

Supplemental Figure 1. Comparison of DNA Binding Interactions of AtERF1 and MtERN2 AP2/ERF Domains.

Interactions of key amino acids of AtERF1 (A) and MtERN2 (B) DNA binding domains with *GCC-box* and *GCC-like* sequences respectively. Arrows indicate conserved amino acid interactions with the sugarphosphate backbone (red arrows) and/or with the bases (green arrows). When MtERN2 is mutated (C) the substitution of T_{61} by an isoleucine abolishes the H-bond interaction with the Guanine 3 and as a consequence negatively affects the interaction of the R_{37} residue with Cytosine 6'. These results were obtained via modeling and docking experiments using either the native or the mutated versions of MtERN2DB in the presence of the *GCC-like* motif (see Material and Methods).



Supplemental Figure 2. The Mutated $T_{61}I$ ERN2 Is Targeted to the Nuclear Compartment But Is No Longer Able to Activate Transcription.

(A) The transcriptional activities of 3xHA-tagged ERN2 (native form), ΔDB (ERN2 deleted for the entire DNA binding domain) and $T_{61}I$ (the critical point mutation in the ERN2 DNA binding domain) were evaluated by histochemical GUS assays in N. benthamiana leaves expressing the respective ERN2 proteins in the presence of the 4xNF-box:GUS reporter. Leaf discs comprising the 4xNF-box:GUS reporter alone were also included as a negative control (-). Only the native ERN2 version is capable of triggering GUS expression, as indicated by the blue staining. (B) Western blot analyses using anti-HA antibodies were performed with N. benthamiana leaf discs expressing the respective 3xHA-tagged ERN2 proteins as well as the reporter construct as negative control (-). This analysis shows that similar levels of ERN2 protein are present for both the ΔDB and $T_{61}I$ variants. (C) YFPtagged native, ΔDB and T₆₁I-ERN2 specifically accumulate in the nuclear compartment of N. benthamiana leaf cells. Scale bars=20 µm.



Supplemental Figure 3. ern2 Mutant Lines Exhibit a Nodule Senescence-Like Phenotype. Expression of senescence-associated marker genes coding for a cysteine protease TC100437 (A) and for the vacuolar processing enzyme TC106338 (B) were quantified in isolated 4 weeks-old pink nodules of ern2 mutant lines (ern2-1 in A and ern2-2 in B) and compared with wild type nodules (A17 in A and R108 in B). Green senescent ern2 nodules were also included for comparison. Data were obtained with 10-15 isolated nodules. One way Analysis of Variance followed by a Tukey HSD test of the values were performed (in A, pvalue<0.001; in **B**, p-value<0.05). Classes sharing the same letter are not significantly different.



Supplemental Figure 4. ern2 Mutants Display a Slightly Reduced Nodulation Phenotype.

M. truncatula plants cultivated in aeroponic growth conditions were analyzed 2-3 days post-inoculation with a *lacZ*-expressing *S. meliloti* strain, following histochemical staining for β -galactosidase activity of intact roots (blue in **C**). (**A-B**) Box plots showing the quantification of the number of infected nodule primordia observed in young seedlings of either wild-type (A17, A17S, R108, R1108S) or *ern2-1* and *ern2-2* inoculated roots. Box plots depict mean value (black circles), first and third quartile (horizontal box sides), minimum and maximum (outside whiskers). Results were obtained from 2 independent experiments with a total of 18-21 in **A** and 9-16 roots in **B**. One way Analysis of Variance (ANOVA) followed by a Tukey HSD test of the values were performed (in **A**, p-value<0.01; in **B** p-value<0.05). Classes sharing the same letter are not significantly different. (**C**) Different stages of rhizobial colonization were analyzed on roots of wild type (A17 and A17S) and mutant (*ern2-1*) plants: curled root hairs with the microcolony inside (RHC=<u>R</u>oot <u>Hair Curling</u>), and infection thread (IT) progression within root hairs (RHs) or in the root cortex. Bars=20 µm.



Supplemental Figure 5. The Double *ern1-1 ern2-2* Mutant Is Totally Defective for Root Nodulation.

S. meliloti-inoculated wild-type (A17), wild-type sibling (A17S), ern2-1, ern1-1 and ern1-1 ern2-1 plants were analyzed 3 days (**A**, **C**, **E**, **G** and **I**) and 4 weeks post-inoculation (**B**, **D**, **F**, **H** and **J**) with *lacZ*-expressing S. *meliloti*, following histochemical staining of β -galactosidase activity. Infected nodule primordia (arrows) and nodules are only observed in wild-type and ern2-1 roots (**A-F**). Characteristic non-infected underdeveloped nodules with arrested ITs on top are only observed in ern1-1 roots (arrowheads in **H** and detailed in enlargement) while no infection or underdeveloped nodules are observed in double ern1-1 ern2-1 mutant roots (**I** and **J**). Data were obtained after analyses of approximately 40 independent plants from three-four biological experiments. Scale Bars=2mm.



Supplemental Figure 6. Colonization of A17 Wild-Type and ern1-1 ern2-1 Mutant Roots by R. irregularis. The percentage of root colonization of A17 wild type and ern1-1 ern2-1 roots was scored using the gridline intersect method after ink staining of R. irregularis inoculated roots harvested 3 weeks post-inoculation (3 wpi) (A). The number of root colonization sites was evaluated 2 weeks post-inoculation (2 wpi) by either scoring for early R. irregularis root colonization sites (Ri colonization, in **B**) with visible extraradical hypha but no detectable arbuscules, or the presence of cortical arbuscule structures (Arbuscules in **B**,). Values represent the percentage of root colonization after scoring about 600 to 800 root pieces of 1 cm length from 24 independent plants of each genotype (in A) or after scoring the entire root system of 20 independent plants of each genotype (in **B**). Box plots represent data from 2 independent experiments and depict mean value (black circles), first and third quartile (horizontal box sides), minimum and maximum (outside whiskers. (C-F) Arbuscule structures (C and D) and Ri colonization sites (E and F) observed respectively in A17 wild type (C and E) and in ern1-1 ern2-1 (D and F) roots. Bars= 25 μ m. (G) Quantitative RT-PCR analysis of relative expression levels of the M. truncatula MtPT4 transcript in R. irregularisinoculated roots (3 wpi). Data represent values of 6 (A17) and 7 (ern1-1 ern2-1) independent plants from two independent experiments. One way Analysis of Variance followed by a Tukey HSD test of the values were performed (in A and G, p-values>0.05; in B, p-value<0.001). Classes sharing the same letter are not significantly different.



Supplemental Figure 7. Complementation of the Double *ern1-1 ern2-1* Mutant with either *ERN1* or *ERN2* Driven by their Respective Promoters.

The *ern1-1 ern2-1* double mutant was transformed via *A. rhizogenes* with *ProERN1:YFP-ERN1*, *ProERN2:YFP-ERN2*, or with the negative control constructs *ProERN1:GUS* and *ProERN2:GUS*. Transformed root systems were analyzed 2 weeks post-inoculation (wpi) with *S. meliloti-lacZ* for the presence of non-infected arrested nodules (**A**) or infected nodules (**B**) after staining for β -galactosidase. Typical "*ern1*-like" non-infected underdeveloped nodules with arrested ITs on top (arrow in **A**) were observed with both *ProERN1:YFP-ERN1* and *ProERN2:YFP-ERN2* constructs while only *ProERN1:YFP-ERN1* could efficiently restore the formation of fully infected nodules (90% of composite plants with about 15 nodules/root system in 40% of composite plants). Quantitative RT-PCR analyses in total RNA samples from *ern1-1 ern2-1* roots (2wpi) transformed with the respective constructs confirmed the expression of *ERN1* (**C**) or *ERN2* (**D**) in complemented roots. Values represent average of 2-3 independent plants after normalization against reference transcript levels. One way Analysis of Variance (ANOVA) followed by a Tukey HSD test of the values were performed (in **C**, p-value<0.001; in **D**, p-value>0.05). Classes sharing the same letter are not significantly different. Scale bars=250 µm.

Supplemental Table 1. List of the Primers Used in this Study.

| ERN2-219-FwCTAGCAGCAACATGAAAATTGAGGERN2-220-RevTAACTCGAAATATTAGTCTTTGCACGALTR6-RevGCTACCAACCAAACCAAGTCAAERN2-222-RevAGGTGAAAGATTCCATTGAGCTTCProENOD11-935-FwCGCATATCTGAATTCTTTTAAATCTAGACACGGUS-1-RevTGCCCACAGGCGTCGAGProENN1-654-FwTCTTTGGATTGTGAACCTGACTCERN2-1060-RevGTCTTTGCACTGGAATATACCERN2-1060-RevGTCTTTGCACGAGAATATACCERN2-1060-RevGTCTTTGCACTGGCAATACAGCTC100437-FwCACTGCCTGTTGTGGAATGCCTC106338-FwAGTTCTGCCTGTTGTGGAATGCCTC106338-FwGGTAGCTCCTGTCTGCGCAATACCVPY-FwAAACCACCATCGCACGAGAATATACVPY-FwAACCACCATCGCACGAGGACVPY-FwAACCCCTCTAGATGGCAACGNIN-RevGTAGCTCCTCTCCCAGGNIN-RevGTAGCTCCCAGTGTGGGGAAIN-FwCGCGTGAATAAGCCACCACAENDD12-Fw1CCGGTGAATAAGCCACCACAENDD12-Fw2CAAGAAAGATTAGAGGAAGGTCTGCPr4-FwCAAGAAAGATTGAGGGCAAAGGPr4-FwCAACCCCCCCCGAGTTGCAACAGGPr4-FwCAAGAAAGATTAGAGCACGAAPr4-FwCAAGAAAGATTAGACCAACGAGPr4-FwCAAGAAAGATTAGACCGAAAGGTGPr4-FwGCCAAAGATTGCAGGAAGGACGGCAAPr4-FwGCCCAACGGAACTGAGAAGGAAGGAAGGAAGGAAGGAAGG | Name | Sequence 5'-3' |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------------------|
| ERN2-220-RevTAACTCGAAATATTAGTCTTTGCACGALTR6-RevGCTACCAACCAAACCAAGTCAAERN2-222-RevAGGTGAAAGATTCCATTGAGCTTCProENOD11-935-FwCGCATATCTGAATTCTTTTAAATCTAGACACGGUS-1-RevTGCCCACAGGCCGTCGAGProERN1-654-FwTCTTTGGTGTTAATATGGGTGTGERN1-Rev1TGTTGGATTGTGAACCTGACTCERN2-1060-RevGTCTTTGCACGAGAATATACCERN2-1060-Rev1CACTGGCTGTGCCAATACAGCT00437-FwCCTGCTGCTACTATTGCTGGATATGCT00437-FwCCTGCTGCTACTATTGCTGGATATGCT00437-Rev1CACTCGCATCAATGGCTACGGCT00437-Rev1CACTCGCATCAATGGCTACGGCT00437-Rev1AGTCTCGCCTGTTGTGGAATGTCCT006338-Rev2GGTAGCTCCTGTCTGCCAATACGVPY-FwAAACCACCATCTGCACCTTCVPY-FwAAACCACCATTGCACCTTCVPY-Rev2ACCCTTCAGATGGCAAATGRPG-FwAACCCCATCTGGGAAATGRPG-FwACCCTTCAGATGCGCAAAATGRPG-FwCGGTGTGCACTGCTGCGACACACACACNIN-Rev2GTATGCCATGGTGTCGCAENOD12-Fw1CCGGTGGAATAAGCCACCACAENOD12-Fw2CAAGAAAGATTAGAGGAAGGTCTGCPr4-FwCAAGAAAGATTAGAGGAAGGTAGGPr4-Rev4GTTCCGCACTGGTGATCCPr4-FwCAAGAAAGATTAGAGCGCAAAPr4-Rev4GCCCCACGAGTTGTGCAMrr.3213.1.S1_at-FwGCCCAAGGACTTAGCAGAAGGTGTGCGAAMrr.3213.1.S1_at-FwGCCCAAGGACTTAGCAAGAACGAAMrr.3213.1.S1_at-FwGCCCAAGGACTTAGGAAATCA | ERN2-219-Fw | CTAGCAGCAACATGAAAATTGAGG |
| LTR6-RevGCTACCAACCAAACCAAGTCAAERN2-222-RevAGGTGAAAGATTCCATTGAGCTTCProENOD11-935-FwCGCATATCTGAATTCTTTTAAATCTAGACACGGUS-1-RevTGCCCACAGGCCGTCGAGProERN1-654-FwTCTTTGGTGTTAATATGGGTGTGERN1-Rev1TGTTGGATTGTGAACCTGACTCERN2-11-FwTCTCCTGTTCAATGGAAATTCERN2-Rev1CACTGGCTGTGCCAATACAGTC100437-FwCCTGCTGTCAATGGCTACGGTC100437-RevCACTCGCATCATTGCTGGAATGTCTC106338-FwAGTTCTGCCTGTTGTGGAATGTCTC106338-RevGGTAGCTCCTGTCGCCAATTACVPY-FwAACCACCACTTGCACGAGATTCVPY-FwAACCCTCTAGCGCACGAGTTCRPG-FwAACCCTTCAGATGGCAAATGRPG-RevTTCCCCAGTTAGATGCAGAGATATCCNIN-FwGGTAGTCCTGTCTGCACACAGAGTCNIN-FwCGTCTTCTTCTGAGTGGGANIN-FwCGTGTGCACTGGTGTGCAAATGPY-FwAAACCACCACGGCAAATGPY-FwCCGGTGAATAAGCCACCACAPY-FwCCTTCTTCTTCGAGTGGGANIN-FwCCTGTGCACTGGTGATTCCCh-NFbax-FwCATGTGCACTGGTGATTCCCh-NFbax-FwCATGTGCACTGGTGATTCCPr4-RevGTTCCGTACCAAGAACGTGHr.3213.1S1_at-FwGCCAAAATTGCAGGCCAAAGGTAGMr0089_00067-842FwGCCCAAGGAACTAGGCAAAGTGMr0089_00067-842FwGCCCAAGGAACTAGGCAAATTCA | ERN2-220-Rev | TAACTCGAAATATTAGTCTTTGCACGA |
| ERN2-222-RevAGGTGAAAGATTCCATTGAGCTTCProENOD11-935-FwCGCATATCTGAATTCTTTTAAATCTAGACACGGUS-1-RevTGCCCACAGGCCGTCGAGProERN1-654-FwTCTTTGGTGTTAATATGGGTGTGERN1-Rev1TGTTGGATTGTGAACCTGACTCERN2-11-FwTCTCCTGTTCAATGGAAATTCERN2-1060-RevGTCTTTGCACGAGAATATACCERN2-Rev1CACTGGCTGTGCCAATACAGTC100437-FwCCTGCTGCTACTATTGCTGGATATGTC100437-RevGGTAGCTCCTGTTGTGGAATGTCTC106338-FwAGTTCTGCCTGTTGTGGAATGTCTC106338-RevGGTAGCTCCTGTCTGCCAATTACVPY-FwAAACCACCATCTGCACGAGTTCRPG-FwAACCCTTCAGATGGCAAATGRPG-RevTTCCCCAGTTTAGATTCCAGNIN-FwCGTCTTCTTCTTCGAGTGGGAANIN-FwCGTGTGCACTGCTGTCTGCAENOD12-Fw1CCGGTGAATAAGCCACACAENOD12-Rev1GCTTGTGCACTGGTGATTCCCh-NFbox-RevCCTTATATAGAGGAAGGTCTTGCPr4-RevGTTTCCGTCACCAAGAACAAPr4-RevGTTTCCGCACGTTGTGCAACMtn-3213.1.S1_at-FwACCCCTCGCAACTTGTGTGGAAMt0089_00067-842FwTCCTCCGAACTGTGTTGTGGAAMt0089_00067-842FwGCCCAAAATTGCAAGGAAATCA | LTR6-Rev | GCTACCAACCAAACCAAGTCAA |
| ProENOD/11-935-FwCGCATATCTGAATTCTTTTAAATCTAGACACGGUS-1-RevTGCCCACAGGCCGTCGAGProERN1-654-FwTCTTTGGTGTTAATATGGGTGTGERN1-Rev1TGTTGGATTGTGAACCTGACTCERN2-11-FwTCTCCTGTTCAATGGAAATTCERN2-1060-RevGTCTTTGCACGAGAATATACCERN2-Rev1CACTGGCTGTGCCAATACAGTC100437-FwCCTGCTGCTACTATTGCTGGATATGTC100437-RevCACTCGCATCAATGGCTACGGTC106338-FwAGTTCTGCCTGTTGTGGAATGTCTC106338-RevGGTAGCTCCTGTCTGCCAATTACVPY-FwAAACCACCATCTGCACCTTCVPY-RevACCCTTCAGATGGCAAATGRPG-FwAACCCACTGCGTGTCTGCANIN-FwCGTCTTCTTCTCGAGTGGGANIN-FwCGTCTTCTTCTCGAGTGGGANIN-FwCCGGTGAATAAGCCACCACAENDD12-Fw1CCGGTGAATAGCCCTAAAGCTAGCh-NFbax-RevCCTTATATAGAGGAAGGTCTTGCPr4-FwCAAGAAAGATTAGACGCGCAAPr4-RevGTTCCCCGCAGTTGTGCACCMtn-3213.1S1_at-FwTCCTCGAACTGTGTTGTGAACMt0089_00067-842FwTCCTCGAACTGTGTTGTGGAAMt0089_00067-802FwGCCCAAGGAACTAAGGAACTAG | ERN2-222-Rev | AGGTGAAAGATTCCATTGAGCTTC |
| GUS-1-RevTGCCCACAGGCCGTCGAGProERN1-654-FwTCTTTGGTGTAATATGGGTGTGERN1-Rev1TGTTGGATTGTGAACCTGACTCERN2-11-FwTCTCCTGTTCAATGGAAATTCERN2-1060-RevGTCTTTGCACGAGAATATACCERN2-Rev1CACTGGCTGTGCCAATACAGTC100437-FwCCTGCTGCTACTATTGCTGGATATGTC100437-FwCCTGCTGCTGCTGTGGGAATGCTC100437-FwCACTGCCATCAATGGCTACGGTC100437-FwCACTGCCATCAATGGCTACGGTC100437-FwCACTCGCATCAATGGCTACGGTC106338-FwAGTCTCGCTGTTGTGGAATGTCTC106338-FwAGTCTCGCTGTTGTGGAATGCTC106338-FwAGTCCCTGTCTGCCAATTACVPY-FwAAACCACCATCTGCACCTTCVPY-FwAAACCACCATCTGCACGAGTTCVPY-RevAACCCTTCAGATGCCAATAGRPG-FwACCCTTCAGATGCGAAATGRPG-RevTTCCCCCAGTTTAGATTCCAGNIN-RevGTAATCCCATGCTGTCGCAENOD12-Fw1CCGGTGAATAAGCCACCACAENOD12-Fw1GCTTGTGCACTGGTGATTCCCh-NFbox-FwAAATAATTGCAGGCCTAAAGCTAGCh-NFbox-RevCCTTATATAGAGGAAGGTCTTGCPi4-FwGTTCCGTCACCAAGAACGTGMir.3213.1.S1_at-FwATCCCTCGCAGTTTGTACCAAGAACGTGMir089_00067-842FwGCCCAAGAACTTAAGGAAACGTGMi0089_00067-842FwGCCCCAAGGAACTAAGGAAGGAACAAG | ProENOD11-935-Fw | CGCATATCTGAATTCTTTTAAATCTAGACACG |
| ProERN1-654-FwTCTTTGGTGTTAATATGGGTGTGERN1-Rev1TGTTGGATTGTGAACCTGACTCERN2-11-FwTCTCCTGTTCAATGGAAATTCERN2-1060-RevGTCTTTGCACGAGAATATACCERN2-Rev1CACTGGCTGTGCCAATACAGTC100437-FwCCTGCTGCTACTATTGCTGGATATGTC100437-RevCACTGCCATCAATGGCTACGGTC106338-FwAGTTCTGCCGTGTTGGAAATGTCTC106338-RevGGTAGCTCCTGTCTGCCAATTACVPY-FwAAACCACCATCGACCTTCVPY-FwAAACCACCATCTGCACGAGTTCRPG-FwACCCTTCAGGCAAGAGCACAGARPG-RevTTCCCCAGTTTAGATTCCAGNIN-FwCGTCTTCTCTCTGCAATGCCACAAENDD12-Fw1CCGGTGAATAAGCCACCACAENDD12-Fw1CCTGTGCACTGGTGATTCCCh-NFbox-FwAAATAATTGCAGGCAAAGCTAGCh-NFbox-FwCAAGAAAGATTAGAACGCGCAAPr4-RevGTTTCCGTCACCAAGAACGTGMir.3213.1.S1_at-FwATCCTCCGCAGTTGTTGCAAGAACGTGMitn3213.1.S1_at-RevGCCCAAAATTGCAGGAAATGAACAMitn3213.1.S1_at-RevGCCCAAAATTGCAGGAAATCAA | GUS-1-Rev | TGCCCACAGGCCGTCGAG |
| ERN1-Rev1TGTTGGATTGTGAACCTGACTCERN2-111-FwTCTCCTGTTCAATGGAAATTCERN2-1060-RevGTCTTTGCACGAGAATATACCERN2-Rev1CACTGGCTGTGCCAATACAGTC100437-FwCCTGCTGCTACTATTGCTGGATATGTC100437-RevCACTCGCATCAATGGCTACGGTC106338-FwAGTTCTGCCTGTTGTGGAATGTCTC106338-RevGGTAGCTCCTGTCTGCCAATTACVPY-FwAAACCACCATCTGCACCTTCVPY-RevAACCCCTCAGATGGCAATGRPG-FwAACCCCTCAGATGGCAAATGNIN-FwCGTCTTCTCTCGAGTGGGANIN-FwCGTCTTCTTCTGCAGTGGGAANIN-RevGTAATCCCATGCTGTCTGCCAACAENOD12-Fw1CCGGTGAATAAGCCACCACAENOD12-Rev1GCTTGTGCACTGGTGATTCCCh-NFbox-RevGCTTTCTGTGCAGGGAAATGPH4-FwCAGAAAGATTAGAGGCGCAAPH4-FwGTTCCGCACCAGAGGCTCTGCCMtr.3213.1.S1_at-FwACCCTCGCAGTTGTGTGGAAMt0089_00067-842FwGCCAAAATTGCAGGCAAATCA | ProERN1-654-Fw | TCTTTGGTGTTAATATGGGTGTG |
| ERN2-11-FwTCTCCTGTTCAATGGAAATTCERN2-1060-RevGTCTTTGCACGAGAATATACCERN2-Rev1CACTGGCTGTGCCAATACAGTC100437-FwCCTGCTGCTACTATTGCTGGATATGTC100437-RevCACTCGCATCAATGGCTACGGTC100437-RevGGTAGCTCCTGTTGTGGAATGTCTC106338-FwAGTTCTGCCTGTTGTGGAATGTCTC106338-RevGGTAGCTCCTGTCTGCCAATTACVPY-FwAAACCACCATCTGCACCTTCVPY-RevACCCTTAGCGCACGAGTTCRPG-FwAACCCCTCTAGTGGGAAATGRPG-RevTTCCCCAGTTTAGATTCCAGNIN-FwCGTCTTCTTCTTCGAGTGGGAANIN-FwCGTCTGTGCACTGCTGTCTGCAENOD12-Fw1CCGGTGAATAAGCCACCACAENOD12-Rev1GCTTGTGCACTGGTGATTCCCh-NFbox-RevCCTTATATGAGGAAGGGTCTTGCPH4-FwCAAGAAGATTAGACGCGCAAPH4-FwGCTAACCACGAGACTGGTGATCCMtr.3213.1.S1_at-FwATCCTCCGCAGTTTGTACCMt0089_00067-842FwGCCGAAGGAACTAAGGAAATGAMt0089_00067-842FwGCCGAAGGAACTAAGGAAATGA | ERN1-Rev1 | TGTTGGATTGTGAACCTGACTC |
| ERN2-1060-RevGTCTTTGCACGAGAATATACCERN2-Rev1CACTGGCTGTGCCAATACAGTC100437-FwCCTGCTGCTACTATTGCTGGATATGTC100437-RevCACTCGCATCAATGGCTACGGTC106338-FwAGTTCTGCCTGTTGTGGAATGTCTC106338-RevGGTAGCTCCTGTCTGCCAATTACVPY-FwAAACCACCATCTGCACCTTCVPY-FwAAACCACCATCTGCACCTTCVPY-RevACCCTTAGCGCACGAGTTCRPG-RevTTCCCCAGTTAGATTCCAGNIN-FwCGTCTTCTCTCTGAGTGGGANIN-FwCCGGTGAATAAGCCACCACAENOD12-Fw1CCGGTGAATAAGCCACCACAENOD12-Rev1GCTTGTGCACTGGTGATTCCCh-NFbox-RevCCTTATATGAGGAAGGGTCTTGCPr4-RevGTTTCCGTCACCAAGAACGTGMtr.3213.1S1_at-FwACCCTCCGCAGTTGTGGAAMt0089_00067-842FwGCCGAAGGAACTAAGGAAATGA | ERN2-11-Fw | TCTCCTGTTCAATGGAAATTC |
| ERN2-Rev1CACTGGCTGTGCCAATACAGTC100437-FwCCTGGTGCTACTATTGCTGGATATGTC100437-RevCACTCGCATCAATGGCTACGGTC106338-FwAGTTCTGCCTGTTGTGGAATGTCTC106338-FwGGTAGCTCCTGTCTGCCAATTACVPY-FwAAACCACCATCTGCACCTTCVPY-FwAAACCACCATCTGCACGAGTTCVPY-RevACCTCTTAGCGCACGAGTTCRPG-FwACCCTTCAGATGGCAAATGNIN-FwCGTCTTCTTCTGAGTGGGANIN-FwCGTCTTCTTCTGCAGTGGGANIN-RevGTAATCCCATGCTGTCTGCAENOD12-Fw1CCGGTGAATAAGCCACACAENOD12-Rev1GCTTGTGCACTGGTGATTCCCh-NFbox-FwAAATAATTGCAGGCCTAAAGCTAGPr4-FwCAAGAAAGATTAGACGCGCAAPt4-RevGTTTCCGTCACCAAGAACGTGMtr.3213.1S1_at-FwACCCTCGGAACTTGCAAGGAAGGMt0089_00067-842FwTCCTCGAACCTGTTGTTGGAAMt0089_00067-909RGCGCAAGGAACTAAGGAAATCA | ERN2-1060-Rev | GTCTTTGCACGAGAATATACC |
| TCI00437-FwCCTGCTGCTACTATTGCTGGATATGTC100437-RevCACTCGCATCAATGGCTACGGTC106338-FwAGTTCTGCCTGTTGTGGAATGTCTC106338-FwGGTAGCTCCTGTCTGCCAATTACVPY-FwAAACCACCATCTGCACCTTCVPY-FwAAACCACCATCTGCACCTTCVPY-RevACCTCTTAGCGCACGAGTTCRPG-FwAACCCTTCAGATGGCAAATGRPG-RevTTCCCCCAGTTTAGATTCCAGNIN-FwCGTCTTCTTCTTCGAGTGGGANIN-RevGTAATCCCATGCTGTCTGCAENOD12-Fw1CCGGTGAATAAGCCACCACAENOD12-Rev1GCTTGTGCACTGGTGATTCCCh-NFbox-FwAAATAATTGCAGGCCTAAAGCTAGPt4-FwCAAGAAAGATTAGACGCGCAAPt4-RevGTTTCCGTCACCAAGAACGTGMtr.3213.1.S1_at-RevGCCAAAATTTGCAGGAACTAAGGAAGGTCTGGGAAMt0089_00067-909RGCGCAAGGAACTAAGGAAATCA | ERN2-Rev1 | CACTGGCTGTGCCAATACAG |
| TCI00437-RevCACTCGCATCAATGGCTACGGTC106338-FwAGTTCTGCCTGTTGTGGAATGTCTC106338-RevGGTAGCTCCTGTCTGCCAATTACVPY-FwAAACCACCATCTGCACCTTCVPY-FwAAACCACCATCTGCACCTTCVPY-RevACCTCTTAGCGCACGAGTTCRPG-FwAACCCTTCAGATGGCAAATGRPG-RevTTCCCCCAGTTTAGATTCCAGNIN-FwCGTCTTCTTCTTCGAGTGGGANIN-RevGTAATCCCATGCTGTCTGCAENOD12-Fw1CCGGTGAATAAGCCACCACAENOD12-Rev1GCTTGTGCACTGGTGATTCCCh-NFbox-RevCCTTATATGAAGGAAGGTCTTGCPt4-FwCAAGAAAGATTAGACGCGCAAPt4-RevGTTTCCGTCACCAAGAACGTGMtr.3213.1.S1_at-FwACCCTCCGCAGTTTGTGGAAMt0089_00067-909RGCGCAAGGAACTAAGGAAATCA | TC100437-Fw | CCTGCTGCTACTATTGCTGGATATG |
| TC106338-FwAGTTCTGCCTGTTGTGGAATGTCTC106338-RevGGTAGCTCCTGTCTGCCAATTACVPY-FwAAACCACCATCTGCACCTTCVPY-RevACCTCTTAGCGCACGAGTTCRPG-FwAACCCTTCAGATGGCAAATGRPG-RevTTCCCCCAGTTTAGATTCCAGNIN-FwCGTCTTCTTCTTCGAGTGGGANIN-RevGTAATCCCATGCTGTCTGCAENOD12-Fw1CCGGTGAATAAGCCACCACAENOD12-Rev1GCTTGTGCACTGGTGATTCCCh-NFbox-FwAAATAATTGCAGGGCAAAGGGTCTTGCPt4-FwCAAGAAAGATTAGACGCGCAAPt4-RevGTTTCCGTCACCAAGAACGTGMtr.3213.1.S1_at-FwACCCTCCGCAGTTTGTACCMt0889_00067-809RGCGCAAGGAACTAAGGAAATCA | TC100437-Rev | CACTCGCATCAATGGCTACGG |
| TC106338-Rev GGTAGCTCCTGTCTGCCAATTAC VPY-Fw AAACCACCATCTGCACCTTC VPY-Rev ACCTCTTAGCGCACGAGTTC VPY-Rev ACCTCTTAGCGCACGAGTTC RPG-Fw AACCCTTCAGATGGCAAATG RPG-Rev TTCCCCCAGTTTAGATTCCAG NIN-Fw CGTCTTCTTCTTCGAGTGGGA NIN-Rev GTAATCCCATGCTGTCTGCA ENOD12-Fw1 CCGGTGAATAAGCCACCACA ENOD12-Fw1 GCTTGTGCACTGGTGATTCC Ch-NFbox-Fw AAATAATTGCAGGCCTAAAGCTAG Ch-NFbox-Rev CCTTATATAGAGGAAGGGTCTTGC Pt4-Fw CAAGAAAGATTAGACGCGCAA Pt4-Rev GTTTCCGTCACCAAGAACGTG Mtr.3213.1.S1_at-Rev GCCAAAATTTGCAGAGCAAG Mtr.3213.1.S1_at-Rev GCCAAAATTTGCAGAGCAAG Mt0089_00067-809R GCCCAAGGAACTAAGGAAATCA | TC106338-Fw | AGTTCTGCCTGTTGTGGAATGTC |
| VPY-FwAAACCACCATCTGCACCTTCVPY-RevACCTCTTAGCGCACGAGTTCRPG-FwAACCCTTCAGATGGCAAATGRPG-RevTTCCCCCAGTTTAGATTCCAGNIN-FwCGTCTTCTTCTGAGTGGGANIN-RevGTAATCCCATGCTGTCTGCAENOD12-Fw1CCGGTGAATAAGCCACCACAENOD12-Rev1GCTTGTGCACTGGTGATTCCCh-NFbox-FwAAATAATTGCAGGGCCTAAAGCTAGPt4-FwCCAGAAAGATTAGACGCGCAAPt4-RevGTTTCCGTCACCAAGAACGTGMtr.3213.1.S1_at-FwATCCCTCCGCAGTTTGTACCMt0089_00067-842FwTCCTCGAACCTGTTGTTGGAA | TC106338-Rev | GGTAGCTCCTGTCTGCCAATTAC |
| VPY-RevACCTCTTAGCGCACGAGTTCRPG-FwAACCCTTCAGATGGCAAATGRPG-RevTTCCCCCAGTTTAGATTCCAGNIN-FwCGTCTTCTTCTGAGTGGGANIN-RevGTAATCCCATGCTGTCTGCAENOD12-Fw1CCGGTGAATAAGCCACCACAENOD12-Rev1GCTTGTGCACTGGTGATTCCCh-NFbox-FwAAATAATTGCAGGCCTAAAGCTAGCh-NFbox-RevCCTTATATAGAGGAAGGGTCTTGCPt4-FwGTTTCCGTCACCAAGAACGTGMtr.3213.1.S1_at-FwATCCCTCCGCAGTTTGTACCMt0089_00067-842FwCCTCGAACCTGTTGTTGGAAMt0089_00067-909RGCGCAAGGAACTAAGGAATCA | VPY-Fw | AAACCACCATCTGCACCTTC |
| RPG-FwAACCCTTCAGATGGCAAATGRPG-RevTTCCCCCAGTTTAGATTCCAGNIN-FwCGTCTTCTTCTGAGTGGGANIN-RevGTAATCCCATGCTGTCTGCAENOD12-Fw1CCGGTGAATAAGCCACCACAENOD12-Rev1GCTTGTGCACTGGTGATTCCCh-NFbox-FwAAATAATTGCAGGCCTAAAGCTAGCh-NFbox-RevCCTTATATAGAGGAAGGGTCTTGCPt4-FwGTTTCCGTCACCAGAACPt4-RevATCCCTCCGCAGTTTGTACCMtr.3213.1.S1_at-FwACCCACAGAACGTGMt0089_00067-842FwCCGCAAGGAACTAAGGAAATCA | VPY-Rev | ACCTCTTAGCGCACGAGTTC |
| RPG-Rev TTCCCCCAGTTTAGATTCCAG NIN-Fw CGTCTTCTTCTGAGTGGGA NIN-Rev GTAATCCCATGCTGTCTGCA ENOD12-Fw1 CCGGTGAATAAGCCACCACA ENOD12-Rev1 GCTTGTGCACTGGTGATTCC Ch-NFbox-Fw AAATAATTGCAGGCCTAAAGCTAG Ch-NFbox-Rev CCTTATATAGAGGAAGGGTCTTGC Pt4-Fw CAAGAAAGATTAGACGCGCAA Pt4-Rev GTTTCCGTCACCAAGAACGTG Mtr.3213.1.S1_at-Fw ATCCCTCCGCAGTTTGTACC Mtr.3213.1.S1_at-Rev GCCAAAATTTGCAGAGCAAG Mt0089_00067-842Fw TCCTCGAACCTGTTGTTGGAA | RPG-Fw | AACCCTTCAGATGGCAAATG |
| NIN-Fw CGTCTTCTTCGAGTGGGA NIN-Rev GTAATCCCATGCTGTCTGCA ENOD12-Fw1 CCGGTGAATAAGCCACCACA ENOD12-Rev1 GCTTGTGCACTGGTGATTCC Ch-NFbox-Fw AAATAATTGCAGGCCTAAAGCTAG Ch-NFbox-Rev CCTTATATAGAGGAAGGGTCTTGC Pt4-Fw CAAGAAAGATTAGACGCGCAA Pt4-Rev GTTTCCGTCACCAAGAACGTG Mtr.3213.1.S1_at-Fw ATCCCTCGCAGTTTGTACC Mtr.3213.1.S1_at-Rev GCCAAAATTTGCAGAGCAAG Mt0089_00067-809R GCGCAAGGAACTAAGGAAATCA | RPG-Rev | TTCCCCCAGTTTAGATTCCAG |
| NIN-Rev GTAATCCCATGCTGTCTGCA ENOD12-Fw1 CCGGTGAATAAGCCACCACA ENOD12-Rev1 GCTTGTGCACTGGTGATTCC Ch-NFbox-Fw AAATAATTGCAGGCCTAAAGCTAG Ch-NFbox-Rev CCTTATATAGAGGAAGGGTCTTGC Pt4-Fw CAAGAAAGATTAGACGCGCAA Pt4-Rev GTTTCCGTCACCAAGAACGTG Mtr.3213.1.S1_at-Fw ATCCCTCCGCAGTTTGTACC Mtr.089_00067-842Fw TCCTCGAACCTGTTGTTGGAA Mt0089_00067-909R GCGCAAGGAACTAAGGAAATCA | NIN-Fw | CGTCTTCTTCGAGTGGGA |
| ENOD12-Fw1 CCGGTGAATAAGCCACCACA ENOD12-Rev1 GCTTGTGCACTGGTGATTCC Ch-NFbox-Fw AAATAATTGCAGGCCTAAAGCTAG Ch-NFbox-Rev CCTTATATAGAGGAAGGGTCTTGC Pt4-Fw CAAGAAAGATTAGACGCGCAA Pt4-Rev GTTTCCGTCACCAAGAACGTG Mtr.3213.1.S1_at-Fw ATCCCTCCGCAGTTTGTACC Mtr.3213.1.S1_at-Rev GCCAAAATTTGCAGAGCAAG Mt0089_00067-842Fw TCCTCGAACCTGTTGTTGGAA | NIN-Rev | GTAATCCCATGCTGTCTGCA |
| ENOD12-Rev1 GCTTGTGCACTGGTGATTCC Ch-NFbox-Fw AAATAATTGCAGGCCTAAAGCTAG Ch-NFbox-Rev CCTTATATAGAGGAAGGGTCTTGC Pt4-Fw CAAGAAAGATTAGACGCGCAA Pt4-Rev GTTTCCGTCACCAAGAACGTG Mtr.3213.1.S1_at-Fw ATCCCTCCGCAGTTTGTACC Mtr.3213.1.S1_at-Rev GCCAAAATTTGCAGAGCAAG Mt0089_00067-842Fw TCCTCGAACCTGTTGTTGGAA | ENOD12-Fw1 | CCGGTGAATAAGCCACCACA |
| Ch-NFbox-Fw AAATAATTGCAGGCCTAAAGCTAG Ch-NFbox-Rev CCTTATATAGAGGAAGGGTCTTGC Pt4-Fw CAAGAAAGATTAGACGCGCAA Pt4-Rev GTTTCCGTCACCAAGAACGTG Mtr.3213.1.S1_at-Fw ATCCCTCCGCAGTTTGTACC Mtr.3213.1.S1_at-Rev GCCAAAATTTGCAGAGCAAG Mt0089_00067-842Fw TCCTCGAACCTGTTGTTGGAA | ENOD12-Rev1 | GCTTGTGCACTGGTGATTCC |
| Ch-NFbox-Rev CCTTATATAGAGGAAGGGTCTTGC Pt4-Fw CAAGAAAGATTAGACGCGCAA Pt4-Rev GTTTCCGTCACCAAGAACGTG Mtr.3213.1.S1_at-Fw ATCCCTCCGCAGTTTGTACC Mtr.3213.1.S1_at-Rev GCCAAAATTTGCAGAGCAAG Mt0089_00067-842Fw TCCTCGAACCTGTTGTTGGAA Mt0089_00067-909R GCGCAAGGAACTAAGGAAATCA | Ch-NFbox-Fw | AAATAATTGCAGGCCTAAAGCTAG |
| Pt4-Fw CAAGAAAGATTAGACGCGCAA Pt4-Rev GTTTCCGTCACCAAGAACGTG Mtr.3213.1.S1_at-Fw ATCCCTCCGCAGTTTGTACC Mtr.3213.1.S1_at-Rev GCCAAAATTTGCAGAGCAAG Mt0089_00067-842Fw TCCTCGAACCTGTTGTTGGAA Mt0089_00067-909R GCGCCAAGGAACTAAGGAAATCA | Ch-NFbox-Rev | CCTTATATAGAGGAAGGGTCTTGC |
| Pt4-Rev GTTTCCGTCACCAAGAACGTG Mtr.3213.1.S1_at-Fw ATCCCTCCGCAGTTTGTACC Mtr.3213.1.S1_at-Rev GCCAAAATTTGCAGAGCAAG Mt0089_00067-842Fw TCCTCGAACCTGTTGTTGGAA Mt0089_00067-909R GCGCAAGGAACTAAGGAAATCA | Pt4-Fw | CAAGAAAGATTAGACGCGCAA |
| Mtr.3213.1.S1_at-Fw ATCCCTCCGCAGTTTGTACC Mtr.3213.1.S1_at-Rev GCCAAAATTTGCAGAGCAAG Mt0089_00067-842Fw TCCTCGAACCTGTTGTTGGAA Mt0089_00067-909R GCGCAAGGAACTAAGGAAATCA | Pt4-Rev | GTTTCCGTCACCAAGAACGTG |
| Mtr.3213.1.S1_at-Rev GCCAAAATTTGCAGAGCAAG Mt0089_00067-842Fw TCCTCGAACCTGTTGTTGGAA Mt0089_00067-909R GCGCAAGGAACTAAGGAAATCA | Mtr.3213.1.S1_at-Fw | ATCCCTCCGCAGTTTGTACC |
| Mt0089_00067-842Fw TCCTCGAACCTGTTGTTGGAA Mt0089_00067-909R GCGCAAGGAACTAAGGAAATCA | Mtr.3213.1.S1_at-Rev | GCCAAAATTTGCAGAGCAAG |
| Mt0089_00067-909R GCGCAAGGAACTAAGGAAATCA | Mt0089_00067-842Fw | TCCTCGAACCTGTTGTTGGAA |
| | Mt0089_00067-909R | GCGCAAGGAACTAAGGAAATCA |
| Mt0085_00020-4865F GAAATCTGTCAGCTGCCAGCAT | Mt0085_00020-4865F | GAAATCTGTCAGCTGCCAGCAT |
| Mt0085_00020-4928R CTAAACCGAGCCTCTTTCTTCCC | Mt0085_00020-4928R | CTAAACCGAGCCTCTTTCTTCCCC |