

LjNIN	MEYGSLLVQQQQQCNSAYGSSLSNLSSDCGSVTTEADHIIIEELLVQGCWVEVSGVGVR-----EG-----ELQLQODESSF	74
MtNIN	MEYGGGLVADGG-----VFGPMV---G-----GGGGDQADIIEELLGEGCWIEASENSLMAMQOTTPQSQYMSNNNNIPMGMGEGRHFNHHHHHHHPHPHHMQECTAPAAHHDDQQESGF	106
Mtnin-16	MEYGGGLVADGG-----VFGPMV---G-----GGGGDQADIIEELLGEGCWIEASENSLMAMQOTTPQSQYMSNNNNIPMGMGEGRHFNHHHHHHHPHPHHMQECTAPAAHHDDQQESGF ****. ** : .:* : . : ***** :***:*. * . : * * : * : * : * * *	106
LjNIN	VVGKRWWIGPAAAVAGSCNSSVVKERLVIIVAGYLKDYTRNS--NVLIQIIVPLRRGILHDHDYHTNYLLSNPPQPEAAADHEVSVSLGFMPAAPSNSNLYSNVHVFRFRSHEYPRVQAQ-	191
MtNIN	VVGKRWWIGPRANPG--PPTSVMKERVAVAGYLKEYTKNSNNVLIQIIVPMRRRSALIHQN-HYLQOES-----SSAPV-----SVNPNMNVHVFRFRSHDYPRHQOQQ	204
Mtnin-16	VVGKRWWIGPRANPG--PPTSVMKERVAVAGYLKEYTKNSNNVLIQIIVPMRRRSALIHQN-HYLQOES-----SSAPV-----SVNPNMNVHVFRFRSHDYPRHQOQQ ***** * . : *****:*****:***:*. * *****:*. * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * *	204
LjNIN	QYGS-LALPVFERGTGCLGVLEIVITNQTTINYNVSN---ALDQAVDFRSSQ-SFIPPAIKVYDELYQAAVNEIEVMVTSVCKTHNPLALTWAPCIQOGK-----CGCGVSSE	296
MtNIN	QYGSLLALPVFERGSCTCLGVIEFVISNQTILINRYPQLDHLNSALEAVDFRSSHNMNIPQAVKVFEELYEAAVNEIMEVLASVCKTHNPLALTWAPCLQQQGGGKSSGASGCGVS---	322
Mtnin-16	QYGSLLALPVFERGSCTCLGVIEFVISNQTILINRYPQLDHLNSALEAVDFRSSHNMNIPQAVKVFEELYEAAVNEIMEVLASVCKTHNPLALTWAPCLQQQGGGKSSGASGCGVS---	322
	**** *****:*****:***:*. * * * . : *****: * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * *	
LjNIN	NYMWCVSTVDSACFVGDLDILGFQACSEYHLFRQGQIVGTAFTTSKPCFAIDITAFSKAEYPLAHHANMFLGHAAVAIPRLRSVYTGSAADFVLEFFLPKDCDHDSEEQQLLSLSMVVQ	416
MtNIN	TMSCCISTVDSACYVGDMDVLGFQACSEYHLFNGQGIVGTAFTTTKPCFAIDITAFSKSEYPLAHHANMFLGHAAVAIPRLRSVYTGSAADFVLEFFLPKDCRDTEQQKQMLNSLSLVVQ	442
Mtnin-16	TMSCCISTVDSACYVGDMDVLGFQACSEYHLFNGQGIVGTAFTTTKPCFAIDITAFSKSEYPLAHHANMFLGHAAVAIPRLRSVYTGSAADFVLEFFLPKDCRDTEQQKQMLNSLSLVVQ . * : *****:***:*. * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * *	442
LjNIN	QACRSLLHVVLVEDEYTL-PMPSHTSKEEEEEITITNHE--Q-----KLFVSPSSHESECSKESSWIAHMMEAQKKGKGVSVSLEYLQEPKKEFKVTT-NWDSSTDHDQQAQVFS	524
MtNIN	QACRSLLHVVMDDNNNNMNDNNSADHDHDQFTFPPTTNSYMPSSASEPLSQVDVAVSGCSTKDTSSSCSWIAHMMEAQKKGKGVSVSLEYLQEPKKEFKVTTNWDREREDNV-----F	557
Mtnin-16	QACRSLLHVVMDDNNNNMNDNNSADHDHDQFTFPPTTNSYMPSSASEPLSQVDVAVSGCSTKDTSSSCSWIAHMMEAQKKGKGVSVSLEYLQEPKKEFKVTTNWDREREDNV-----F *****: * * * : . * * * . : : * : * . . . : * : * * . . . : * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * *	557
LjNIN	SDFGQMS-----GFK--ASTVEGGDQESSYTFGSRSSSGGRKSGEKRRTKAECTISLQVLRQYFAGSLKDAASIGVCPPTLLKRICRQHGITRWPSSRKIKKVGHSLKKLQLVIDS	634
MtNIN	SEFGQVLQQQHQDQSSNSRASVSVVEAGEESPGACGRRSSSSSSGRKSGDKRRRTKAECTISLQVLRQYFAGSLKDAASIGVCPPTLLKRICRQHGITRWPSSRKIKKVGHSLKKLQLVIDS	677
Mtnin-16	SEFGQVLQQQHQDQSSNSRASVSVVEAGEESPGACGRRSSSSSSGRKSGDKRRRTKAECTISLQVLRQYFAGSLKDAASIGVCPPTLLKRICRQHGITRWPSSRKIKKVGHSLKKLQLVIDS *:***: . : * * * : * : * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * *	677
LjNIN	VQGAEGAIQIGSFYASFPELSSSDFASCRSDSSSKMHNYPDQNNLYGHGDHGGVVTSLKSPSACSQTFAGNQPC---TIINNGDVLMTESPPVPEALLS-RRDHCEEAEELNNASI	749
MtNIN	VQGAEGAIQIGSFYASFPELNSATANGGDG-----NDNSNNSFYNNHGDGIVTSLKSPSACSQTHAGNKLPMTTITAINHHHVMTENPTGAPLGVDFHAFMHASNINIQDYHQ	788
Mtnin-16	VQGAEGAIQIGSFYASFPELNSATANGGDG-----NDNSNNSFYNNHGDGIVTSLKSPSACSQTHAGNKLPMTTITAINHHHVMTENPTGAPLGVDFHAFMHASNINIQDYLLM	788
	*****:*****:***:*. * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : * * * * *	
LjNIN	QEDT--KRF---SRPKSQTLPPL-----SDSSGWSLETGAFRVKATFADEKIRFSLQPIWGFSDLQLEIARRFNLDVNTNILLKYLDDDGEWVVLACDGDLEECKDIHRSSQSRTIR	857
MtNIN	QEDLTKQLLHFNNNQILPRPTVAWNNNSSSSTLLERGAFAFRVKATFADEKIRFSLQAMWGFRLQLEIARRFNLDVNTNILLKYLDEDEGEWVVLSCDADLEECKDLHTSSHTRTIR	908
Mtnin-16	SISLKKY ----- *** *: : . : * * * * * . : * * . * * *****:*****:***:*. * * * : * * * * * : * * * * * : * * * * * : * * * * *	795
LjNIN	LSLFQASPLNLANTRFRNSSPS----	878
MtNIN	LSLFQASPLNLPNTRFRNSSSSPS	933
Mtnin-16	----- ***** ***** *	795

Additional File 14: Figure S2: Comparison of *Mtnin-16*'s encoded sequence with that of *Lotus japonicus NIN* and *M. truncatula NIN*. The LjNIN sequence is Genbank accession CAB61243, the MtNIN sequence is Genbank accession ACN58567 and the Mtnin-16 sequence is from this work. The seven blocks of sequence shaded in gray correspond to the six blocks of sequence conserved in NIN and NIN-like proteins and block L that is conserved in NINs, NLP1 and NLP2 (Schauer et al. J Mol Evol (2005) 60:229–237). The ten amino acid residues highlighted in yellow in Mtnin-16 correspond to those encoded by *Tnt1* in the Mtnin-16 hybrid protein. Mtnin-16 contains the first six conserved blocks of sequence found in NIN proteins, but lacks the seventh block corresponding to the PB1 domain that is important for hetero-dimerization.