-R-KpnI	GGTACCTTATCTCTGTGTGTTCTGGTCGC	<i>SLR1-P+BnARC1</i> CDS	

**Table S2.** Primers used in qRT-PCR assay.

Primer name	Sequence	Use
BnARC1-qF	AAAGCCCCTCTCTTCAAGC	qPCR
BnARC1-qR	TCAACGTAGTGCTGCATGTG	qPCR
BnSCR1-qL	ATGAAATCTGCTGTTATAATGCTT	qPCR
BnSCR1-qR	TGTCCATACCCCTCGAATATAAC	qPCR
BnSRK-qL	CTCGTCTTCGTTGTCATGATTCT	qPCR
BnSRK-qR	GTTTCATGTTGGATATTTTGAGGG	qPCR
AhSRK <sub>13</sub> -qF:	TCGTTCTGCATTACCCATCA	qPCR
AhSRK <sub>13</sub> -qR:	CAAATCCCGAGATACCAACG	qPCR
AhSCR <sub>13</sub> -qF:	CAAGATGGGGAAAGCTCTGAC	qPCR
AhSCR <sub>13</sub> -qR:	TGCACAAACGTGTTTCATC	qPCR
AhARC1-qF:	CGTTCCAAATTCCTTCTCCA	qPCR
AhARC1-qR:	TGATGCAAAAGCTCGATTG	qPCR
Actin2-F	GAAATCACAGCACTTGACC	qPCR
Actin2-R	AAGCCTTTGATCTGAGAGC	qPCR
TUB4-F	AACGCTGACGAGTGTATGGTT	qPCR
TUB4-R	CCAAAGGTAGGATTAGCGAGC	qPCR