Fig. S1. Subcellular localization of SlCAT2. (a) Plasmid construct used for subcellular localization of CAT2. The expression of CAT2-YFP was driven by the CaMV 35S promoter. Tnos, 3'-transcription terminator of the nopaline synthase (*NOS*) gene. (b) Transient expression of 35S:CAT2-YFP in tobacco (*N. benthamiana*) leaves. Fluorescence images were acquired using a confocal laser scanning microscope (Leica TCS SP2) 24-48 hrs after infiltration with *Agrobacterium*. ATCAT2-RFP (AT4G35090) was used as a peroxisome marker. Bars, 23.9 μm.
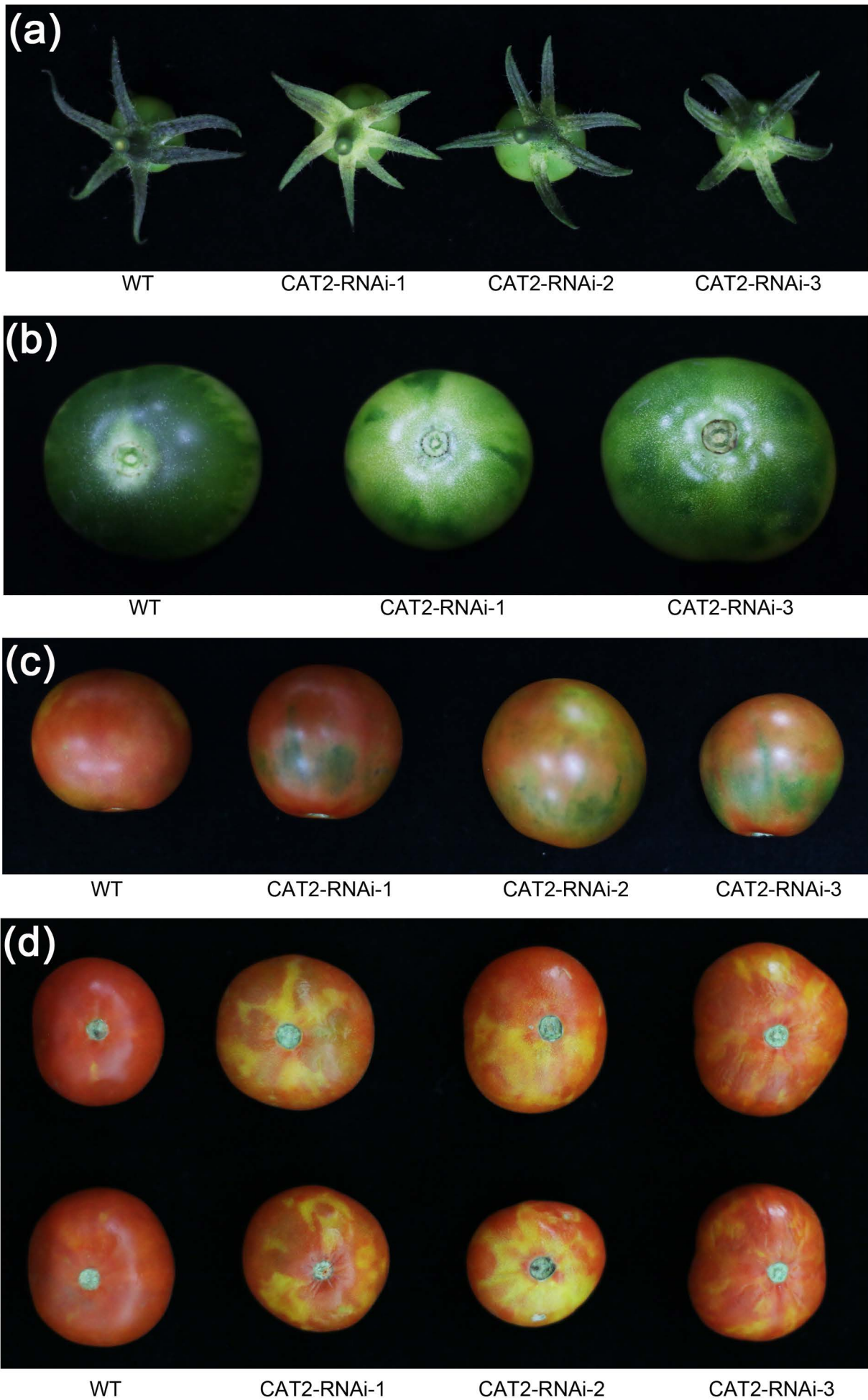
WT **CAT2-R-1** **CAT2-R-2** **CAT2-R-3**

Fig. S2. Phenotypes of tomato seedlings expressing *CAT2*-RNAi. Seedlings of three *CAT2* RNAi lines (CAT2-R-1, -2 and -3) displayed pale green leaf phenotypes as compared to the normal WT control.

Fig. S3. Fruit phenotypes of tomato plants expressing *CAT2*-RNAi. (a-b) Phenotypes of tomato sepals and young fruits in WT and three *CAT2*-RNAi lines. (c-d) Phenotypes of tomato red fruits in WT and three *CAT2*-RNAi lines. Note that in the RNAi lines, the sepals were pale green (a) and the shoulders of young fruits were unevenly green (b-c), which become unevenly yellow spots in fully ripe fruits (d).
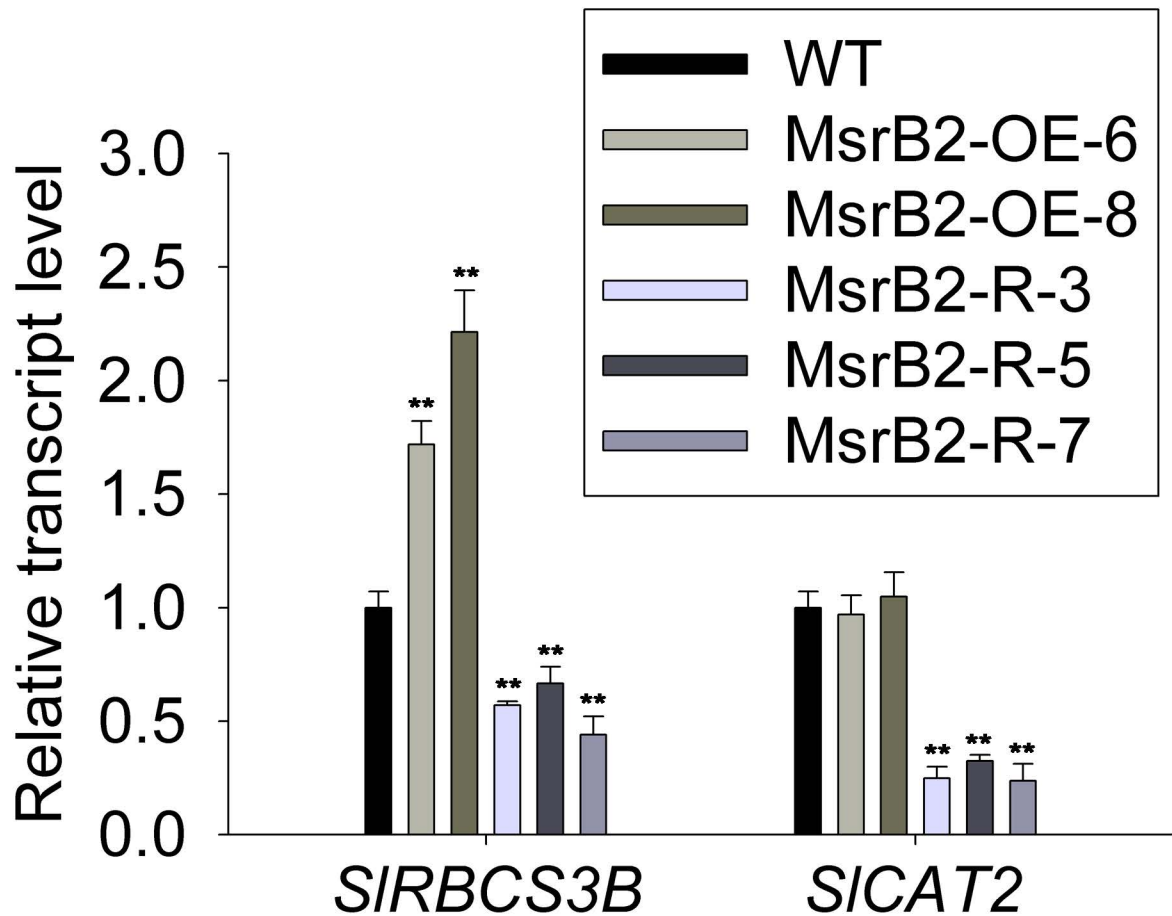
Fig. S4. Quantitative RT-PCR analysis of *RBCS3B* and *CAT2* gene expression in young leaves of *MsrB2* transgenic tomato plants. Leaf tissues were collected 20 days after planting. Quantification of the expression levels of the *RBCS3B* and *CAT2* genes by RT-PCR was performed using RNA from young leaves of wild type (WT) tomato plants and transgenic lines overexpressing *SlMsrB2* (MsrB2-OE-6 and -8) or expressing *SlMsrB2*-RNAi (MsrB2-R-3, -5 and -7). Experiments with three replicates were performed. The bars represent mean values ± SE. Asterisks indicate statistically significant differences relative to the wild type and were determined using *t*-tests. **, $P < 0.01$.

(a)
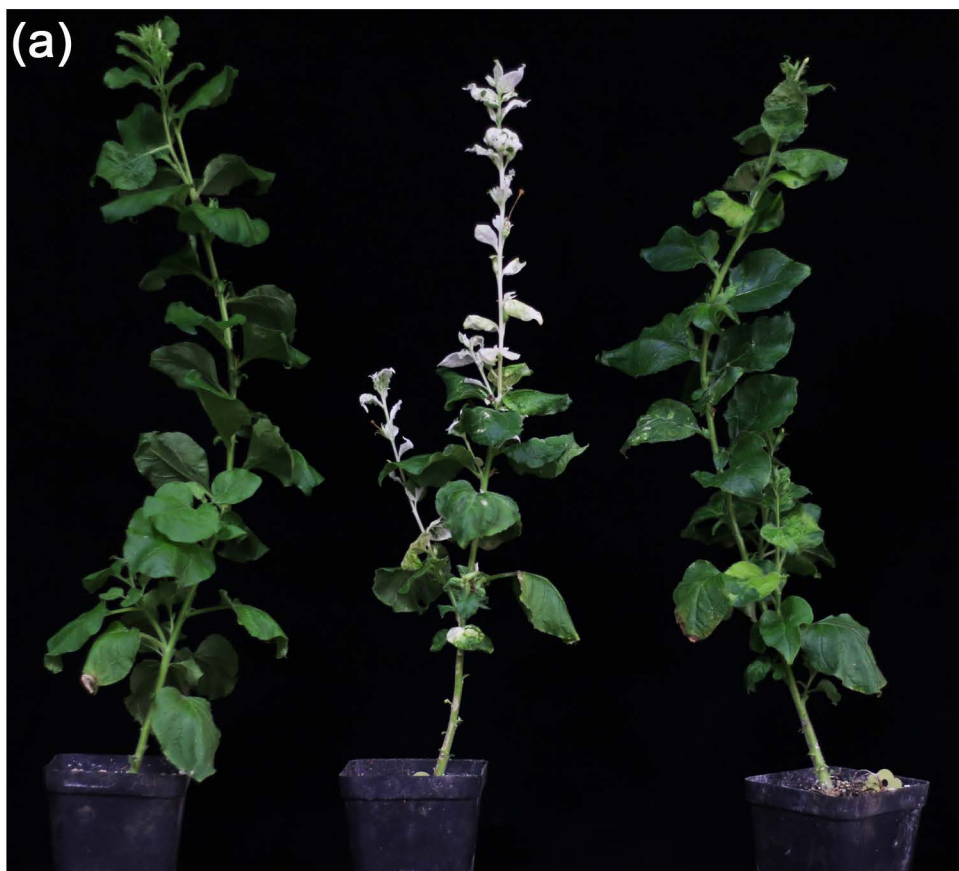
TRV1+TRV2   TRV1+PDS   TRV1+SlRBCS3B

(b)

TRV1+TRV2   TRV1+SlRBCS3B   TRV1+PDS

Fig. S5. Phenotypes of tobacco plants with the *RBCS3B* gene silenced by VIGS. (a-b) Phenotypes of tobacco plants inoculated with *Agrobacterium* strains containing TRV1 + TRV2 (negative control), TRV1 + TRV2-PDS (positive control) and TRV1+TRV2-RBCS3B. Note that pale leaves were visible in the positive control plants with the silenced *PDS* gene and pale green leaves were present in the plants with the silenced *RBCS3B* gene.
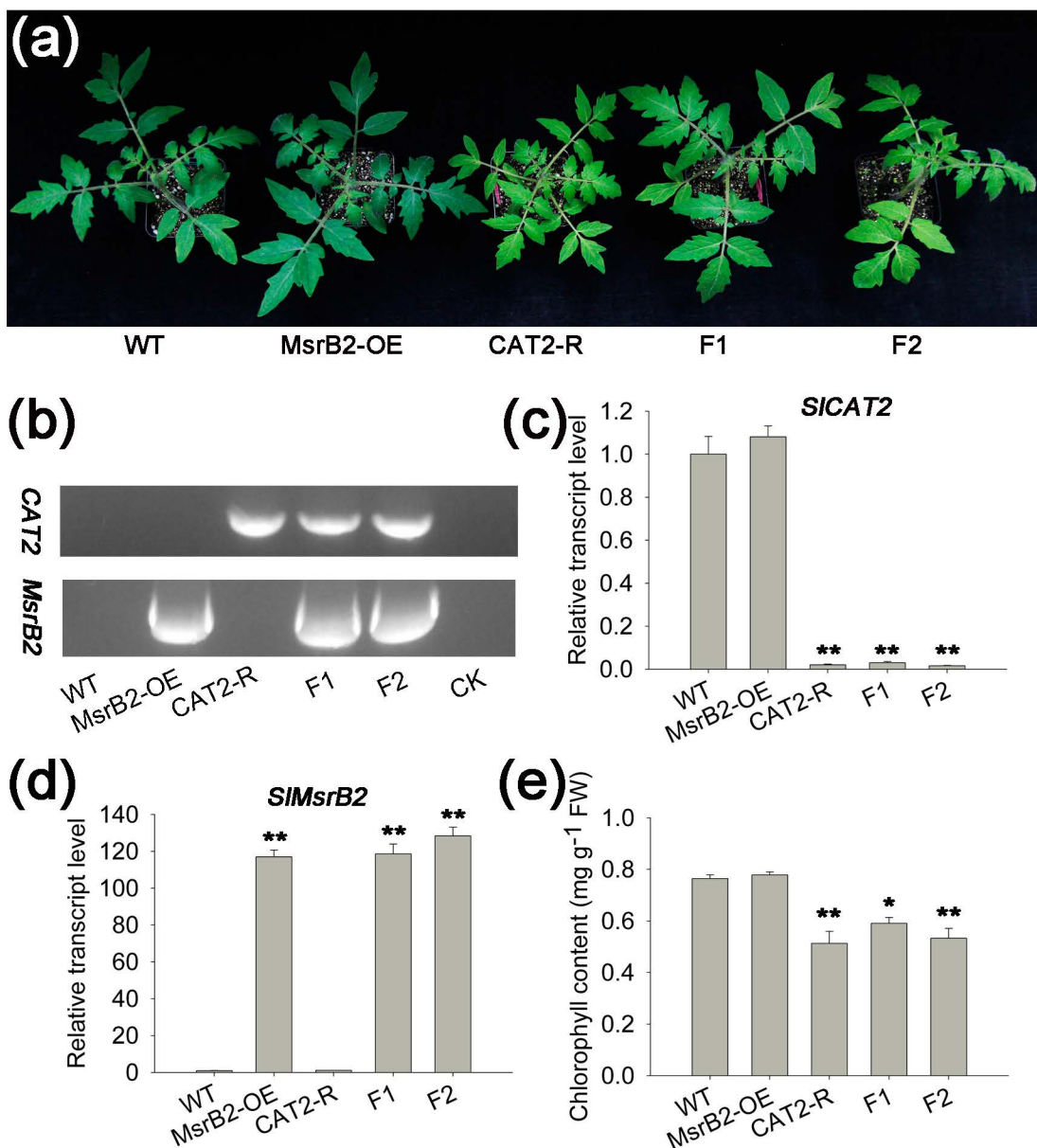
Fig. S6. Phenotypes of tomato hybrid progenies from a cross between the *MsrB2* over-expressing line and the *CAT2* RNAi line. (a) Phenotypes of WT tomato plant, MsrB2-OE line, CAT2-RNAi line and their F1 and F2 progenies. F2 plants were obtained from self-fertilization of F1. Note that pale green leaf phenotypes were visible in CAT2-RNAi lines and F1 and F2 plants, suggesting that overexpression of the *MsrB2* gene (MsrB2-OE) cannot overcome the reduced expression of the *CAT2* gene. (b) Verification of transgenes in transgenic lines and their F1 and F2 progenies. Primers specific to the transgenes of MsrB2-OE and CAT2-RNAi were used for PCR reactions of genomic DNA isolated from the WT control, MsrB2-OE, CAT2-RNAi, and their F1 and F2 progenies. (c-d) Quantitative RT-PCR analysis of *MsrB2* and *CAT2* expression in young leaves of the WT tomato plant, MsrB2-OE, CAT2-RNAi, and their F1 and F2 progenies. Experiments with three replicates were performed. The bars represent mean values ± SE. Asterisks indicate statistically significant differences relative to the wild type and were determined using *t*-tests. **, $P < 0.01$. (e) Chlorophyll contents of 30-d-old wild-type (WT) tomato plant, MsrB2-OE, CAT2-RNAi and their F1 and F2 grown in normal growth conditions. Experiments with three replicates were performed. The bars represent mean values ± SE. Asterisks indicate statistically significant differences relative to the wild type and were determined using *t*-tests. *, $P < 0.05$, **, $P < 0.01$.

Table S1. Primers used in this study.

Primer name	Sequence (5'-3')
SlSMsrB2-OE-FW	CATTTGGAGAGGACACGCTCGAGCTTGAGAGTTGGTCTTTGCGTG
SlSMsrB2-OE-RV	TCTCATTAAAGCAGGACTCTAGACCCAAATGCGATGAACTAAGAAT
SlMsrB2-RNAi-FW	AAAAAGCAGGCTCTTGAGAGTTGGTCTTTGCGTG
SlMsrB2-RNAi-RV	AGAAAGCTGGGTCCATAGCAACAACCCCACCT
SlCAT2-OE-FW	CATTTGGAGAGGACACGCTCGAGCTTATTTTTGTTGGATATGATTGTG
SlCAT2-OE-RV	TCTCATTAAAGCAGGACTCTAGATTTCATTGATTTTTCACATTGTAGG
SlRBCS3B-VIGS-FW	CTGTGAGTAAGGTTACCGAATTCAAAGAAGGCTTACCCTCAGGC
SlRBCS3B-VIGS-RV	CGCGTGAGCTCGGTACCGGATCCATGTACTCTTTTGTCGAGCTTATGC
SlCAT2-RNAi-FW	AAAAAGCAGGCTGCTATTAGAGTCGGTGGT
SlCAT2-RNAi-RV	AGAAAGCTGGGTTTGGTCCAATACGGTGTC
SlRBCS3B-RT-PCR-FW	CAAGTCCACTGCTTCTTTCCCT
SlRBCS3B-RT-PCR-RV	GGTCCAGTATCTGCCATCGTAGT
SlRBCS3B-AD-FW	ACGTACCAGATTACGCTCATATGATGGCTTCCTCTATAGTTTCTTCAG
SlRBCS3B-AD-RV	TACGATTCATCTGCAGCTCGAGCGTATCCTTCGGGCTTGTAAGC
SlCAT2-AD-FW	ACGTACCAGATTACGCTCATATGAATTCTTCTTTCATTTCCATCACC
SlCAT2-AD-RV	TACGATTCATCTGCAGCTCGAGCTCACATTGTAGGCTTCACAGTGAG
SlMsrB2-BD-FW	TCTCAGAGGAGGACCTGCATATGATGGGTTCTCATATTCTCAAAATCTC
SlMsrB2-BD-RV	TTATGCGGCCGCTGCAGGTCGACGCTAAGAATTTGCTGGTGTAAACTTGA
SlMsrB2-LIC6FLAG-FW	GACGATGACAAGGAATTCATGGGTTCTCATATTCTCAAAATCTC
SlMsrB2-LIC6FLAG-RV	ATAGGGAAGAGGCCTGAATTCAGAATTTGCTGGTGTAAACTTGAGG
SlRBCS3B-LIC6MYC-FW	GATTTGAATGAAGAATTCATGGCTTCCTCTATAGTTTCTTCAG
SlRBCS3B-LIC6MYC-RV	ATAGGGAAGAGGCCTGAATTCGTATCCTTCGGGCTTGTAAGC
SlCAT2-LIC6MYC-FW	GATTTGAATGAAGAATTCAATTCTTCTTTCATTTCCATCACC
SlCAT2-LIC6MYC-RV	ATAGGGAAGAGGCCTGAATTCCATTGTAGGCTTCACAGTGAGACG
SlMsrB2-101YFP-FW	GAATTCATCGATGGATCCATGGGTTCTCATATTCTCAAAATCTC
SlMsrB2-101YFP-RV	CTCGAGCCCGGGGGGTACCAGAATTTGCTGGTGTAAACTTGAGG
SlMsrB2-Q-FW	TAAGACAGAAAGGCACTGAGTATCC
SlMsrB2-Q-RV	TGAATTTTGCTGTGGACTTGTAGAG
SlCAT2-Q-FW	GCGATGAAGAGGTGGATTATTTG
SlCAT2-Q-RV	TCCCATGATCTGTACCTCTCCC
Actin-Q-FW	GTCCTCTTCCAGCCATCCA
Actin-Q-RV	ACCACTGAGCACAATGTTACCG
β -actin-Fw	ATGGCAGACGGAGAGGATATTCA
β -actin-Rv	GCCTTTGCAATCCACATCTGCTG
RBS-mCherry-FW	CATTTGGAGAGGACACGCTCGAGATGGCTTCCTCTATAGTTTCTTCAG

RBS-mCherry-RV	TCGCCCTTGCTCACCATGAATTCGTATCCTTCGGGCTTGTAAGC
MSRB2-NE173-FW	GGCCCAGGCCTACTAGTGGATCCATGGGTTCTCATATTCTCAAAATCTC
MSRB2-NE173-RV	AGCTCCTACCCGGGAGCGGTACCCTAAGAATTTGCTGGTGTAAACTTG
CAT2-CE155-FW	AGAGAACACGGGGGGACTCTAGAATGGATCCCTCTAAGTATCGCC
CAT2-CE155-RV	ATCCCGGGAGCGGTACCCTCGAGCATTGTAGGCTTCACAGTGAGACG
ATCAT2-mCherry-FW(RFP)	CATTTGGAGAGGACACGCTCGAGATGGATCCTTACAAGTATCGTCCAG
ATCAT2-mCherry-RV(RFP)	TCGCCCTTGCTCACCATGAATTCGATGCTTGGTCTCACGTTCAGA