

Supplementary Data

R2

AtMYB32 MGRSPCCEKDH^{R3}TNKGAWTKEEDDKLISYKAHGEGCWRSLPRASGLQRCGKSCRLRWINYLRFD 64
 AtMYB7 MGRSPCCEKEHMNKGAWTKEEDERLVSYIKSHGEGCWRSLPRAAGLLRCGKSCRLRWINYLRFD 64
 FtMYB15 MGRSPCCEKAHTNKGAWTKEEDRLIAYIKTHGEGCWRSLPKAAGLLRCGKSCRLRWINYLRFD 64
 FtMYB14 MGRSPCCEKAHTNKGAWTKEEDRLTAYIRAHGEGCWRSLPKAAGLLRCGKSCRLRWINYLRFD 64
 FtMYB16 MGRSPCCEKEHTNKGAWTKEEDERLINYINSHGEGSWRSLPKHAGLQRCGKSCRLRWINYLRFD 64
 FtMYB13 MGRAPCCSKVGLHRGPWTPKEDSLITNYIQTHGEGQWRSLPKNAGLLRCGKSCRLRWINYLRFD 64
 FtMYB11 MASSSRKDLDRIKGFWSPFEDDLQKLVKHCGRNWSLISKSIPLGRSGKSCRLRWINYLRFD 63
 AtMYB3 MGRSPCCEKAHMNKGAWTKEEDQLIVDYIRKHGEGCWRSLPRAAGLLRCGKSCRLRWINYLRFD 64
 AtMYB4 MGRSPCCEKAHTNKGAWTKEEDERLVAYIKAHGEGCWRSLPKAAGLLRCGKSCRLRWINYLRFD 64
 Consensus mgrspccekahtnkgawtkeedrliaayikahgegcwrsllpkaagllrcgkscrlrwinylrpd

AtMYB32 LKRGNF^{R3}TLEEDDLIIKLESLIGNKWSLIATRIEGRDNEIKNYWNTHVKKLLRKGIDPATHRP 128
 AtMYB7 LKRGNFTHDEDEIIKLESLIGNKWSLIATRIEGRDNEIKNYWNTHIKRLLSKGIDPATHRG 128
 FtMYB15 LKRGNFTEEEDDLIIKLESLIGNKWSLIAGRLEGRDNEIKNYWNTHIKRLLSRGIDPITHRS 128
 FtMYB14 LKRGNFSDDEEDDLIIKLESLIGNKWSLIAGRLEGRDNEIKNYWNTHIKRLLSRGIDPVTHRP 128
 FtMYB16 LKRGNF^{R3}TQCEDDLIIIDIFTLIGNKWSFIATRIEGRDNEIKNYWNTHIKRLLARQSFTRRKN 128
 FtMYB13 IKRGNISPD^{R3}EDDLIIIRLEHALIGNKWSLIAGRLEGRDNEIKNYWNTHLSKLLRSQGTDPNTHKK 128
 FtMYB11 VEHRPFTPEDEAAIVQAFARFGNKWATIARMIVGRDNEIKNHWNSTLKRKCSSMSGDFNFDL 127
 AtMYB3 LKRGNFTEEEDDLIIKLESLIGNKWSLIAGRLEGRDNEIKNYWNTHIKRLLSRGIDPNSHRL 128
 AtMYB4 LKRGNFTEEEDDLIIKLESLIGNKWSLIAGRLEGRDNEIKNYWNTHIRKLLINRGIDPTSHRP 128
 Consensus lkrgnfteeedeliihlhslignkwsliagrlpgrtdneiknywnthikrllsrgidp thrp

AtMYB32 INETKTSQDSSDSSKTEDPLVK.....ILSFG..PQLEKIANFG..DERIQKRV.....EY 175
 AtMYB7 INEAKIS....DLKKTQDQIVK.....DVSVFV..TKFEETDKSG..DQKQNKYIRNGLVCKEER 179
 FtMYB15 VNEVEVEGEVIPSPTP.TTTTSSISFGATIP...KLEQD.LHDHNLMTNSRFAAIT.GSKSEERN 186
 FtMYB14 LNEASSPTNTTTTNSNTRTSSTKITTTISFASNLKQEPILLDQNIITRLLSSSSPGSKLRSTN 192
 FtMYB16 VTTTASS.....ILHFAPTSN.....NIT.....TKVLHGGPVDVGVSG.....HYHD 166
 FtMYB13 LSDLDP^{R3}IPPKPSKPKKRTPTQTNKKQKGS^{R3}DP^{R3}SAQNKTKVHQPKPVRVTSLSLTRNNSNTSEFS 192
 FtMYB11 HANPPPLKR...SASVGPATNVSG...LNFN.PGSPSGSDISDSGSLSHVYRPVPLSVVPSFRE 185
 AtMYB3 INESVVS....PSSLQNDVVET...IHLDFSGPVKPEPVREEIGMVNNCESG...TTSEKD 180
 AtMYB4 IQESSASQ...DSKPTQLEPVTNT.INISFTSAPKVE^{R3}TFHESISFPGSEKISMLTFKEEKDE 188
 Consensus ine s dsskt dtvts nisf s pk ekvhdsg d k gsk see

EAR

AtMYB32 SVVEERC...LDLNLELRISPPWQDKLHDERNLRFG..RVKYRCSACRF^{R3}FGNGKECSCNNVK 233
 AtMYB7 VVVEEKIG...PDLNLELRISPPWQNCQ.....REISTCTASRFY^{R3}MEMDMECSSETVK 228
 FtMYB15 PGY.....RCPDLNLELRISPPS.HQHQPEQLKSGGIIVNSNPCFKCSFGMQSGQVCKCNTFD 243
 FtMYB14 SGLGFEIRDQSLDLNLDL^{R3}KISPPSHHQHQPEQLKIG.....VMCFKCNLGLQNSQDCSCNIFG 250
 FtMYB16 SNN.....SINLELSISL^{R3}PSTSN.....NMQEH^{R3}ERTLW 195
 FtMYB13 NLT^{R3}SVSTP...TSQSGGPP^{R3}IVPPT^{R3}Y^{R3}QPYD.....LTTSGVRF^{R3}LIGCEEEDDVAGLVVQ 244
 FtMYB11 ITPKIE.....EPETALSLSLPGFDSGEG.....SNQCSGSVDMLSQTS^{R3}CPVVEK 231
 AtMYB3 YGNEED.....WVNLNLELSVGP^{R3}SYRYES.....TRKVSVD^{R3}SAESTRRWGS^{R3}ELFG 225
 AtMYB4 CPVQEK^{R3}...PDLNLELRISL^{R3}DDVDRLQGHG...K..STTPRCFKCSLGMINGME^{R3}CRCGRMR 243
 Consensus sgvee pdlnlelrispps q e rcfkcsfgmengqecscntfk

SID-domain

AtMYB32 CQTEDSSSSSYSSSTDISSS.IGYDFLGLNN...TRVLDF.....STLEMK..... 274
 AtMYB7 CQTE^{R3}NSSSISYSSIDISSNVGYDFLGLK...TRILDF.....RSLEMK..... 269
 FtMYB15 SKG.NSS...ECSNIGFH...DFLGLRG...SATLDY.....RTLEMK..... 276
 FtMYB14 NKT.NASN...DHSNIGIH...DFLGLRV...SANLDF.....RSLEMK..... 284
 FtMYB16 RESSNAT.....TS..... 204
 FtMYB13 EQGVMEEP^{R3}LVSDQSDMLDK.LYDEYLQLIKADDDHGLDFDL^{R3}LLSDQARELDSFAESLL 302
 FtMYB11 VFGPFSRELLSVMQDMIRQEV^{R3}.SYM^{R3}DQGGGT^{R3}CYNQTEAISNAMMNRMG^{R3}MNSVE... 285
 AtMYB3 AHESDAVC...LCCRIGLF...RNESCRN...CRVSDV.....RTH..... 257
 AtMYB4 CDVVGGS...KGS^{R3}DMNG...DFLGLAKKET^{R3}TSLLGF.....RSLEMK..... 282
 Consensus cqg nsss sdig dflglr tr ldf rslemk

Fig. S1. Amino acid sequence alignment of a clade of subgroup 4 R2R3-MYB TFs from *F. tataricum* with subgroup 4 R2R3-MYB TFs from *Arabidopsis*. Sequences were aligned using the clustalW and MEGA version 5. FtMYB11 (KU498041), FtMYB13 (KY290579), FtMYB14 (KY290580), FtMYB15 (KY290581), FtMYB16 (KY290582).

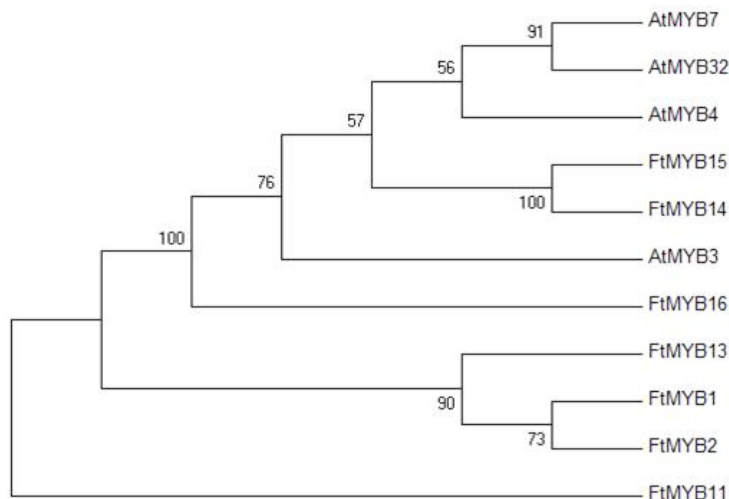


Fig. S2. Phylogeny of R2R3-MYB TFs including two activators: FtMYB1 (JF313345) and FtMYB2 (JF313347) from *F. tataricum* with subgroup 4 R2R3-MYB TFs from *Arabidopsis*. Phylogenetic tree is based on alignment of complete protein sequences.

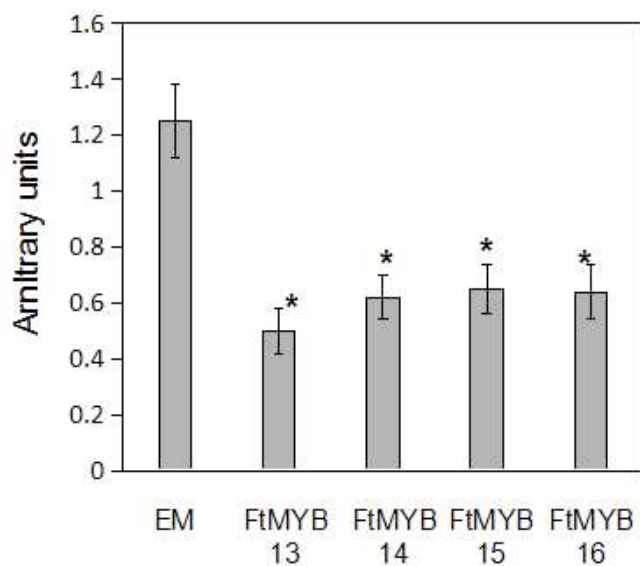


Fig. S3. Transcriptional repression activity assays of FtMYB13, FtMYB14, FtMYB15 and FtMYB16. The transformed yeasts were selected on SD/-W media and then β -galactosidase activity assays (Arbitrary units) were performed. Empty pAS2.1 vector was used as a negative control. The mean value is from three independent measurements, and error bars indicate \pm SD.

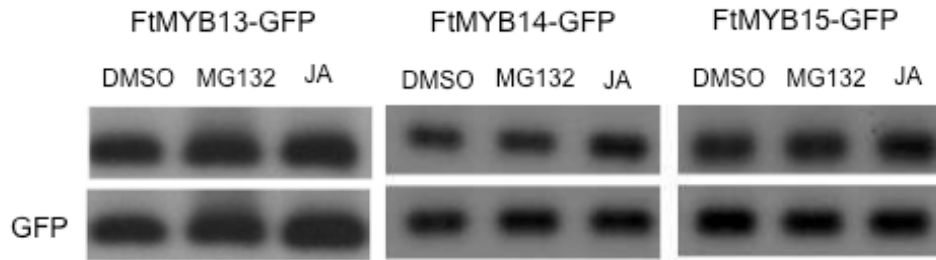


Fig. S4. Immunoblot analysis with anti-GFP antibodies of total protein extracts from *Arabidopsis coi-1* leaf protoplasts transiently co-expressing GFP and FtMYB13-GFP, FtMYB14-GFP or FtMYB15-GFP. *Arabidopsis* protoplasts were harvested 18 hrs after transformation of protoplasts treated for 4 hrs with the solvent DMSO at 0.1% (v/v) final concentration or with 50 μ M of the 26S proteasome inhibitor MG132 or with 50 μ M MeJA.

	<u>SID-motif</u>
AtMYB4	G--FDFL--GL
AtMYB7	G--YDFL--GL
AtMYB32	G--YDFL--GL
FtMYB13	G--LDFDLDL
FtMYB14	G IHDFL--GL
FtMYB15	GFHDFL--GL
Consensus	GxxDFxxxG/DL

Fig. S5. Amino acid sequence alignment of the SID domain of FtMYB13, FtMYB14 and FtMYB15 with AtMYB4, AtMYB7 and AtMYB32. Sequences were aligned using the clustalW and MEGA version 5.

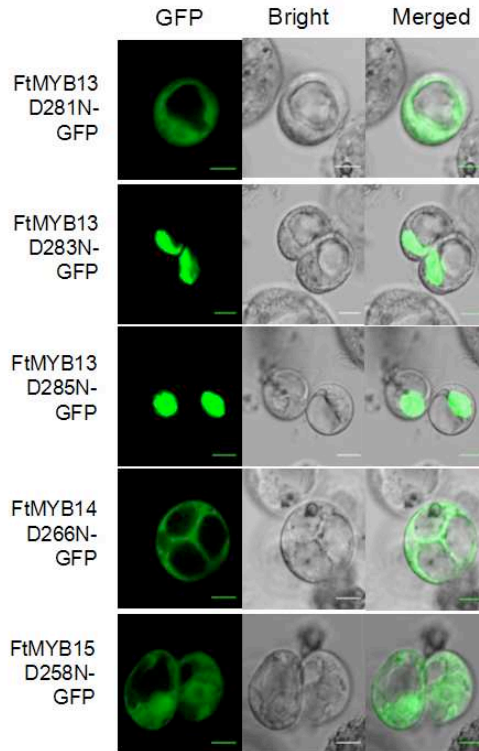


Fig. S6. Subcellular localization of FtMYB13D281N-GFP, FtMYB13D283N-GFP, FtMYB13D285N-GFP, FtMYB14D266N-GFP or FtMYB15D258N-GFP in Arabidopsis protoplasts. Scale bar=20 μ m.

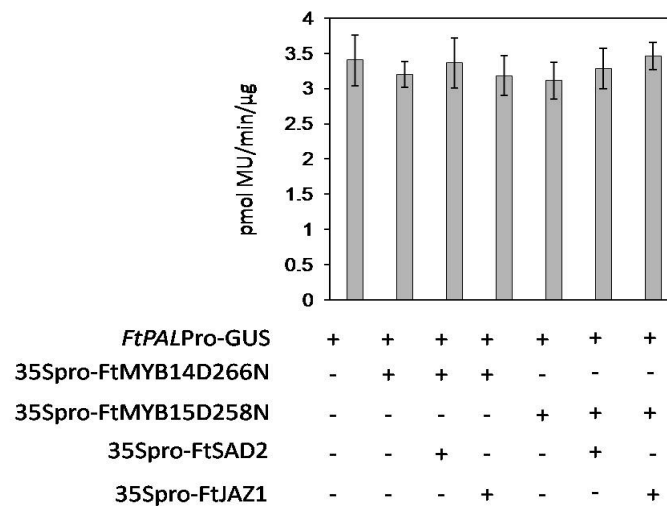


Fig. S7. The transcriptional activity of FtMYB14^{D266N} or FtMYB15^{D258N} was not affected by FtSAD2 or FtJAZ1. Arabidopsis protoplasts were co-transformed with 2 μ g reporter construct of *FtPALpro*-GUS and 2 μ g of effector plasmids. The effector constructs consisted of an expression vector carrying the CaMV 35S promoter without or with the *FtMYB14*^{D266N}, *FtMYB15*^{D258N}, *FtSAD2* or *FtJAZ1* genes. Values represent means \pm SE of triplicate experiments.

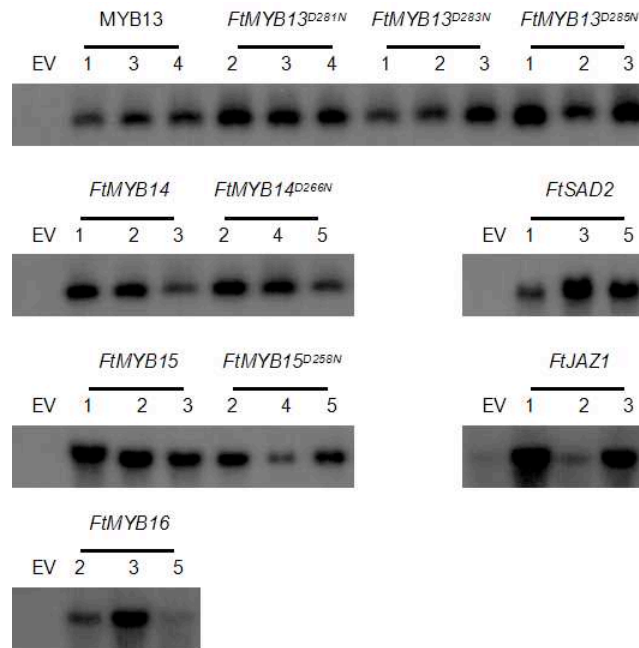


Fig. S8. Immunoblot analysis with anti-HA antibodies of total protein extracts from *FtMYB13-HA*, *FtMYB13^{D281N}-HA*, *FtMYB13^{D283N}-HA*, *FtMYB13^{D285N}-HA*, *FtMYB14-HA*, *FtMYB14^{D266N}-HA*, *FtMYB15-HA*, *FtMYB15^{D258N}-HA*, *FtMYB16-HA*, *FtSAD2-HA* or *FtJAZ1-HA* overexpressing hairy root lines of *F. tataricum* as indicated. 5 μ g protein were loaded for each sample.



Fig. S9. Immunoblot analysis with anti-HA antibodies of total protein extracts from *F. tataricum* hairy roots expressing *FtMYB13-HA*, *FtMYB13^{D281N}-HA*, *FtMYB13^{D283N}-HA* and *FtMYB13^{D285N}-HA*. The 20 days hairy root lines were harvested 12 hrs after treated with the solvent DMSO at 0.1% (v/v) final concentration or with 50 μ M MeJA. 5 μ g protein were loaded for each sample.

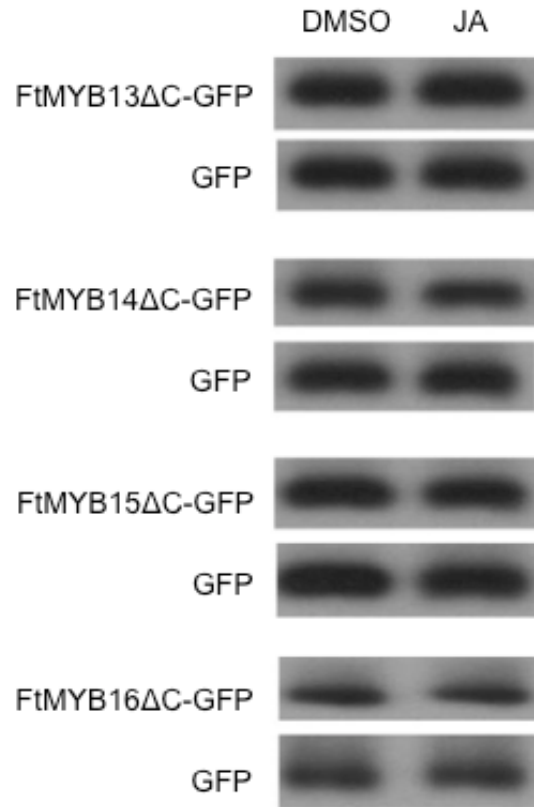


Fig. S10 Immunoblot analysis with anti-GFP antibodies of total protein extracts from Arabidopsis cell suspension protoplasts transiently co-expressing GFP and FtMYB13ΔC-GFP, FtMYB14ΔC-GFP, FtMYB15ΔC-GFP or FtMYB16ΔC-GFP. Arabidopsis protoplasts were harvested 18 hrs after transformation of protoplasts treated for 4 hrs with the solvent DMSO at 0.1% (v/v) final concentration or with 50 μM MeJA.

Table S1. List of primers used in this study.

Genes	Primers
Primers used for qRT-PCR	
FtMYB13	Fw: 5'-GCCGTACGATCTGACGACGAG-3' Rv: 5'-GTCCATGATCATCATCCGC-3'
FtMYB14	Fw: 5'-CGAGATAAGAGATCAAAGC-3' Rv: 5'-CTATGATCATTACTAGCAT-3'
FtMYB15	Fw: 5'-CATCAGCCAGAACAACACTG-3' Rv: 5'-CATGGAAGCCAATGTTGC-3'
FtMYB16	Fw: 5'-ACGTCGGAGTATCCGGTC-3' Rv: 5'-GCTTGTTGTGGCATTAG-3'
FtSAD2	Fw: 5'-GATCCTGTGGAGCAATCTAAG-3' Rv: 5'-AGACCCTGCCATTGCTCG-3'
FtH3	Fw: 5'-GAAATTCGCAAGTACCAGAAGAG-3' Rv: 5'-CCAACAAGGTATGCCTCAGC-3'
Primers used for yeast two hybrid	
FtMYB13	ADFw: 5'-GCCCGGGGATGGGAAGAGCTCCTTGTTGC-3' ADRv: 5'-AGCTCGAGTCAGATGAGCAAAGACTCAGC-3'
FtMYB14	ADFw: 5'-GCCCGGGGATGGGTAGATCTCCATGTTGTG-3' ADRv: 5'-AGCTCGAGTCATTTTCATCTCCAATGATC-3'
FtMYB15	ADFw: 5'-GCCCGGGGATGGGTTCGATCTCCATGTTGC-3' ADRv: 5'-AGCTCGAGTCATTTTCATCTCCAAAGTTCTATAG-3'
FtMYB16	ADFw: 5'-GCCCGGGGATGGGGAGATCACCTTGCTGC-3' ADRv: 5'-AGCTCGAGCTAGCTTGTGTTGTGGCATTAGAAG-3'
FtSAD2	BDFw: 5'-CTCATATGGATCTTCCAAGCCTCGCT-3'

	BDRv: 5'-CCGTCGACTCAAGAGAGTTCTTCGAGCAT-3'
FtJAZ1	ABDFw: 5'-TGCCATGGAGATGAACTTGTTCCCACTGAAAG-3' ABDRv: 5'-CGGGATCCTCAGGGCTGAATCGACGTCCG-3'
FtJAZ2	ABDFw: 5'-CTCATATGATGGTGAATTTGTCGGCTTCC-3' ABDRv: 5'-CCGTCGACTCAAGAACGTGGATTAGCAGC-3'
Primers used for yeast one hybrid	
FtMYB13	BDFw: 5'-CTCATATGGGAAGAGCTCCTTGTTGC-3' BDRv: 5'-CCGTCGACTCAGATGAGCAAAGACTCAGC-3'
FtMYB14	BDFw: 5'-CTCATATGGGTAGATCTCCATGTTGTG-3' BDRv: 5'-CCGTCGACTCATTTTCATCTCCAATGATC-3'
FtMYB15	BDFw: 5'-CTCATATGGGTCGATCTCCATGTTGC-3' BDRv: 5'-CCGTCGACTCATTTTCATCTCCAAAGTTCTATAG-3'
FtMYB16	BDFw: 5'-CTCATATGGGGAGATCACCTTGCTGC-3' BDRv: 5'-CGGGATCCCTAGCTTGTTGTGGCATTAGAAG-3'
<i>FtPALpro</i>	Fw: 5'-CGGCGGCCGCGTCGTTAAATATCGTTAAAAT-3' Rv: 5'-TGCCCGGGCCACCCCAACGGATCCTGCAC-3'
Primers used for protoplast transactivation assays	
FtMYB13-HA	RT101Fw: 5'-AGCTCGAGATGGGAAGAGCTCCTTGTTGC-3' RT101Rv: 5'-TGTCTAGATTAGGCGTAGTCAGGCACGTCGTAAGG GATGAGCAAAGACTCAGC-3'
FtMYB14-HA	RT101Fw: 5'-AGCTCGAGATGGGTAGATCTCCATGTTGTG-3' RT101Rv: 5'-TGTCTAGATTAGGCGTAGTCAGGCACGTCGTAAGG TTTCATCTCCAATGATC-3'
FtMYB15-HA	RT101Fw: 5'-AGCTCGAGATGGGTCGATCTCCATGTTGC-3' RT101Rv: 5'-TGTCTAGATTAGGCGTAGTCAGGCACGTCGTAAGG

	TTTCATCTCCAAAGTTCTATAG-3'
FtMYB16-HA	RT101Fw: 5'-AGCTCGAGATGGGGAGATCACCTTGCTGC-3' RT101Rv: 5'-TGTCTAGATTAGGCGTAGTCAGGCACGTCGTAAGG GCTTGTGTGGCATTAGAAG-3'
FtSAD2-HA	RT101Fw: 5'-AGCTCGAGATGGATCTTCCAAGCCTCGCT-3' RT101Rv:5'-TGTCTAGATTAGGCGTAGTCAGGCACGTCGTAAGGGT CAAGAGAGTTCTTCGAGCAT-3'
FtJAZ1-HA	RT101Fw: 5'-AGCTCGAGATGAACTTGTTCCCACTGAAAGAG-3' RT101Rv:5'-CCGGTACCTCAGGGCTGAATCGACGTCCG-3'
<i>FtPALpro</i>	GUSXXFw: 5'-CGGGATCCGTCGTTAAATATCGTTAAAAT-3' GUSXXRv: 5'-TGCCATGGCCACCCCAACGGATCCTGCAC-3'
Primers used for BiFC	
FtMYB13	pRTL2-HAYCFw: 5'-CCGTCGACAATGGGAAGAGCTCCTTGTTGC-3' pRTL2-HAYCRv: 5'-GCAAGCGGCCGCGATGAGCAAAGACTCAGC-3' GFPFw: 5'- TCGTCGACATGGGAAGAGCTCCTTGTTGC-3' GFPΔNFw: 5'- TCGTCGACATGTCGGATCAGAGTGACATG-3' GFPΔCRv: 5'- TCGTCGACCATGTCACTCTGATCCGACAT-3' GFPRv: 5'- TCGTCGACGATGAGCAAAGACTCAGC-3'
FtMYB14	pRTL2-HAYCFw: 5'-CCGTCGACAATGGGTAGATCTCCATGTTGTG-3' pRTL2-HAYCRv: 5'-GCAAGCGGCCGCTTTCATCTCCAATGATC-3' GFPFw: 5'- TCGTCGACATGGGTAGATCTCCATGTTGTG-3' GFPΔNFw: 5'- TCGTCGACATGTTAGGGTTGCAAAACAGC-3' GFPΔCRv: 5'-TCGTCGACGCTGTTTTGCAACCCTAACAT-3' GFPRv: 5'- TCGTCGACTTTCATCTCCAATGATC-3'

FtMYB15	<p>pRTL2-HAYCFw: 5'-<u>CCGTCGACA</u> ATGGGTCGATCTCCATGTTGC-3'</p> <p>pRTL2-HAYCRv: 5'-GCAAGCGGCCGC TTTCATCTCCAAAGTTCTATAG-3'</p> <p>GFPFw: 5'- TCGTCGACATGGGTCGATCTCCATGTTGC-3'</p> <p>GFPΔNFw: 5'- TCGTCGACATGAGTTTTGGTATGCAAAGTG-3'</p> <p>GFPΔCRv: 5'-TCGTCGACCACCTTGCATACCAAACTCAT-3'</p> <p>GFPPrv: 5'- TCGTCGAC TTTCATCTCCAAAGTTCTATAG-3'</p>
FtMYB16	<p>pRTL2-YNEEFw: 5'- CCGGACTAGT ATGGGGAGATCACCTTGCTGC-3'</p> <p>pRTL2-YNEERv: 5'- CGGGATCC CTAGCTTGTTGTGGCATTAGAAG-3'</p> <p>GFPΔNFw: 5'- TCGTCGACATGGTTGACGTCGGAGTATCC-3'</p> <p>GFPΔCRv: 5'-TCGTCGACGGATACTCCGACGTCAACCAT-3'</p> <p>GFPPrv: 5'- TCGTCGACGCTTGTTGTGGCATTAGAAG-3'</p>
FtSAD2	<p>pRTL2-HAYCFw: 5'-CCGTCGACAATGGATCTTCCAAGCCTCGCT-3'</p> <p>pRTL2-HAYCRv: 5'-GCAAGCGGCCGCGTCAAGAGAGTTCTTCGAGCAT-3'</p>
FtJAZ1	<p>pRTL2-HAYCFw: 5'-CCGTCGACAATGAACTTGTTCCCACTGAAAGAG-3'</p> <p>pRTL2-HAYCRv: 5'-GCAAGCGGCCGCGTCAGGGCTGAATCGACGTCCG-3'</p>