

## **Supplemental Material to:**

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LjNIN 1 MEYGSLLVQQQQQ -- QDCNSAYGSLSNLSSDCGSVT ----- TAEADHHIIEBLVQGCWVEVSG ----- VGVRR 61  
MtNIN 1 MEYGGGLVAD ----- GGVFQPMVGG ----- GGGQADIIEBLGEGCWI EASENSLMMAMQQTTPSQYMSNNNNIPMGMG 70  
PsNIN 1 MEYGGGIVDD ----- GGVFQTM ----- VGGDQCDIIEBLGEGCWI EASENNMMAMQQTASPQQHYIGNNIPMG 67  
AtNLP1 1 MEDDGGSDGEGEGNGGFSNNSFGAFA ----- DTAMDLD FMDDELFDGCWLETTDSKSLKQTEQSPAS - TAMNDNS - PFL 73  
AtNLP2 1 ME - GGRGGDGN - FLPNSNFVFS ----- DSAMD FMDDELFDGCWLETTDGKSLKQTMQQVSDSTMMNDNNSV 72  
LjNLP1 1 MGDGAVTTTSAAMMEAPT ----- ETSMD FEYMSLDL DGCWLEASADGNSNLLQSSPPFSPLDPDSF - SWPA 68  
AtNLP4 1 MEDSFLQSE ----- NVVMDAD FMDG LLDGCWLETTDGESEFLNIAPSTSSVSP - FDPTSFMWSP 58  
AtNLP5 1 MENNSLPM ----- DPAMSS FMDG LLDGCWLETTDASEFLNFPSPSTVA - P - FDPSSFMVSP 56  
AtNLP3 1 MVGFNFKLHAHQRFPPSSSSSLDPVVDSS ----- SRKQTR ILLSYLLHLSLSLHITYSLCLLHFFGSSNPFSPMEESNNSAV 81  
LjNLP4 1 MSESDEEKDFPQKARPTTEPGFAM ----- DFDL DLESSWPMDHMSFVSNPMS ----- PFLFSTMSDQPCSLWAFSDGE 70  
AtNLP6 1 ----- ME ----- LDDLDL DSGSWPLDQITPFAFNFKS ----- PVIFSSS - EQPSPPLWFSSETS 46  
AtNLP7 1 MCEPDDNSARNGVTTQPSRSRELLMD ----- VDL DLDGWSWPLDQIPYLSNRMISPIFVSSSESEQPCSLWAFSDGG 74  
AtNLP8 1 MENPFASRE - KGFNYSDPTEQMDGLSSNF GSVNRNLSDD - MFPNSS - ELMNFD SLAAWCNPSPATDILFAQYGLSNSQPM - PFGAFTSFHVADPKA 95  
AtNLP9 1 MENPSASRDNKGFC - FPDIPVEEMDGW ----- VKNLISEEDMFSSSSTSELMNFESFASWCNPSAADILFTQYGLSTSQSIIIPFG ----- 81  
LjNLP2 1 MEYFPSPKG - GELGYWQSPSAQFGSIS - DNGISN - SISDDMPSNF - SELLNFD SYAGWFTGPSVTDQIFANELPFSFVSYPLSDGFLNLAEQNSGQ 94  
LjNLP3 1 MDHLSLPGK - KGIGY - SASFDG ----- GMKN - SASDEM FNNI - SELMNF DTYAGWCNPSMTDPLNLANGLTPFVSVYPPPDGLNLVEQSSGP 84

LjNIN 62 EG ----- ELQLQOD ----- ESSFVV ----- GKRWWICRAAAVAGSCNSS 95  
MtNIN 71 EG ----- DHFNHHHHHPHHPHMQMCTAPAAHDDQO ----- ESGFVV ----- GKRWWICRANPGPTTS -- 125  
PsNIN 68 EG ----- DHFNHHQVDQ ----- ESGFVV ----- GKRWWICRGRSQGFSTSS -- 102  
AtNLP1 74 C ----- FGENPSQDNFSNEETERMFP ----- QAEKFLLEEAE ----- VGKSWIAPASSEGESSS -- 123  
AtNLP2 73 YG ----- YQYAE NLSQDHI SNEETGRKFPPIPPGFLKIEDLSNQVPFDQSAVMSAAQAEKFLLEESE ----- GGRRYWIAPRTSQGFSSS -- 152  
LjNLP1 69 LETN ----- EP ----- THVEDQHESQEA PLGNTQLVSSQSNMNVVDRYNNQSE ----- TETHSVVEGTSDG ----- VKRWWIAPRTSQGFSSS -- 143  
AtNLP4 59 TQDT ----- SALCTSGVVSQMYGQDCVE - RSSLDFQW ----- NKRWWICP - GGGGSS -- 104  
AtNLP5 57 TQDT ----- SN ----- SLS - QMYGQDCPE - RSSLDFQW ----- NKRWWICP - GGGGSS -- 105  
AtNLP3 82 DFP ----- DNFM DQLLWEECEEEAT ----- QHDQALSSPSG ----- 113  
LjNLP4 71 DDRH ----- TSLAAP - AFS DCHKIFPCDSNSVTEKPMENDDNN ----- KLLPFVVPQPIENLDRFCV -- 127  
AtNLP6 47 GVG - ----- GELYSAAVAP - TRFTDYSLVLASS - ESETTYKENN ----- QVPSPSWCTMPELENPDGYCA - 103  
AtNLP7 75 GNGFHATSGGDEKISSVSGVPSFRLAEYPLFLPYSSPAAENTTEKHSNF ----- QFPSPMLSLVPENTDNYCV -- 146  
AtNLP8 96 TSLTR ----- SFYDLESSYGEERSSAQEMN - SQPHRSSDDELSGKRRKVVNQ ----- KILGFPVNLCT - IPRSLSHS -- 162  
AtNLP9 82 ----- LEGSYACEK ----- RPLDCTSVPRSLSHS -- 105  
LjNLP2 95 FFTTGVCG ----- NSNLESSSTHGERVVCOQMDTLGLFLETDNDANTLNSKQKINDTL ----- QQFSTFEENYTI SRPSPS -- 168  
LjNLP3 85 FFMTEATG ----- NYNDMQSSPSYGDVV LQOMENQFEFFDVLNDTNLDAKQKQSVPF ----- QQLNTSDMGNHMSWSSSWS -- 158

LjNIN 96 VKERLVIAVGYLKYDYTRNS - NVLHQI WVP L - RR - GILHDHYHTNYLSN - NPPQPEAAADHESVSLG ----- FMPAPANSNLYSNVH 176  
MtNIN 126 VKERLVIAVGYLKEYTKNSSNNVLIQI WVP - RRRSALIHITQ - NHYLOQE - SSS ----- APVSNPNMNVH ----- 188  
PsNIN 103 VKERLVIAVGYLKEYTKNSSNNVLIQI WVPALRRRSAT - HYLOQD - SSSS ----- VPVSNPNMNVH ----- 162  
AtNLP1 124 VKERLLQALISGLNEAVQDK - DFLHQI WVP LQOEGKSF LITWA - QPHLFNQE - YSSLAEYRHVSETYMFADEGMD ----- FVGLPGRV LCRFPPEWT 213  
AtNLP2 153 VKERLVCAIEGLNEAVQDK - DFLHQI WVP LQOEGKSNFLITSE - QPHFENPK - YSSLKRYRVDVSVAYNFADEDSKE ----- SVGLPGRV LCRFPPEWT 242  
LjNLP1 144 IMEKLIRALKWIKOFNWNK - DMLHQI WVP VPRGDRPILSANN - LFFS DSG - SENLARYREISEGFCFAEEDSKE ----- LVLGLPGRV LCRFPPEWT 234  
AtNLP4 105 VTERLVCAVEHIDYTTAR - GSLHQI WVP VNRGGRV LITKE - QPFSHDPL - CQRLARYREISVNYHFAEQDSDK ----- ALGLPGRV LCRFPPEWT 195  
AtNLP5 106 VMERLVCAVTHIKDFTSER - GSLHQI WVP VDRGGKRV LITKE - QPFSHDP - CQRLARYREISEGFCFAEEDSKE ----- LVLGLPGRV LCRFPPEWT 200  
AtNLP3 114 LKERVACAMGHLQFVMGER - ELLHQI WVP VETRSGRV LITSE - QPYSINTFSQSQSLALYRDA SAGYSFAEVEGSEQ ----- LVGLPGRV LCRFPPEWT 205  
LjNLP4 128 IKERMTQALRHKELTEL - NVLACQWVAPVRNGRYV LITSG - QPFDLDPH - SNGLHCYRTASLMYMFADGENDG ----- TLGLPGRV LCRFPPEWT 216  
AtNLP6 104 IKERMTQALRYKESSTGQ - HVLACQWVAPVKNRGRV LITSG - QPFDLDPH - SNGLHCYRMYSLTYMFLDGERD ----- ELGLPGRV LCRFPPEWT 193  
AtNLP7 147 IKERMTQALRYKESSTEQ - HVLACQWVAPVRNGRDL LITGL - QPFDLDPH - SNGLHCYRMYSLTYMFLDSESVD ----- ELGLPGRV LCRFPPEWT 235  
AtNLP8 163 LDEKMLKALSFLMFSGSGE - GILACQWVPIKTDGYL LITSDC - QAYL DSR - FSCYREVSRRFTFAEANQCS ----- FGLPGRV LCRFPPEWT 250  
AtNLP9 106 LDEKMLKALSFLMFSGSGE - GILACQWVPIKTDGYL LITSDC - QAYL DSR - FSCYREVSRRFTFAEANQCS ----- YPGLPGRV LCRFPPEWT 191  
LjNLP2 169 LDERMLRALSFKESAGG - GILACQWVPLEHGGQV LITSE - QPFLDQ - LAGYREVSRTFFFAEGKPGG ----- FGLPGRV LCRFPPEWT 254  
LjNLP3 159 LDERMLKALSFLKESAGG - GILACQWVVKHGDEF LITSE - QPFLDQ - LAGYREVSRTFFFAEGKAGS ----- CGLPGRV LCRFPPEWT 244

LjNIN 177 - - - - - VRFFRSHEYPVRAQQ - - - - - YGS - LALPVFERGTGT - CLGVIEFVITNQTTINYNV - - - - - SNALDCAVDFRSSQSF - IPPAIKVYD - - - - - ELYQAAVNE 260  
MtNIN 189 - - - - - VRFFRSHEYPVRAQQ - - - - - YGS LALPVFERGSGT - CLGVIEFVITNQTTINYNV - - - - - LDHLSNALE - AVDFRSSHMMNIQPAVKVFE - - - - - ELYBAAVNE 279  
PsNIN 163 - - - - - VRFFRSHEYPVRAQQ - - - - - YGS LALPVFERGSGT - CLGVIEFVITNQTTINYNV - - - - - LDHLSNALE - AVDFRSSHMMNIQPAVKVFE - - - - - ELYBAAVNE 254  
AtNLP1 214 PDVRFRRDEYPRKHAQKCDVRGSLALPVFERGSGT - CLGVIEFVITNQTTINYNV - - - - - LEKMKCALE - AVDLRSSHMMNIQPAVKVFE - - - - - SYQAALPE 309  
AtNLP2 243 PDVRFRRDEYPRKHAQKCDVRGSLALPVFERGSGT - CLGVIEFVITNQTTINYNV - - - - - LEKMKCALE - AVDLRSSHMMNIQPAVKVFE - - - - - SYQAALPE 338  
LjNLP1 235 PDVRFRRDEYPRKHAQKCDVRGSLALPVFERGSGT - CLGVIEFVITNQTTINYNV - - - - - LEKMKCALE - AVDLRSSHMMNIQPAVKVFE - - - - - SYQAALPE 328  
AtNLP4 196 PDVRFRRDEYPRKHAQKCDVRGSLALPVFERGSGT - CLGVIEFVITNQTTINYNV - - - - - LEKMKCALE - AVDLRSSHMMNIQPAVKVFE - - - - - SYQAALPE 288  
AtNLP5 201 PDVRFRRDEYPRKHAQKCDVRGSLALPVFERGSGT - CLGVIEFVITNQTTINYNV - - - - - LEKMKCALE - AVDLRSSHMMNIQPAVKVFE - - - - - SYQAALPE 293  
AtNLP3 206 PDVRFRRDEYPRKHAQKCDVRGSLALPVFERGSGT - CLGVIEFVITNQTTINYNV - - - - - LEKMKCALE - AVDLRSSHMMNIQPAVKVFE - - - - - SYQAALPE 299  
LjNLP4 217 PNVLYYSNKEYPRRDAEHYVNRGILALPVFERGSGT - CVGVLELMTSP - KINYGPE - VEKICALE - AVNLRSSSEILHPPYTQICNE - - - - - SRQNALAE 309  
AtNLP6 194 PNVLYYSNKEYPRRDAEHYVNRGILALPVFERGSGT - CVGVLELMTSP - KINYGPE - VEKICALE - AVNLRSSSEILHPPYTQICNE - - - - - SRQNALAE 286  
AtNLP7 236 PNVLYYSNKEYPRRDAEHYVNRGILALPVFERGSGT - CVGVLELMTSP - KINYGPE - VEKICALE - AVNLRSSSEILHPPYTQICNE - - - - - SRQNALAE 328  
AtNLP8 251 SNVMYKTEYLRMKHALDNEVRGSIATPVEASGTS - CCAVLELVTRE - KPNFDVE - MNSVORALO - AVNLRSSSEILHPPYTQICNE - - - - - DALAE 340  
AtNLP9 192 SNVMYKTEYLRMKHALDNEVRGSIATPVEASGTS - CCAVLELVTRE - KPNFDVE - MNSVORALO - AVNLRSSSEILHPPYTQICNE - - - - - DALAE 281  
LjNLP2 255 SNVGYYSKBYLRVHARNYKVRGTIAPPHDTHSELPCAVLELVTRE - MSDFDRE - LEVVCALQ - TVNLRITMPLRIFPEQCSNN - - - - - KRAALAE 347  
LjNLP3 245 SNVGYYSKBYLRVHARNYKVRGTIAPPHDTHSELPCAVLELVTRE - MSDFDRE - LEVVCALQ - TVNLRITMPLRIFPEQCSNN - - - - - KRAALAE 337

LjNIN 261 IIBVMTSVCKTHNLPLALTWAPCIQQQK - - - - - GCGVS - - - - - SENYMCVSTVDSACVGDLDLIGFCEACSEVHLFRGQIGVTAFT 340  
MtNIN 280 IIBVMTSVCKTHNLPLALTWAPCIQQQK - - - - - GCGVS - - - - - TMSCHSTVDSACVGDMDLIGFCEACSEVHLFRGQIGVTAFT 366  
PsNIN 255 IIBVMTSVCKTHNLPLALTWAPCIQQQK - - - - - GCGVS - - - - - TMSCHSTVDSACVGDMDLIGFCEACSEVHLFRGQIGVTAFT 353  
AtNLP1 310 IKDFLTIICRSYDFPLALTWAPCARQKGV - - - - - GSRHS - - - - - DENFSECVSTVDSACVGDMDLIGFCEACSEVHLFRGQIGVTAFT 389  
AtNLP2 339 VSEFLITVCRVYDPLALTWAPCARQKGV - - - - - GSRHS - - - - - DENFSECVSTVDSACVGDMDLIGFCEACSEVHLFRGQIGVTAFT 418  
LjNLP1 329 IQBVLRSACMHRPLALTWAPCFQKQK - - - - - GCRHS - - - - - EDNYLHCISPEVQACVGDMDLIGFCEACSEVHLFRGQIGVTAFT 408  
AtNLP4 289 IRNLLRCACETHRPLALTWAPCFQKQK - - - - - GCRHN - - - - - DENYHCVSTVDSACVGDMDLIGFCEACSEVHLFRGQIGVTAFT 368  
AtNLP5 294 IRNLLRCACETHRPLALTWAPCFQKQK - - - - - GCRHN - - - - - DENYHCVSTVDSACVGDMDLIGFCEACSEVHLFRGQIGVTAFT 373  
AtNLP3 300 VASILQICSSHLPLALTWAPCFQKQK - - - - - GCRHN - - - - - DENYHCVSTVDSACVGDMDLIGFCEACSEVHLFRGQIGVTAFT 366  
LjNLP4 310 ILELITVVCETHRPLALTWAPCFQKQK - - - - - LAHGGGLKICSSFDG - - - - - SCMGQVCMSTVDSACVGDMDLIGFCEACSEVHLFRGQIGVTAFT 399  
AtNLP6 287 ILELITVVCETHRPLALTWAPCFQKQK - - - - - LAHGGGLKICSSFDG - - - - - SCMGQVCMSTVDSACVGDMDLIGFCEACSEVHLFRGQIGVTAFT 376  
AtNLP7 329 ILELITVVCETHRPLALTWAPCFQKQK - - - - - LAHGGGLKICSSFDG - - - - - SCMGQVCMSTVDSACVGDMDLIGFCEACSEVHLFRGQIGVTAFT 418  
AtNLP8 341 IQBVLRSACMHRPLALTWAPCFQKQK - - - - - KDQYIRVSGQK - - - - - SGENCILCEETACVGDMDLIGFCEACSEVHLFRGQIGVTAFT 420  
AtNLP9 282 IRDVLRAVCAHRLPLALTWAPCFQKQK - - - - - NDELVKVYKGN - - - - - SKECSLLCIETSCYVNDMEMEGFVHACLEHHLFRGQIGVTAFT 366  
LjNLP2 348 IRDVLRAVCAHRLPLALTWAPCFQKQK - - - - - KGAMRIQIKEGHSSGKVLICIESACVGDMDLIGFCEACSEVHLFRGQIGVTAFT 436  
LjNLP3 338 IRDVLRAVCAHRLPLALTWAPCFQKQK - - - - - GDETERIRIKEGHSSGKVLICIESACVGDMDLIGFCEACSEVHLFRGQIGVTAFT 426

III

IV

|        |     |  |     |
|--------|-----|--|-----|
| LjNIN  | 341 | TSKPCFAIDITAFSKAEYPLAHHANMFGLHAAVAIFLRSVYTGSAADFVLEFFLPKDCRDTTEQOKQMLNLSLVLVVOQACRSLHVVLEVEYTLPLMPSHTS | 440 |
| MtNIN  | 367 | TTKPCFAIDITAFSKSEYPLAHHANMFGLHAAVAIFLRSVYTGSAADFVLEFFLPKDCRDTTEQOKQMLNLSLVLVVOQACRSLHVVMDNNNNNNNDNN    | 466 |
| PsNIN  | 354 | TTKPCFAIDITAFSKAEYPLAHHADMFGLHAAVAIFLRSVYTGSAADFVLEFFLPKDCRDTTEQOKQMLNLSLVLVVOQACRSLHVVMDNDNHHED       | 451 |
| AtNLP1 | 390 | ATKLFVPEVAVTFSKTNYPLAHHAKISGLHAALAVPLRKSGL--VEVLEFFLPKACLDTEAQEMLRSLCVTLQDFRSNNLFI-KDLELEVLPVR-        | 485 |
| AtNLP2 | 419 | ATKLFVPEVAVTFSKTNYPLAHHAKISGLHAALAVPLRKNKFNSS-VEVLEFFLPKACLDTEAQEMLRSLCVTLQDFRSNNLFI-KDLELEVLPVR-      | 516 |
| LjNLP1 | 409 | INQPFHSDITMLSKTYPLSHHARIFGLRAAVAIRLRSYSSA-DYVLEFFLPVNCNDSEBQKNMLLSLSTIQRCCRSRVRTDKPLERT-----           | 500 |
| AtNLP4 | 369 | TNPGCFSSDVNFKSEYPLSHHANNYGLHGAVAIRLRCTIFGS-ADVLEFFLPKCDLKEBQRKMLNALSTIMAHVPRSLRVTQKLEEE-----           | 460 |
| AtNLP5 | 374 | TNPGCFSSDVNFKSEYPLSHHANNYGLHGAVAIRLRCTIFGS-ADVLEFFLPKNCRDIKEBQRKMLNALSTIMAHVPRSLRVTQKLEEE-----         | 465 |
| AtNLP3 | 367 | TKKQCFADVAIFSKWYPLSHVAKMFDLHAALAVPLTRGNRT-VQVLEFFLPKCDLKEBQRKMLNALSTIMAHVPRSLRVTQKLEEE-----            | 464 |
| LjNLP4 | 400 | SHSMFCFNTIQTQKTYPLVHYALMFGLTSCFAICLRSSHTGD-DYVLEFFLPPIRTHFSBQKTLVGSLLATMKQHFCQSLKIAAGVEL-EDGGSV---     | 494 |
| AtNLP6 | 377 | SGNLCFCRDVTRFKTYPLVHYALMFGLTSCFAICLRSSHTGD-DYVLEFFLPPIRTHFSBQKTLVGSLLATMKQHFCQSLKIAAGVEL-EDGGSV---     | 472 |
| AtNLP7 | 419 | NGGSCFCRDITKFKTYPLVHYALMFGLTSCFAICLRSSHTGD-DYVLEFFLPPIRTHFSBQKTLVGSLLATMKQHFCQSLKIAAGVEL-EDGGSV---     | 516 |
| AtNLP8 | 421 | SNQPFSSDVKAYDISYPLVCHARKYGLNAVAIKLRSTYTCG-DYVLEFFLPVSMKGSLEQQLLLSLSTQRIORCRIRTVSEVGTKEGKPKGF           | 519 |
| AtNLP9 | 367 | SNKPFSSDVKTFDICEYPLVCHARKYGLNAVAIKLRSTYTCG-DYVLEFFLPVSMKGSLEQQLLLSLSTQRIORCRIRTVSEVGTKEGKPKGF          | 463 |
| LjNLP2 | 437 | SNHPEFYDVKYDISYPLVHHARKCNLSAAVAIRLRSTYTCG-DYVLEFFLPVSMKGSLEQQLLLSLSTQRIORCRIRTVSEVGTKEGKPKGF           | 535 |
| LjNLP3 | 427 | SNHPEFYDVKYDISYPLVHHARKYGLNAVAIKLRSTYTCG-DYVLEFFLPVSMKGSLEQQLLLSLSTQRIORCRIRTVSEVGTKEGKPKGF            | 525 |

IV

|        |     |  |     |
|--------|-----|--|-----|
| LjNIN  | 441 | -----KEELEEEIT--ITNNEQK-----LFVSPSSHESECSK---SSWIAHMMEAQNGKGVSVSLEYL-EEPKEEFKVT--NWDSSDTHDQ          | 518 |
| MtNIN  | 467 | SSADHDDQFTTPTN-SYMPSSASEP----LSQVDAVSGCSTKDT-SSS--CSWIAHMMEAQNGKGVSVSLEYL-QEPKEEFKVTTCNWREREDNV      | 556 |
| PsNIN  | 452 | -----QDQFTPTTNNYMPSSASDAATTASLSQVDAAGCSTKDTTSSS--CSWIAHMMEAQNGKGVSVSLEYL-QEPKEEFKVTTCNWEREG-NSV      | 541 |
| AtNLP1 | 486 | -----ETMLFSENL--LCAETVES-----LTELQOQES-----SWIAHMIKANEKGDVLSWEYQKEDPK-----LSSGRENSQLDVG              | 554 |
| AtNLP2 | 517 | -----EEVFAENP--LINAGTGED-----MKPLLEEISQED--SSWISHMIKANEKGVSVLSWEYQKEDPK-----GWDNNQIGSG               | 593 |
| LjNLP1 | 501 | -----SSVVEVMAL-----EDSG-----PARTVWSEPHQT--SVASLEPEEK--SETVGGKFS--DLREHQEDSI                          | 557 |
| AtNLP4 | 461 | -----SEVIEREEI-----VTPK-----IENASELHGNSPWN--SLEETQRSNNTSNPQNLGLVFD-----GGDKPNDGFG                    | 520 |
| AtNLP5 | 466 | -----GDSMVSEV-----TEKGVTLPKIENT-----T--EVHQISIT--PQNVGLVFD-----GGTTEMGELG                            | 514 |
| AtNLP3 | 465 | -----PLTQEDPKGKQVFSFSSASL-----PLTQEDPKGKQVFSFSSASL-----PLTQEDPKGKQVFSFSSASL-----PLTQEDPKGKQVFSFSSASL | 486 |
| LjNLP4 | 495 | -----EIEATNER-----VTLRLESIPIAQSVQSPGPGGSPNMBVEVPEKDPSEQQTMNMCNMDNEGGAGHDNAGGNIDQMSSL                 | 569 |
| AtNLP6 | 473 | -----EVVEASEDGM-----VYSKLEPIRIHHPAQIS-----KDYLELNAP-----EQKVS LN--SDFMENNEVDDGVERFQTL                | 534 |
| AtNLP7 | 517 | -----EIIQALPDKK-----VHSKIESIRVPSFGFKS----NATETMLIP-----QPVVQSS-----DPVNETN-VATV                      | 571 |
| AtNLP8 | 520 | RSS-----DMSNFPQTSSEN-FQT-----ISLSEFNSTRSMFGMSDSEKNSIT-----VSEQTLEQDV                                 | 574 |
| AtNLP9 | 464 | RSV-----EMTNLPQATVSVGSFHT--TFLDTDVNSTRTSFSNISNKRNEMA-----GSQGTQQEI                                   | 519 |
| LjNLP2 | 536 | ENK-----NLPFSPLSRENSQIPLI-----NANQDSVQKS-LKASRLRNK-----GSKPPYQVS                                     | 585 |
| LjNLP3 | 526 | QKE-----KVQGFIPISGRNSQTASI-----GCDYLLDRKMYLKATNLRNN-----GIEAARSQAI                                   | 576 |

RWP-RK

|        |     |   |     |
|--------|-----|---|-----|
| LjNIN  | 519 | QAQVPS-SDFQGM---SSGFKASTVEGGQDESSYTFGSRSSS--GGRKSGEKRRKRAEKTISLQVLRQYFAGSLKDAAKSIGVCPPTLKRCRQHGIR | 612 |
| MtNIN  | 557 | FSEFGQ-VLQOQHDQSSNSRASVVEAGEESPGACGRSSSSSSGKSGDKRRKRAEKTISLQVLRQYFAGSLKDAAKSIGVCPPTLKRCRQHGIR     | 655 |
| PsNIN  | 542 | FSEFGQ-VIHDQ---SSNSRASVEAGEESGGGTGGGRSSSSSSGKSGDKRRKRAEKTISLQVLRQYFAGSLKDAAKSIGVCPPTLKRCRQHGIR    | 637 |
| AtNLP1 | 555 | NPNVLEAEQLQ---ASTPGLRVDIGPSTESASTGGNMLS---SRPGEKRRKRAEKTISLQVLRQYFAGSLKDAAKSIGVCPPTLKRCRQHGIR     | 647 |
| AtNLP2 | 594 | HNNFLSEAEQFQ---VTNSGLRIDMPSFESASFGVQTLLG---SRPGEKRRKRAEKTISLQVLRQYFAGSLKDAAKSIGVCPPTLKRCRQHGIR    | 687 |
| LjNLP1 | 558 | LKG-----NLECDRE-----CSPFVGNLSSG-LSKTEKRRKRAEKTISLQVLRQYFAGSLKDAAKSIGVCPPTLKRCRQHGIR               | 634 |
| AtNLP4 | 521 | LKRGF-----DYTMDSNVN-----ESSTFSSG-FMMAEKRRKRAEKTISLQVLRQYFAGSLKDAAKSIGVCPPTLKRCRQHGIR              | 597 |
| AtNLP5 | 515 | SE-----YKGVSVN-----ENMTFSSASGFNRVTEKRRKRAEKTISLQVLRQYFAGSLKDAAKSIGVCPPTLKRCRQHGIR                 | 588 |
| AtNLP3 | 487 | -----ENRKRKRAEKTISLQVLRQYFAGSLKDAAKSIGVCPPTLKRCRQHGIR   | 537 |
| LjNLP4 | 570 | ET-----KTMKPSERKRAEKTISLQVLRQYFAGSLKDAAKSIGVCPPTLKRCRQHGIR  | 627 |
| AtNLP6 | 535 | DPIP-----EAKTVKSEKRRKRAEKTISLQVLRQYFAGSLKDAAKSIGVCPPTLKRCRQHGIR                                   | 595 |
| AtNLP7 | 572 | NG-----VVKEKKEKRRKRAEKTISLQVLRQYFAGSLKDAAKSIGVCPPTLKRCRQHGIR                                      | 630 |
| AtNLP8 | 575 | S-----KART-EKKSSTTEKRVSLALQCHFSGSLKDAAKSIGVCPPTLKRCRQHGIR   | 629 |
| AtNLP9 | 520 | S-----GARR-LEKKSSTTEKRVSLALQCHFSGSLKDAAKSIGVCPPTLKRCRQHGIR  | 574 |
| LjNLP2 | 586 | N-----GSRROVEKRRKRAEKTISLQVLRQYFAGSLKDAAKSIGVCPPTLKRCRQHGIR                                       | 641 |
| LjNLP3 | 577 | N-----GSRKQVEKRRKRAEKTISLQVLRQYFAGSLKDAAKSIGVCPPTLKRCRQHGIR                                       | 632 |

V

RWP-RK

|        |     |  |     |
|--------|-----|--|-----|
| LjNIN  | 613 | WPSRKIKKVGHSLKQLQVIDSVOCAECAIQIG---SFYASFPBELSSDFSASCRSDSSKMM-----HNYPDQNTLYGHG-DH----           | 687 |
| MtNIN  | 656 | WPSRKIKKVGHSLKQLQVIDSVOCAECAIQIG---SFYASFPBELSNATANGDGD--NDN-----SNNSFYNNM-HG----                | 721 |
| PsNIN  | 638 | WPSRKIKKVGHSLKQLQVIDSVOCAECAIQIG---SFYASFPBELSAAAHGGGGGGGDH-----INNNSFYNS--H----                 | 704 |
| AtNLP1 | 648 | WPSRKIKKVGHSLKQLQVIDSVOCAECAIQIG---SFYASFPBELSNPNMSSNGPSSKNEQ-----PS--HLNAQTDNGTMAE----          | 721 |
| AtNLP2 | 688 | WPSRKIKKVGHSLKQLQVIDSVOCAECAIQIG---SFYASFPBELSSPHSGTGFKNP-----NAQTENGVSQAQ----                   | 755 |
| LjNLP1 | 635 | WPSRKIKKVGHSLKQLQVIDSVOCAECAIQIG---SFYASFPBELSAPNLASGALVSNALN-----QSENPNLSIQPDLG----             | 708 |
| AtNLP4 | 598 | WPSRKIKKVGHSLKQLQVIDSVOCAECAIQIG---SFYASFPBELSAPNLASGALVSNALN-----QSENPNLSIQPDLG----             | 663 |
| AtNLP5 | 589 | WPSRKIKKVGHSLKQLQVIDSVOCAECAIQIG---SFYASFPBELSAPNLASGALVSNALN-----QSENPNLSIQPDLG----             | 658 |
| AtNLP3 | 538 | WPSRKIKKVGHSLKQLQVIDSVOCAECAIQIG---SFYASFPBELSAPNLASGALVSNALN-----QSENPNLSIQPDLG----             | 595 |
| LjNLP4 | 628 | WPSRKIKVNRSLKRLKRVIDSVOCAECAFGLN---SLSTSPPLVSSGFPPESTPNKFSQASMRPLESQMKENEIDASKILEIEDPLLGGMTQN--- | 719 |
| AtNLP6 | 596 | WPSRKIKVNRSLKRLKRVIDSVOCAECAFGLN---SLSTSPPLVSSGFPPESTPNKFSQASMRPLESQMKENEIDASKILEIEDPLLGGMTQN--- | 656 |
| AtNLP7 | 631 | WPSRKIKVNRSLKRLKRVIDSVOCAECAFGLN---SLSTSPPLVSSGFPPESTPNKFSQASMRPLESQMKENEIDASKILEIEDPLLGGMTQN--- | 710 |
| AtNLP8 | 630 | WPSRKIKVNRSLKRLKRVIDSVOCAECAFGLN---SLSTSPPLVSSGFPPESTPNKFSQASMRPLESQMKENEIDASKILEIEDPLLGGMTQN--- | 724 |
| AtNLP9 | 575 | WPSRKIKVNRSLKRLKRVIDSVOCAECAFGLN---SLSTSPPLVSSGFPPESTPNKFSQASMRPLESQMKENEIDASKILEIEDPLLGGMTQN--- | 669 |
| LjNLP2 | 642 | WPSRKIKVNRSLKRLKRVIDSVOCAECAFGLN---SLSTSPPLVSSGFPPESTPNKFSQASMRPLESQMKENEIDASKILEIEDPLLGGMTQN--- | 733 |
| LjNLP3 | 633 | WPSRKIKVNRSLKRLKRVIDSVOCAECAFGLN---SLSTSPPLVSSGFPPESTPNKFSQASMRPLESQMKENEIDASKILEIEDPLLGGMTQN--- | 732 |

V

|        |     |   |     |
|--------|-----|---|-----|
| LjNIN  | 688 | -----GGVVTLSKSPSSA-----CSQTFAGNQP-----CTIINNG   | 717 |
| MtNIN  | 722 | -----DGIVTSLKSPSSA-----CSQTHAGNKL--PMT-----TTTAINHH   | 755 |
| PsNIN  | 705 | -----GDLVTNLKSPSSA-----CSQTHAGNKL--SII-NG-----DHHHHHHH  | 741 |
| AtNLP1 | 722 | -----E---NPRSPSSS-----CSKSSGSS-----NINNETNG   | 745 |
| AtNLP2 | 756 | -----G-TAAAPKSPSSS-----SCSHSSGSSGCCSTGA-----NQSTNTG   | 790 |
| LjNLP1 | 709 | -----LSPGATKLSGSS-----CQGSLSHSCSSMPE-----QQPHTSD  | 744 |
| AtNLP4 | 664 | -----KSPVSS-----YSHSSNSQCSSSETQ-----LNSGATD   | 692 |
| AtNLP5 | 659 | -----KSPVSS-----YSHSSNSQCSSSETQ-----LNSGATD   | 683 |
| AtNLP3 | 596 | -----VHVPPKSPSSS-----SGSQSSGSSGCCSSEE-----VIKEDPT   | 623 |
| LjNLP4 | 720 | -----LEKVFNDKCPRRIRTGSGS-SEDSNTPISSHGSCYGSPPIESSH-VKDISITSNNERCVVPRGSPSSPLQPIN                        | 790 |
| AtNLP6 | 657 | -----PLS-NLQDVKIENRDAE-DAGSSTSRASCXV--  | 687 |
| AtNLP7 | 711 | -----EPNGPELPEPNSGHKRSRTVDESAGTPTSHGSCDGNQ-----LDEPKVNPQDPLFTVGGSPGLLFPYSRD                           | 776 |
| AtNLP8 | 725 | -----TMNQAR-PCSFMEVNASQPWAMWAKESGLNGSEGI-----KSVCN--LSSVEI  | 770 |
| AtNLP9 | 670 | -----ETNHQAGPCSLK-----PWTWISKQSLIYSDDTDYG-----KRSEEVNKD--EDLCVNRCLSSVAL                               | 726 |
| LjNLP2 | 734 | -----GKLLKTNASLVDCEDSSKSMAMDRSSHSSSLWTKAQCSSEQASLGS-----LAKRDKVNLNDGLRVENLKNCTVQCSG                   | 810 |
| LjNLP3 | 733 | -----GNQLVHSTVLSMNSYEGELKIDNASSADGSEDSKSMAVDD-----VTKAQDCPEQNSLGSV-----LEKEGDQWSLNKYGWVENS IHDIVCNTNS | 819 |

|        |     |   |     |
|--------|-----|---|-----|
| LjNIN  | 718 | DVLMTPE-SPPVPEALLSRDHCEEAELNNASIQEDTKR-----FSRPKS-----QTLPP-----LSDSSGWNLETG-----           | 779 |
| MtNIN  | 756 | HVVMTEPNTGAPLGVDFHAFMHASNINIQDYHQLEDLTKQ-LLLHFNNNN-----QILLPPRPTVAVNNNNSSSSSTLLERG-----     | 830 |
| PsNIN  | 742 | HLVMTPE-NLAAPSVAVDALMQHASTINIQDYQQLEDHDTKQ-LLLHFNNNNNNNNNQTLPPRPTVTVWNNNNSSSSGGLERG-----    | 821 |
| AtNLP1 | 746 | --NIL--VAEDADAVLKRAHSEAOHNVNQEETKCLART-----QSHKT-----FKEPLVLDNSSPLTGSSNTSLRARG-----         | 810 |
| AtNLP2 | 791 | TTSNTVTTLMAENASAILKRARSEVRLHTMNQDETksLsRt-----LSHKT-----FSEHPLFENPPRLPENSSRKLKAGG-----      | 861 |
| LjNLP1 | 745 | VACNKDPVVGKDSADVVLKRIRSEABLKSHSENKAKLPRLSQET-----LGEHTKTEYQSYLLKTKCHKATPKED-----            | 815 |
| AtNLP4 | 693 | DPPSTD-----VGGALKKTSSEIEIQSSSLDETILTLSSLENIP-----QGTNLLSS-QDDD-----                         | 743 |
| AtNLP5 | 684 | D-----KTR-----LVSRSFKET-----QTTHLSPSSQEDD-----  | 709 |
| AtNLP3 | 624 | -----QQLGGQKPALSHPOQLTLSSMHEDQRVPRVT-----SSLPLPSATTPRKAKD-----                              | 672 |
| LjNLP4 | 791 | TLNSPSPPIPIDIVLTELQEPFGMLIEDAGSS-KDLRNLCP-----AAEAILEDQVPEACPNNPPGCCSLAPKRPVDTLGKVTVPFAAKEM | 879 |
| AtNLP6 | 688 | -PICETRFRLPTHNQ---EPSRQVALDDSSSSKMTNFWA-----HLTCQDTASPTILQHK-----                           | 740 |
| AtNLP7 | 777 | HDSVAASFAMPNRLGSI-DHFRGMLIEDAGSS-KDLRNLCP-----TAAFDDKFDTNMNNNDNNNNNLYAPPKEEAIANVACEPSGSEM   | 861 |
| AtNLP8 | 771 | SD-GMDPTIRCS-GSIVEPNQSMSCSISDSSNGSGAVLRGSSS-----TSMED-WNQMRTHNSNSSESGST-----                | 833 |
| AtNLP9 | 727 | AGDGMNTRIERNQTV-EPNHSISSSMSDSSNSGAVLLGSSS-----ASLEQMNQIRTHN-NSGESGSSS-----                  | 791 |
| LjNLP2 | 811 | SFTDDEMGIDVDNDEVVELNHTPCSSITGSSNGSFPMLHGSS-----SSSQSFENQ--SKGKSTTV-DRGS-----                | 873 |
| LjNLP3 | 820 | SISLIELSGDGGNGAD-EHNHPTSSMTDSSNGSGSMTLGCS-----SGSQSFENQKSKAKSACVVDSSG-----                  | 884 |

**PB1**

|        |     |  |     |
|--------|-----|--|-----|
| LjNIN  | 780 | -AFRVKATFADEKTRFSLQETIWFGS-DLQLEIARRFNLDMNVTN---ILKYLDDDEGEWVVLACDGLBECKDIHRSSQSR-TIRLSLQASPLN-LANTF | 872 |
| MtNIN  | 831 | -AFRVKATFADEKTRFSLQAMWGFR-DLQLEIARRFNLDMN---LVLKYLDDDEGEWVVLSCDADLBECKDLHTSSHTR-TIRLSLQASPLN-LPNTF   | 923 |
| PsNIN  | 822 | -AFRVKATFADEKTRFSLQAVWCFR-DLQLEIARRFNLDMN---LVLKYLDDDEGEWVVLACDGLBECKDLHTSSHTR-TIRLSLQASPLN-LANSF    | 915 |
| AtNLP1 | 811 | -AIKVKATFGEAKTRFSLQVWCFR-ELQCEIARRFNLDMN---FDLKYLDDEGEWVVLACDGLBECKDIYRLTQTH-TIKLSLNEASQVK-LSGSF     | 903 |
| AtNLP2 | 862 | -ASKVKATFGEAKTRFSLQVWCFR-ELQCEIARRFNLDMN---FDLKYLDDEGEWVVLACDGLBECKDIYRISQSR-TIKLSLNEASQVK-LGGSF     | 954 |
| LjNLP1 | 816 | -AHRVKATYGEKTRFRMPKSWSYE-HLLCEIARRFNVSDMSK---FDVKYLDDDEGEWVVLACDGLBECKDIYRISQSR-TIKLSLNEASQVK-LGGSF  | 904 |
| AtNLP4 | 744 | -FLRIVKVSYGEEKTRLRMRNSRRLR-DLLWEIARRFNLDMN---YDLKYLDDEGEWVVLACDGLBECKDIYRISQSR-TIKLSLNEASQVK-LGGSF   | 837 |
| AtNLP5 | 710 | -FLRIVKVSYGEEKTRFRMRNSRRLR-DLLWEIARRFNLDMN---YDLKYLDDEGEWVVLACDGLBECKDIYRISQSR-TIKLSLNEASQVK-LGGSF   | 803 |
| AtNLP3 | 673 | -GMVKAMFGDSMIRMSLIHHSRLT-DLRREIARRFNLDMN---FDLKYLDDEGEWVVLACDGLBECKDIYRISQSR-TIKLSLNEASQVK-LGGSF     | 767 |
| LjNLP4 | 880 | KVTITKATYREDITRFVSLTTCGIV-ELKEEVSARKLKEVGT---FDIKYLDDDEGEWVVLACDGLBECKDIYRISQSR-TIKLSLNEASQVK-LGGSF  | 973 |
| AtNLP6 | 741 | -LVSITKATYREDITRFKISPEVSITELKQVAKRLKLETA---FDLKYLDDEGEWVVLACDGLBECKDIYRISQSR-TIKLSLNEASQVK-LGGSF     | 833 |
| AtNLP7 | 862 | RTVTITKATYREDITRFKISPEVSITELKQVAKRLKLETA---FDLKYLDDEGEWVVLACDGLBECKDIYRISQSR-TIKLSLNEASQVK-LGGSF     | 955 |
| AtNLP8 | 834 | -TLIVKATYREDITRFKIFPESV-GCPQLYKEVGRKFLQDGS---FQLKYLDDEGEWVVLACDGLBECKDIYRISQSR-TIKLSLNEASQVK-LGGSF   | 925 |
| AtNLP9 | 792 | -TLIVKATYREDITRFKIFPESV-GCPQLYKEVGRKFLQDGS---FQLKYLDDEGEWVVLACDGLBECKDIYRISQSR-TIKLSLNEASQVK-LGGSF   | 885 |
| LjNLP2 | 874 | -KIIIVKATYRKDITRFKIFPESV-GCPQLYKEVGRKFLQDGS---FQLKYLDDEGEWVVLACDGLBECKDIYRISQSR-TIKLSLNEASQVK-LGGSF  | 966 |
| LjNLP3 | 885 | -KMIIVKATYRGDITRFKIFPESV-GCPQLYKEVGRKFLQDGS---FQLKYLDDEGEWVVLACDGLBECKDIYRISQSR-TIKLSLNEASQVK-LGGSF  | 977 |

**VI**

|        |     |             |     |
|--------|-----|-------------|-----|
| LjNIN  | 873 | RNSSPS----  | 878 |
| MtNIN  | 924 | RNSSSSPSS   | 933 |
| PsNIN  | 916 | RNSSSS-PSS  | 924 |
| AtNLP1 | 904 | GNTGLS----  | 909 |
| AtNLP2 | 955 | SGISGLGPSL- | 963 |
| LjNLP1 | 904 | -----       | 904 |
| AtNLP4 | 838 | TEYSLWH---  | 844 |
| AtNLP5 | 804 | SGCLS-----  | 808 |
| AtNLP3 | 767 | -----       | 767 |
| LjNLP4 | 974 | SGE-----    | 976 |
| AtNLP6 | 834 | SEETMMCL--  | 841 |
| AtNLP7 | 956 | TGEL-----   | 959 |
| AtNLP8 | 926 | SNGYLGTLG-  | 934 |
| AtNLP9 | 886 | SNGYLGTLG-  | 894 |
| LjNLP2 | 967 | A-AHSEL---  | 972 |
| LjNLP3 | 978 | S-CFLSESS-  | 985 |

**Supplemental Fig. 1** Alignment of the amino acid sequences of NIN and its homologs from pea and *M. truncatula* and the NLPs from *L. japonicus* and *A. thaliana*. Conserved amino acid regions in the N-terminal regions are highlighted with a yellow box. The RWP-RK DNA binding domain and the PB1 domain are indicated with red and blue bars, respectively. Six blocks of conservation (blocks I to VI), which were previously proposed by Schauer et al. (2005), are indicated by black underlines. Amino acid residues that are conserved in more than half of the amino acid sequences are indicated by the black shading.