

**Table S1.** Primer list

Primer name and sequence (5'→3')	Purpose
Seq7_156F: ttgatcggtaaggtgctt	MLO7 sequence verification
MLO7_R: atctcatgttgggttcgatt	
P6-VvU6.2_F: cactagggatgactgcctgga	Promoter VvU6.2 sequence amplification
P6-VvU6.2_R: cgcaggggcatgctaactt	
UBQ2-F: gctgacggagtcgttagtca	Promoter VvUBQ2 sequence amplification
UBQ2-R: tctacacagatctaagagag	
121: agatctgtcgtacgacctggtagcaagggcgagg	GFP-P2A-HygR fusion PCR
122: gtacagctcgtcgccagctttgtacagctcgtccatgccg	
123: gggatcactctcggcatggacgagctgtacaagactggcgac	
124: cttctcgacagacgtcgcggtgagttcaggcttttcatggtg	
125: ggggatccaccggtcgccacatgaaaagcctgaactcac	
126: agagtcccgctattcctttgccctcggacg	
127: aaaggaataggcgggactctggggttcg	
128: attaattcgggaagttcctattcttagaaagtataggaacttcgcctgcggaga tctggattttag	
129: taggaacttcccgaattaattcggcgtaattcag	
130: acggagccgattttgaaaccgcgggcggtgatcacaggcagc	
131: gaagtgagctcatattgaaagtaatatgtattatt	HSP-FLP amplification
132: acataatatataaattggctcatcaccttc	
133: atggctctaagaagaagaggaaggtgatgagccaattgatattatg	
134: atgattacaggcctccgatctagtaacatagatgacaccgc	
1F_FRT: ctcttaattaatagggataacaggg	Fusion PCR and cloning
2R_FRT: ccttcagtttgaagttcctattcttagaaag	
3F_preP: taggaactcaaactgaaggcgggaaac	
4R_preP: aaggtgagatctcatatctaagaatgaagatgt	
5F_VvU6- 26: agatatgaagatctcaccttctggtggggaaca	
6R_VvU6- 26: gttggtctccaatctctaagcgtttgtcctg	
7F_preUBQ: ttagagattgggagaccaaccagtgac	
7F'preUBQSbf/Stu: catggcaggcctcaacatggtggagcacg	
8R'preUBQSbf/Stu: tgaaggcctgcatgcaagcttattggtttatctc	
8R_preUBQ: ctccgtcagcattgccctttggtcttctgag	
9F_VvUBQP: aaagggaatgctgacggagtcgtagtc	
10R_VvUBQ: tgaggctgagcttacacagatctaagagagtacc	
11F_Cas9: tctgttagactcgacctcaacacaacataac	
12R_Cas9SbfI: ctctgcaggtagcagatgcg	
prF Hyper/m1NcoI: gatcaccttgggccaatagagaatgcgt	HyPer sequence PCR mutagenesis
PrR Hyper/m1NcoI: ggccaagggtgatctcatagattgctaaa	

prF Hyper/m2NcoI: cctgtcccttggccaacattagtaacaacctt	Hyper sequence fusion PCR and cloning
prR Hyper/m2NcoI: tggccaaggacaggaagtttccagtgt	
prF_HyperNcoI: gccacatggaaatggcttcaacagg	
prR_HyperSacII: gaaaccgcggccgcggcggtgatcacaggc	
prRHyperfusion: gagtcccgcttacactgcttcttcaaaacc	
prFHyperfusion: gaagcaagcagtgaagcgggactctggggttc	gRNA expression
gRNA 7.7F: attgttggttcttccaaagcca	
gRNA 7.7R: aaactggccttgggaagaaccaa	Vector sequencing
Seq_1_F: ttctcttaggtttaccgcgcaa	
Seq_1_R: tcttgaagggttcgatgcctaata	
Seq_2_F: ctggaaccgtagcttctgtttct	
Seq_2_R: aactttgttttagggcgactgc	
Seq_3_F: ttgggttacagtctatgcctcg	
Seq_3_R: cctgttcaggaaccggatcaaa	
Seq_4_F: cacgatcgacattgatctggct	
Seq_4_R: acggactagcctattttaacttgc	
Seq_5_F: gctcacagccaaactatcaggt	
Seq_5_R: cacggcatctagatgtcccttg	
Seq_10_F: aggatcttcttagaaagcagagaacc	
Seq_10_R: acgtacttaaccttggaagctcg	
Seq_11_F: catcgagagaatgaccaactcga	
Seq_11_R: tcgtggataagctgcatgaagt	
Seq_12_F: cggaatcagagataagcagtctgg	
Seq_12_R: atcagaacgggtaagaaccttgt	
Seq_13_F: acgttgatcaggagcttgacat	
Seq_13_R: ttccgatctcctgctcagact	
Seq_14_F: tgttgaaccgctcttatcaaga	
Seq_14_R: tggcaacttgatgataagatccttct	
Seq_15_F: caccatcatggagcgttcttct	
Seq_15_R: tcctcaagctgagaaagatcg	
Seq_16_F: gctccagctgcttcaagtact	
Seq_16_R: ttcaacaaaaactgaaacatagag	
Seq_18_F: tatcccttcgtcctcgtaaa	
Seq_18_R: gatctcccagatgctttcacc	
Seq_19_F: tcgaatcatcggaagaagcaga	
Seq_19_R: ttagtcaactccgttaggcct	
Seq_20_F: tgcgccttatcaatcttggct	
Seq_20_R: tgccaaatgttgaacgatcg	

Seq_21_F: tcagttccagcgacttgattcg	
Seq_21_R: tgggagatgaggaggctttctt	
Seq_22_F: ccactaattcgtctctgctggtt	
Seq_22_R: gcaacgcaattaatgtgagttagc	
Seq_23_F: atccgctcacaattccacacaa	
Seq_23_R: tcaatagccctttggtcttctga	
Seq_24_F: acgttccaaccacgtcttcaaa	
Seq_24_R: tgaacttgtggccgtttacgtc	
Seq_25_F: agctttcgcagatctgtcgatc	
Seq_25_R: atgggggtgttctgctggta	
Seq_29_F: gggttctatagggtttcgctc	
Seq_29_R: actgttcctgcattctaaaacctt	
Seq_30_F: tcggctccgtcgatactatggt	
Seq_30_R: aattcggctaagcggctgtcta	
Seq_31_F: ttatcgagctgtatcgaggatg	
Seq_31_R: cagcagattacgcgcagaaaaa	
Seq_32_F: acgtgagttttcgttccactga	
Seq_32_R: ctcaagtcagaggtggcgaaac	
Seq_33_F: gtgagctatgagaaagcgccac	
Seq_33_R: agacggtcacagcttgtctg	
Seq_34_F: tatcgctacgtgactgggtcat	
Seq_34_R: ctacgagggaagaggtcgaa	
Seq_35_F: gtacggctttgggttccaat	
Seq_35_R: gtacgaagaaggccaagaacgg	
Seq_36_F: tcagctagctcatctcgatgt	
Seq_36_R: ccgctgatcgaaatccgcaa	
1F_FRTslic: cctgtcaaactgatagtttcttctaataataggataaca	AtU6-26, 35S promoters replacement by VvU6-26, VvUBQ2 promoters
2R_FRT: ccttcagtttgaagttctattcttagaaag	
3F_preP: taggaacttcaaactgaaggcgggaaac	
4R_preP: aaggtgagatcttcatatctaagaatgaagatgt	
5F_VvU6-26: agatatgaagatctcaccttctggtggggaaca	
6R_VvU6-26: gttggtctcccaatcttaagcgtttgctctg	
7F_preUBQ: ttgagattgggagaccaaccagtggaac	
7F'preUBQSbf/Stu: catggcaggccttcaacatggtggagcacg	
8R'preUBQSbf/Stu: tgaaggcctgcatgcaagcttattggtttatctc	
8R_preUBQ: ctccgtcagcattgccctttggtcttctgag	
9F_VvUBQP: aaagggaatgctgacggagtcgtagtc	
10R_VvUBQ: tgaggtcaggtctacacagatctaagagagtacc	

11F_Cas9: tctgttagactcgacctcaacacaacatatac	
12R: gccatctcgttgagaaaatctctgcaggtagcagatgc	