**Supplemental Table 1: The name and sequence of the primers used in this study**

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| Purpose | Primer name | Primer sequence (5'-3') |
| SCMV mutants | SCMV-HCR184I-F | GGATTCATTTATTAACAAGATCTCACCAAAGAGCACGATC |
| SCMV-HCR184I-R | GATCTTGTTAATAAATGAATCCAATGTGTCCGTTTTAAGTGATTC |
| SCMV-HCR184K-F | ATTCATTTAAAAACAAGATCTCACCAAAGAGCACGATCAATG |
| SCMV-HCR184K-R | GAGATCTTGTTTTTAAATGAATCCAATGTGTCCGTTTTAAGTG |
| SCMV-HCC57A-F | CAAAATTACAGCAAAAACGTGCAATATTGATGATCTGGAACTGTCAGATG |
| SCMV-HCC57A-R | CACGTTTTTGCTGTAATTTTGAAAGTTGAATGGAATAGGATTTCTAACAGTG |
| SCMV-HCC60A-F | GCAAAACGGCAAATATTGATGATCTGGAACTGTCAGATGATGAATTTG |
| SCMV-HCC60A-R | TCAATATTTGCCGTTTTGCATGTAATTTTGAAAGTTGAATGGAATAGGAT |
| Real-time RT-PCR | SCMV-CP-qRT-F | GGCGAGACTCAGGAGAATACA |
| SCMV-CP-qRT-R | ACACGCTACACCAGAAGACACT |
| *ZmUbi*-qRT-F | GGAAAAACCATAACCCTGGA |
| *ZmUbi*-qRT-R | ATATGGAGAGAGGGCACCAG |
| *actin*-qRT-F | CTGATGAAGATACTCACAGAAAGAG |
| *actin*-qRT-R | CAGGATACGGGGAGCTAATG |
| GFP-qRT-F | GTGGAGAGGGTGAAGGTGAT |
| GFP-qRT-R | CGGATAACGGGAAAAGCATTGA |
| Transient expression vectors | pBin-SCMV-HC-F | CGGGATCCATGGCTGATCCACAAGCGAATAG |
| pBin-SCMV-HC-R | GGAGCTCTTATCCCACTATATATTCACGCATCTC |

The underlined letters represented the mutation sites or multiple cloning sites.