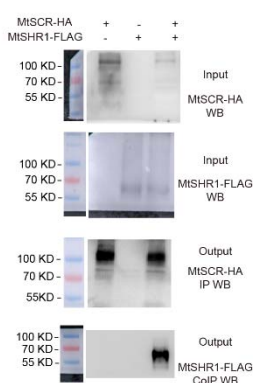

Supplementary information

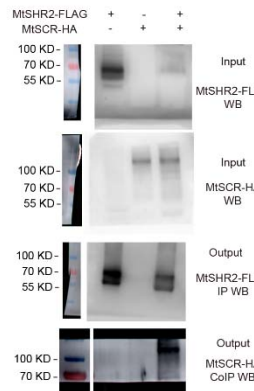
An SHR–SCR module specifies legume cortical cell fate to enable nodulation

In the format provided by the
authors and unedited

Extended Data Figure 7c



Extended Data Figure 7c



Extended Data Figure 9a

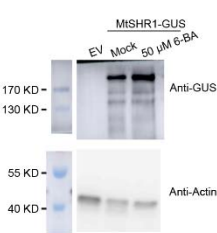
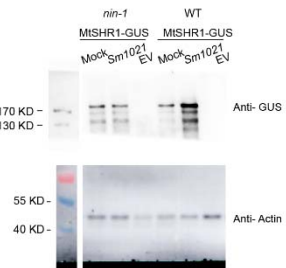
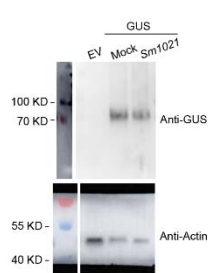


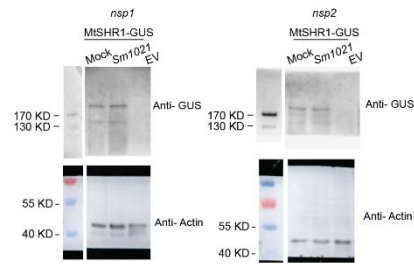
Fig.4e



Extended Data Figure 10i



Extended Data Figure 10j



Supplementary Table. 2 | Genes used for screening in this study.

Locus	Name	Family
<i>Medtr7g074650</i>	SCR	GRAS
<i>Medtr2g093960</i>	BIB	Zinc finger
<i>Medtr1g066550</i>	JKD	Zinc finger
<i>Medtr2g017720</i>	MGP	Zinc finger
<i>Medtr5g009620</i>	TMO3	ERF/AP2
<i>Medtr3g438070</i>	TMO7	bHLH
<i>Medtr2g015890</i>	T5L1a	bHLH
<i>Medtr1g093750</i>	T5L1b	bHLH
<i>Medtr5g035360</i>	CYCD1;1	Cyclin
<i>Medtr6g045630</i>	CYCB1;4	Cyclin
<i>Medtr4g065630</i>	PLT2	ERF/AP2
<i>Medtr5g031880</i>	PLT3	ERF/AP2
<i>Medtr7g080460</i>	BBM	ERF/AP2
<i>Medtr5g075300</i>	PLT6	MFS
<i>Medtr1g077640</i>	LHL3	bHLH
<i>Medtr4g051565</i>	LHW	bHLH
<i>Medtr1g093095</i>	WIP6	Zinc finger
<i>Medtr4g101680</i>	VND4	NAC
<i>Medtr8g467490</i>	FEZ	NAC
<i>Medtr5g032820</i>	DRNL	ERF/AP2
<i>Medtr8g077510</i>	HAN	GATA
<i>Medtr3g074130</i>	WIND1	ERF/AP2
<i>Medtr3g064840</i>	KAN1	KANADI
<i>Medtr1g017080</i>	KNAT1	Homeobox
<i>Medtr7g096530</i>	LBD16	LOB-domain
<i>Medtr8g006705</i>	HAT3	HD-ZIP
<i>Medtr4g100550</i>	ATHB2/HAT4	HD-ZIP

Locus	Name	Family
<i>Medtr8g107210</i>	WOX1a	Homeobox
<i>Medtr3g088485</i>	WOX1b	Homeobox
<i>Medtr8g095580</i>	WOX1c	Homeobox
<i>Medtr5g021930</i>	WOX1d	Homeobox
<i>Medtr7g060630</i>	WOX3	Homeobox
<i>Medtr1g019130</i>	WOX4	Homeobox
<i>Medtr5g081990</i>	WOX5	Homeobox
<i>Medtr4g084550</i>	WOX6	Homeobox
<i>Medtr7g025010</i>	WOX9a	Homeobox
<i>Medtr2g015000</i>	WOX9b	Homeobox
<i>Medtr0777s0020</i>	WOX9c	Homeobox
<i>Medtr7g086940</i>	WOX11	Homeobox
<i>Medtr4g088065</i>	WOX9d	Homeobox
<i>Medtr1g115315</i>	WOX13a	Homeobox
<i>Medtr3g115620</i>	WOX13b	Homeobox
<i>Medtr7g023810</i>	WOX13c	Homeobox
<i>Medtr5g013010</i>	ATHB2/HAT4	HD-ZIP
<i>Medtr4g058970</i>	PHV/ATHB9	HD-ZIP
<i>Medtr2g030130</i>	PHB/ATHB14	HD-ZIP
<i>Medtr4g096660</i>	SACL3	bHLH
<i>Medtr3g101870</i>	SCZ/HSFB4	Hsf
<i>Medtr5g098970</i>	SSP	RLCK
<i>Medtr3g070970</i>	T5L2	bHLH

Supplementary Table. 3 | Promoter screening primers.

Name	Primer sequences
7g074650-F	5'-TATGATGGTGCTCCATGGGAAC-3'
7g074650-R	5'-ATTGATAGAAAGCAAGATGAATA-3'
2g093960-F	5'-CTGTACCAGTCAGTCATCTC-3'
2g093960-R	5'-CTTTGAAATGGAACTCCACT-3'
1g066550-F	5'-GCTTTGCTTAGTTTGTTGCTC-3'
1g066550-R	5'-CAGTACAAGGAAGAAAACAATGG-3'
2g017720-F	5'-CTTCAAGGGAGTATTCGCAAAAC-3'
2g017720-R	5'-TTTGACGAAAAATGGTTCGGAGA-3'
5g009620-F	5'-TTAGCATGGACATGCACGGTTAC-3'
5g009620-R	5'-GATGAATATGAAGCTATGTTCT-3'
3g438070-F	5'-CCACCTAATCAAACCTCTACCTTT-3'
3g438070-R	5'-TTTCAAGCCTAGGTGAATCCT-3'
2g015890-F	5'-ATTCGTATATGCCAACACTA-3'
2g015890-R	5'-GATCAAAATGAGATATTAATGCAAA-3'
1g093750-F	5'-AATTAATTCTAAACAATGTGAG-3'
1g093750-R	5'-CCAATTATTCTTCTAAACTT-3'
5g035360-F	5'-AATTGGTGTAGTGGCCCAACTG-3'
5g035360-R	5'-CGGGAGTGGATGAGATTC-3'
6g045630-F	5'-CATTACAGTAAGGAGTGATCATGG-3'
6g045630-R	5'-GGACGACAGACTCGTTCATGGTTG-3'
4g065630-F	5'-ATTCTAAAAAAATTTGGACCTTGC-3'
4g065630-R	5'-TATTTTAGTACTCTGACTCATTC-3'
5g031880-F	5'-TATGCACAGATAACTATAGTGATTTC-3'
5g031880-R	5'-ACGAGTTTAACACAACACACACA-3'
7g080460-F	5'-CATCTAAAATATGACTAGTGTTTC-3'
7g080460-R	5'-ATGATTTTTGTGAAAGAAAAAAA-3'
5g075300-F	5'-TGAGAGTGAAAATATGTGAATTT-3'

5g075300-R	5'-GATGAGAATGAGATATTGTTGAA-3'
1g077640-F	5'-CGTTCATGACAATAGACATAGAAAT-3'
1g077640-R	5'-CAATCAAATCTAAATGCACATTAGT-3'
4g051565-F	5'-GAATCAATTTGACCCTCTAGAAC-3'
4g051565-R	5'-CCAAACCAATGGATTCAAAGT-3'
1g093095-F	5'-ACCTGGTCCTATTAATGGTGT-3'
1g093095-R	5'-GGTTATTATGCAGCATTTGGTT-3'
4g101680-F	5'-ATGTGAAAAGTTAAACTAGCTC-3'
4g101680-R	5'-ATTCCACCTCAGAAGAATTAAAAC-3'
8g467490-F	5'-CCCTCCTGTTATGAGGAATA-3'
8g467490-R	5'-CTTCTAAGAGTCAAAGACTAACC-3'
5g032820-F	5'-CTGACTTAATTATCACAATATTGG-3'
5g032820-R	5'-GAGAGTGAAGTTGATGAAAGGG-3'
8g077510-F	5'-ATAAATGTTAGGTGAGGTTGCG-3'
8g077510-R	5'-TGGTGATGAATGATTGTGACA-3'
3g074130-F	5'-CATGTCCATTAAACAGAAGGA-3'
3g074130-R	5'-TATTCTGGATCTCGATTCT-3'
3g064840-F	5'-CCGATCTAAGGGTACAAC-3'
3g064840-R	5'-AGGTGAACTAACCTTGATAA-3'
1g017080-F	5'-ATTTGATGATTATTTGGAGAG-3'
1g017080-R	5'-TTAACTCAAATTTAAGAAACC-3'
7g096530-F	5'-GCATTATGTAGAATTTATTTC-3'
7g096530-R	5'-ATTGATATTAGAAAGGTTG-3'
8g006705-F	5'-TGA CTCAGTTATTATGAGAGTATT-3'
8g006705-R	5'-ATTAAGAAGAAAGGAAGGACAG-3'
4g100550-F	5'-ATGCAAATCTGAGATTGGA-3'
4g100550-R	5'-AAAGCTCCTTTGTTTGGTTTGAA-3'
8g107210-F	5'-CTCAACTCTAATATTATCAAGGAAT-3'
8g107210-R	5'-TTGTCAACTAGGGCTTTTCT-3'
3g088485-F	5'-TTCTTAGTGATTTGTTAATGTGC-3'

3g088485-R	5'-GTTGTCAACTAGGCCTTTTCTC-3'
8g095580-F	5'-TTACGTTTTTAGTTTCTTCTTGC-3'
8g095580-R	5'-GTTGTCAACTAGGCCTTTTCT-3'
5g021930-F	5'-GATTGATGGTGTTAAATGAT-3'
5g021930-R	5'-GATAGAATAGAGAGGGTAGG-3'
7g060630-F	5'-GTTTCCAGGTGAGGTAATACCA-3'
7g060630-R	5'-TGATGAGAGGGATGAAAGTGAT-3'
1g019130-F	5'-AATTCCCAGCTACTCAAGA-3'
1g019130-R	5'-TATAATTTGCCACACGGT-3'
5g081990-F	5'-CTCAGTAGGTATACTTTAAATAG-3'
5g081990-R	5'-TACTCTGAACTCAATACTTT-3'
4g084550-F	5'-CTACAAGGAGTTATTCAATGC-3'
4g084550-R	5'-GATGGGAAGGATGATTAGA-3'
7g025010-F	5'-CTCATTCGAAAGGGTGCAGGG-3'
7g025010-R	5'-ACTGATCGATCGATGATTTC-3'
2g015000-F	5'-TATGGGAATGAATTAATATTGT-3'
2g015000-R	5'-GATGATGATGAAGAATCACT-3'
0777s0020-F	5'-GGTGTTTCTCCTTCTTTTCAG-3'
0777s0020-R	5'-GTTCTGCGAATCTCTCA-3'
7g086940-F	5'-GGAAAAGTACAAGGGATATTC-3'
7g086940-R	5'-TCCAATGCACTATAGATAGAAG-3'
4g088065-F	5'-CACTTCGTTCAAGCTCTTCCTT-3'
4g088065-R	5'-ATTTAGCCTACAACACTACTTGCTC-3'
1g115315-F	5'-GGACATGTATTTTGAAACGGAGG-3'
1g115315-R	5'-TTTCTCTCTCTTACTCACAGAC-3'
3g115620-F	5'-CTGAGTTGAACGAGCCTCATAG-3'
3g115620-R	5'-TTCTCTTTGCAACTCAACAAGCC-3'
7g023810-F	5'-CATCATTGTTTCCTCTCCAC-3'
7g023810-R	5'-CTCTTTCTTTTCTGTAAA-3'
5g013010-F	5'-AATACTCCGCAACATGACTT-3'

5g013010-R	5'-TGCAAGTCAAAAACCTTTTCAC-3'
4g058970-F	5'-GTTGAGCGTTGATAATGACA-3'
4g058970-R	5'-AGCCATGTTTCTTCCCACA-3'
2g030130-F	5'-TTATCCAATATCGCTAAGTGC-3'
2g030130-R	5'-TGTTGAAGGAAAAAAGAAAG-3'
4g096660-F	5'-CAATGTCGATCTAATCCAAC-3'
4g096660-R	5'-TAAATATCTGGTCACTCTCAC-3'
3g101870-F	5'-ACGATTATGGAACAATGACTT-3'
3g101870-R	5'-TTTCAGTGATGATCATTCAATAAC-3'
5g098970-F	5'-ACGGAGCAAGGAGTTAGT-3'
5g098970-R	5'-TATTTTCACTTTCTCTCTCTATC-3'
3g070970-F	5'-GGTAGCAGCATTAAATCCAA-3'
3g070970-R	5'-CCAATTATTCTTCTAAACTTTCTTC-3'

Supplementary Table. 4 | Primers used in this study.

Name	Primer sequences
<i>Tnt1</i> mutant identification primers	
Tnt1-F1	5'-TCCTTGTTGGATTGGTAGCCAACTTTGTTG-3'
Tnt1-F2	5'-TCTTGTTAATTACCGTATCTCGGTGCTACA-3'
scr-Tnt-F	5'-TAAGCTGCTACTCTTTGTGCC-3'
scr-Tnt-R	5'-CACGAGATAACGTTGCTGTTC-3'
scl23-Tnt-F	5'-ATGCTTCAAAGCTTGGTCCCTC-3'
scl23-Tnt-R	5'-TCGCCTGAGAAGCCGGGTAC-3'
scl2-Tnt-F	5'-ATGATGAAAGTAGGATTTGAA-3'
scl2-Tnt-R	5'-CTACCTAGAAGTTCTACAAGTC-3'
shr2-Tnt-F	5'-ATGGATACGCTGTTTAGGCTTG-3'
shr2-Tnt-R	5'-TCAAGGCCTCCATACACTGG-3'
Promoter primers	
MtSCR-F	5'-TATGATGGTGCTCCATGGGAAC-3'
MtSCR-R	5'-ATTGATAGAAAGCAAGATGAATA-3'
MtSCR promoter Enhancer lose forward primer	5'-GAGTTTAATTTCAATCACTTCATCTAAGACCAAAA-3'
MtSCR promoter Enhancer lose reverse primer	5'-GTCTTAGATGAAGTGATTGAAATTAACTCATACAC-3'
MtSCR promoter AT1 lose forward primer	5'-CACTTCATCTAAGACCGACAATCGTATAAACATACGATG-3'
MtSCR promoter AT1 lose reverse primer	5'-GTTTATACGATTGTCGGTCTTAGATGAAGTGGTAATTC-3'
MtSCR promoter Enhancer and AT1 lose forward primer	5'-CACTTCATCTAAGACGACAATCGTATAAACATACGATGG-3'
MtSCR promoter Enhancer and AT1 lose reverse primer	5'-GTCTTAGATGAAGTGATTGAAATTAACTCATACACAAC-3'
MtSCL23-F	5'-GGCCAAAAGAGTTTGGCCAG-3'

MtSCL23-R	5'-GATCGTGATGAGGGAGAAAA-3'
MtSCL2-F	5'-GAATTCATGGCAAAAACATGGG-3'
MtSCL2-R	5'-AGAAACAAAAATAACAAATTAATGC-3'
MtSHR1-F	5'-ACGCAACACATCAACCACTTAC-3'
MtSHR1-R	5'-TTAAGTTGTATGAGACCCACATC-3'
MtSHR2-F	5'-AATGGTGTTGGACGATGTTAGTG-3'
MtSHR2-R	5'-TTAACCAAAGAGATACATACACC-3'
AtSCR-F	5'-AAGTCTAAAAGGGCAGAAAAG-3'
AtSCR-R	5'-GGAGATTGAAGGGTTGTTGGTC-3'
PsSCR-F	5'-GGTTGGATAAAGGTCTTAACATTG-3'
PsSCR-R	5'-AATGAGAAGAAGAGGAAGAAGATG-3'
LaSCR2-F	5'-CATCCATTCATATATTCATCTACTT-3'
LaSCR2-R	5'-AGCACAAGCATCCATTTTAGAGAG-3'
StSCR-F	5'-TGTTGACAATAGCATGCCTCT-3'
StSCR-R	5'-GATATATGAAATAAATTCTCAAACCTC-3'

Protein location primers

MtSHR1-F	5'-ACGCAACACATCAACCACTTAC-3'
MtSHR1-R	5'-AGGCCTCCATGCACTGGCCAC-3'
MtSHR2-F	5'-AATGGTGTTGGACGATGTTAGTG-3'
MtSHR2-R	5'-AGGCCTCCATACACTGGCCCA-3'

MtSHR1 promoter and AtSHR gene overlap forward primer

5'-GATGTGGGTCTCATACAACCTTAAATGGATACTCTCTTTAGACTAG-3'

MtSHR1 promoter and AtSHR gene overlap reverse primer

5'-CTAGTCTAAAGAGAGTATCCATTTAAGTTGTATGAGACCCACATC-3'

MtSHR1 promoter and MtSCR gene overlap forward primer

5'-GATGTGGGTCTCATACAACCTTAAATGGCTGCTTGTGCTTTGTTC-3'

MtSHR1 promoter and MtSCR gene overlap reverse primer

5'-GAACAAAGCACAAGCAGCCATTTAAGTTGTATGAGACCCACATC-3'

MtSHR1 and GUSA overlap forward primer

5'-GCCAGTGCATGGAGGCCTATGTTACGTCCTGTAGAAACC-3'

MtSHR1 and GUSA overlap forward primer

5'-GGTTTCTACAGGACGTAACATAGGCCTCCATGCACTGGC-3'

GUSA-R 5'-TCATTGTTTGCCTCCCTGCTG-3'

AtSHR-R 5'-CGTTGGCCGCCACGCACTAGC-3'

cDNA primers

MtSCR-F 5'-ATGGCTGCTTGTGCTTTGTTCAATG-3'

MtSCR-R 5'-GTTATGATGTGGTATGATATTG-3'

MtSCL23-F 5'-ATGCTTCAAAGCTTGGTCCC-3'

MtSCL23-R 5'-ATCAACATAAGCAATCAAATCAG-3'

MtSHR1-F 5'-ATGGATACATTGTTTAGACTTG-3'

MtSHR1-R 5'-AGGCCTCCATGCACTGGC-3'

MtSHR2-F 5'-ATGGATACGCTGTTTAGGCTTG-3'

MtSHR2-R 5'-AGGCCTCCATACACTGGCCCA-3'

qRT-PCR primers

MtSCR-Tnt1-F 5'-AGACCTCCCTTTCATACCAACAA-3'

MtSCR-Tnt1-R 5'-AATTTCAACCGTCCGATCTTCAT-3'

MtSCR-F 5'-AGACCTCCCTTTCATACCAACAA-3'

MtSCR-R 5'-AATTTCAACCGTCCGATCTTCAT-3'

MtSCL23-F 5'-AACTACTCCAGCGAGAAAGCC-3'

MtSCL23-R 5'-AAGCCCTAGAAGTTTGAGACCTG-3'

MtSCL2-F 5'-ATGATGAAAGTAGGATTTGAAGTC-3'

MtSCL2-R 5'-GTGTTCAACCCAATCACTTACC-3'

1g029420-F 5'-AGTCCCTTGACGCCACTCTT-3'

1g029420-R 5'-TTTCATCCTTGCCCTCCATT-3'

5g015950-F 5'-AGTCCCTTGACGCCACTCTT-3'

5g015950-R 5'-TTTCATCCTTGCCCTCCATT-3'

MtSHR1-F 5'-ACGATACTCCTCACCTCCGTCTA-3'

MtSHR1-R 5'-ACCATTGCCAACTGTTACTGAAT-3'

MtSHR2-F 5'-CGGTGGTGTGGGCCAGTGTAT-3'

MtSHR2-R	5'-AATCCCAAACGCACGTGCCAA-3'
MtNSP2-F	5'-GTCCTCGAACAGCTCAGTCC-3'
MtNSP2-R	5'-GCGTTTTTATTGCCGTTGTT-3'
MtLBD16-F	5'-GGACGAAACTACGATGGAACC-3'
MtLBD16-R	5'-CCAGACAAATTATTATCGAGCAACT-3'
EF-F	5'-CTTTGCTTGGTGCTGTTTAGATGG-3'
EF-R	5'-ATTCCAAAGGCGGCTGCATA-3'

In situ primers

MtSCR-F	5'-CAATGTGCAGAAGCAGTATCAGC-3'
MtSCR-R	5'-GGGAGGTCTCCAAGCAGAAGC-3'
LjSCR-F	5'-CAGTGTGCAGAAGCAGTTTCAG-3'
LjSCR-R	5'-GGGAGGTCTCCAAGCTGAAGC-3'
GmSCR-F	5'-GCTTCAGTGTGCAGAAGCGGTTTC-3'
GmSCR-R	5'-GGTGGTCTCCAAGCTGAAGCA-3'
CaSCR-F	5'-CAATGTgGCAGAAGCTGTATCAG-3'
CaSCR-R	5'-GAGGTCTCCAAGCTGAAGCAGTA-3'
MtSHR1-F	5'-TGGTGACATAGAACAAAACTAGC-3'
MtSHR1-R	5'-AGTCTTTGCTTTGGTCTTACTTAC-3'
PsSCR-F	5'-CAATGCGCAGAAGCTGTATCAGC-3'
PsSCR-R	5'-AGGAGGTCTCCAAGCAGAAGC-3'
LaSCR2-F	5'-GGGACAGAAGAAAGACGAAGAGG-3'
LaSCR2-R	5'-GGCGGTAGTGGTGTGGAAGGGA-3'

RNAi primers

MtSHR1-F	5'-ACAACCTTCGGCCATGTCGCATG-3'
MtSHR1-R	5'-CAAACGCTCGTTACTCGTCTTC-3'

Chip-PCR primer

pMtSCR-S1-F	5'-TGTTTGAGTTAATGTGTTTTTAG-3'
pMtSCR-S1-R	5'-CTTCTTCAGGGGTTACCGATT-3'
pMtSCR-S2-F	5'-AAGTGCAAACATGATAAGTTAATG-3'

pMtSCR-S2-R

5'-AAACATGCTGCTCAATTCTTCA-3'

MtSCR and MtSHR1 overexpression in rice primers

d1-pUBI-F

5'-GCTAGCTCGAGAGGCGCGCCTACCGGTCGTGCCCCTCTCTAGAGATA

ATG -3'

pUBI-SHR1-R

5'-TAAACAATGTATCCATCTGCAGAAGTAACACCAAACAACAGGG

TG-3'

pUBI-SHR1-F

5'-GTGTTACTTCTGCAGATGGATACATTGTTTAGACTTGTCAGTTTT

C-3'

SHR1-TNOS-R

5'-GTTTGAACGATCGGGATCAAGGCCTCCATGCACTGGCCCACACCACCGG

-3'

SHR1-TNOS-F

5'-TGCATGGAGGCCTTGATCCCGATCGTTCAAACATTTGGCAATAA

AGT-3'

d1-TNOS-R

5'-GGCCGGCCTTATGCGGCCGCTAAGCTTTCTAGTAACATAGAT

GACACC-3'

d2-p35S-F

5'-GCAAGCTTGTACATGTCTGACTAGTCAGATTAGCCTTTTCAATTCAGAAA

G-3'

p35S-MtSCR-R

5'-AAGCACAAGCAGCCATCGTGTTCTCTCCAAATGAAATGAACTT

CC-3'

p35S- MtSCR-F

5'-TTTGGAGAGAACACGATGGCTGCTTGTGCTTTGTTCAATGGTG

CTA-3'

MtSCR-35SPolyA-R

5'-ACTCGAGCTTGTCGATCAGTTATGATGTGGTATGATATTGTTGGT
ATG-3'

MtSCR-35SpolyA-F

5'-ACCACATCATAACTGATCGACAAGCTCGAGTTTCTCCATAATAA
TG-3'

d2-35SPolyA-R

5'-GATCGATGCATGCGGCCGCTAGCTCCTGAATTAACGCCGAATTA
ATTC-3'

Other primers

Ub-F 5'-AACTTGTTGCATGGGTCTTGA-3'

Ub-R 5'-CATTAAGTTTGACAAAGAGAAAGAGACAGA-3'

GmELF1B-F 5'-GTTGAAAAGCCAGGGGACA-3'

GmELF1B-R 5'-TCTTACCCCTTGAGCGTG-3'

GmSCR-RT-F 5'-GAGGCATATCTCTAGCTGGTAAT-3'

MtSHR1-SRDX-F 5'-GAGTCGATTGAACGGAGAGAAAC-3'

MtSCR-SRDX-F 5'-GCTTCAACAGTGTGGTTTTAGAGG-3'

SRDX-R 5'-ACCCAAACGGAGTTCTAGATCCAG-3'

2 X NLS-SRDX-R

5'-CGAGCTCTTAAACCTTTCTCTTCTTCTTAGGAACCTTTCTCTTCTTCTTAG
GAGCGAAACCCAAACGGAGTTC-3'
