



KSPPPPVVYSSPPPPYYSPSPKVDYKSPPPPVVYNSPPPPYYSPSPKPTYKSPPPPVVYSSPPPPYYSPSPKPVYKS  
PPPPPVVYSSPPPPYYSPSPKPAYKSPPPPVVYSSPPPPYYSPSPKPIYKSPPPPVVYNSPPPPYYSPSPKPAYKSP  
PPVYVYSSPPPPYYSPSPKPVYKSPPPPVVYNSPPPPYYSPSPKPAYKSPPPPVVYSSPPPPYYSPSPKPTYKSPPP  
VYVYSSPPPPYYSPSPKPVYKSPPPPVVYNSPPPPYYSPSPKPSYKSPPPPVVYSSPPPPYYSPSPKLTYSKSPPP  
YSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSPSPKPSYKSPPPPVVYNSPPPPYYSPSPKVIYKSPPHVVCV  
CPPPPPCYSHSPKIEYKSPPTPVYVYHSPPPPPYYSPSPKPAYKSSPPPVVYSSPPPPYYSPAPKPVYKSPPPPVVYNS  
SPPPPYYSPSPKPTYKSPPPPVVYSSPPPPYYSPKPTYKSPPPPVVYSSPPPPYYSPSPKPTYKSPPPPVVYSSP  
PPPVYSPAPKPTYKSPPPPVVYSSPPPPYYSPSPKPTYKSPPPPVVYSSPPPPYYSPSPKVEYKSPPPPVVYSSP  
PPVYSPSPKVEYKSPPPPVVYSSPPPPYYSPSPKVEYKSPPPPVVYSSPPPPYYSPSPKVEYKSPPPPVVYNSP  
PPAYSPSPKIEYKSPPPPVVYSSPPPPYSYSPSKAEYKSPPPPSLYY

>At2g24980-EXT7 68415.m02987 proline-rich extensin-like family protein  
contains proline-rich extensin domains, INTERPRO:IPR002965

MGIENCIVYVVLSAIAATVTSYYPYSSPQTSPNSPSYEHKGPYAPHKPYVKS SPPPVYQYTPSPKVNYKSPPPPV  
VYSSPPPPYYSPSPKVDYKSPPPPVVYSSPPPPYYSPSPKVDYKSPPPPVVYSSPPPPYYSPSPKVDYKSPPPPVV  
NSPPPPYYSPSPKVDYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSS  
PPPVYSPSPKVYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSP  
PPVYSPSPKVYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSP  
YSPSPKVYKSPPPPVVYNSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYY  
SPSPKVYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSP  
SPKVYKSPPPPVVYKTPY

>At2g43150-EXT8 68415.m05358 proline-rich extensin-like family protein  
similar to CRANTZ hydroxyproline-rich glycoprotein [Manihot esculenta]  
gi|7211797|gb|AAF40442; similar to extensin gi|1165322|gb|AAB53156; contains  
proline-rich extensin domains, INTERPRO:IPR002965

MATPAWASHAKAQWVAMLALLVGSAMATEPYYSSPPPPYEYKSPPPPVKSPPPPYEYKSPPPPVKSPPPPVYHSP  
PPPVKSPPPPVYSSPPPPVKSPPPPVYHSPPPVKSPPPPVYHSPPPVKSPPPPVYHSPPPVKSPPPPVYHSP  
HSPPPVKSPPPPVYHSPPPVKSPPPPVYLYSSPPPVKSPPPPVYVYASPPPPVTHY

>At3g28550-EXT9 68416.m03565 proline-rich extensin-like family protein  
contains proline-rich extensin domains, INTERPRO:IPR002965

MGPSAHLVYAIGVIMATMVAAIEPYTDS SPPPVYSVPLPKVEYKSPPLPDVYSSPPPPLEYSAPKVDYKSPPPPVY  
SPSPKVEYKSPPPPVVYNSPPPPYYSPSPKVDYKSPPPPVVYSSPPPPIYSPSPKVDYKSPPPPVVYSSPPPPYYSP  
SPKVEYKSPSPVYVYNSPPPVYSSPPPVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSPSP  
KVDYKSPPPPVYVYSSPPPPYYSPSPKIVYKSPPPPVVYSSPPPPYYSPSPKVDYKSPPPPVVYSSPPPPYYSPSPK  
VYKSPPPPVYSSPPPPYYSPKVDYKSPPPPVVYSSPPPPYYSPSPKVDYKSPPPPVVYSSPPPPYYSPSPKIVY  
KSPPPPVYSSPPPPYYTPSPKVYKSPPPPVVYSSPPPPYYSPSPKVDYKSPPPPVVYSSPPPPYYSPSPKVYK  
PPPPVYSSPPPPYYSPSPKVDYKSPPPPVVYSSPPPPYYSPSPKVLYKSPPPPVVYSSPPPPYYSPSPKVYKSP  
PPVYVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSPSPKVYKSP  
YHAPSPKVLYKSPPHVVCVCPPPPCYSPSPKVYKSPPPPVVYSSPPPPYHSPSPKVHYKSPPPPVVYSSPPPPY  
YSPSPKVHYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYY  
PSPKVYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSP  
PKVYKSPPPPVVYSSPPPPYYSPSPKVDYKSPPPPVVYSSPPPPYYSPSPKVDYKSPPPPVVYSSPPPPYYSPSP  
VDYKSPPPPVVYSSPPPPYYSPAPKVDYKSPPPPVVYSSPPPPYYSPSPKVDYKSPPPPVYSSPPPPYYSPSP  
VSSPPPPYSYSPKTEY

>At3g54580-EXT10 68416.m06039 proline-rich extensin-like family protein  
contains proline-rich extensin domains, INTERPRO:IPR002965

MGPSTHLICALGVIMATMVAAIDPYTDS SPPPVYLSPLPKIEYKTPPLPYIDS SPPPVYVYSPAPEVEYKSPPPPVY  
SSPPPPYYSPSPKVEYKSPPPPVVYSSPPPPYYSPSPKVEYKSPPPPVVYSSPPPPYYSPSPKVEYKSPPPPVYSS  
PPPVYSPSPKVEYKSPPPPVVYSSPPPPYYSPSPKVEYKSPPPPVVYSSPPPPYYSPSPKVEYKSPPPPVVYSSP  
PPTYSPSPKVDYKSPPPPVVYSSPPPPYYSPSPKVEYKSPPPPVVYSSPPPPYYSPSPKVDYKSPPPPVVYSSP  
YSPSPKVDYKSPPPPVVYSSPPPPYYSPSPKVEYKSPPPPVVYSSPPPPYYSPSPKVEYKSPPPPVVYSSP  
SPSPKVEYKSPPPPVVYSSPPPPYYSPSPKVEYKSPPPPVVYSSPPPPYYSPSPKVEYKSPPPPVVYSSP  
SPKVDYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSPSP  
KVYKSPPPPVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYYSPSPKVYKSPPPPVVYSSPPPPYHSPSPKVQYKSPPPPVY

VYSSPPPPYSSPSPKVYYKSPPPPYVYSSPPPPYSSPSPKVYYKSPPPPYVYSSPPPPYSSPSPKVYYKSPPHPHVC  
VCPPPPPCYSSPSPKVYYKSPPPPYVYSSPPPPHYSSPSPKVYYKSPPPPYVYSSPPPPYSSPSPKVHYKSPPPPYAP  
TPKVHYKSPPPPYVYSSPPPPYSSPSPKVHYKSPPPPYVYSSPPPPYSSPSPKVEYKSPPPPYVYSSPPPPYSSPS  
KVDYKSPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPSPVVDYKSPPPPYVYSSPPPPYSSPSPKV  
EYKSPPPPYVYKSPPPPSYSSPSPKTEY

>At3g54590-EXT2 68416.m06040 proline-rich extensin-like family protein  
contains proline-rich extensin domains, INTERPRO:IPR002965

MGPSAHLISALGVIIMATMVAAYEPETYASPPPLYSSPLPEVEYKTPPLPYVDSPPPTYTPAPEVEYKSPPPPYVY  
SSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYVYNSPPPPYSSPSPKVDYKSPPPPYVYSS  
PPPYSSPSPKVEYKSPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPSPKVEYKSPPPPYVYSSPP  
PPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYVYSSPPPP  
YSSPSPKVDYKSPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPY  
SPSPKVEYKSPPPPYVYSSPPPPYSSPSPKVYYKSPPPPYVYSSPPPPYSSPSPKVYYKSPPPPYVYSSPPPPYSSP  
SPKVYYKSPPPPYVYSSPPPPYSSPSPKVYYKSPPPPYVYSSPPPPYSSPSPKVYYKSPPPPYVYSSPPPPYSSPS  
KVHYKSPPPPYVYSSPPPPYSSPSPKVHYKSPPPPYVYNSPPPPYSSPSPKVYYKSPPPPYVYSSPPPPYSSPSPKV  
YKSPPPPYVYSSPPPPYSSPSPKVYYKSPPPPYSSPSPKVYYKSPPHPHVCVCPPPPPCYSSPSPKVYYKSPPPPYV  
YNSPPPPYSSPSPKVYYKSPPPPSYSSPSPKVEYKSPPPPSYSSPSPKTEY

>At4g08400-EXT11 68417.m01388 proline-rich extensin-like family protein  
contains proline-rich extensin domains, INTERPRO:IPR002965

MGVIRTSRTMGLGQCMVYVVVLSAIAATVTSYPTTSPQTPHYNSPSHEHKIPKYTPHPKPSIYSSPPPSYSSPSPK  
VDYKSPPPSYVYSSPPPPYSSPSPKVDYKSLPPPYVYSSPPPPYSSPSPKVNYKSPPPPYVYSSPPPPYSSPSPKGD  
YKSPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPTPKVDYKSPPPPYVYSSPPPPYSSPSPKVDYK  
SPPPPYVYSSPPPPYSSPSPKVNYKSPPPPYRSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPSPKVDYKSP  
PPYVYSSPPPPYSSPTPKVDYKSPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPSPKVDYKSPPP  
YVYNSPPPPYSSPSPKVDYKSPPPPYLYNSPPPPYSSPSPKVNYKTPPPPYVYSSPPPPYSSPSPKVNYKSPPPPYV  
YSSPPPPYSSPSPNVDYKSPPPPYVYSSPPTPYSSPKVYTKSPPPPYVY

>At4g08410-EXT12 68417.m01390 proline-rich extensin-like family protein  
contains proline-rich extensin domains, INTERPRO:IPR002965;

MFMIKYNIKPKQRKKIVAMGVIRTSRTMGLGQCMVYVVVLSAIAATVTSYPTTSPQTPHYNSPSHEHKIPKYTPHPK  
PSIYSSPPPSYSSPSPKVDYKSPPPSYVYSSPPPPYSSPSPKVDYKSLPPPYVYSSPPPPYSSPSPKVNYKSPPP  
YVYSSPPPPYSSPSPKGDYKSPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPTPKVDYKSPPPPYV  
YSSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPSPKVNYKSPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYVY  
SPPPPYSSPSPKVNYKSPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYVYSS  
PPPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYLYSSTPLPYSSPSPKVDYKSPPPPYVYSSPP  
PYSSPSPKVDYKPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPY  
YSSPSPKVNYKSPPPPYVYSSPPPPYSSPSPKVEYKSPPPPYLYSSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPYSS  
PSPKVDYKSPPPPYVYSSPPPPYSSPSPKVNYKSPPPPYVYSSPPPPYSSPSPKVDYKSSPPQYVYSSPPTPYSSPS  
PKVYTKSPPPPYVY

>At5g06630-EXT13 68418.m00749 proline-rich extensin-like family protein  
contains proline-rich extensin domains, INTERPRO:IPR002965

MRSSRTMGLMNCMVYVVVLSAIAATVTSYPTSSPHTPAYDSPSYEHKPKYAPHKPIVYSSPPPPYSSPSPKVNYK  
SPPPPYVYNSPPPPYSSPSPKVYYKSPPPPYVYSSPPPPYSSPSPKVYYKSPPPPYVYSSPPPLYSSPSPKVYYKSP  
PPPYVYSSPPPPYSSPSPKVYYKSPPPPYVYSSPPPPYSSPSPKVYYKSPPPPYVYSSPPPPYSSPSPKVYYKSP  
PYVYSSPPPPYSSPSPKVYYKSPPPPYVYSSPPPPYSSPSPKVYYKSPPPPYVYSSPPPPYSSPSPKVYYKSPPPPY  
VYSSPPPPYSSPSPKVYYKSPPPPYVYSSPPPPYSSPSPNVYYKSPPPPYVYSSPPPPYSSPSPKVHYKSPPPPYVY  
SSPPPPYSSPSPKVHYKSPPPPYVYSSPPPPYSSPSPKVYTKSPPPPYVYKTPYY

>At5g06640-EXT14 68418.m00750 proline-rich extensin-like family protein  
contains proline-rich extensin domains, INTERPRO:IPR002965

MFKYNIKPKQINKNKEMGMMRSSRTMGLGHCMVYVVVLSAIAATVTSYPTSSPYSSPQTP  
HYNSPSHEHKSPKYAPHKPIVYISPPPPSYSSPSPKVNYKSPPPPNVYNSPPPPYSSPSPKVDYKSPPPPYVYSSP  
PPPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPSPKVEYKSPPPPYVYNSPPPPYSSPSPKIEYKSPPPPYVYSSPP  
PYSSPSPKVDYKSPPPPYVYNSPPPPYSSPSPKVDYKSPPPPYVYSSPPPPYSSPSPKVEYKSPPPPYVYNSPPPPY





**METNHLTYLSTLVVMLLVSVTPTVTS**KDEVVSTMCSSCDNPCSPVQS**SPPPPSPPPP**STPTTACPPPPSPSSGGG  
SS**YY**PPPSQSGGGSKYPPPYGGGGQG**YY**PPPYSGNYTPPPPNPIVPYFPFYHTPPPGSGSDRFMSSYSIIFAL  
FAVFLCLV

>At1g12040-LRX1 68414.m01390 leucine-rich repeat family protein / extensin family protein (LRX1) similar to extensin-like protein [Lycopersicon esculentum] gi|5917664|gb|AAD55979; contains leucine-rich repeats, Pfam:PF00560; contains proline rich extensin domains, INTERPRO:IPR002965  
**MLFPPLRSLFLFTLLSSVCFLQIKA**DHDEESDLGSDIKVDKRLKFENPKLRQAYIALQSWKKAIFSDPFNFNTANWN  
GSDVCSYNGIYCAPSPSPYKTRVAGIDLNHADMAGYLASELGLLSDLALFHINSNRFCGEVPLTFNRMKLLYELDL  
SNNRFVVGKFPKVVLSLPSLKLFLDLRYNEFEGKIPSKLFDRELDIAIFLNHNRFVFGIPKMNMGNSPVSALVADNLLGG  
CIPGSIQMKGKTLNELILSNDNLTGCLPPQIGNLKKVTVFDDITSNRLQGPLPSSVGNMKSLEELHVANNAFTGVIPP  
SICQLSNLENFTYSSNYFSGRPPICAASLLADIVVNGTMNCITGLARQRSDKQCSSLARPVDCSKFCYNI**SPPP**  
**PTFKMSPVTRTLPPPI****YVYS****SPPPPP****SSKMSPTVRAY****SPPPPP****SSKMSPSVRAY****SPPPPP****YSKMSPSVRAY****PPPPPP**  
**SP****SPPPPYVY****SPPPPYVY****SPPPPYVY****SPPPPYVY****SPPPPYVY****SPPPPYVY****SPPPPYVY****SPPPPP****SPPPP****CPES****SPP**  
**PPVYYAPVTQ****SPPPPP****SPVYYPPVTQ****SPPPPP****SPVYYPPVTNS****SPPPPP****SPVYYPPVTY****SPPPPP****SPVYYPPVTQ****SPPPPP**  
**PLYPPVTP****SPPPPP****SPVYYPPVTP****SPPPPP****SPVYYPPVTP****SPPPPP****SPVYYPSETQ****SPPPPP****TE****YYY****S****SQ****SPPPP****TKACK**  
EGHPPQATPSYEPPPE**YS****SS****SPPPPP****SPTS****YFP****MP****SV****SY****DA****SPPPPP****SY**

>At1g49490-PEX2 68414.m05547 leucine-rich repeat family protein / extensin family protein contains similarity to disease resistance protein GI:3894383 from [Lycopersicon esculentum]; contains leucine-rich repeats, Pfam:PF00560; contains proline rich extensin domains, INTERPRO:IPR002965  
**MERPFGCFFILLISYTVVA**TFDDEPSFPENADLTKDLEQKCFKFSINKVDPNLKFENDRLKRAYIALQAWKKAISDP  
FKTTANWVGS DVCSYNGVYCAPALDDDSLTVVAGVDLNHADIAGHLPELGLMTDLALFHINSNRFCGIIPKLSKL  
ALMYEFDVSNRNFVVGQFPEVSLSWPSLKLFLDLRYNEFEGSLPSEIFDKDLDAIFLNHNRFESVPGTIGKSKASVVT  
FANNKFSGCIPKSIGNMKNLNEIVFTGNLGTGCFNEIGLLNNVTVFDASKNGFVGLPSTLSGLASVEQLDLSHNK  
LTGFVVDKFKLPLNLSDFKFSYNFFNGEAESCVPGRNNGKQFDDTNNCLQNRPSQKPAKQCLPVVSRPVDCSKDKCS  
GGSNGGSSPNPPTTPEKPKPEPVMKPKSDSSKPKTPKTPEQPSPKPQPPKHESPKPEEPENKHELKPKQKESPK  
PQSPKPEDSPKPEQPKPEESPKPEQPIPEPTKVPSPNEAQGTPDDPYDASPVKNRR**SPPPP****KVEDTRVPPQPP**  
**MP****SP****SPP****SPIY****SPPPP****VH****SPPPP****VYS****SPPPP****HVY****SPPPP****V****SPPPP****SPPPP****VH****SPPPP****V****SPPPP****V****SPPPP****SPVY**  
**SPPPP****SH****SPPPP****VYS****SPPPP****TF****SPPPP****THNTN****QPP****MG****A****PT****PT****Q****A****P****T****P****S****S****E****T****T****Q****V****P****T****P****S****S****E****S****D****Q****S****I****L****S****P****V****Q****A****P****T****V****Q****S**  
**TP****S****S****E****P****T****Q****V****P****T****P****S****S****E****S****Y****Q****A****P****N****L****S****P****V****Q****A****P****T****V****Q****A****P****T****S****S****E****T****S****Q****V****P****T****P****S****S****E****S****N****Q****S****P****S****Q****A****P****T****I****L****E****P****V****H****A****P****T****P****N****S****K****P****V****Q**  
**S****P****T****P****S****S****E****P****V****S****S****E****Q****S****E****E****V****E****A****E****P****T****P****V****N****P****S****S****V****P****S****S****S****P****S****T****D****T****S****I****P****P****P****E****N****N****D****D****D****D****D****G****D****F****V****L****P****P****H****I****G****F****Y****A****SPPPP****MFQGY**

>At1g62440-LRX2 68414.m07044 leucine-rich repeat family protein / extensin family protein similar to extensin-like protein [Lycopersicon esculentum] gi|5917664|gb|AAD55979; contains leucine-rich repeats, Pfam:PF00560; contains proline rich extensin domains, INTERPRO:IPR002965  
MESSDDCFIQLEVSRLGVNDLLSFENYRTSFPWDSYSGLDGFFHLGAVDDEGNLTEIGQLMNLEIRGDDDDDDISD  
DNIKVDPSLKFENPSLRQAYIALQSWQAIIFSDPFNFNTANWNGSDVCSYNGIFCAPSPSSPKTRVAGIDLNHADMA  
GYLPRELGLLTDLALFHLNSNRFCGEVPLTFKHMKLLFELDLSNNRFVVGKFPNVVLSLPSLKLFLDLRYNEFEGSIPS  
KLFDKELDAIFLNHNRFMFGIPENMGNSPVSALVADNDLGGCIPGSIGLMGKTLNEIILSNDNLTGCLPPQIGNLK  
NVTVFDISFNRLSGPLPSSIGNMKSLEQLNVANNRFTGVIPSSICQLSNLENFTYSSNFFTGDAAPRCVALLGDNVVV  
NGSMNCIDGKEDQRSSKECSPASRSVDCSKFGCENNFF**SPPPP****SFKMSPTVRVLP****PPPP****SSKMSPTFRAT****PPPP****SSK**  
**MSP****SFRAT****PPPP****SSKMS****SFRAT****PPPP****SSKMS****SP****V****K****A****P****P****P****P****P****P****P****E****Y****E****P****SPPPP****SSEMS****PS****VR****A****P****P****P****P****L****SPPPP****S**  
**PPPP****Y****Y****S****SPPPP****SP****SPPPP****Y****Y****S****SPPPP****V****N****C****P****P****T****T****Q****SPPPP****K****Y****E****Q****T****P****S****P****R****E****Y****Y****P****S****P****P****Y****Y****O****Y****T****S****SPPPP****T****Y****A****T****Q**  
**SPPPP****P****P****T****Y****A****V****Q****SPPPP****P****V****Y****P****P****V****T****A****SPPPP****P****V****Y****T****P****V****I****Q****SPPPP****P****V****Y****S****P****V****T****Q****SPPPP****P****V****Y****P****P****V****T****Q****SPPPP**  
**P****V****Y****P****P****V****T****Q****SPPPP****P****V****Y****L****P****V****T****Q****SPPPP****P****S****P****V****Y****P****P****V****A****K****SPPPP****P****S****P****V****Y****P****P****V****T****Q****SPPPP****S****T****P****V****E****Y****H****P****P****A****S****N****Q****SPPPP**  
**Y****Q****SPPPP****K****G****C****N****D****S****P****S****N****D****H****Y****Q****T****P****P****S****L****P****P****P****Y****E****D****T****L****P****P****I****R****G****V****S****Y****A****SPPPP****S****I****P****Y**

>At2g15880-PEX3 68415.m01820 leucine-rich repeat family protein / extensin family protein similar to extensin-like protein [Lycopersicon esculentum] gi|5917664|gb|AAD55979; contains leucine-rich repeats, Pfam:PF00560; contains proline rich extensin domains, INTERPRO:IPR002965  
MPHIYKQPLGIFQGFVPTLTDAEVSFIAQRQLLTLPENGLPDDIEYVDLKVTFANHRLKRAYIALQAWKKAIVYS  
PFNTTGNWHGPHVCGYTGVCAPALDDPDVAVVAGVDLNGADIAGHLPAELGLMTDVAMFHLNSNRFCGIIPKSFEK

LSLMHEFDVSNRNFVGGPFPSVVLSPAVKFI DVRYNDFEGQVPPELFFKKDLDAIFLNNRFTSTIPDSLGESSASV  
TFAHNKFSGCIPRSIGNMKNLNEIIFKDNSLGGCFPSEIGKLANVNVFDASMNSFTGVLPPSFVGLTSMEEFDISGN  
KLTGFIPENICKLPKLVNLT VAYNYFNGQGDSCVPGSQKQIALDDTRNCLPDRPKQRSACECAVVISRPVDCSKDKC  
AGSSQATPSKSPSPVTRPVHKPQPKESQPNDPYNQSPVKFRRSPPPPQPHHHVVHSPPPASSPPTSPPVHST  
PSPVHKPQPKESQPNDPYDQSPVKFRRSPPPPVHSPPPSPPIHSPPPPVYSPPPPVYSPPPPVYSPPP  
PPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSP  
PPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSP  
SQTVEAPPSEEFIIIPFFIGHQYASPPPPMFQGY

>At3g19020-PEX1 68416.m02415 leucine-rich repeat family protein / extensin  
family protein similar to extensin-like protein [Lycopersicon esculentum]  
gi|5917664|gb|AAD55979; contains leucine-rich repeats, Pfam:PF00560; contains  
proline rich extensin domains, INTERPRO:IPR002965

MTRRTMEKPFGCFLLLFCFTISIFFYSAAALTDEEASFLTRRQLLASENGDLPDDIEYEVLDLDFKANNRLKRAYI  
ALQAWKKAFFYSDPFNTAANWVGPVCSYKGVFCAPALDDPSVLVVGADLNHADIAGYLPPELGLLTDVALFHVNSN  
RFCGVIPKSLSKLTLMEYFDVSNRNFVGGPFPTVALSWPSLKFLDIRYNDFFEGKLPPEIFDKDLDAIFLNNRFE  
PETIGKSTASVVTFAHNKFSGCIPKTIGQMKNLNEIVFIGNNSLGLPNEIGSLNNVTVFDASSNGFVGS  
LANVEQMDFSYNKFTGFVTDNICKLPKLSNFTFSYNFFNGEAQSCVPGSSQEKQFDDTSNCLQNRPNQKSAKE  
VSRPVDCSKDKCAGGGGGSNPSKPTPTPKAPEPKKEINPPNLEEPSKPKPEESPKPQQPSKPKPETPSHE  
PKPESPKQESPKTEQPKPKPESPKQESPKQEAQPKPEQPKPKPESPKQESSKQEPKPEESPKPEPKPEES  
KQETPKPEESPKPQQPKQETPKPEESPKPQQPKQETPKPEESPKPQQPKQETPKPEESPKPQQPKQETPK  
SPIKRRPQPPSPSTEETKTTSPQSPPVHSPPPPVHSPPPVFSPPPMHSPPPVYSPPPVHSPPPVHSP  
PPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSP  
VHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSPPPVHSP  
STPVQAPTDSIEDIEAPSDSNHSPVFKSSPAPSPDSEPEVEAPVPSSEPEVEAPKQSEATPSSSPSSNPSP  
PSEDNDDGDNFILPPNIGHQYASPPPPMFPGY

>At3g22800-LRX6 68416.m02874 leucine-rich repeat family protein / extensin  
family protein similar to extensin-like protein [Lycopersicon esculentum]  
gi|5917664|gb|AAD55979; contains leucine-rich repeats, Pfam:PF00560; contains  
proline rich extensin domains, INTERPRO:IPR002965

MREDTFFFQWVFLVSLGSFIFLLPOAFTYHTPPINPCFAHPFLPPIITNPRLLKAFTALQAWKFTITSDPN  
GPNVCNYTGVFCAPALDNPYVLTVAGIDLNHANIAGYLPLELGLLTDLALFHINSNRFQGLPKTLKCLHLL  
SNNKLSGEFSPSVIFSLPSLKFLDIRFNEFQGDVPSQLFDLNLDFINDNKFQFRLPRNIGNSPVSVLVL  
SCVPPSFYKMGKTLHEIITNSQLTGCLNREIGLLNQLTVFDVSYNNLVGSLPETIGDMKSLEQLNIAHNK  
ESICRLPRLENFTYSNFFSGEPPACLRLQEFDDRRNCLPSRPMQRLAELCKSFSSYPIDCASFGCSPP  
PP  
VYVPSPPPPPPSPPPPVYPPPPPPVYPPPPSPPVYPPPPSPQPVYPSPPCN  
DLPTPVHY

>At3g24480-LRX4 68416.m03070 leucine-rich repeat family protein / extensin  
family protein similar to extensin-like protein [Lycopersicon esculentum]  
gi|5917664|gb|AAD55979; contains leucine-rich repeats, Pfam:PF00560; contains  
proline rich extensin domains, INTERPRO:IPR002965

MKNNTTQSLLLLLLFFFFFIEISHLSLSSISNAPLSDTEVRFIQRRLYYRDEFGRGENVTVDPSLIFENPRL  
YIALQAWKQAILSDPNITVNWIGSNVCNYTGVFCASKALDNKIRTVAGIDLNHADIAGYLPPELGLLTDL  
SNRFCGTVPKFKQKLLFELDLNRRFAGKFPPTVVLHPLSLKFLDLRFNEFEGTVPKELFSKNLDAIFIN  
ELPENFGDSPVSVIVLANNHFHGCIPVSLVEMKNLNEIIFMNNGLNSCLPADIGRLKNVTVFDVSNELV  
GGMVEVEQLNVAHNLLSGKIPASICQLPKLENFTYSNFFFTGEAPVCLRLSEFDDRRNCLPGRPAQRSS  
RPSVDCGSFGGRSVVKPSPPIVALPPPPPPSPLPPPVYSPPPSPPVYSPPPPSIHYSPPPPVH  
HSPPPPSPEFEGPLPPVIGVSYASPPPPPFY

>At4g13340-LRX3 68417.m02084 leucine-rich repeat family protein / extensin  
family protein similar to extensin-like protein [Lycopersicon esculentum]  
gi|5917664|gb|AAD55979; contains leucine-rich repeats, Pfam:PF00560; contains  
proline rich extensin domains, INTERPRO:IPR002965

MKKTIQILLFFFLLINLTNALSISSDGGVLSDNEVRHIQRRQLLEFAERSVKITVDPSLNFENPRLRNAYIALQAWK  
QAILSDPNNFTSNWIGSNVCNYTGVFCSPALDNRKIRTVAGIDLNHADIAGYLPEELGLLSDLALFHVNSNRFVCGTV  
PHRFNRLKLLFELDLNRRFAGKFPTVVLQPLSLKFLDLRFNEFEGTVPKELFSKDLDAIFINHNRRFRFELPENFGD  
SPVSVIVLANNRFHGCVPSSLVEMKNLNEIIFMNNGLNSCLPSDIGRLKNVTVFDVSNELVGLPESVGMVSVEQ  
LNVAHNMLSGKIPASICQLPKLENFTYSYNFFFTGEAPVCLRLPEFDDRRNCLPGRPAQRS PGQCKAFLSRPPVNCGS  
FSCGRSVSPRPPVVTPLPPPSLP SPPPPAPIFSTPPTLT SPPPPSPPPPVYSPPPPPPPPPPVYSPPPPPPPPPPPP  
VYSPPPPPPPPPPPPVYSPPPPSPPPPPPVYSPPPPPPPPPPPPVYSPPPPVYS SPPPPSPAPTVPYCTRPP  
PPPH SPPPPQF SPPPPPEP VYYS SPPPPHS SPPPH SPPPPHS SPPPPH IYPL SPPPPPTPV S SPPPTPVY SPPPPPC  
EPPPPPCIEY SPPPPFPVHHYS SPPPPVYYS SPPPPVYYS SPPPPVHHYS SPPPEVHHYS SPPPSPVHHYS SPP  
PPSAPCEE SPPPAFVVHH SPPPMVHHS SPPPIVHQ SPPPSPEYEGPLPPVIGVSYA SPPPPPFY

>At4g18670-LRX5 68417.m02762 leucine-rich repeat family protein / extensin family protein similar to extensin-like protein [Lycopersicon esculentum] gi|5917664|gb|AAD55979; contains leucine-rich repeats, Pfam:PF00560; contains proline rich extensin domains, INTERPRO:IPR002965

MKTKMMMKNTSLIFVLLFITFFFSTISYSLSLTFNGDLSDNEVRLITQRQLLYFRDEFGRGENVDVDPVSLVFNENP  
LRNAYIALQAWKQAILSDPNNFTTNWIGSDVCSYTGVCAPALDNRRI RTVAGIDLNHADIAGYLPQELGLLTDLAL  
FHINSNRFVCGTVPHRFNRLKLLFELDLNRRFAGIFPTVVLQPLSLKFLDLRFNEFEGPVPRELFSKDLDAIFINHN  
RFRFELPDNLGDSVSVIVVANNHFHGC IPTSLGDMRNLEE IIFMENGFN SCLPSQIGRLKNVTVFDVSNELVGS  
PASIGMVSMEQLNVAHNRFSGKIPATICQLPRLENFTFSYNFFFTGEPPVCLGLPGFDDRRNCLPARPAQRS PGQCA  
AFSSLPPVDCGSGFCGRSTRPPVVPSPPTTSPGGSPSPSISPSPPITVPSPTTSPGGSPSPSIVPSPPST  
PSPGSPPTSPPTTPGGSPSPSPTTTPGGSPSPSPTTTPGGSPSPSPTTSPGGSPSPSISPSPPITVPSPPST  
PTSPGSPSPSPTSPSPSPPTPSTPPTPISPGQNSPPIIPSPFFTGPSPPSPSPPLPPVIPSPPVIGPTPS S  
PSTPTPGTLLHPHLLLQLSHLPHQYLHRLRHLILPSRHRLLRRKHTIHRNHLHNNPRNLQFTALPLLLPLYLTC  
RHRLNLA SPPPPAPVYYS SPPQPPPPHYSLPPPTPT VHYISPPPPPTPIHS SPPPSHPPCIEY SPPPPPTVHYNPP  
PPSPAHY SPPSPPVYYS SPPPPAVHY SPPPPVIHHSQPPPPPIYEGPLPPIPGISYA SPPPPPFY

>At4g33970-PEX4 68417.m04820 leucine-rich repeat family protein / extensin family protein similar to extensin-like protein [Lycopersicon esculentum] gi|5917664|gb|AAD55979; contains leucine-rich repeats, Pfam:PF00560; contains proline rich extensin domains, INTERPRO:IPR002965

MPFYKQPWVFSKVFVLAMAKPSPFGCCFFLLFFSFLSSS FVSFALTDTEAAFI VQRQLLTLDPNGELPDDIEYEVDL  
KATFANTRLKRAYIALQAWKKAIFSDPFNTTGNWHGPHVCGYTGVCAPALDDSDVTVVAGVDLNGADIAGHLPAEL  
GLMTDVAMFHLNSNRFVCGIIPKSF EKLMHEFDVSNRRFVGPFPNVVLSWPDVKYFDLRFNDFEGQVPELFFKEL  
DAIFLNDNRFTSVIPELGE SPASVVT FANNKFTGCIPK SIGNMKNLNEIVFMDNDLG GCFPSEIGKLSNVTVFDAS  
KNSFIGRLPTSFVGLTSVEEIDISGNKLTGLVPHNICQLPNLVNLT YSYNYFSGQGGSCVPGGRKEIALDDTRNCL  
ASRPEQRSAQECVVINRPVDCSKDKCAGGSSTPSKPSVHKPTPVPTT PVHKPTPVPTT PVQKPSVPTT PVQKPS  
PVPTT PVHEPSPVLATPVDKPSVPSRPVQKPPKESQPDDPYDQSPVTKRR SPPPAFVN SPPPVYSPPPPPP  
VHSPPPPVHS SPPPPVYSPPPPPPVHS SPPPPVF SPPPPVYS SPPPPVHS SPPPPVHS SPPPPAPVHS SPPPPVHS SPPPP  
PVYSPPPPVF SPPPSQSPPVVYS SPPPRPPKINSPPVQS SPPPAVVEKKTTPAHAPAPSDEFIIPPFIGHQYASPP  
PMFAGY

>At5g25550-LRX7 68418.m03040 leucine-rich repeat family protein / extensin family protein similar to leucine-rich repeat/extensin 1 (GI:13809918) [Arabidopsis thaliana]; contains Pfam PF00560: Leucine Rich Repeat domains

MRIYQPTLLIFTTVLLSISAVAPGGSRQLLYTRDDPITIPPYLIFENVRLERAYVALQAWKRAMISDPWNLT TNWF  
GSRVCDYNGVVCESLDDPLVKT VSGVDLNQGD IAGHLPEELGLLTDIALFHVNSNRFVCGTLPVGFSQLSLLFELD  
SNRRFAGKFPEVVI GLPKLYLDLRYNEFEGELPESLFDKDL DALFLNSNRFRSKI PVNMGNSPVSVLVLASNRFEG  
CIPPSFGKMGKTLNEI IILMDNGLQSCIPNDMGLLQNVTVL DI SYNWL VGELPKSMGQ MENLEVLNVERNML SGLIPD  
ELCSLEKLRDFRYGSNYFTGEPATCRYLEN YNY TMNCFKDVRDQRSMMECKMFLSKPVDCDSFKCSPGSSCF SPPPS  
QISPSSQPLAPAPSPTSPPLSTPPPARPCPPVYSPPPPPLSLAPSMN

>At1g10620-PERK11 68414.m01204 protein kinase family protein contains serine/threonine protein kinases active-site signature, PROSITE:PS00108  
MDKVQQADLFGKTI SPPFVASQPTNVGGFTDQKI IGGSETTQPPATSPSPSPSDTQT SPPATAAQPPNPQPPNTT  
PPPTPPS SPPSITPPSPSPQPPPPQSTPTGDSPVVIFPKPQLPPPSLFPFPPSLVNQLPDRPNNDNNILEPINNP  
ISLSPSPSTPFPSPSQENSGSQSPPLSSLPLPMLPLNPNSPGNLQPLD SPLGGESNRVPSSSSSSPSPPSLGSNN



HSGGSNRHNANSNGDGGTSQQSNESNYTEKTVIGIGIAGVVLVILFIAGVFFVRRKQKKGSSSPRSNQYLPPANVSVN  
TEGFIHYRQKPGNGNSSAQNSSPDNTSLGNPKHGRGTPDSAVIGTSKIHFTYEELSQITEGFCKSFVVGEGGFVGCVY  
KGILFEGKPVAIKQLKSVSAEGYREFKAEVEIISRVHHRHLVSLVGYCISEQHRFLIYEFVFNNTLDYHLHGKNLPLV  
LEWSRRVRIAIGAAGLAYLHEDCHPKIIHRDIKSSNILLDDEFEAQVADFGLARLNDTAQSHISTRVMGTFGYLAP  
EYASSGKLTDRSDVFSFGVVLLELITGRKPVDTSQPLGEESLVEWARPLIEAIEKGDISEVVDPRLENDYVESEVY  
KMIETAASCVRHSALKRPRMVQVVRALDTRDDLSDLTNGVKVQSRVYDSGQYSNEIRIFRRASEDSSDLGTNTGY  
PSQDYATSHEYESESRAFNTSHRNH

>At1g23540-PERK12 68414.m02960 protein kinase family protein contains Pfam  
domain, PF00069: Protein kinase domain  
MSDLGESPPSSPPAPPADTAPPETPSENSALPPVDSSPPSPADSSSTPPLSEPSTPPPDSQLPPLPSILPPLTDS  
FPPFSDSSPPVDSTPSPFFETSNESSPPEDSETPPAPPNESNDNNPPPSQDLQSPFFSSSPNVGPTNPESPPLOS  
PPAPPASDPTNSPPASPLDPTNPPPIQPSGPATSPPANPNAPSPFPTVPPKTPSSGPVVSPLTSPSKGTPTPNQG  
NGDGGGGGGGGYQKTMVGMVAVAGFAIMALIGVVFLVRRKKNRIDSYNHSQYLPHNFSVKS DGFLYQDPGKGYSS  
GPNGSMYNNSSQQQSSMGNSYGTAGGGYPHHQMSSGTPDAILGSGQTHFSYEELAEITQGFARKNILGEGGFVGCV  
YKGLTQDGKVVAVKQLKAGSGQGDREFKAEVEIISRVHHRHLVSLVGYCISDQHRLLIYEVSNQTLHHLHGKGLP  
VLEWSKRVRRIAIGSAKGLAYLHEDCHPKIIHRDIKSANILLDDEYEAQVADFGLARLNDTTQTHVSTRVMGTFGYLA  
PEYASSGKLTDRSDVFSFGVVLLELVTGRKPVDTQPLGEESLVEWARPLLLKAIETGDLSELIDTRLEKRYVEHEV  
FRMIETAAACVRHSGPKRPRMVQVVRALDCDGDSDISNGIKIGQSTTYDSGQYNEDIMKFRKMAFGGDNSVESGLY  
SGNYSKSSSDFSGNESETRPFNNRRF

>At1g26150-PERK10 68414.m03192 protein kinase family protein similar to Pto  
kinase interactor 1 GI:3668069 from [Lycopersicon esculentum]  
MTTPAQAPREEVSLSPSLASPLMALPPPQPSFPGDNATSPTREPTNGNPPETTNTPAQS SPPPETPLS SPPPEPSP  
PSPSLTGPPPTTIPV SPPPEP SPPPLPTEAPPPANPVSSPPES SPPPPPTTEAPPTTIPITSPSPPTNPPPPPEP  
PSLPAPDPPSNPLPPPKLVPSSHSPRHLPSPPASEIPPPRHLPSPPASERPSTPPSDSEHP SPPFGHPKRRQEP  
PPPGSKRPTSPSPSPSDSKRPVHPSPPSPEETLPPPKPSDPLPSNSSSPTLLPSSSVVSPSPPRKSVSGPDNP  
SPNNPTPVTDNSSSSGISIAAVVGVSIGVALVLLTLIGVVVCCCLKRKRRLSTIGGGYVMPTPMESSSPRSDSALLK  
TQSSAPLVGNRSSNRTYLSQSEPGGFGQSRELFYSYEELVIATNGFSDENLLGEGGFGRVYKGVLPDERVVAVKQLKI  
GGGQGDREFKAEVDTISRVHHRNLLSMVGYCISENRRLLIYDYVPNNNLYFHLHGTPGLDWATRVKIAAGAARGLAY  
LHEDCHPRIHRDIKSSNILLNENFHALVSDFLAKLALDCNTHITTRVMGTFGYMAPEYASSGKLTEKSDVFSFGV  
VLELITGRKPVDSQPLGDESLEWARPLLSNATETEEFTALADPKLGRNYVGVEMFRMIEAAAACIRHSATKRPR  
MSQIVRAFDSLAEEDLTNGMRLGESEIINSAQQSAEIRLFRMAFGSQNYSTDLSLTRNSYISKDENL

>At1g49270-PERK7 68414.m05524 protein kinase family protein contains Pfam  
domain PF00069: Protein kinase domain  
MAEQSPENSPPAPPPSPSSPSSNDQOTT SPPSDNQETT SPPFSSPDIAPPPQQQOE SPPFPLPENSSDGSSS  
SPPFSDSSSQS SPPFSTSPQQSDNNGNKGNNNENKNGNDGSSGDGKNMSHTPPPPSKTSDHSSHSQPRSL  
APPTSNSGNSSSNDGLNIGAVIGLVAAAGILFIVMILLCVCCFRKKKKKSKLDQMPYYGSNAYPAGKTGGDQYYNQ  
NAATQQQHYNQNDHIVNLPPPPGSMGTNWVS SPPPPPGNWQPMPSPPAPVSGGANVIQSGEMSSNFSSGPYAPSL  
PPPHPSVALGFNNSTFTYEELASATQGFSKDRLLGQGGFGYVHKILPNGKEIAVKSLKAGSGQGEREFQAEVEIIS  
RVHHRHLVSLVGYCSNAGGQRLLVYEFPLPNDTLEFHLHGKSGTVMDWPTRLKIALGSAKGLAYLHEDCHPKIIHRDI  
KASNILLDHNFEAKVADFGLAKLSQDNNTHVSTRVMGTFGYLAPEYASSGKLTEKSDVFSFGVLMLELITGRGPVDL  
SGDMEDSLVDWARPLCMRVAQDGEYEGELVDPFLEHQYEPYEMARMVACAAA VRHSGRRRPKMSQIVRTLEGDASLD  
DLDDGVKPKQSSSGGEGSSDYEMGTYGAEMRKRKVTLESRDYGASSEYATSEYGLDPSSSSSEEMHIGGSTSKTT  
TTNRGI

>At1g52290-PERK15 68414.m05900 protein kinase family protein contains Pfam  
PF00069: Protein kinase domain  
MSTDTIPSLSSPPAPEFPSTTPDTATSPAPSQPSIIGPSSLAPFPETTTNIDGGSRNVALTGLITGVVLGATFVLLG  
VCIFVCFYKRKRKRLK KKKKEDIEASINRDSLDPKDDSNLQQWSSSEIGQNLFTYEDLSKATS NFSNTNLLGQGGF  
GYVHRGVLVDGTLVAIKQLKSGSGQGEREFQAEIQTISRVHHRHLVSLVGYCITGAQRLLVYEFVFNKTLFHLHEK  
ERPVMESKRMKIALGAAGLAYLHEDCNPKTIHRDVKAANILIDDSYEAKLADFLARSSLDTDTHVSTRIMGTFG  
YLAPEYASSGKLTEKSDVFSIGVVLLELITGRRPVDKSPFADDDSIDWAKPLMIQALNDGNFDGLVDPRLENDFD  
INEMTRMVACAAA SVRHSARRPKMSQIVRAFEGNISIDDLTEGAAPGQSTIYSLDGSSDYSSSTQYKEDLKKFKKMA  
FESKTFGSSECSGLTSDNGQNPSGSSSITTEGQRTTQEIEPEKNTKDT

>At1g70460-PERK13 68414.m08107 protein kinase, putative contains Pfam  
PF00069: Protein kinase domain  
MSDSPTSSPPAPSADSAPPPDTSSDGSAAAPPPTDSAPPPSPPADS**SPP**ALPSLPPAVF**SPP**TVS**SPPPP**LDS**SPP**  
**PPPP**DLTPPPS**SPPPP**DAPPPIPIVFPPPID**SPP**ESTNS**SPP**PEVFEP PPPPADEDESPPAPPPPEQLPPPASSPQ  
GGPKKPKKHHPGPATSPPAPSAPATSPPAPPNAPPRNSSHALPPKSTAAGGPLTSPSRGVPSSGNSVPPPANSGGGY  
QGKTMAGFAIAGFAVIALMAVFLVRRKKRNIDAYSDSQYLPPSNFSIKSDGFLYGQNPTKGYSGPGGYSQQQSN  
SGNSFGSQRRGGGYTRSGSAPDSAVMGSGQTHFTYEELTDITEGFSKHNILGEGGFVCVYKGLNDGKLVAVKQLKV  
GSGQGDREFKAEVEIISRVHHRHLVSLVGYCIADSERLLIYEYVFNQTLHHLHGKGRPVLEWARRVRIAIGSAKGL  
AYLHEDCHPKIIHRDIKSNILLDDEFEAQVADDFGLAKLNDSTQTHVSTRVMGTFGYLAPEYASGKLTDRSDVFSF  
GVVLELITGRKPVDDQYQPLGEEESLVEWARPLLHKAIEITGDFSELVDRRLEKHYVENEVFRMIETAAACVRHSGPKR  
PRMVQVVRALDSEGDMGDISNGNKVQSSAYDSGQYNNNDTMKFRKMAFGFDDSSSDSGMYSGDYSVQDSRKGSSNGASS  
EFTRNETENRNFNNRRY

>At2g18470-PERK4 68415.m02151 protein kinase family protein contains Pfam  
PF00069: Protein kinase domain  
MASSPESAPPTNSTSSPSPSNTNSTSSPPAPSPSPPTPPQGDSSS**SPP**DSTSPAPQAPNPPNSSNNSPSPPSQ  
GGGGERGNGGNGGNDTPPSRGSPPSPSRSDGNGSRSSPPGDTGGSRSNDNPPSSGGSSGGGGGGRSNTNTAIIV  
GVLVAGALLMIVLIIIVCLRRKKRKRKDSFYPEPMKGNQ**YQ**YGNNNNNNASQNYPNWHLNSQGNQOSTGGWGGGGPS  
**PPPP**RMPTSGEDSSMYSGPSRPVLPSPALALGFNKSTFTYQELAAATGGFTDANLLGQGGFGYVHKGVLPSPGKE  
VAVKSLKAGSGQGEREFQAEVDIIISRVHHRHLVSLVGYCIADGQRLVYEFVFNKTLEYHLHGKLPVMEFSTRLRI  
ALGAAKGLAYLHEDCHPRIIHRDIKSNILLDFNFDAMVADDFGLAKLTSNNTHVSTRVMGTFGYLAPEYASSGKLT  
EKSDVFSYGVMLLELITGRKPVDNSITMDDTLVDWARPLMARALEDNFNELADARLEGNYNPQEMARMVTCAAASI  
RHSGRKRPKMSQIVRALEGEVSLDALNEGVKPGHSNVIYGLGASSDYSQTSYNADMKKFRQIALSSQEFVPSDCEGT  
SSNDSRDMGTKSPTPPK

>At3g18810-PERK6 68416.m02389 protein kinase family protein contains Pfam  
PF00069: Protein kinase domain  
MAEQSPENSPPSPTPPSPSSSDNQOQS**SPP**SDSSSPSPAPPPDDSSNGSPQPPSSDSQSPSPQGNNDGNN  
GNNNNNPNNNNGNNNNNDNNNGNNKDNNNNGNNNNNGNNNNGNDNNGNNNNGNNNDNNNQNNGGSSNNR**SPP**SRNS  
DRNSPSPRALAPPSSGGGSSNGNEPNTAAIVGIVAGAGLLFLVMILFCVCCCRKKKKKHQMPYYAGNGYATGK  
GDQYQQQYNNQSDHVMNLSQQYPGSNGNNNWMN**SPPPP**PGSWQP**SPPPP**PPVSGGMNGNSSDFSSNYSGPHGPS  
VPPPHPSVALGFNKSTFTYDELAATQGFQSRLLGQGGFGYVHKGILPNGKEIAVKSLLKAGSGQGEREFQAEVDII  
SRVHHRFLVSLVGYCIAGGQRLVYEFVFNQTLHHLHGKSGKVLDPWTRLKIALGSAKGLAYLHEDCHPRIIHRDI  
KASNILLDESFEAKVADDFGLAKLSQDNVTHVSTRIMGTFGYLAPEYASSGKLTDRSDVFSFGVMLLELVTGRRPVDL  
TGEMEDSLVDWARPICLNAAQDGDYSELVDPRLNQYEPHEMAQMVACAAA AVRHSARRRPKMSQIVRALEGDATLD  
DLSEGGKAGQSSFLGRGSSSDYDSSTYSADMKKFRKVALDSHEYGASSEYGNNTSEYGLDPSSSSSEEIRGGANNK  
TTPSRDH

>At3g24540-PERK3 68416.m03082 protein kinase family protein contains protein  
kinase domain, Pfam:PF00069  
MARSNRCVPQNSSIVQIPIEEVFKTQLKSRWQITMSSAS**SPP**QVVFPEPLFSEPPPPKAPVNVSL**SPPPP**RS  
PSTSTPPRLGNRNPPPPASPSGQEPPTPTMTPGFSLSPSPSRLSTGAVVGISIGGGVFVLTLIFFLCKKKRPRDDK  
ALPAPIGIHQSTFTYGEARATNKFSEANLLGEGGFVYKILNNGNEVAVKQLKVGSAQGEKEFQAEVNIISQIH  
HRNLVSLVGYCIAGAQRLLVYEFVFNQTLHHLHGKGRPTMEWSLRLKIAVSSSKGLSYLHENCNPKIIHRDIKAA  
NLIIDFKFEAKVADDFGLAKIALDTNTHVSTRVMGTFGYLAPEYAAAGKLTAKSDVYSFGVLELITGRRPVDANNVY  
ADDSLVDWARPLLVQALEESNFEGGLADIKLNNEYDREEMARMVACAAAACVRYTARRRPRMDQVVRVLEGNISPSDLN  
QGITPGHSNTVSVRLDARAVRVKPHGEMDSRWGRFKRTAQRYGGDSL

>At3g24550-PERK1 68416.m03083 protein kinase family protein contains Pfam  
domain PF00069: Protein kinase domain  
MSTAPSPGTTSPSPSPPTNSTTTTTPPPAAS**SPP**TTTTPS**SPP**SPSTNST**SPP**SSPLPPSLPPSPPPGLTPPL  
PQPSAPITPPSPSPTTPSNRSPSPSNQGPNTPSGSTPRTPSNTKSPSPSDSSDGLSTGVVVGIAIGGVAILVI  
LTLICLLCKKKRRRRRHDEAAAYVPPPPSPGPKAGGYPYGGQQYQWQQNASRPSDNHVVTSLPPKPPSPRPPPP  
PPPPAFMSSSGSDYSDLPVLPSPGLVLGFSKSTFTYEELSRATNGFSEANLLGQGGFGYVHKGILPSGKEVAVK  
QLKAGSGQGEREFQAEVEIISRVHHRHLVSLIGYCMAGVQRLVYEFVFNQTLHHLHGKGRPTMEWSLRLKIALG  
AKGLSYLHEDCNPKIIHRDIKASNILIDFKFEAKVADDFGLAKIASDTNTHVSTRVMGTFGYLAPEYAAAGKLTAKSD  
VFSFGVLELITGRRPVDANNVYVDDSLVDWARPLLNRASEEGLADSKMGNEYDREEMARMVACAAAACVRHS

ARRRPRMSQIVRALEGVSLSDLNEGMRPGHSNVYSSYGGSTDYDTSQYNDDMIKFRKMALGTQEYGTTEYSNPTS  
DYGLYPSGSSSEGGATREMEMGKIKKTGGYSGPSL

>At4g32710-PERK14

MPPPIHAKYISSGGCDTKENNSVAKNISMPSGMFSYEELSKATGGFSEENLLGEGGGFGYVHKGVLLKNGTEVAVKQLK  
IGSYQGEREFQAEVDTISRVRHKKHLVSLVGYCVNGDKRLLVYEFVPKDTLEFHLHENRGSVLEWEMRLRIAVGAAGK  
LAYLHEDCSPTIIHRDIKAANILLDSKFQAEVSDVDFGLAKFFSDTNSSTHISTRVVGTFGYMAPEYASSGKVTDKSD  
VYSFGVVLLELITGRPSIFAKDSSTNQSLVDWARPLLTKAISGESFDFLVDVSRLEKNYDTTQMANMAACAAACIRQS  
AWLRPRMSQVVRALGEVALRKVEETGNSVTVYSSSENPNIDITPRYGTNKRFRFDTGSSDGYTSEYGVNPSQSSSEHQQ  
VNT

>At4g34440-PERK5 68417.m04894 protein kinase family protein contains Pfam  
domain, PF00069: Protein kinase domain

MADSPVDSSPAPETSNGTTPSNGTSPSNESPPTPPSSPPSSISAPPDISASFSPPPAPPTQETSPPTSPSSSPP  
VVANPSPQTPENPSPPAPEGSTPVTPAPPQTPSNQSPERPTPPSPGANDDRNRTNGGNNNRDGTSPSPSSGNRTS  
GDGGSPSPPRSISPPQNSGSDSSSGNHPQANIGLIIGVLVAGLALLLLAVCICICCNRKKKKKSPQVNHMHYNNN  
PYGGAPSGNGGYKGTPODHVVNMAGQGGNWPQPVSGPHSDASNLTGRTAIPSPQAATLGHNQSTFTYDELSIA  
TEGFAQSNLLGQGGFGYVHKGVLPKGKAVKSLKLGSGQGEREFQAEVDIISRVRHHRHLVSLVGYCISGGQRLVY  
EFIPNNTLEFHLHGKGRPVLDWPTRVKIALGSARGLAYLHEDCHPRIHRDIKAANILLDFSFTKQVADFLAKLSQ  
DNYTHVSTRVMGTFGYLAPEYASSGKLSKSDVFSFGVMLLELITGRPPLDLTGEMEDSLVDWARPLCLKAAQDGDY  
NQLADPRLELNYSHQEMVQMASCAAAAIRHSARRRPKMSQIVRALEGDMSMDDLSEGTRPGQSTYLSPGSVSSEYDA  
SSYTADMKKFKKLALENKEYQSSSEYGGTSEYGLNPSASSSEEMNRGSMKRNPL

>At5g38560-PERK8 68418.m04662 protein kinase family protein contains protein  
kinase domain, Pfam:PF00069

MSLVPLPILSPSSNSSTTAPPPLQTQPTTSPAPPVTPPPSPPOSPVVSSSPPPVVSPPSSSPPV  
TSPPPTVASSPPPVVIASPPSTPATTTPAPPQTVSPPPDASPSPPAPTTTNPCKPSPPGETPSPPGETPS  
PPKPSPTPTTTTTSPPPATASAPSSNPTDPSLAPPPTPLPVVPREKPIAKPTGPASNNGNLTPSSSPGKS  
EVGTGGIVAIGVIVGLVFLSLFVMGVWFTRKRKRKDPGTFVGYTMPPSAYSSPQSDVFLNRSRSPAPKMRSHSGS  
DYMYASSDSGMVSNQRSWFSDYDELSQVTSGFSEKNLLGEGGFGCVYKGVLSDGREVAVKQLKIGSQGEREFKAEVE  
IISRVRHHRHLVTLVGYCISEQHRLLVYDYPNNTLHYHLHAPGRPVMTWETRVRVAAGAARGIAYLHEDCHPRIHR  
DIKSSNILLDNSFEALVADFLAKIAQELDLNTHVSTRVMGTFGYMAPEYATSGKLSEKADVYSYGVILLELITGRK  
PVDTSQPLGDESLVEWARPLLGQAIENEEFDELVDPRLGKNFIPGEMFRMVEAAAACVRHSAKRPKMSQVVRALDT  
LEEATDITNGMRPGQSQVFDNRQQAQIRMFQRMAFGSQDYSSDFFDRSQSHSSWGSRDQSRFVP

>At3g11030-EXT50 68416.m01331 expressed protein contains Pfam domain PF03005:  
Arabidopsis proteins of unknown function

MTTALFSPSNRRKRRLTHFFFTVLAFILLAAFIYGHDFISFSRRSLHSPTIVHQSAIVVVVDEPPPPPTSPPPSP  
PPSPPPPSPPPPSPPPFAFAVGKTPEGCDVFKGNWVKDWSTRPLYRESECPYIQQLTCRTHGRPDSDYQSWRWRP  
DSCSLPSFNATVMLESRLRGKMMFVGDLSLRGMYVSLICLLHSQIPENSKSMDTFGSLTVFSLKDYNATIEFYWAPF  
LLESNSDNATVHRVSDRIVRKGSKINKHGRHWGADIVVFNTYLWWRGTGFKMKILEGSFKDEKRIVEMESDAYRMA  
LKTVMKWKVKNMDPLKTRVFFATMSPTHYKGEDWGGEQKNCYNQTTPIQDMNHWPSCSKTLMKVIGEELDQRAEF  
PVTVLNITQLSGYRKAHTSIYKKQWSPLTKEQLANPASYSDCIHWCLPGLQDTWNELFFAKLFYP

>At3g19430-EXT51 68416.m02464 late embryogenesis abundant protein-related /  
LEA protein-related similar to late embryogenesis abundant protein [Picea  
glauca] GI:1350543

MADTPPGIAKNPSSHATCIKIKYKHCYNLEHVCPKFCPDSCHVECASCKPICGPPSPGDDG  
GGDSSGGDDGGYTPPAPVPPVSPPPTPSVPSPTPPVSPPPPTTPSVPSPTPPVSPPPPTTPSVPSPTPPVSPPP  
PTTPSVPSPTPPVSPPPPTTPSVPSPTPPVPTDMPSPPPVSPPPPTTPSVPSPPDVTPTPTTPSVPSPPDVT  
PTPTTPSVPSPPDVTPTPTTPSVPTPSGSPYVPPPSDEEEAAGAKRVRCKQRSPCYGVEYTCPADCRSCQVDC  
VTCKPVCNCDKPGSVCQDPRFIGDGDLTFYFHGKDSNFCLISDPNLHINAHFIGKRRAGMARDFTWVQSIAILFGT  
HRLYVGAALKTATWDDSDVRIAVSFDGNVISLPQLDGARWTSPPGVYPEVSVKRVNTDTNNLEVEVEGLLKITARVVP  
ITMEDSRIHGVDKEDDLAHLDLGFKFQDLSDNVDGVLGQTYRSNYVSRVKIGVHMPVMGGDREFQTTGLFAPDCS  
AARFTGNGDSNNGRSKLELPEMSCASGLGGKGVVCKR

>At3g53330-EXT52 68416.m05884 plastocyanin-like domain-containing protein similar to mavicyanin SP:P80728 from [Cucurbita pepo]  
MITKKIFGFVLAITILLSCCSAKIYKVGGSRGWSGKTNSWAERKEFHVGDLSLIFQYHQNVNDVTQLSDALKYESCNS  
SSPKAVYNTGHDVTFLLSSMKSHVRSLLHHHEARPMNGHDPLAITPSPPPPSTKTHEPSRPITPSPPPPSTKTHEPSRPNT  
PPPPPPSKTHEPSRRITPSPPPPSTKILPFGKIYRVGDYGGWSVYYSYYSYKWSSEGKQFHVEDTLFFQYNKELNDVR  
EITDELEFRSCESTSTVAVYKTGHDLIKLTKPGVHYFVSLKTGLCQAGIKLRVTVQPSTEAVTFPNVPKKLSPTVN  
RW

>At1g62760-HAE1 68414.m07083 invertase/pectin methylesterase inhibitor family protein low similarity to extensin [Volvox carteri] GI:21992  
MNILSQTQILHLSIAILLFITSSSLSLSPSSSSPSLSPSPSSSPSSAPPSSLSLSPSPSPLSLSPSPSPSSPSSP  
LSSLSPSLSPSPSSSPSSAPPSSLSLSPSPSPLSLSPSPSPSSPSSSPLSSLSPSSSSSTYSNQTNLDYIKTSCNI  
TLYKTICYNLSLSPYASTIRSNPQKLAVIALNLTLSSAKSASKFVKNI SHGGGLTRLEVAVADCVEEIGDSVTSLQD  
SIRELDSINYKDSAKFEMVMSDVETWVSAALTNDTDCMDGFSLVKTAVKDLVRRHVVEVARLTSNALALINMYASTQ  
ENFS

>At3g50580-HAE2 68416.m05532 proline-rich family protein contains proline-rich extensin domains, INTERPRO:IPR002965  
MKTSIVLVAAAFCLVAFPTTVGKYWPKIEGWPNPSEITRNLMLLNTGHSFGYGDSKVVKCTYSNGSAPAISISP  
STPIPSTPSTPSPPPPAPKKSPPPPSTPKKSPSPSLTFVPHPTPKKSPSPPSTPSLPPPAPKKSPSTPSLPPPTPK  
KSPPPPSSHSSSPSNPPHHQONPWEHIERCMINMGPVGMCRMQMEVSFYTRLFQVSDYCCNLVVMKSECDDVAWG  
FFNDPFFVPLVRYTCHSCDICCRSYLMNGSFVKV

>At4g11430-HAE3 68417.m01841 hydroxyproline-rich glycoprotein family protein contains proline-rich extensin domains, INTERPRO:IPR002965; related to hydroxyproline-rich glycoprotein [Phaseolus vulgaris] gi|169349|gb|AAA33765  
MKGKKFNCKRQPPPLATTAGHHRRSPPPATTGHHRRSPPPAITACHHRRPPLPATTAGHHRQLRPPSIPVTTNTGHR  
HCRPPSNPATTNSGHHQLRPPPPPPPLSAITTTGHHHRRSPPPPFP PPPPPPTITPPVTTTTAGHHHRRSPPPP  
PPPPPPPTITPPVTTTTTGHHHHRPPPPPATTTPITNTSDHHQLHPPPATTITTTTTISNQKD

>At4g22470-HAE4 68417.m03245 protease inhibitor/seed storage/lipid transfer protein (LTP) family protein similar to hydroxyproline-rich glycoprotein DZ-HRGP from Volvox carteri f. nagariensis GP|6523547; contains Pfam profile PF00234 Protease inhibitor/seed storage/LTP family  
MASTTIILFLSFSIIPLLTIVRADNHSVYCP PPPPCICICNPGPPPPQDPQPPTPPTFQPAPPANDQPPPPQSTS  
PPPVATTTPPALPPKPLPPPLSPPQTTPPPPPAITPPPPPAITPPLSPPPPAITPPPPLATTTPPALPPKPLPPPLSP  
QTTPPPPPAITPPLSPPLVGICSKNDTELKICAGILAISDGLLTTGRAEPCCSIIRNVSDLDAVTCFCKSVGAPRFS  
LSPNFGIFFKVCGRRIPOGFSCPGSPPTISPPPLPPQTLKPPPPQTTPPPPPAITPPLSPPLVGICSKNDTELKICA  
GILAISDGLLTTGRAEPCCSIIRNVSDLDAVTCFCKSVGARRFSLSPNFGIFFKVCGRRIPOGFSCP