

Supplemental materials

Figure S1-S8

Table S1-S3

Supplemental figure 1

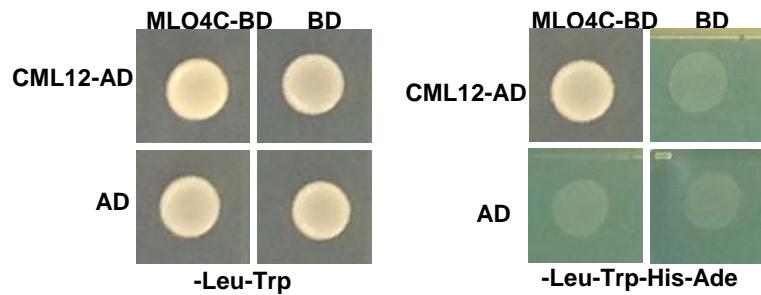


Figure S1. Y2H showed that CML12 interacted with cytoplasmic domain of MLO4 (MLO4-C).

Supplemental figure 2

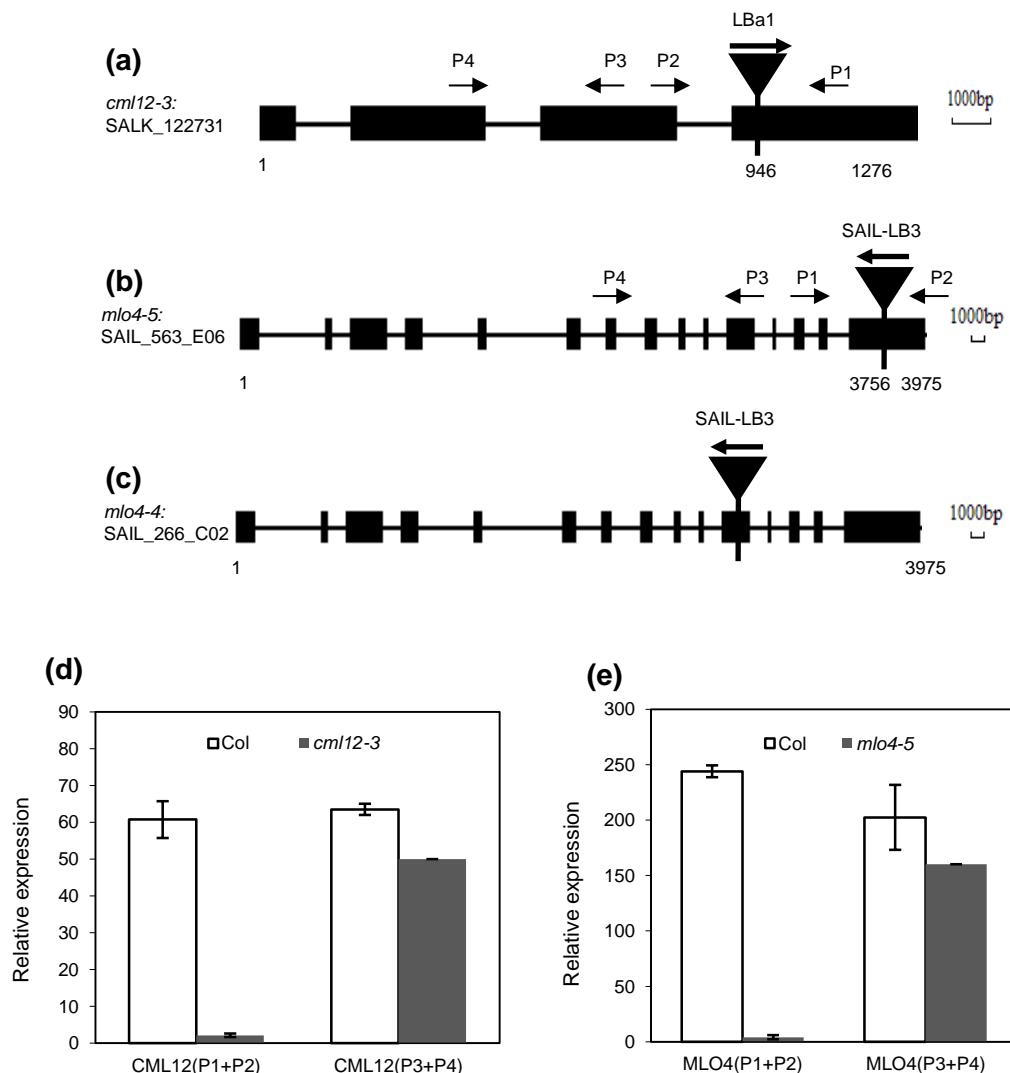


Figure S2. Identification of *cml12* and *mlo4* mutant. (a) T-DNA was inserted at the forth exon in *CML12* gene. Black box: exon; black line: intron; Arrow: primers used in the following real-time PCR. (b) T-DNA was inserted at the last exon in *MLO4* gene in *mlo4-5* mutant. (c) T-DNA was inserted at eleventh exon in *MLO4* gene in *mlo4-4* mutant. Black box: exon; black line: intron; Arrow: primers used in the following real-time PCR. (d) Real-time PCR showed that *cml12-3* was a knock-out mutant and expressed truncated protein. (E) Real-time PCR showed that *mlo4-5* was a knock-out mutant and expressed truncated protein.

Supplemental figure 3

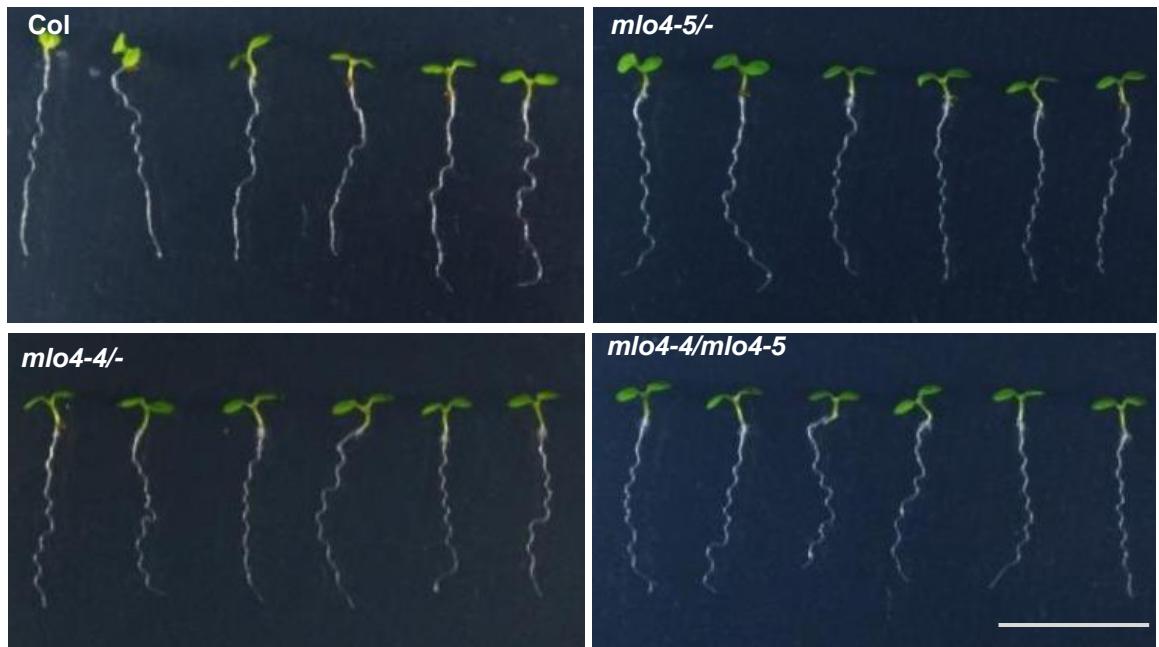


Figure S3. *mlo4-5* was another allelic mutant of *MLO4* gene.

Compared to wild-type roots, single mutant *mlo4-5* formed denser loops in roots, similar to *mlo4-4* roots. And F1 progeny of *mlo4-5* and *mlo4-4* showed resembled phenotype like both singe *mlo4* mutants. Bar = 1 cm.

Supplemental figure 4

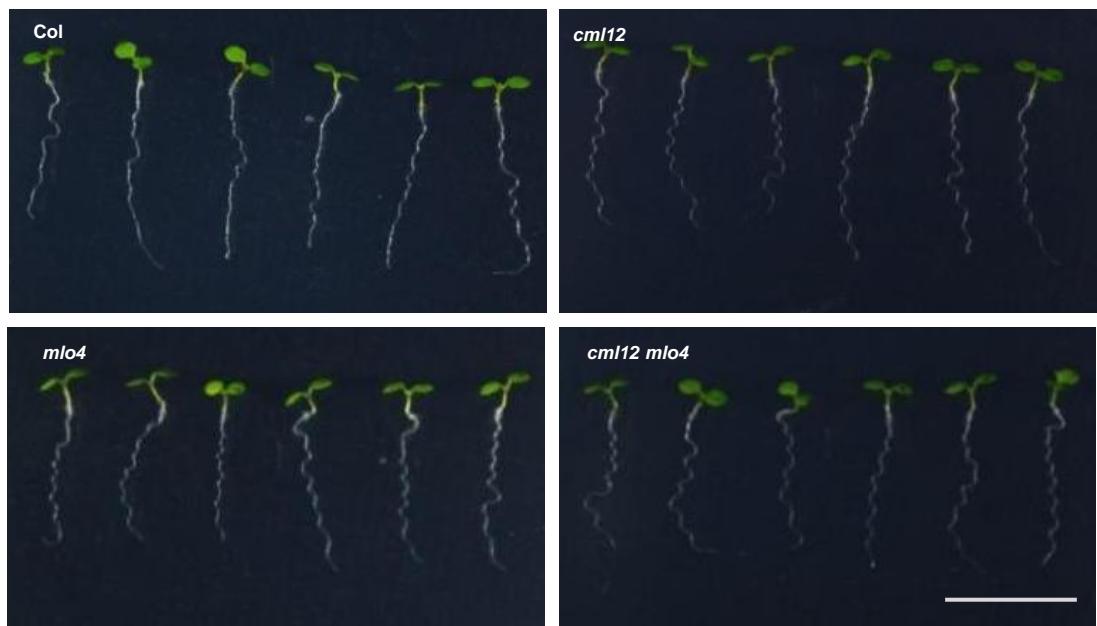


Figure S4. *cml12* and *mlo4* roots shared similar growth pattern on reclined agar medium. Single mutant *cml12* and *mlo4* roots formed denser loops and wavelengths were shorter. Phenotype of double mutant *cml12 mlo4* wasn't obviously aggravated. Bar = 1 cm.

Supplemental figure 5

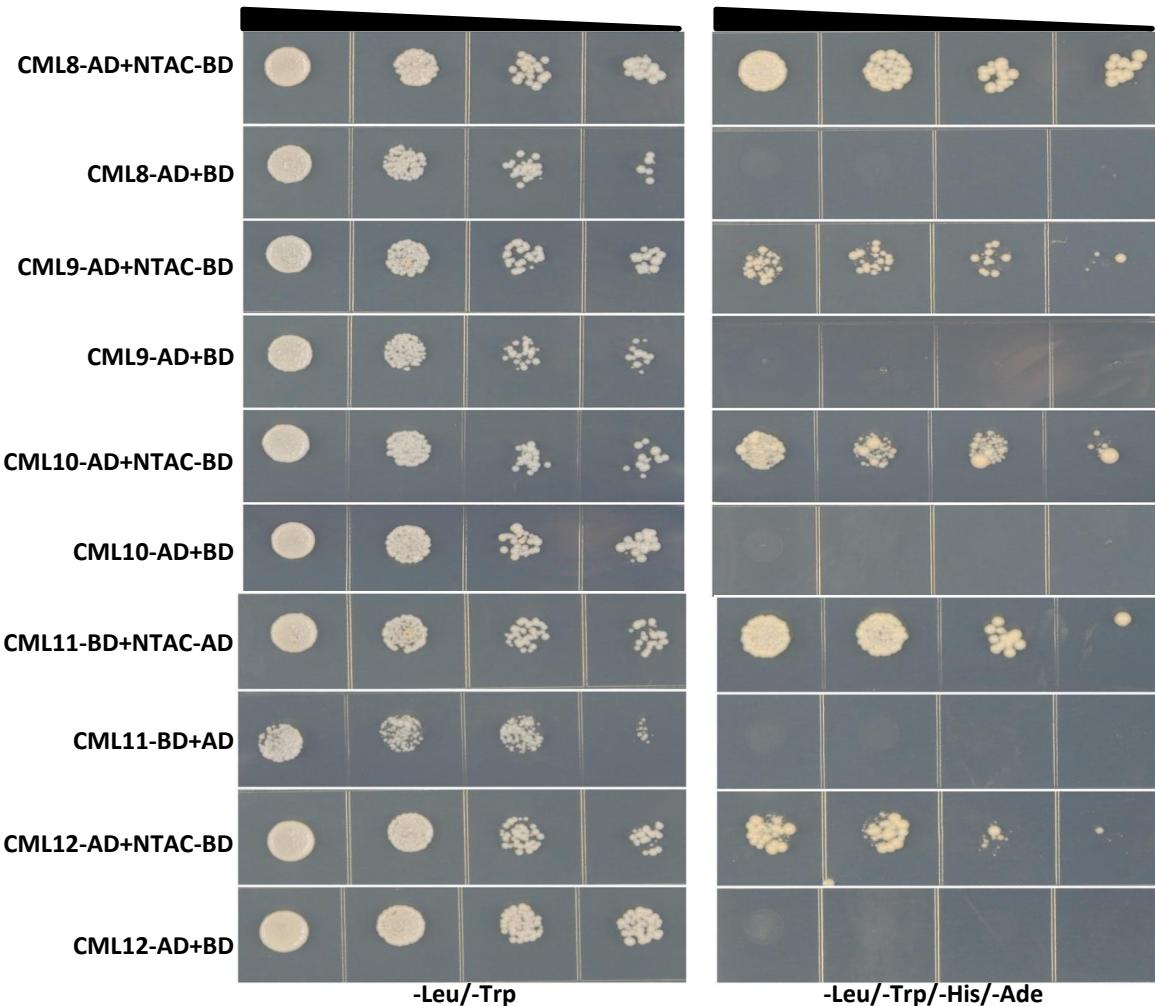


Figure S5. Y2H showed that NTA C-termini (NTAC) interacted with CML8-12 in yeast cells.

Supplemental figure 6

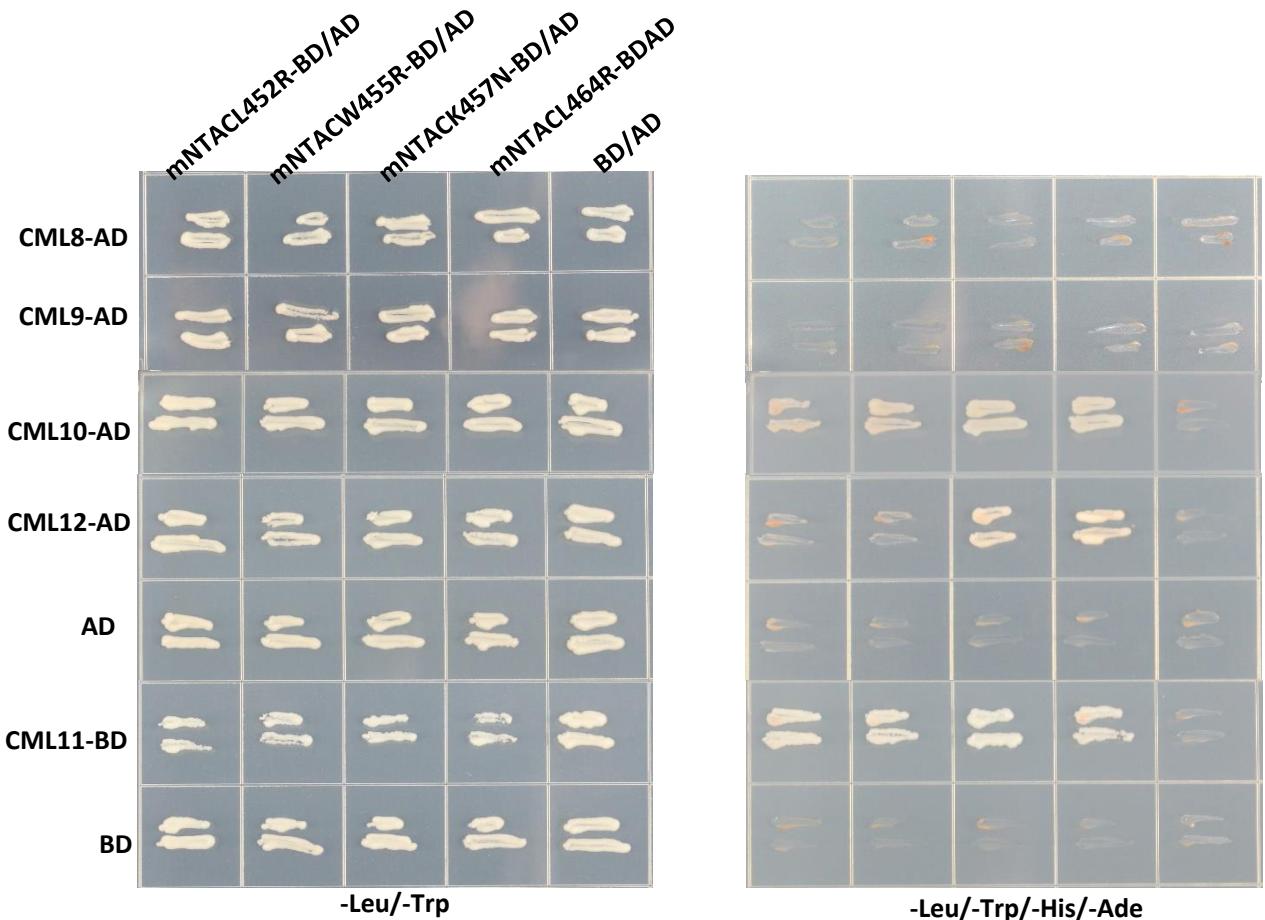


Figure S6. Y2H showed interaction between NTA and CMLs was specific.

NTA variants (L452R, W455R) with conservative sites changed were unable to interact with CML12. And NTA variants (K457N, L464R) with unconservative sites changed were still able to interact with CML12. All NTA variants (L452R, W455R, K457N, L464R) failed to interact with CML8 or CML9 but still bound CML10 and CML11.

Supplemental figure 7

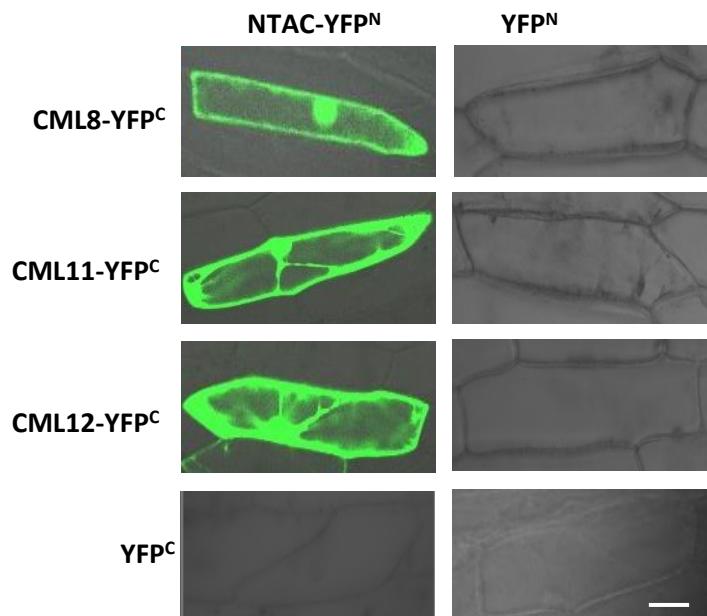


Figure S7. BiFC showed that cytoplasmic domain of NTA interacted with CML8, CML9 and CML11. Bars= 50 μ m.

Supplemental figure 8

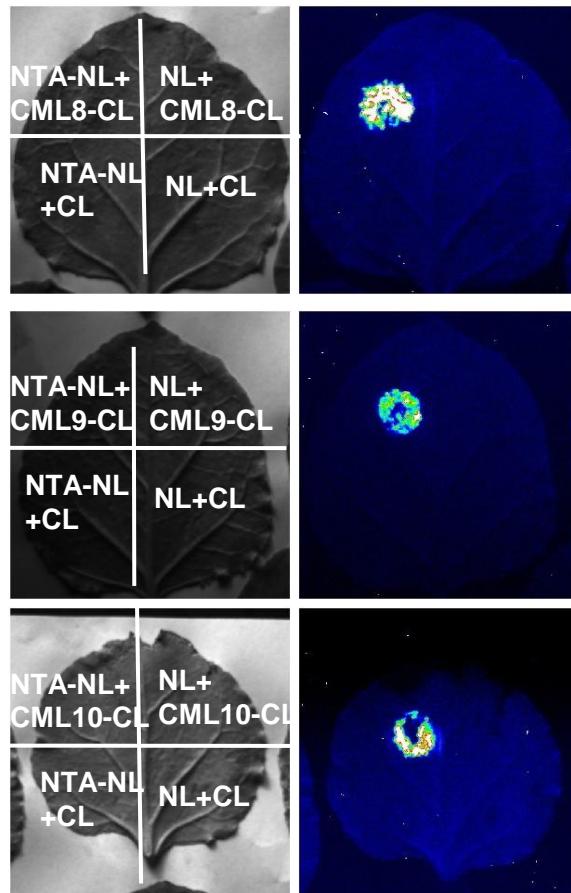


Figure S8. LCI showed full length of MLO4 interacted with CML8, CML9 and CML10 in tobacco cells.

Table S1. CML-BD interacted with MLO-AD

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Table S2. CML-AD interacted with MLO-BD

Table S3. Primers used in the study.

Uses of the primers	Names of the primers	Sequences of the primers (5'-3')
Identify mutants	SAIL-LB3	TAGCATCTGAATTCATAACCAATCTCGATACAC
	SAIL266C02-1	ATCTCGTCCAATCCATGCTA
	SAIL266C02-2	CTCATCTTCCATCGTCCGTA
	SAIL563E06-1	GTTCTTGgtaggccacctataaaatgca
	SAIL563E06-2	cctaattgcataatctcggttccatccatgc
	LBa1	TGGTTCACGTAGTGGGCCATCG
	SK122731-1	ggtaaacacactaacacatgc
	SK122731-2	AGGTCAATGATCAAGCGCC
Real-time-PCR	MLO4-P1	GAGACTCACTTCACAGTTGG
	MLO4-P2	CTCTGCTTGGTCTATGGAGT
	MLO4-P3	GGCAACATTCTATGGTTCT
	MLO4-P4	CCATAACTACACCAGAACTG
	CML12-P1	GTACTACTATGCGCTCCCTT
	CML12-P2	GACCTTGATTACAACCTCTG
	CML12-P3	TACCGTGTGTTCCCTCG
	CML12-P4	ATCTGATCGTCAGTGAGCTG
GUS assay	HindIII-PCML12	CCC AAGCTT AATGACCGACTTCATCAAAA
	PCML12-XbaI	AGC TCTAGA tgatgactgaaagaagagtgtga
	XbaI-TCH3	AGC TCTAGA CAGAAAACAAAAAAACA
	TCH3-BamHI	TCA GGATCC AGATAACAGCGCTTCGAACA
Complementation	HindIII-PCML12	CCC AAGCTT AATGACCGACTTCATCAAAA
	PCML12-PstI	CGA CTGCAG tgatgactgaaagaagagtgtga
	PstI-TCH3	CGA CTGCAG CAGAAAACAAAAAAACA
	TCH3-BamHI	TCA GGATCC AGATAACAGCGCTTCGAACA
Y2H	NdeI-CML12	CTC CATATG CAGAAAACAAAAAAACAAT
	CML12-BamHI	CTA GGATCC AGATAACAGCGCTTCGAACA
	NdeI-MLO4C	CTC CATATG ACTCAGATGGATCTCGGCAT
	MLO4C-ECORI	CTG GAATTCA GTCCCTCTAAACAACTCA

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BiFC	XbaI-CML12	AGC TCTAGA CAGAAAACAAAAAAACA
	CML12-BamHI	TCA GGATCC AGATAACAGCGCTTCGAACA
	XbaI-MLO4	CTG TCTAGA ATGGAGCATATGATGAAAGAAGG
	MLO4-BamHI	CTA GGATCC AGTCCTCCTAAACAACTCAAG
	XbaI-MLO4C	TAG TCTAGA ACTCAGATGGATCTCGGCA
LCI	KpnI-CML12	TAC GGTACC CAGAAAACAAAAAAACA
	CML12-Sall	CAT GTCGAC TCAAGATAACAGCGCTTCGAACAA
	KpnI-MLO4	CTA GGTACC ATGGAGCATATGATGAAAGAAGG
	MLO4-Sall	CTA GTCGAC AGTCCTCCTAAACAACTCAAG
Y2H	NcoI-CaM1	CATG CCATGG AC ATGGCGGATC AACTCACTGA
	CaM1-Sall	CGC GTCGAC CTTAGCCATCATAATCTTGA
	CAM1-CLal	CCC ATCGAT AC ATGGCGGATC AACTCACTGA
	NdeI-CaM2	ATC CATATG ATGGCGGATCAGCTCACAGACGATCAG
	CaM2-BamHI	CAT GGATCC CTTAGCCATCATAACCTTCA
	ECoRI-CaM3	CTC GAATTCA TGGCGGATCAGCTCACCGA
	CaM3-BamHI	CGC GGATCC CTTAGCCATCATGACCTTAA
	CAM4-ECoRI	CCG GAATT ATGATTAGCT AAAAACCCAA CTAG
	CAM4-BamHI	CGC GGATCC CAACAAAATA AAAAAGATA AGTC
	NdeI-CaM5	CGA CATATG ATGGCAGATCAGCTCACCGATGATC
	CaM5-BamHI	CGA GGATCC GAGAACACGGCAGTGACTTT
	BamHI-CaM6	CGC GGATCC AC ATGGCGGATCAGCTCACCGATGACCAGA
	CaM6-Xhol	ATC CTCGAG CTTAGCCATCATGACTTTGA
	CaM6-Sall	CGC GTCGAC CTTAGCCATCATGACTTTGACGAATT
	ECoRI-CaM7	CGC GAATTCA TGGCGGATCAGCTAACCGA
	CaM7-BamHI	CCG GGATCC CTTTGCCATCATGACTTTGA
	ECoRI-CML1	CAT GAATTCA ATGCCGATAT TCCAGTGGCT
	CML1-BamHI	CAC GGATCC TCTATTGCTA AAGTCACCAAGT

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Y2H	ECoRI-CML2	CCG GAATTCAATGGATCGTG GAGAATTGAGT AGAG
	CML2-BamHI	CGC GGATCC ATTGGAGCTA AGAGCAGCAA TCC
	ECoRI-CML3	CCG GAATTCAATGGATCAAG CGGAGCTTGCC AGGAT
	CML3-BamHI	CGC GGATCC CAAGTTGAT CCTAAGGCAGGC A
	Ndel-CML4	CGC CATATG ATGGTGAGAG TCTTCCTTCTC
	CML4-BamHI	CGC GGATCC TGATCTATTG CTAAAGTCACC AC
	ECoRI-CML5	CCG GAATTCAATGGTGAGAA TATTCCCTCTC TAC
	CML5-BamHI	CGC GGATCC ATTACTGCTG CTAAAGGCCACC ACC
	ECoRI-CML6	CCG GAATTCAATGGATTCCA CGGAGCTGAAC CGT
	CML6-BamHI	CGC GGATCC GCTCAAAGAG CTAAAAAAGCG ACCC
	Ndel-CML7	CGC CATATG ATGGATCCGA CAGAGCTAAAA CGCGTGTTC
	CML7-ECoRI	ATC GAATTCAAAAGAATTAA AACCAACCGCC TTTC
	ECoRI-CML8	CCG GAATTCAATGGAAAGAAA CAGCACTGAC AA
	CML8-BamHI	CGC GGATCC GTCAATGTTG ATCATCATCT TG
	Ncol-CML9	CTA CCATTG AG ATGGCGGATGCTTCACAGATG
	Clal-CML9	CCC ATCGAT AC ATGGCGGATG CTTCACAGA TGAAC
	CML9-BamHI	CGC GGATCC ATAAGAGGCA GCAATCATCA TT
	ECoRI-CML10	CCG GAATTCAATGGCGAATA AGTTCACTAG ACAA
	CML10-BamHI	CGC GGATCC AGAAAACAAC GCTTCGAACA AA
	ECoRI-CML11	CCG GAATTCAATGGAAAGAAA TTCAACAACA ACAAC
	CML11-BamHI	CGC GGATCC ACCATTGATC ATCATCATCC TGAC
	Ndel-CML13	CGC CATATG ATGGGGAAAG ATGGTCTGAG CGAC
	CML13-ECoRI	CCG GAATTCCTTAGCAACC ATCCTTGCTA TG
	ECoRI-CML14	CCG GAATTCAATGAGCAAGG ATGGTTGAG CA
	CML14-BamHI	CGC GGATCC TTACTTAGCA ACCATTCTAG C
	Ndel-CML15	CGC CATATG ATGGAGGATC AGATAAGACA AC
	CML15-BamHI	CGC GGATCC CGAATTAATT TTTAATCCAA AGTAATC
	Ndel-CML16	CGC CATATG ATGGCGTCAA CAAAACCAAC CGAT
	CML16-ECoRI	CCG GAATTCAAGAGCGGTT AATCCAAGAA
	ECoRI-CML17	CCG GAATTCAATGAGTCACA AAGTCTCCAA AAAG
	CML17-BamHI	CGC GGATCC ACCCATATA TCATCAAATG CAGC

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Y2H	ECoRI-CML18	CCG GAATT C ATGAGCTGCG ACGGAGGCAA A
	CML18-BamHI	CGC GGATCC ACCCAAGCA TTATCAAACG CAGCT
	ECoRI-CML19	CCG GAATT C ATGGCGAATT ACATGTCGGA AGCAG
	CML19-BamHI	CGC GGATCC GCCGTAAGAG GTTCTCTTC A TCATC
	Ncol-CML20	CATG CCATGG AC ATGTCGAGTA TATACAGAAC TG
	CML20-CLal	CCC ATCGAT AC ATGTCGAGTA TATACAGAAC TG
	CML20-BamHI	CGC GGATCC CTAGTTACCA CCATAAGCAG TTC
	Ndel-CML21	CGC CATATG ATGGGAGGTGCAGTGACGAAATCTGA
	CML21-BamHI	CGC GGATCC AGCTTCTCATTGTTGTCCTC
	ECoRI-CML22	CCG GAATT C ATGCTTGCTGCTGTGTTACT
	CML22-BamHI	CGC GGATCC GCTGCTCATAAAATCATCATCTGC
	ECoRI-CML23	CCG GAATT C ATGTCGAAGAACGTTGAGAAC
	CML23-BamHI	CGC GGATCC AGCACTACCATTAAATCATCATCAT
	Ncol-CML24	CATG CCATGG AC ATGTCATCGA AGAACGGAGT TG
	CML24-CLal	CCC ATCGAT AC ATGTCATCGA AGAACGGAGT TG
	CML24-BamHI	CGC GGATCC TCAAGCACCA CCACCATTAC TC
	Ndel-CML25	CGC CATATG ATGTTAACAAAAACCAAGGATCC
	CML25-ECoRI	ATC GAATT C CCTCGGACCACCTCCCATGACAT
	ECoRI-CML26	CCG GAATT C ATGGCAAACACAAATCTGAATCCA
	CML26-BamHI	CGC GGATCC AGAGTCGCAACGGTCCCTTAACG
	Ncol-CML27	CATG CCATGG AC ATGGCAAGCG CGAATCCAGA AAC
	CML27-CLal	CCC ATCGAT AC ATGGCAAGCG CGAATCCAGA AAC
	CML27-Sacl	C GAGCT CTAGGTCGAA GGAGGAGCGG CGGAT
	Ndel-CML28	CGC CATATG ATGGCTGACGCAACAGAAAAAGCTG
	CML28-BamHI	CTA GGATCC GAAAATCTGGCAACGTCTTC
	Ndel-CML29	CAT CATATG ATGGCTGATGCAACGGAGAAAGCCG
	CML29-BamHI	CTC GGATCC GAAAATTTGGCAACATCCTTCATAAGTCC
	ECoRI-CML30	CCG GAATT C ATGTCAAACGTGAGTTCTTGAGTTGC
	CML30-BamHI	CGC GGATCC GACATTGTTGGAAGACATCATTG
	Ndel-CML31	CGC CATATG ATGGCAGAGATTTGAAAGTGTGAC
	CML31-BamHI	CGC GGATCC ATGTGACTCTTGTAGAGTTCATC
	ECoRI-CML32	CCG GAATT C ATGTCTGTCAGAGATCTCGAG
	CML32-BamHI	CGC GGATCC TTGTAATTTGTTACAACTCATC

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Y2H	ECoRI-CML33	CCG GAATT C ATGAATAATATGTCTTAAGTGATATC
	CML33-BamHI	CGC GGATCC AACT CCTACGAATCTAATATAACC
	ECoRI-CML34	CCG GAATT C ATGTCTGC AAAAC GTGTCTCGAG
	CML34-BamHI	CGC GGATCC TATGTCACCAATAACCAAAGCCAT
	ECoRI-CML35	CCG GAATT ATGAAGCTCG CCGCTAGCCT CAA
	CML35-BamHI	CGC GGATCC CTAATGATGA TGATCATTCA TCGC
	MLO2C-ECoRI	CTC GAATT C TTTCTTAAAAGAAAAATCTC
	Ndel-MLO3C	CTC CATATG ACTCAGATGGGGTCAAGCTACAA
	MLO3C-ECoRI	CTG GAATT C CCTTCAGTTCTCTTGTA
	Ndel-MLO4C	CTC CATATG ACTCAGATGGGATCTCGGCAT
	MLO4C-ECoRI	CTG GAATT C AGTCCTCCTAAACAACTCA
	Ndel-MLO5C	CTC CATATG ACACT CCTCTTTACGCTCTCG
	MLO5C-ECoRI	CTA GAATT C GGGACCGCTTAAGAGGTCT
	Ndel-MLO6C	CTC CATATG GTTACTCAAATGGGTTCAAAG
	MLO6C-Sacl	TCA GAGCTC TCGCTTAAACGAAAAATCCC
	MLO6C-Sall	TCA GTCGAC TCGCTTAAACGAAAAATCCC
	Ndel-MLO8C	CTC CATATG ACTCAGATGGGTCTCGGATG
	MLO8C-ECoRI	CCG GAATT C CCGTCTTGAGATGATTCA
	Ndel-MLO9C	CTC CATATG ACATTGCCCTTACGCTCT
	MLO9C-ECoRI	CTG GAATT C CTTTCATTCTTTCTCGCC
	Ndel-MLO10C	CTC CATATG CAGATGGGTTCAAACATGAAG
	MLO10C-ECoRI	CTG GAATT C GTCAATATCATTAGCAGGAACG
	Ndel-MLO11C	CTC CATATG ACTCAGATGGGAACGAACTAT
	MLO11C-ECoRI	CTG GAATT C GACTCTCTCACTGGCA
	Ndel-MLO12C	TCA CATATG GTTACTCAGATGGGAACATCA
	MLO12C-BamHI	TCA GGATCC CTTCTGAACGTAAACTCAGAC
	Ndel-MLO13C	CTC CATATG ACACAAATGGGTAGCAAATT
	MLO13C-ECoRI	CTG GAATT C AGGGTTTCACTTGGACA
	Ndel-MLO14C	CTC CATATG ACTCAGATGGGAACAAACTAC
	MLO14C-ECoRI	CTG GAATT C ACATTCTCTCATTGGC
	Ndel-MLO15C	CTC CATATG CTCGT CATGGGTAAATAAT
	MLO15C-ECoRI	CTG GAATT C ATCATGGTGAGCAATCTCTGAT
	CML48-BamHI	CGC GGATCC ATCATAGGTGGCGATGAACGGAATG

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Y2H	ECoRI-CML49	CTA GAATT C ATGTCTGGTTATCCTCCATC
	CML49-BamHI	ATC GGATCC AGCGACGAGGAATGGTAAAC
	ECoRI-CML50	CCG GAATT C ATGTCAGGATATCCTCCGACTAGCCA
	CML50-BamHI	CGC GGATCC TGCGATGAGGAAGGGGAGGACGGT
	Ndel-MLO1C	CTC CATAT G TCACAGATGGGAAGTAGCTTCAAG
	MLO1C-BamHI	TCA GGATCC GTTGTATGATCAGGTGTAATCTC
	Ndel-MLO2C	CTC CATAT G ACTCAGATGGTAGTAAAATG
	MLO2C-ECoRI	CTC GAATT C TTTCTAAAAGAAAAATCTC
	Ndel-MLO3C	CTC CATAT G ACTCAGATGGGGTCAAGCTACAA
	MLO3C-ECoRI	CTG GAATT C CCTTCAGTTTCTCTTGTA
	Ndel-MLO4C	CTC CATAT G ACTCAGATGGGATCTCGGCAT
	MLO4C-ECoRI	CTG GAATT C AGTCCTCCTAAACAACCTCA
	Ndel-MLO5C	CTC CATAT G ACACTCCTCTTACGCTCTCG
	MLO5C-ECoRI	CTA GAATT C GGGACCGCTTAAGAGGTCT
	Ndel-MLO6C	CTC CATAT G GTTACTCAAATGGGTTCAAAG
	MLO6C-Sacl	TCA GAGCT C TCGCTTAAACGAAAAATCCC
	MLO6C-Sall	TCA GTCGAC TCGCTTAAACGAAAAATCCC
	Ndel-MLO8C	CTC CATAT G ACTCAGATGGGTTCTCGGATG
	MLO8C-ECoRI	CCG GAATT C CCGGTCTTGAGATGATTCA
	Ndel-MLO9C	CTC CATAT G ACATTGCCCTTACGCTCT
	MLO9C-ECoRI	CTG GAATT C CTTTCATTCTTTCTCGCC
	Ndel-MLO10C	CTC CATAT G CAGATGGGTTCAAACATGAAG
	MLO10C-ECoRI	CTG GAATT C GTCAATATCATTAGCAGGAACG
	Ndel-MLO11C	CTC CATAT G ACTCAGATGGGAACGAACTAT
	MLO11C-ECoRI	CTG GAATT C GACTCTCTCACTGGCA
	Ndel-MLO12C	TCA CATAT G GTTACTCAGATGGGAACATCA
	MLO12C-BamHI	TCA GGATCC CTTCTGAACGTAACACTCAGAC
	Ndel-MLO13C	CTC CATAT G ACACAAATGGTAGCAAATTC
	MLO13C-ECoRI	CTG GAATT C AGGGTTTCACTTGGACA
	Ndel-MLO14C	CTC CATAT G ACTCAGATGGGAACAAACTAC
	MLO14C-ECoRI	CTG GAATT C ACATTCTCTCATTGGC
	Ndel-MLO15C	CTC CATAT G CTCGTCATGGGTAAATAAT
	MLO15C-ECoRI	CTG GAATT C ATCATGGTGAGCAATCTCTGAT

