Additional file 4 The amino acid sequences of MAPK cascade members in *B. distachyon*, *Arabidopsis* and *O. sativa*.

Gene name	Amino acid sequences
AtMPK1	MATLVDPPNGIRNEGKHYFSMWQTLFEIDTKYMPIKPIGRGAYGVVCSSVNSDTNEKVAIKKIHNVYENRIDALRTLRELKLLRHLRHENVIALKDVMMPIHKMSFKDVYLVYELMDTDLHQIIKSSQRLSNDHCQYFLFQLLRGLKYIHSANILHRDLKPGNLLVNANCDLKICDFGLARASNTKGQFMTEYVVTRWYRAPELLLCCDNYGTSIDVWSVGCIFAELLGRKPIFQGTECLNQLKLIVNIIGSQREEDLEFIVNPKAKRYIRSLPYSPGMSLSRLYPCAHVLAIDLLQKMLVFDPSKRISASEALQHPYMAPLYDPNANPPAQVPIDLDVDEDLREEMIREMIWNEMLHYHPQASTLNTEL
AtMPK2	MATPVDPPNGIRNQGKHYFSMWQTLFEIDTKYMPIKPIGRGAYGVVCSSVNRESNERVAIKKIHNVFENRIDALRTLRELKLLRHLRHENVVALKDVMMANHKRSFKDVYLVYELMDTDLHQIIKSSQVLSNDHCQYFLFQLLRGLKYIHSANILHRDLKPGNLLVNANCDLKICDFGLARTSNTKGQFMTEYVVTRWYRAPELLLCCDNYGTSIDVWSVGCIFAELLGRKPVFPGTECLNQIKLIINILGSQREEDLEFIDNPKAKRYIESLPYSPGISFSRLYPGANVLAIDLLQKILVLDPSKRISVTEALQHPYMAPLYDPSANPPAQVPIDLDVDEDEDLGAEMIRELMWKEMIHYHPEAATINNNEVSEF
AtMPK3	MNTGGGQYTDFPAVDTHGGQFISYDIFGSLFEITSKYRPPIIPIGRGAYGIVCSVLDTETNELVAMKKIANAFDNHMDAKRTLREIKLLRHLDHENIIAIRDVVPPPLRRQFSDVYISTELMDTDLHQIIRSNQSLSEEHCQYFLYQLLRGLKYIHSANIIHRDLKPSNLLLNANCDLKICDFGLARPTSENDFMTEYVVTRWYRAPELLLNSSDYTAAIDVWSVGCIFMELMNRKPLFPGKDHVHQMRLLTELLGTPTESDLGFTHNEDAKRYIRQLPNFPRQPLAKLFSHVNPMAIDLVDRMLTFDPNRRITVEQALNHQYLAKLHDPNDEPICQKPFSFEFEQQPLDEEQIKEMIYQEAIALNPTYG
AtMPK4	MSAESCFGSSGDQSSSKGVATHGGSYVQYNVYGNLFEVSRKYVPPLRPIGRGAYGIVCAATNSETGEEVAIKKIGNAFDNIIDAKRTLREIKLLKHMDHENVIAVKDIIKPPQRENFNDVYIVYELMDTDLHQIIRSNQPLTDDHCRFFLYQLLRGLKYVHSANVLHRDLKPSNLLLNANCDLKLGDFGLARTKSETDFMTEYVVTRWYRAPELLLNCSEYTAAIDIWSVGCILGETMTREPLFPGKDYVHQLRLITELIGSPDDSSLGFLRSDNARRYVRQLPQYPRQNFAARFPNMSAGAVDLLEKMLVFEPSRRITVDEALCHPYLAPLHDINEEPVCVRPFNFDFEQPTLTEENIKELIYRETVKFNPQDSV
AtMPK5	MAKEIESATDLGDTNIKGVLVHGGRYFQYNVYGNLFEVSNKYVPPIRPIGRGAYGFVCPAVDSETHEEIAIKKIGKAFDNKVDAKRTLREIKLLRHLEHENVVVIKDIIRPPKKEDFVDVYIVFELMDTDLHQIIRSNQSLNDDHCQYFLYQILRGLKYIHSANVLHRDLKPSNLLLNSNCDLKITDFGLARTTSETEYMTEYVVTRWYRAPELLLNSSEYTSAIDVWSVGCIFAEIMTREPLFPGKDYVHQLKLITELIGSPDGASLEFLRSANGGKYVKELPKFPRQNFSARFPSMNSTAIDLLEKMLVFDPVKRITVEEALCYPYLSALHDLNDEPVCSNHFSFHFEDPSSTEEEIKELVWLESVKFNPLPSI
AtMPK6	MDGGSGQPAADTEMTEAPGGFPAAAPSPQMPGIENIPATLSHGGRFIQYNIFGNIFEVTAKYKPPIMPIGKGAYGIVCSAMNSETNESVAIKKIANAFDNKIDAKRTLREIKLLRHMDHENIVAIRDIIPPPLRNAFNDVYIAYELMDTDLHQIIRSNQALSEEHCQYFLYQILRGLKYIHSANVLHRDLKPSNLLLNANCDLKICDFGLARVTSESDFMTEYVVTRWYRAPELLLNSSDYTAAIDVWSVGCIFMELMDRKPLFPGRDHVHQLRLLMELIGTPSEEELEFLNENAKRYIRQLPPYPRQSITDKFPTVHPLAIDLIEKMLTFDPRRRITVLDALAHPYLNSLHDISDEPECTIPFNFDFENHALSEEQMKELIYREALAFNPEYQQ
AtMPK7	MAMLVEPPNGIKQQGKHYYSMWQTLFEIDTKYVPIKPIGRGAYGVVCSSINRETNERVAIKKIHNVFENRVDALRTLRELKLLRHVRHENVIALKDVMLPANRTSFKDVYLVYELMDTDLHQIIKSSQSLSDDHCKYFLFQLLRGLKYLHSANILHRDLKPGNLLVNANCDLKICDFGLARTSQGNEQFMTEYVVTRWYRAPELLLCCDNYGTSIDVWSVGCIFAEILGRKPIFPGTECLNQLKLIINVVGSQQESDIRFIDNPKARRFIKSLPYSRGTHLSNLYPQANPLAIDLLQRMLVFEPTKRISVTDALLHPYMAGLFEPGTNPPAHVPISLDIDENMEEPVIREMMWNEMLYYHPEAEILNA
AtMPK8	MGGGGNLVDGVRRWLFQRPSSSSSSSSSNNNNNNHEQPIFNSSSFSSSSNPNHSANSGELIIEEDLDFSGLTLINVPKRNHLPMDPHKKGETEFFTEYGEANRYQIQEVVGKGSYGVVASAVDSHTGERVAIKKINDVFEHVSDATRILREIKLLRLLRHPDVVEIKHIMLPPSRREFPHIYVVFELMESDLHQVIKANDDLTPEHYQFFLYQLLRGLKYVHAANVFHRDLKPKNILANADCKLKICDFGLARVSFNDAPTAIFWTDYVATRWYRAPELCGSFFSKYTPAIDIWSVGCIFAEMLLGKPLFPGKNVVHQLDLMTDFLGTPPPESISRIRNEKARRYLSSMRKKQPVPFSHKFPKAEPLALRLLERLLAFDPKDRASAEDALADPYFSGLSNSEREPTTQPISKLEFDFERKKLVKDDVRELLYREILEYHPQMLEEYLRGGDQLSFMYPSGVDRFKRQFAHLEENQGKPVAAGGGRSTALHRHHASLPRERVPAPNGETAEESSDVERRAAAAVASTLESEEQTMEEVTVLVTS
AtMPK9	MDPHKKVALETEFFTEYGEASRYQIQEVIGKGSYGVVASAIDTHSCEKVAIKKSNDVFEHVSDATRILREIKLLRLLRHPDIVEIKHVMLPPSRRDFRDIYVVFELMESDLHQVIKANDDLTPEHYQFFLYQLLRGLKFIHTANVFHRDLKPKNILANSDCKLKICDFGLARVSFNDAPSAIFWTDYVANRWYRAPELCGSFFSKYTPAIDIWSIGCIFAEMLTGKPLFPGKNVVHQLDIMTDLLGTPPPEAIARIRNEKARRYLGNMRRKPPVPFTHKFPHVDPLALRLLHRLLAFDPKDRPSAEEALADPYFYGLANVDREPSTQPIPKLEFEFERRKLTKEDVRELIYREILEYHPQMLQEYLRGGEQTSFMYPSGVDRFKRQFAHLEENYGKGEKGSPLQRQHASLPRERVPAPKKENGSHNHDIENRSIASLVTTLESPPTSQHEGSDYRNGTSQQGYSARSLLKSASISASKCIGMKPRNKSEYGESNNDTVDALSQKVAALHT
AtMPK10	MEPTNDAETLETQGEVTTAIWPSSQILKTTIDIPGTLSHDGRYIQYNLFGHIFELPAKYKPPIRPIGRGACGIVCSAVDSETNEKVAIKKITQVFDNTIEAKRTLREIKLLRHFDHENIVAIRDVILPPQRDSFEDVYIVNELMEFDLYRTLKSDQELTKDHGMYFMYQILRGLKYIHSANVLHRDLKPSNLLLSTQCDLKICDFGLARATPESNLMTEYVVTRWYRAPELLLGSSDYTAAIDVWSVGCIFMEIMNREPLFPGKDQVNQLRLLLELIGTPSEEELGSLSEYAKRYIRQLPTLPRQSFTEKFPNVPPLAIDLVEKMLTFDPKQRISVKEALAHPYLSSFHDITDEPECSEPFNFDLDEHPFSEEQFRELIYCEALAFNPETSND
AtMPK11	MSIEKPFFGDDSNRGVSINGGRYVQYNVYGNLFEVSKKYVPPLRPIGRGASGIVCAAWNSETGEEVAIKKIGNAFGNIIDAKRTLREIKL

	LKHMDHDNVIAIIDIIRPPQPDNFNDVHIVYELMDTDLHHIIRSNQPLTDDHSRFFLYQLLRGLKYVHSANVLHRDLKPSNLLLNANCDL KIGDFGLARTKSETDFMTEYVVTRWYRAPELLLNCSEYTAAIDIWSVGCILGEIMTREPLFPGRDYVQQLRLITELIGSPDDSSLGFLRSD NARRYVRQLPQYPRQNFAARFPNMSVNAVDLLQKMLVFDPNRRITVDEALCHPYLAPLHEYNEEPVCVRPFHFDFEQPSLTEENIKELI YRESVKFNP
AtMPK12	MDLVSSRDTLGDPSTSTKALLLGFSRSRSDHCIIMSGESSSGSTEHCIKVVPTHGGRYVQYNVYGQLFEVSRKYVPPIRPIGRGACGIVC AAVNSVTGEKVAIKKIGNAFDNIIDAKRTLREIKLLRHMDHENVITIKDIVRPPQRDIFNDVYIVYELMDTDLQRILRSNQTLTSDQCRFL VYQLLRGLKYVHSANILHRDLRPSNVLLNSKNELKIGDFGLARTTSDTDFMTEYVVTRWYRAPELLLNCSEYTAAIDIWSVGCILGEIM TGQPLFPGKDYVHQLRLITELVGSPDNSSLGFLRSDNARRYVRQLPRYPKQQFAARFPKMPTTAIDLLERMLVFDPNRRISVDEALGHA YLSPHHDVAKEPVCSTPFSFDFEHPSCTEEHIKELIYKESVKFNPDH
AtMPK13	MEKREDGGILTYDGRYVMYNVLGNIFELSSKYIPPIEPIGRGAYGIVCCATNSETNEEVAIKKIANAFDNRVDAKRTLREIKLLSHMDHD NVIKIKDIIELPEKERFEDVYIVYELMDTDLHQIIRSTQTLTDDHCQYFLYQILRGLKYIHSANVLHRDLKPSNLVLNTNCDLKICDFGLA RTSNETEIMTEYVVTRWYRAPELLLNSSEYTGAIDIWSVGCIFMEILRRETLFPGKDYVQQLKLITELLGSPDDSDLDFLRSDNARKYV KQLPHVQKQSFREKFPNISPMALDLAEKMLVFDPSKRITVDEALKQPYLASLHEINEEPTCPTPFSFDFEETALDEQDIKELVWRESLHF KNM
AtMPK14	MAMLVDPPNGIRQEGKHYYTMWQTLFEIDTKYVPIKPIGRGAYGVVCSSINSETNERVAIKKIHNVFENRIDALRTLRELKLLRHVRHE NVISLKDVMLPTHRYSFRDVYLVYELMDSDLNQIIKSSQSLSDDHCKYFLFQLLRGLKYLHSANILHRDLKPGNLLVNANCDLKICDFG LARTYEQFMTEYVVTRWYRAPELLLCCDNYGTSIDVWSVGCIFAEILGRKPIFPGTECLNQLKLIINVVGSQQDWDLQFIDNQKARRFI KSLPFSKGTHFSHIYPHANPLAIDLLQRMLVFDPTKRISVSDALLHPYMEGLLEPECNPSENVPVSSLEIDENMEGDMIREMMWEEMLH YLPRA
AtMPK15	MGGGGNLVDGVRRWLFFQRRPSSSSSSNNHDQIQNPPTVSNPNDDEDLKKLTDPSKLRQIKVQQRNHLPMEKKGIPNAEFFTEYGEAN RYQIQEVVGKGSYGVVGSAIDTHTGERVAIKKINDVFDHISDATRILREIKLLRLLLHPDVVEIKHIMLPPSRREFRDVYVVFELMESDLH QVIKANDDLTPEHHQFFLYQLLRGLKYVHAANVFHRDLKPKNILANADCKLKICDFGLARVSFNDAPTAIFWTDYVATRWYRAPELCG SFFSKYTPAIDIWSVGCIFAEMLLGKPLFPGKNVVHQLDIMTDFLGTPPPEAISKIRNDKARRYLGNMRKKQPVPFSKKFPKADPSALRL LERLIAFDPKDRPSAEEALADPYFNGLSSKVREPSTQPISKLEFEFERKKLTKDDIRELIYREILEYHPQMLEEYLRGGNQLSFMYPSGVD RFRRQFAHLEENQGPGGRSNALQRQHASLPRERVPASKNETVEERSNDIERRTTAAVASTLDSPKASQQAEGTENGGGGGYSARNLMK SSSISGSKCIGVQSKTNIEDSIVEEQDETVAVKVASLHNS
AtMPK16	MQPDHRKKSSVEVDFFTEYGEGSRYRIEEVIGKGSYGVVCSAYDTHTGEKVAIKKINDIFEHVSDATRILREIKLLRLLRHPDIVEIKHIL LPPSRREFRDIYVVFELMESDLHQVIKANDDLTPEHYQFFLYQLLRGLKYIHTANVFHRDLKPKNILANADCKLKICDFGLARVAFNDT PTAIFWTDYVATRWYRAPELCGSFFSKYTPAIDIWSIGCIFAELLTGKPLFPGKNVVHQLDLMTDMLGTPSAEAIGRVRNEKARRYLSSM RKKKPIPFSHKFPHTDPLALRLLEKMLSFEPKDRPTAEEALADVYFKGLAKVEREPSAQPVTKLEFEFERRRITKEDVRELIYRESLEYH PKMLKEYLDGSEPTNFMYPSAVEHFKKQFAYLEEHYKNGTSHNPPERQQHASLPRACVLYSDNNHPVAQQSSAEVTDGLSKCSIRDER PRGADRNAQMPMSRIPINVPQTIQGAAVARPGKVVGSVLRYNNCGAATGVEALEQQQRRMVRNPAAASQYPKRTQPCKSNRGDEDC ATAAEGPSRLKPNTQYIPQKVSAAQDTAMSRWY
AtMPK17	MLEKEFFTEYGEASQYQIQEVVGKGSYGVVASAECPHTGGKVAIKKMTNVFEHVSDAIRILREIKLLRLLRHPDIVEIKHIMLPPCRKEF KDIYVVFELMESDLHHVLKVNDDLTPQHHQFFLYQLLRGLKFMHSAHVFHRDLKPKNILANADCKIKICDLGLARVSFTDSPSAVFWT DYVATRWYRAPELCGSFYSNYTPAIDMWSVGCIFAEMLTGKPLFPGKNVVHQLELVTDLLGTPSPITLSRIRNEKARKYLGNMRRKDP VPFTHKFPNIDPVALKLLQRLIAFDPKDRPSAEEALADPYFQGLANVDYEPSRQPISKLEFEFERRKLTRDDVRELMYREESLKTFFFVL FLDMKQILEYHPQMLQEYLQGEENINSHFLYPRESVSYFGESILISSGVDQFKQEFARLEEHNDDEEEHNSPPHQRKYTSLPRERVCSSE DEGSDSVHAQSSSASVVFTPPQTPNTATGLSSQKASQVDKAATPVKRSACLMRSDSICASRCVGVSSAVS
AtMPK18	MEFFTEYGDANRYRILEVIGKGSYGVVCAAIDTHTGEKVAIKKINDVFEHISDALRILREVKLLRLLRHPDIVEIKSIMLPPSKREFKDIY VVFELMESDLHQVIKANDDLTREHHQFFLYQMLRALKFMHTANVYHRDLKPKNILANANCKLKVCDFGLARVAFNDTPTTVFWTDY VATRWYRAPELCGSFFSKYTPAIDVWSIGCIFAEVLTGKPLFPGKSVVHQLELITDLLGTPKSETISGVRNDKARKYLTEMRKKNPVTFS QKFSKADPLALRLLQRLLAFDPKDRPTPAEALADPYFKGLSKIEREPSSQQISKMEFEFERRRLTKDDIRELIYREILEYHPQLLKDYMSG SEGSNFVYPSAIGHLRQQFTYLEENSSRNGPVIPLERKHASLPRSTVHSTVVHSTSQPNLGATDSRRVSFEPSKNGASSAGHPSTSAYPTK SIGPPPRVPPSGRPGRVVESSVSYENGRNLKEAYFRSAVSSPHCYFRPNTMTNPENRNIEASSFPPKPQNPVHQFSPTEPPAATTNQADVE TMNHPNPYFQPQLPKTDQLNNNTHMAIDAKLLQAQSQFGPAGAAAVAVAAHRNIGTISYSAAS
AtMPK19	MQKTQEKKNMKEMEFFTEYGDANRYRILEVIGKGSYGVVCAAIDTQTGEKVAIKKINDVFEHVSDALRILREVKLLRLLRHPDIVEIKS IMLPPSKREFKDIYVVFELMESDLHQVIKANDDLTREHHQFFLYQMLRALKYMHTANVYHRDLKPKNILANANCKLKVCDFGLARVS FNDTPTTVFWTDYVATRWYRAPELCGSFCSKYTPAIDIWSIGCIFAEVLTGKPLFPGKSVVHQLDLITDLLGTPKSETIAGVRNEKARKY LNEMRKKNLVPFSQKFPNADPLALRLLQRLLAFDPKDRPTAAEALADPYFKCLAKVEREPSCQPISKMEFEFERRRLTKDDIRELIYREI LEYHPQLLKDYMNSEGSSFLYPSAIGHLRKQFAYLEENSGKSGPVIPPDRKHASLPRSAVHSSAVNSNAQPSLNASDSRRVSIEPSRNGV VPSTSAYSTKPLGPPPRVPSGKPGRVVESSVTYENDRNLKESSYDARTSYYRSTVLPPQTVSPNCYFLPNTMNQEKRSGTEAASQPKPQ FVPTQCNSAKPAELNPNPYVQSQHKVGIDAKLLHAQSQYGPAGAAAVAVAAHRNIGAVGYGMS
AtMPK20	MQQDNRKKNNLEMEFFSDYGDANRFKVQEVIGKGSYGVVCSAIDTLTGEKVAIKKIHDIFEHISDAARILREIKLLRLLRHPDIVEIKHI MLPPSRREFKDIYVVFELMESDLHQVIKANDDLTREHYQFFLYQLLRALKYIHTANVYHRDLKPKNILANANCKLKICDFGLARVAFN DTPTTIFWTDYVATRWYRAPELCGSFYSKYTPAIDIWSIGCIFAEVLMGKPLFPGKNVVHQLDLMTDLLGTPSLDTISRVRNEKARRYLT SMRKKPPIPFAQKFPNADPLSLKLLERLLAFDPKDRPTAEEALADPYFKGLAKVEREPSCQPITKMEFEFERRKVTKEDIRELISREILEY HPQLLKDHMNGADKASFLYPSAVDQFRRQFAHLEENSGKTGPVAPLERKHASLPRSTVIHSTAVARGGQPKLMNNTNTLNPETTQNIPF NHATIQAQQRNLSAAKPSTFMGPVAPFDNGRISRDAYDPRSFIRSTNLPFSQQSAATVAMGKQQERRTTMEPEKQARQISQYNRYAPDV AINIDNNPFIMARTGMNKAENISDRIIIDTNLLQATAGIGVAAAAAAAAPGGSAHRKVGAVRYGMSKMY

BdMPK3	MDGAPVAEFRPTMTHGGRFLLYNIFGNQFEITAKYQPPIMPIGRGAYGIVCSVMNFETREMVAIKKIANAFDNNMDAKRTLREIKLLRH LDHENIVGLRDVIPPAIPQSFNDVYIATELMDTDLHHIIRSNQELSEEHCQYFLYQLLRGLKYIHSANVIHRDLKPSNLLLNANCDLKICD FGLARPSSESDMMTEYVVTRWYRAPELLLNSTDYSAAIDVWSVGCIFMELINRAPLFPGRDHMHQMRLITEVIGTPTDDDLGFIRNED ARRYMRHLPQFPRRPFPAQFPRVQPAALDLIERMLAFNPLQRITVEEALEHPYLERLHDIADEPICTDPFSFDFEQHPLTEDQMKQLIFNE ALELNPNFRY
BdMPK4	MDTSGGGGAGGAAQIQGMATHGGRYVLYNVYGNLFEVASKYAPPIRPIGRGAYGIVCAAVSSDTGEEVAIKKIGNAFDNHIDAKRTLR EIKLLRHMDHENIIAIKDIIRPPRRDDFKDVYIVTELMDTDLHQIIRSNQPLTDDHCQYFLYQLLRGLKYVHSANVLHRDLKPSNLFLNA NCDLKIADFGLARTTSETDLMTEYVVTRWYRAPELLLNCSQYTAAIDVWSVGCILGEIITRQPLFPGRDYIQQLKLITELIGSPDDSSLGF LRSDNARRYMKQLPQYPRQDFRLRFRNMSDGAVDLLERMLVFDPSRRITVDEALHHPYLASLHDINEEPTCPAPFSFDFEQPSFTEEHM KELIWRETLAFNPDPPY
BdMPK6	MDGGAQPPDAEMADAGAAVPGAGAGAAGTMENIQATLSHGGRFIQYNIFGNVFEVTVKYKPPILPIGKGAYGIVCSALNSETGEQVAI KKIANAFDNKIDAKRTLREIKLLRHMDHENIVAIRDIIPPAQRNSFNDVYIAYELMDTDLHQIIRSNQALSEEHCQYFLYQILRGLKYIHS ANVLHRDLKPSNLLLNANCDLKICDFGLARTTSETDFMTEYVVTRWYRAPELLLNSSEYTAAIDVWSVGCIFMELMDRKPLFPGRDH VHQLRLLMELIGTPNEADLDFVNENARRYIRQLPRHARQSFSEKFPHVHPSAIDLVEKMLTFDPRQRITVEGALAHPYLASLHDISDEPV CTMPFSFDFEQHALSEEQMKDLIHQEALAFNPDYQ
BdMPK7-1	MPSRFPFLSPGCFIRLLSGSASSDLLLLLPRRGQSAPRARVLLKMAMMVDPPNGTGNHGKHYYTMWQTMFEIDTKYVPIKPIGRGAYG IVCSSTNQENNEKVAIKKINNVFDNRVDALRTLRELKLLRHLRHENVIALKDIMMPVHRRSFKDVYLVSELMDTDLHQIIKSSQPLSND HCQYFLFQLLRGLKYLHSAGILHRDLKPGNLLVNANCDLKICDFGLARTNNTKGQFMTEYVVTRWYRAPELLLCCDNYGTSIDVWSV GCIFAELLGRKPIFPGTECLNQLKLIVNVLGTMSENDLEFIDNPKARKYIKSLPYTPGTPLTSMYPQAHPLAIDLLQKMLVFDPSKRISVT EALEHPYMSPLYDPSANPPAQVPIDLDIDENLGVEMIREMLWQEMLQYHPEAARMVNM
BdMPK7-2	MAMMVDPPNGTGNHGKHYYTMWQTMFEIDTKYMPIKPIGRGAYGIVCSSTNQENNEKVAIKKINNVFDNRVDALRTLRELKLLRHL RHENVIALKDIMMPVHRRSFKDVYLVFELMDTDLHQIIKSSQPLSNDHCQYFLFQLLRGLKYLHSAGILHRDLKPGNLLVNANCDLKIC DFGLARTNNTKGQFMTEYVVTCLYRAPELLLCCDNYGTSIDVWSVGCIFAELLGRKPIFPRTQCLDQLKLIVNVLGTMSENDLEFIDNP KARKYIKSLPYTPGTPLTSMYPQAHPLAIDLLQKMLVFDPSKRISVTEALEHPYMSPLYDPSANPPAQVPIDLDIDENLGVEMIREMLWQ EMLQYHPEAARMVNM
BdMPK11	MRMEGGGAGPAAAAAAGGAHGLGEAQIKGTLTHGGRYVQYNVYGNLFEVSAKYVPPIRPVGRGACGIICAAINVQTREEVAIKKIGN AFDNQIDAKRTLREVKLLRHMNHENVISIKDIIRPPRRENFNDVYIVYELMDTDLHHLLRSNQPLTDDHCQYFLYQVLRGLKYVHSAN VLHRDLRPSNLLLNAKCDLKIGDFGLARTTTETDFMMEYVVTRWYRAPELLLNCSEYTGAIDMWSVGCILGEIATREPLFPGKDYVHQ LRLITELLGSPDDTSLGFLRSDNARRYVRSLPQYPKQQFRSRFPNMSSGAMDLLERMLVFDPNKRITVDEALCHPYLASLHEINDEPVCP APFSFDFEQPSFTEEDIKELIWRESVKFNPEPIH
BdMPK14	MAMLVDPPNGMGNQGKHYYSMWQTLFEIDTKYVPIKPIGRGAYGIVCSSINRETNEKVAIKKIHNVFDNRVDALRTLRELKLLRHLRH ENVISLKDIMMPVQRRSFKDVYLVYELMDTDLHQIIKSPQGLSNDHCQYFLFQLLRGLKYLHSAEILHRDLKPGNLLVNANCDLKICDF GLARTNSSKGQFMTEYVVTRWYRAPELLLCCDNYGTSIDVWSVGCIFAELLGRKPIFPGTECLNQLKLIVNVLGTMSESDLEFIDNPKA RRYIKTLPYTPGVPLASMYPHAHPLAIDLLQKMLIFDPTKRISVTEALEHPYMSPLYDPSANPPAQVPIDLDLDENISADMIREMMWQE MLHYHPEAATAISM
BdMPK16	MDFFTEYGEGNRYKIEEVIGKGSYGVVCSALDTHTGDKVAIKKINDIFEHVSDATRILREIKLLRLLRHPDIVEIKHILLPPSRREFKDIYV VFELMESDLHQVIKANDDLTPEHYQFFLYQLLRGLKYIHTANVFHRDLKPKNILANADCKLKICDFGLARVAISDTPTAIFWTDYIATRW YRAPELCGSFFSKYTPAIDIWSIGCIFAELLTGKPLFPGKNVVHQLDIITDLLGTPSAETIARIRNEKARRYLSSMRRKKTVPFTQKFPNAD PLALNLLERMLAFDPKDRPSAEEALADPYFKNIASVDREPSAQPITKLEFEFERRRITKDDIRELIYREILEYHPNMLREFLEGAEPTGFM YPSAVDHFKKQFTFLEEHYAKGSTAAPPERQHNSLPRPSVIYSDNRPQNAANITDDLSRCAIRDNTQKAQKDSASVGANRIPHGAAAA AARPGKVVGSVLRYGNCSTSGTEQYEQRRVVRSPGIAPNGVTSGSSYPRRNNTCKSETGEAERIDTNQGGPPKPYVANKLPATVDGRN GHW
BdMPK17	MVGGGGIVDGFRRLFHRRTPSGSGPSSNQSSAGEESSDIDAVVEDLDLVGLRAIRVPKRKMPLPVESHKKNILEKEFFTEYGEASQYQIQ EVIGKGSYGVVAAAVDTRTGERVAIKKINDVFEHVSDATRILREVKLLRLLRHPDVVEIKHIMLPPSRREFQDIYVVFELMESDLHQVIR ANDDLTPEHYQFFLYQLLRALKYIHAANVFHRDLKPKNILANSDCKLKICDFGLARVSFNDAPTAIFWTDYVATRWYRAPELCGSFFSK YTPAIDIWSIGCIFAELLTGRPLFPGKNVVHQLDIITDLLGTPSSETLSRIRNEKARRYLSCMRKKHPVPLTQKFPNVDPLALRLLGRLLAF DPKDRPSAEEALADPYFAVLANVEREPSRNPISKLEFEFERRKVTKDDVRELIYREILEYHPQMLQEYMQGGEQLSFLYPSGVDRFKRQ FAHLEENYSKGERGSPLQRKHASLPRQRVGASNDNNDQHASDQERGADSIAPATGNPPGSQDAGQQHVSGGQNGVGSTNISPRSYQK SASISASKCVVVNANKNPEYDDDISEEMEGAVDGLSEKVSRMHP
BdMPK20-1	MQQDQRKKSSAEAEFFTEYGDASRYKIQEIVGKGSYGVVCSAIDVHTGEKVAIKKIHDIFEHISDAARILREIKLLRLLRHPDIVEIKHIM LPPSRRDFKDIYVVFELMESDLHQVIKANDDLTKEHYQFFLYQLLRALKYIHTANVYHRDLKPKNILANSNCKLKICDFGLARVAFNDT PTTIFWTDYVATRWYRAPELCGSFFSKYTPAIDVWSIGCIFAEVLTGKPLFPGKNVVHQLDLMTDLLGTPSMDTISRVRNEKARRYLSS MRKKEPIPFSQKFPNADPLALDLLQRLLAFDPKDRPTAGEALSHPYFKGLAKVEREPSCQPITKMEFEFERRRATKEDIRELIFREILEYH PQLLKDYINGTERTTFLYPSAVDQFRKQFAHLEENSESGPVVPMDRKHTSLPRSTIVHSAPIHAKEQPRIGPSRDRPLTDESYKNPRDSEK YSGNVPRSSHHSQAPQRVPTARPGRVVGPVLPYENVGTSHPYDPRRVAMNSGYPPQQQIPQTYGYYQTTGKSACSEPSQAERYTLHQQ AYACANSSTAPDVALDMRAPPFHQSAGPKSGSSDRLTAETNLYTRSLNGIVATTSGVAASAHRKVSVVPYGMSQMY
BdMPK20-2	MSTDVDFFSEYGDANRYRIQEVIGKGSYGVVCSAMDMQTRQKVAIKKIHNIFDHVSDAARILREIKLLRLLRHPDVVEIKHIMLPPSRK DFKDIYVVFELMESDLHQVIKANDDLTKEHYQFFLYQLLRALKYIHTASVYHRDLKPKNILANSNCKLKICDFGLARVAFNDTPTTVF WTDYVATRWYRAPELCGSFFTKYTPAIDIWSIGCIFAEVLTGKPLFPGKNVVHQLDLMTDLLGTPSMDTISRVRNEKARRYLSSMRKKD PVPFSKKFPNADPLGLKLLEKLLAFDPKDRPTAEEALTDPYFKSLSKPDREPSCQPIRKVEFDFEHRRMSKDDIRELIFQEILEYHPQLLK

	NYIDGTEKTTFLYPSAVDQFKKQFSHLEESDGSGPVVPTERKHASLPRSTTVHSTPIPAKEQPLVASSRGRPIANEPCKPWAPGNVPGASQ TAHVAQAGRAVGVGSVPPYESGSGKYPYDATSRPAVSSGYPPQQKIPQTYGYHHHHQTPGAGQSSQAMGGYACGYTKGTTPPPAAAQ DMRASPYHHRSAGTKNDPLNRLAAESDIYTRSLNGIVAAAASAGTGAHRKVGAVPFGMSGMY
BdMPK20-3	MQHGDLHKKSAAEMDFFTAYDDANRYKILEVIGKGSYGLVCSANDLQTGEKVAIKKIHNIFEHISDAARILREIKLLRLLRHPDVVEIK HILLPPSKKDFKDIYVVFELMESDLHQVIKANDDLTREHYQFFLYQMLRALKYMHTANVYHRDLKPKNVLANANCKLKICDFGLARV AFSDAPTTVFWTDYVATRWYRAPELCGSFYSKYTPAIDIWSIGCIFAEVLIGKPLFPGKNVVHQLDLITDILGTPSLDAISRVRNDKARKY LTCMRKKQPASFSQKFPKADPLALQLLRRLLAFDPKDRPSAEEALADPYFNGLAKVEREPSCQPIPKIEFEFEGRRVTKEDIKELIFEEILE YHPQLLKEHIIGKERPNFVHLSAVDQFKKHFTQLEENDNETGAAVSLQRKHSSLPRQAFNHR
BdMPK20-4	MQTTEQQRKKGSSEMDFFSEYGDANRYKIQEVIGKGSYGVVCSAIDQHTGDKVAIKKIHNIFEHLSDAARILREIKLLRLLRHPDIVEIR HIMLPPSRRDFKDIYVVFELMDTDLHQVIKANDDLTKEHHQFFLYQMLRALKYIHTANVYHRDLKPKNILANANCKLKICDFGLARVA FNDTPTTVFWTDYVATRWYRAPELCGSFFTKYSRAIDIWSIGCIFAEILTGKPLFPGKNVVHQLDLMTDLLGTPSLDTVSRIRNEKARRY LSSMRKKQSVSFSERFPKADPAALKLLQRLLAFDPKDRPTAEEALADPYFKGLGKVEREPSCQPITKMEFEFERKNVTKADVKELIFREI LEYHPQLLKDYMNGTEKTNFLYPSAVDNFRRQFANLEENGGKGGAVVPPDRKHVSLPRNTTVHSTPIPPKDQKYSQVPQRIPTGRPGR VVGPVIPFENSSTMDPYSQRRVARNPVLPAAATNLSAYAYRNSDNSERELQQELEKDRMQYHPMQRFMDAKMVSPDLRSTSYYMPKG VPKADVAERSALQSNMMQGIAPFNGIATVGGAFNKVSAVQYGVSRMY
BdMPK20-5	MPEANAAARGGGGGGDARAAEQRSNNKNSEEMGFFSEYVDASRYKILEIIGKGSYGVVCSAIDQETGDKVAIKKIQNIFEHLSDAARIL REIKLLRLLRHPDIVQIKHIMLPPSRRDFRDIYVVFELMDTDLHQVIKANDDLTKEHYQFFLYQMLRALKYIHTANVYHRDLKPKNILA NANCKLKICDFGLARVAFNDTPTTVFWTDYVATRWYRAPELCGSFFTKYSPAIDTWSIGCIFAEILTGKPLFPGKNVVHQLDLMTDLLG TPSTETISRIRNDKARKYLSSMRRKQPIPFSEKFPNADPSALKLLERLLAFDPKDRPTAEEALAHPYFKRLARVEREPSCQQPISKTEFEFE RRKFTKEDVKELIFREILEYHPKLLKDYMNGSEKTSFLYPSAVDNFRRQFANLEIDGGRSGAADRKHFSLPRTTTVHSAPILPTNGPTSQ VPQRIPTARPGRVVSSAMQTDNPSVSDRHNGRRVARDPAVPPAAAYHLKSDYSDRQHQQEFEKDRVRPDRQRQEELEKDRMQYRPGH HSMDAKVAPEISPYMRSSPYYIPPFNGIAAVASGYSKVAAVTRMY
BdMPK21-1	MGGLIRWLRHHRSRRVSSSSSSHLPSNTTSSSSTSDLRAHSLPQHQGDHHGEVVVEWEDAAEGPDSDPEEYIVVVLGDDEQGVVAARA PVRTKPPRVMDPGKKTSESEFFTEYGEANRYKVSEVIGKGSYGVVAAAVDTQTGERCAIKKINDVFDHVSDATRILREIKLLRLLRHPDI VEIKHIMLPPSRREFRDIYVVFELMESDLHQVIKANDDLTPEHHQFFLYQLLRGMKYIHTANVFHRDLKPKNILANADCKLKICDFGLA RVSFNDGAPSAIFWTDYVATRWYRAPELCGSFFSKYTPAIDIWSVGCIFAEMLTGKPLFPGKNVVHQLDLMTDLLGTPSAESLSKIRNEK ARRYLSNMRKKPKVPLTKKFPGIDPMALHLLERLLAFDPKDRPSADEALTDPYFTGLANSEREPITQPISKLEFEFEKRKLAKDDVRELI YREILEYHPHMLQEYLRGGGDQMSFMFPSGVDRFKRQFAHLEEGGAKGEKSSPQLRQNASLPRERVIGNKHGDGDYNMKLNVGEKP ELASVSDGISKPLMSARSLLKSETMSASKCIGEIKNKDEDSLSECVEGTDDDVSQKIAQLKT
BdMPK21-2	MESGRWRKFMSSRREVEKSVIFASTKRGSGRTWRTAYYRKSRDCEGKEKGCEVLMRKEKQENTSRYTRTRGRRGKSGLQGSDEAEFF TEYGEANRYEVGEVVGKGSYGVVAAAVDTHTGERVAIKKINDVFEHVSDATRILREIKLLRLLRHPDIVEIKHIILPPSRREFRDIYIIFEL MESDLHQVIKANDDLTPEHHQFFFYQLLRGMKYIHAANVFHRDLKPRNILANADCKLKICDFGLARVSFNDTPSAIFWTDYVATRWYR APELCGSFFSKYTPAIDIWSIGCIFAEMLSGRPLFPGKNVVHQLDLMTDLLGTPSAESLSRIRNEKARRYLGNMRKKHPVPFSQKFPGVD PMALDLLERLLAFDPKDRPTAAEALADPYFTGLANSDREPTTQPISKLEFEFERRKLARDDVRELIYREILEYHPQMLHEYHHGGDQA NFVYPSGVDRFKRQFVHLEEGVTKGEKTSPQLRQHASLPRERIIGIGDELGRPNADYCIKLHVGEEPGHTSVTDGLSKPLLNARNFLKS ESISASQCVVIKEKREKDTLLLKTKSFYFVHSDHARADSSVQD
OsMPK2	MRMEGGGGGGHGHHGGGGGGHGHHGGIGGGEAQIKGTLTHGGRYVQYNVYGNLFEVSSKYVPPIRPVGRGACGIICAVVNAQTRQ EVAIKKIGNAFDNQIDAKRTLREIKLLRHMDHDNVISIKDIIRPPRRENFNDVYIVYELMDTDLHHLLRSNQPLTDDHCQYFLYQVLRGL KYVHSANVLHRDLRPSNLLLNAKCDLKIGDFGLARTTNETDFMMEYVVTRWYRAPELLLNCSEYTAAIDIWSVGCILGEIVTREPLFP GKDYVHQLRLITELIGSPDDSSLGFLRSDNARRYVRSLPQYPKQQFRARFPTMSSGAMDLLERMLVFDPSKRITVDEALCHPYLASLHE IYDEPVCPAPFSFDFEQPSLTEEDIKEIIWREALKFNPEPIH
OsMPK3	MDGAPVAEFRPTMTHGGRYLLYDIFGNKFEVTNKYQPPIMPIGRGAYGIVCSVMNFETREMVAIKKIANAFNNDMDAKRTLREIKLLR HLDHENIIGIRDVIPPPIPQAFNDVYIATELMDTDLHHIIRSNQELSEEHCQYFLYQILRGLKYIHSANVIHRDLKPSNLLLNANCDLKICD FGLARPSSESDMMTEYVVTRWYRAPELLLNSTDYSAAIDVWSVGCIFMELINRQPLFPGRDHMHQMRLITEVIGTPTDDELGFIRNED ARKYMRHLPQYPRRTFASMFPRVQPAALDLIERMLTFNPLQRITVEEALDHPYLERLHDIADEPICLEPFSFDFEQKALNEDQMKQLIFN EAIEMNPNIRY
OsMPK4	MDSSSGGAGGGGGAQIKGMGTHGGRYVLYNVYGNFFEVSSKYAPPIRPIGRGAYGIVCAAVNSENGEEVAIKKIGNAFDNHIDAKRTL REIKLLRHMDHENIIAIKDIIRPPRRDNFNDVYIVSELMDTDLHQIIRSNQPLTDDHCQYFLYQLLRGLKYVHSANVLHRDLKPSNLFLN ANCDLKIADFGLARTTTETDLMTEYVVTRWYRAPELLLNCSQYTAAIDVWSVGCILGEIVTRQPLFPGRDYIQQLKLITELIGSPDDSSL GFLRSDNARRYMKQLPQYPRQDFRLRFRNMSAGAVDLLEKMLVFDPSRRITVDEALHHPYLASLHDINEEPTCPAPFSFDFEQPSFTEE HIKELIWRESLAFNPDPPY
OsMPK6	MDAGAQPPDTEMAEAGGGQQPPAAAAAAGAGAGAGMMENIQATLSHGGRFIQYNIFGNVFEVTAKYKPPILPIGKGAYGIVCSALNS ETGEQVAIKKIANAFDNKIDAKRTLREIKLLRHMDHENIVAIRDIIPPPQRNSFNDVYIAYELMDTDLHQIIRSNQALSEEHCQYFLYQILR GLKYIHSANVLHRDLKPSNLLLNANCDLKICDFGLARTTSETDFMTEYVVTRWYRAPELLLNSSEYTAAIDVWSVGCIFMELMDRKPL FPGRDHVHQLRLLMELIGTPNEADLDFVNENARRYIRQLPRHARQSFPEKFPHVHPLAIDLVEKMLTFDPRQRITVEGALAHPYLASLH DISDEPVCSSPFSFDFEQHALSEEQMKDLIYQEGLAFNPDYQ
OsMPK7	MAMMVDPPNGMGNQGKHYYTMWQTLFEIDTKYVPIKPIGRGAYGIVCSSINRATNEKVAIKKINNVFDNRVDALRTLRELKLLRHLR HENVIALKDIMMPVHRRSFKDVYLVYELMDTDLHQIIKSSQPLSNDHCQYFLFQLLRGLKYLHSAGILHRDLKPGNLLVNANCDLKIC DFGLARTNNTKGQFMTEYVVTRWYRAPELLLCCDNYGTSIDVWSVGCIFAELLGRKPIFPGTECLNQLKLIVNVLGTMSEADIEFIDNP KARKYIKTLPYTPGIPLTSMYPQAHPLAIDLLQKMLVFDPSKRISVTEALEHPYMSPLYDPSANPPAQVPIDLDIDENLGVDMIREMMW

	QEMLHYHPEVVAGVNM
OsMPK14	MAIMVDPPNGMGNQGKYYYSMWQTLFEIDTKYVPIKPIGRGAYGIVCSSINRETNEKVAIKKIHNVFDNRVDALRTLRELKLLRHLRH ENVIALKDIMMPVHRRSFKDVYLVYELMDTDLHQIIKSPQGLSNDHCQYFLFQLLRGLKYLHSAEILHRDLKPGNLLVNANCDLKICD FGLARTNSSKGQFMTEYVVTRWYRAPELLLCCDNYGTSIDVWSVGCIFAELLGRKPIFPGTECLNQLKLIVNVLGTMSESDLEFIDNPK ARRYIKSLPYTPGVPLASMYPHAHPLAIDLLQKMLIFDPTKRISVTEALEHPYMSPLYDPSANPPAQVPIDLDIDENISADMIREMMWHE MLHYHPEVVAAMSAR
OsMPK15	MDFFTEYGEGNRYKIEEVIGKGSYGVVCSALDTHTGDKVAIKKINDIFEHVSDATRILREIKLLRLLRHPDIVEIKHILLPPSRREFKDIYV VFELMESDLHQVIKANDDLTPEHYQFFLYQLLRGLKYIHTANVFHRDLKPKNILANADCKLKICDFGLARVAFSDTPTAIFWTDYIATR WYRAPELCGSFFSKYTPAIDIWSIGCIFAELLTGKPLFPGKNVVHQLDIITDLLGTPSPETISRIRNEKARRYLNSMRRKKPIPFTQKFPNA DPLAMRLLERMLAFDPKDRPSAEEALADPYFKNIANVDREPSAQPITKLEFEFERRRITKEDIRELIYREILEYHPKMLREFLEGTESTGF MYPSAVDHFKKQFAYLEEHYAKGSTAAPPERQHNSLPRPCVVYSDNRPQSTASVTEDLSRCLIRDNNLKSQDSASVGASRIPQGAAARP GKAVGSVLRYGNCSTSAAEQQYEQRRVVRNPAIAPNSSVPLGSSYPRRNQTCKSETGDVERIDSSQTGPPKPYVANKLPATVDGRSGH W
OsMPK16	MDFFTEYGEGNRYKIEEVIGKGSYGVVCSALDTHTGEKVAIKKINDIFEHVSDATRILREIKLLRLLRHPDIVEIKHILLPPSRREFKDIYV VFELMESDLHQVIKANDDLTPEHYQFFLYQLLRGLKYIHTANVFHRDLKPKNILANADCKLKICDFGLARVAFSDTPTAIFWTDYVATR WYRAPELCGSFFSKYTPAIDIWSIGCIFAELLTGKPLFPGKNVVHQLDIITDLLGTPSTEAISRIRNEKARRYLSSMRRKKPIPFTQKFPNA DPLALRLLERMLSFEPKDRPNAEEALADPYFRNIANVDREPSAQPVTKLEFEFERRRITKEDIRELIYRDILEYHPNMLREYLEGTESAG FMYPSAVDHFKKQFAYLEEHYAKGSTAAPPERQHNSLPRPSVLYSDDRPQNTANIAEDLSKCVLGDNTQKMHQGSASVCANRVPQGG AARPGKVVGSALRYGNCSTSTAEQYEHRRTDRNPALATNTVSPRGSYP
OsMPK17-1	MGGGGTLVDGFRRLFHRRTASGSNQSSNAGEEAASSDLEVADDPDLVALRSIRIRVPKRKMPLPVESHKKNTVEMEFFTEYGEASQYQI QEVIGKGSYGVVAAAVDTRTGERVAIKKINDVFEHVSDATRILREIKLLRLLRHPDIVEIKHIMLPPSRREFQDIYVVFELMESDLHQVIR ANDDLTPEHYQFFLYQLLRALKYIHAANVFHRDLKPKNILANSDCKLKICDFGLARASFNDAPSAIFWTDYVATRWYRAPELCGSFFSK YTPAIDIWSIGCIFAELLTGRPLFPGKNVVHQLDIITDLLGTPSSETLSRIRNEKARRYLSTMRKKHAVPFSQKFRNTDPLALRLLERLLAF DPKDRSSAEEALADPYFASLANVEREPSRHPISKLEFEFERRKLTKDDVRELIYREILEYHPQMLQEYMKGGEQISFLYPSGVDRFKRQF AHLEENYSKGERGSPLQRKHASLPRERVGVSKDGYNQQNTNDQERSADSVARTTVSPPMSQDAQQHGSAGQNGVTSTDLSSRSYLKS ASISASKCVAVKDNKEPEDDYISEEMEGSVDGLSEQVSRMHS
OsMPK17-2	MEFFTEYGEASQYQIQEVVGKGSYGVVAAAVDTHTGERVAIKKINDVFEHVSDAIRILREIKVLRLLRHPDIVVIKHIMLPPTRREFRDIY VVFELMESDLHQVIEANHDLSPEHHRFFLYQLLCALKYIHSANVFHRDLKPKNILANSDCKLKICDFGLARVAFNDSPSTIFWTDYVATR WYRAPELCGSFFSKYTPAIDIWSIGCIFAEILTGRPLFPGRNVVHQLDLITDLLGTPSSETLSRIRNENARGYLTGMQRKHPIPFSHKFHNA DPLALRLLERLLAFDPKDRPTAEEALADPYFRGISKLSREPSRLPVSKFEFEFERRKLTKDDVREMIYREILEYHPQMLQEYIRGGEQISF LYPSGVDRFKRQFAHLEENYSRGERSTPLRRQHASLPRERVCSSVDSNNQDSDNEERRAISSIARTMISPPRSQEKGKNRASAYPNGIINL NSNPKIYLKSASISASTCIIRGNKGPKENGISEDMEEVVYELSDNVTRMLS
OsMPK20-1	MQQDQRKKSSTEADFFTEYGDASRYKIQEVIGKGSYGVVCSAIDVHTGEKVAIKKIHDIFEHISDAARILREIKLLRLLRHPDIVEIKHIM LPPSRRDFKDIYVVFELMESDLHQVIKANDDLTKEHYQFFLYQLLRALKYIHTANVYHRDLKPKNILANSNCKLKICDFGLARVAFNDT PTTIFWTDYVATRWYRAPELCGSFFSKYTPAIDIWSIGCIFAEVLTGKPLFPGKNVVHQLDLMTDLLGTPSMDTISRVRNDKARRYLSSM RKKEPILFSQKFPSADPLALDLLQKLLAFDPKDRPTAEEALAHPYFKGLAKVEREPSCQPITKMEFEFERRRVTKEDIRELIFREILEYHP QLLKDYINGTERTTFLYPSAVDQFRKQFAHLEENGGNGPVIPMDRKHTSLPRSTIVHSTPIPAKEQPRIGPSRDKPSDEPYSNPREFDRFS GNAPRTSQAPQRVPTARPGRVVGPVLPYENGATKDSYDARRLAMNSGYPPQQQIPQAYGYYQIPGKSACSELSQAERYTLHQQAYTCA NSATVTDVALDMRAPPFHLSGGPKSDSSERLAAETNLYTRSLNGLAATAAGVAASAHRKVGVVPYGMSRMY
OsMPK20-2	MAVKMRIGRRRAIQQGIAEGGFEWRRVWGCREADSRGALWELVWGERSVRERNAAGAAEEVIALFIMDEMCDPASNLEYVVEKAKC DVHRTSSAEEFFTEYGDANRYRIQEVIGKGSYGVVCSAIDLHTRQKVAIKKVHNIFEHVSDAARILREIKLLRLLRHPDIVEIKHIMLPPS RRDFKDIYVVFELMESDLHQVIKANDDLTKEHYQFFLYQLLRALKYIHTASVYHRDLKPKNILANSNCKLKICDFGLARVAFNDTPTTV FWTDYVATRWYRAPELCGSFFSKYTPAIDIWSIGCIFAEVLTGKPLFPGKNVVHQLDLMTDLLGTPSMDTISRVRNEKARRYLSSMRKK DPVPFSQKFPNADPLALKLLQRLLAFDPKDRPTAEEALTDPYFKGLSKIDREPSCQPIRKLEFEFEQKKLSKEDIRELIFQEILEYHPQLQK NYYRNGRERATFLYPSAVDQFKKQFSNLEESNGSGSAIPMERKHASLPRSTTVHSTPIPPKEQPLAASLKSSRPVSDEPCKNPWVMGGFS GNIPTSSQVSQVAKPVAPGRPVGSVFPYETGSTNDPYGPRGPVMSSGYPPQQQISQAYGYHQVPARMNCVEQSQAMDAYKMHSQSQT QAYAYPNSKVTADVALDMRGSTFHHSAGSKNGSLDRMVTQTDIYTRSLNGIVAAATSAGVGTNRKVGAVPISTSRMY
OsMPK20-3	MQTSNFRKKNAAEVDFFMGYGDVNRYEVLEVIGKGSYGLVCSANDIHTGEKVAIKKIHNIFEHISDAARILREIKLLRLLRHPDIVEIKH IMLPPSKMDFRDIYVVFELMESDLHQVIKANDDLTREHYQFFLYQMLRALKYIHTANVYHRDLKPKNILANANCKLKICDFGLARVAF TDAPTTVFWTDYVATRWYRAPELCGSFYSKYTPAIDIWSIGCIFAEVLIGKPLFPGKNVVHQLDLITDLLGTPSLDAISQVRNDKARKYL TCMRKKQPASFSHKFLKADPLALQLLRKLLAFDPKDRPSAQEALADPYFNGLAKVEREPSCQPIPKMEFEFERRRATKEDIKELIFQEIL EYHPQLLKEHISGTERPNFHHLSVVDQFRKQFTQVEENLNGSGAAVSLQRKHSSLPRSTIVHSAAIPAKDYKHVASSSTKLAVDGSWNA QIQGVHANIAGEPSTIVRPAVSSERSLAPTLQWQPNMTHFLNHALCYQNTVFSGSLLDATGPAQAIPRTTPYVDYRSGNLDLYQHHVSR EDVQSDTATAQAHAASHGPVPAVSYSLPGTYRIT
OsMPK20-4	MAMQTMQTEQQQQQRRKGSPEMDFFSEYGDANRYKIQEVIGKGSYGVVCSAIDQHTGDKVAIKKIHNIFEHLSDAARILREIKLLRLL RHPDIVEIKHIMLPPSRRDFKDIYVVFELMDTDLHQVIKANDDLTKEHHQFFLYQMLRALKYIHTANVYHRDLKPKNILANANCKLKIC DFGLARVAFNDTPTTVFWTDYVATRWYRAPELCGSFFTKYSPAIDIWSIGCIFAEILTGKPLFPGKNVVHQLDLMTDLLGTPSMDTVTRI RNEKARRYLSSMRKKQPVPFSERFPKADPAALKLLQRLLAFDPKDRPTAEEALADPYFKGLAKAEREPSCQPITKMEFEFERRKVTKE DVKELIFREILEYHPQLLKDYMNGTEKTNFLYPSALDNFRRQFANLEENGGKNGDAVPSDRKHVSLPRTTTVHSAPIPPKDHQNITSQV PQRIPGRTGRGACPVIPFENLSAMGPYNQRRVVRNPVLPPATTNLSAYAYHRKSDSSERELQQELEKDRMRYQPSEHFMDAKVVSHMS

	HDLRASSYYVSKAKSDVADRAALQSNMMQGIGPFNGIAAVGGNYNKVSTVQYGVSRMY
OsMPK20-5	MDFFSEYGDSSRYKIQEIVGKGSYGVVCSAIDQHTGDKVAIKKIHNIFEHLSDAARILREIKLLRLLRHPDIVEIKHIMLPPSRRDFKDIYV VFELMDTDLHQVIKANDDLTKEHHQFFLYQMLRALKYIHTANVYHRDLKPKNILANANCKLKICDFGLARVAFNDTPTTVFWTDYVA TRWYRAPELCGSFFSKYSPAIDTWSIGCIFAEILTGKPLFPGKNVVHQLDLMTDLLGTPSMDAISRIRNDKARRYLSSMRRKQPVPFSEK FPNVDPLALKLLQRLLAFDPKDRPTAEEALADPYFKGLAKVEREPSCQPISKMEFEFERRKVTKDDIKELIFREILEYHPQLLKDYMNGS ENTSFLYPSAVDNFRRQFAILEENGGKSGALDRKHVSLPRATTVHSTSIPPNEGLDATSQVTQRIPTARPGRTVGPVLPFENPGAADPHSA RRVVRNPMVPPAAANKSGYSYNLKSDYSDRQHQEELEKDRVQYRPAQHLMDAKVAPDTAPDIRSSQYYFTRSAPRTDLTDRAALQGS MLYGIAPFNGIAAVAGGYSKVGAVQYGVSRMY
OsMPK21-1	MGGRARSILRWLRHHRSRRVSSSSFHLTTTGDDTVKDLHDPRREDAEGDGWEEVHEGPESDPEEYIALVSEDAGTHLPVRTEPRRMDP SKKEPDFFTEYGEANRYKVSEVIGKGSYGVVAAAVDTQTGERVAIKKINDVFDHVSDATRILREIKLLRLLRHPDIVEIKHIMLPPSRREF RDIYVIFELMESDLHQVIKANDDLTPEHHQFFLYQLLRGMKYIHAASVFHRDLKPKNILANADCKLKVCDFGLARVSFNDTPSAIFWTD YVATRWYRAPELCGSFFSKYTPAIDIWSVGCIFAELLTGKPLFPGKNVVHQLDLMTDLLGTPSAESLAKIRNEKARRYLSNMRKKPRVP FTKKFPGVDPMALHLLERLLAFDPKDRPSAEEALTDPYFNGLANSEREPIAQPISKLEFEFEKRKLAKDDVRELIYREILEYHPHMLQEY LRGGDQMSFMYPSGVDRFKRQFAHLEEGVSKGEKSSPQLRQNASLPRERAIGNKHGDDEYHAKLNVGEKPCHASVTDGISKPLMSAR SLLKSESISASKCIGEKPKQDRDQEDSLTESMDETADEVSEKVAQLKT
OsMPK21-2	MDAKKGSGEPEFFSEYGDASRYEVTEVVGKGSYGVVAAAVDTHTGGRVAIKKINDVFEHISDATRILREIKLLRLLRHPDIVEIKHIMLP PSRREFRDIYIIFELMESDLHQVIKANDDLTPEHHQFFLYQLLRGMKYIHAASVFHRDLKPKNILANADCKVKICDFGLARVSFDDTPSA IFWTDYVATRWYRAPELCGSFFSKYTPAIDIWSVGCIFAEMLMGKPLFPGKNVVHQLDLMTDLLGSPSGETISRIRNEKARRYLGNMRK KPRVPFSQKFPGADPMALHLLERLLAFDPKDRPTAAEALTDPYFTGLANSEREPIAQPISKLEFEFERRKLAKDDVRELIYREILEYHPQ MMQKYLRGGDQSNFLYPSGVDRFKRQFAHLEEGVAQGDKTSPQLRQHVSLPRERVVRNGDEPDPTADYCIKLHVGEQPGHSSVTDGL NKPLLSARNFLKSESIGASQCVVIKEKREKDEESMSEYMNEAADGVPHKIAQLKT
AtMEK1	MNRGSLCPNPICLPPLEQSISKFLTQSGTFKDGDLRVNKDGIQTVSLSEPGAPPPIEPLDNQLSLADLEVIKVIGKGSSGNVQLVKHKLTQ QFFALKVIQLNTEESTCRAISQELRINLSSQCPYLVSCYQSFYHNGLVSIILEFMDGGSLADLLKKVGKVPENMLSAICKRVLRGLCYIHH ERRIIHRDLKPSNLLINHRGEVKITDFGVSKILTSTSSLANSFVGTYPYMSPERISGSLYSNKSDIWSLGLVLLECATGKFPYTPPEHKKGW SSVYELVDAIVENPPPCAPSNLFSPEFCSFISQCVQKDPRDRKSAKELLEHKFVKMFEDSDTNLSAYFTDAGSLIPPLAN
AtMEK2	MKKGGFSNNLKLAIPVAGEQSITKFLTQSGTFKDGDLRVNKDGVRIISQLEPEVLSPIKPADDQLSLSDLDMVKVIGKGSSGVVQLVQH KWTGQFFALKVIQLNIDEAIRKAIAQELKINQSSQCPNLVTSYQSFYDNGAISLILEYMDGGSLADFLKSVKAIPDSYLSAIFRQVLQGLI YLHHDRHIIHRDLKPSNLLINHRGEVKITDFGVSTVMTNTAGLANTFVGTYNYMSPERIVGNKYGNKSDIWSLGLVVLECATGKFPYA PPNQEETWTSVFELMEAIVDQPPPALPSGNFSPELSSFISTCLQKDPNSRSSAKELMEHPFLNKYDYSGINLASYFTDAGSPLATLGNLSG TFSV
AtMEK3	MAALEELKKKLSPLFDAEKGFSSSSSLDPNDSYLLSDGGTVNLLSRSYGVYNFNELGLQKCTSSHVDESESSETTYQCASHEMRVFGAI GSGASSVVQRAIHIPNHRILALKKINIFEREKRQQLLTEIRTLCEAPCHEGLVDFHGAFYSPDSGQISIALEYMNGGSLADILKVTKKIPEP VLSSLFHKLLQGLSYLHGVRHLVHRDIKPANLLINLKGEPKITDFGISAGLENSMAMCATFVGTVTYMSPERIRNDSYSYPADIWSLGL ALFECGTGEFPYIANEGPVNLMLQILDDPSPTPPKQEFSPEFCSFIDACLQKDPDARPTADQLLSHPFITKHEKERVDLATFVQSIFDPTQR LKDLADMLTIHYYSLFDGFDDLWHHAKSLYTETSVFSFSGKHNTGSTEIFSALSDIRNTLTGDLPSEKLVHVVEKLHCKPCGSGGVIIRA VGSFIVGNQFLICGDGVQAEGLPSFKDLGFDVASRRVGRFQEQFVVESGDLIGKYFLAKQELYITNLD
AtMEK4	MRPIQSPPGVSVPVKSRPRRRPDLTLPLPQRDVSLAVPLPLPPTSGGSGGSSGSAPSSGGSASSTNTNSSIEAKNYSDLVRGNRIGSGAGG TVYKVIHRPSSRLYALKVIYGNHEETVRRQICREIEILRDVNHPNVVKCHEMFDQNGEIQVLLEFMDKGSLEGAHVWKEQQLADLSRQ ILSGLAYLHSRHIVHRDIKPSNLLINSAKNVKIADFGVSRILAQTMDPCNSSVGTIAYMSPERINTDLNQGKYDGYAGDIWSLGVSILEFY LGRFPFPVSRQGDWASLMCAICMSQPPEAPATASPEFRHFISCCLQREPGKRRSAMQLLQHPFILRASPSQNRSPQNLHQLLPPPRPLSSS SSPTT
AtMEK5	MKPIQSPSGVASPMKNRLRKRPDLSLPLPHRDVALAVPLPLPPPSSSSSAPASSSAISTNISAAKSLSELERVNRIGSGAGGTVYKVIHTPT SRPFALKVIYGNHEDTVRRQICREIEILRSVDHPNVVKCHDMFDHNGEIQVLLEFMDQGSLEGAHIWQEQELADLSRQILSGLAYLHRR HIVHRDIKPSNLLINSAKNVKIADFGVSRILAQTMDPCNSSVGTIAYMSPERINTDLNHGRYDGYAGDVWSLGVSILEFYLGRFPFAVSR QGDWASLMCAICMSQPPEAPATASQEFRHFVSCCLQSDPPKRWSAQQLLQHPFILKATGGPNLRQMLPPPRPLPSAS
AtMEK6	MVKIKSNLKQLKLSVPAQESPISSFLTASGTFHDGDFLLNQKGLRLTSDEKQSRQSDSKELDFEITAEDLETVKVIGKGSGGVVQLVRHK WVGKFFAMKVIQMNIQEEIRKQIVQELKINQASSQCPHVVVCYHSFYHNGAFSLVLEYMDRGSLADVIRQVKTILEPYLAVVCKQVLL GLVYLHNERHVIHRDIKPSNLLVNHKGEVKISDFGVSASLASSMGQRDTFVGTYNYMSPERISGSTYDYSSDIWSLGMSVLECAIGRFP YLESEDQQNPPSFYELLAAIVENPPPTAPSDQFSPEFCSFVSACIQKDPPARASSLDLLSHPFIKKFEDKDIDLGILVGTLEPPVNYLR
AtMEK7	MALVRKRRQINLRLPVPPLSVHLPWFSFASSTAPVINNGISASDVEKLHVLGRGSSGIVYKVHHKTTGEIYALKSVNGDMSPAFTRQLA REMEILRRTDSPYVVRCQGIFEKPIVGEVSILMEYMDGGNLESLRGAVTEKQLAGFSRQILKGLSYLHSLKIVHRDIKPANLLLNSRNEV KIADFGVSKIITRSLDYCNSYVGTCAYMSPERFDSAAGENSDVYAGDIWSFGVMILELFVGHFPLLPQGQRPDWATLMCVVCFGEPPRA PEGCSDEFRSFVDCCLRKESSERWTASQLLGHPFLRESL
AtMEK8	MVMVRDNQFLNLKLSPIQAPTTIPPCRFPIIPATKVSATVSSCASNTFSVANLDRISVLGSGNGGTVFKVKDKTTSEIYALKKVKENWDS TSLREIEILRMVNSPYVAKCHDIFQNPSGEVSILMDYMDLGSLESLRGVTEKQLALMSRQVLEGKNYLHEHKIVHRDIKPANLLRSSKE EVKIADFGVSKIVVRSLNKCNSFVGTFAYMSPERLDSEADGVTEEDKSNVYAGDIWSFGLTMLEILVGYYPMLPDQAAIVCAVCFGEPP KAPEECSDDLKSFMDCCLRKKASER
AtMEK9	MALVRERRQLNLRLPLPPISDRRFSTSSSSATTTTVAGCNGISACDLEKLNVLGCGNGGIVYKVRHKTTSEIYALKTVNGDMDPIFTRQL MREMEILRRTDSPYVVKCHGIFEKPVVGEVSILMEYMDGGTLESLRGGVTEQKLAGFAKQILKGLSYLHALKIVHRDIKPANLLLNSK

	NEVKIADFGVSKILVRSLDSCNSYVGTCAYMSPERFDSESSGGSSDIYAGDIWSFGLMMLELLVGHFPLLPPGQRPDWATLMCAVCFGE PPRAPEGCSEEFRSFVECCLRKDSSKRWTAPQLLAHPFLREDL
AtMEK10	MTLVRERRHQEPLTLSIPPLIYHGTAFSVASSSSSSPETSPIQTLNDLEKLSVLGQGSGGTVYKTRHRRTKTLYALKVLRPNLNTTVTVEA DILKRIESSFIIKCYAVFVSLYDLCFVMELMEKGSLHDALLAQQVFSEPMVSSLANRILQGLRYLQKMGIVHGDIKPSNLLINKKGEVKI ADFGASRIVAGGDYGSNGTCAYMSPERVDLEKWGFGGEVGFAGDVWSLGVVVLECYIGRYPLTKVGDKPDWATLFCAICCNEKVDIP VSCSLEFRDFVGRCLEKDWRKRDTVEELLRHSFVKNR
BdMKK1	MRKPGKLALPSHESTIGKFLTQSGTFKDGDLLVNKDGLRIVHNSEEGEAPPIVPLDDHQLSLDDLDAIKVIGKGSSGIVQLVRHKWTDQ FFALKVIQLNIQESIRKQIAQELKISLSTQCQYVVTCYQCFYVNGVISIVLEYMDGGSLADFLKTVRTIPEAYLAAICKQVLQGLMYLHH EKRVIHRDLKPSNILINHRGEVKISDFGVSAIIASSSAQRDTFTGTFNYMAPERISGQKHGYMSDIWSLGLVMLECATGNFPYPSPDSFYE LLEAVVDQPPPSAPTDQFSPEFCSFISACIQKEATDRSSAQVLSDHPFLSMYDDLNIDLADYFTTAGSPLATFKQIVL
BdMKK3-1	MAGLEELKKKLQPLLFDDPDKDGISTRVPFLEDNCDSYVVSDGGTINLLSRSFGEYNINEHGFHKRSTGADESDFGEKAYRCASHDMH IFGPIGNGASSVVQRAIFIPVHRILALKKINIFEKEKRQQILNEMRTLCEASCYPGLVEFQGAFYMPDSGQISIALEYMDGGSLADVIKVK KSIPEQVLAHMLQKVLLGLRYLHEVRHLVHRDIKPANMLVNLKGEAKITDFGVSAGLDNTMAMCATFVGTVTYMSPERIRNENYSYA ADIWSLGLTILECATGKFPYNVNEGPANLMLQILDDPSPTPPADAYSPEFCSFVNDCLQKDPDARPTCEQLFGHPFIKRYENAGVDLIAY VKGVVDPTERLKEIAEMLAVHYYLLFNGSDGLWHHMKTFYMEESTFSFSGNVYVGRNDIFDTLSSIRKKLKGDRPREKIVHVVEKLH CRANGETGIAIRVSGSLIVGNQFLVCGEGLQAEGMPSVEELSIDIPSKRVGQFREQFMMLPGISMGSFHISRQDLYIIQA
BdMKK3-2	MAGLEELKKKLQPLMFNDPDKDGFSTRVPFPEDTCDSYVVSDGGTINLLSRSFGEYNINEHGFHKRSAGADESDFGEKAYRCASQDM HIFGPIGNGASSVVQRAIFIPVHRILALKKINIFEKEKRQQILNEMRTLCEACCYPGLVEFQGAFYMPDSGQISIALEYMDGGSLADVIKV KKSIPEPVLAHMLQKVLLGLRYLHEVRHLVHRDIKPANMLVNLKGEAKITDFGVSAGLDNTMAMCATFVGTVTYMSPERIRNENYSY AADIWSLGLTILECATGKFPYNVNEGPANLMLQILDDPSPAPPENAFSSEFCSFVNDCLQKDADARPTCEQLLSHPFIKRYENAGVDLAA YVKGVVNPEERLKQIAEMLAVHYYLLFNGSDGLWHHMKTFYMEDSTFSFSGNLYVGQSDIFDTLSNIRTKLKGDRPREKIVHVVEKL HCRANEETGIAIRVSGSFIVSNQFLICGEGLQAEGMPSLEELSIDIPSKRVGQFREQFIMHPGRSMGCYYISRQDLYIIQA
BdMKK3-3	MDGGWDGMGQRKRRHRAGIPIPTYPGLAASLEFCFVTAGACHTAPGPGSKIAASLFAALLFQRPPASTSRAIFFCFVIMAAGLEDLRRR VQPIFFDADGNVMPAPDDDSEVLDGGTINLLSRSSDEYNINERGFHKRTIRSDDEYSSEKAFRCSCHDMHIFDSVGNGASSVVHRAIYV PVHRVLALKKINIFEKERRQQILNEIITLSEACCYPGLVEFHGVFYTPDSGEIYFALEYMDGGSLADIIRVKKFISEPVLSHMLQKVLLALR YLHEVRHLVHRDIKPANLLLNLKGDTKITDFGVTSGLHDSIDMCATFLGSVTYMSPERIRNESYSYSADIWSLGLTALECATGRYPYDV NGGEADLMLQKDADARPTCDQLLSHSFIKRYEGPGVDLSEYNKSVHDPSERLSQIAHMLAVHYYLIFDGGDDQWCHMKTFYQQDSIF SFSGETHVGKSEIFETLSRIRKMLKGNSPCEKIAHVMEKVYCRSHGEEGMRVRVSGSFIVGNEFVVCADGVRAEGMLSIDELSPDILSK QAGHFQEDFFMEPGTALGCYVISKQELHIADT
BdMKK4	MRPGGPPNARPQQPGTPGRARRRPDLTLPLPQRDLTSLAVPLPLPPPPSSAPSSASSSGSSLSSMGAPTPPNSAGSAPPPPPPLAELERVRR IGSGAGGTVWMVRHRPTGRPYALKVLYGNHDDAVRRQITREIAILRTAEHPAIVRCHGMYEQAGELQILLEFMDGGSLEGRRIASEAFL ADVARQVLSGIAYLHRRHIVHRDIKPSNLLIDSGRRVKIADFGVGRILNQTMDPCNSSVGTIAYMSPERINTDLNDGAYDGYAGDIWSF GLSILEFYLGRFPLGENLGKQGDWAALMCAICYSDSPAPPPIASPEFKSFISCCLQKNPARRPSAAQLLQHRFIAGPQPQVLAAPPS
BdMKK5	MRPAGSLPSPQPGTPGRPRRRPDLTLPMPQRPDVSSSLAVPLPLPPPSSLGLAQPPAAAAAAAAPPPPPLGELERVRRVGSGAGGTVWM VRHRPTGRCYALKQLYGNHDDAVRRQIAREIAILRTAEHPAVVRCHGMYERGGELQILLEYMDGGSLDGRRIAAEGFLADVARQVLSG IAYLHRRHIVHRDIKPSNLLIDSARRVKIADFGVGRILNQTMDPCNSSVGTIAYMSPERINTDLNDGAYDGYAGDIWSFGLSILEFYLGRF PFGENLGKQGDWAALMVAICYNDPPEPSAAASPEFRGFISCCLQKNPAKRLSAAQLLQHPFVAGPQPLPLAAPPS
BdMKK6	MRGKKPLKELKLSVPAQETSVDKFLTASGTFKDGELRLNQRGLRLISEEENGDEHQSTNMKVEDVQLSMDDLEMIQVIGKGSGGVVQ LVQHKWVGTFYALKGIQMNIQEAVRKQIVQELKINQATQSPHIVSCHQSFYHNGVIYLVLEYMDRGSLADIIKQVKTILEPYLAVLCKQ VLEGLLYLHHERHVIHRDIKPSNLLVNHKGEVKITDFGVSAVLASSIGQRDTFVGTYNYMAPERISGSSYDYKSDVWSLGLVILECAIGR FPYTPSEGEGWLSFYELLEAIVDQPPPGAPADQFSPEFCSFISACIQKDPAERMSASELLNHAFIKKFEGKDLDLRILVESLEPPMNVPE
BdMKK10-1	MALLREKRLQLSLHVPTRAADAQEAGLHRRPNPAAALPLAATTPAARSSQFRVADFEKLAVLGRGNGGTVYKVRHRETCELYALKVQ HCNGDATAEAEVLSRTASPFVVRCHSVLPAAASGDVAMLLELVDGGSLDSIVKSRSRGQAEAFSQFPEEALAEVAAQALSGLAYLHAR RIVHLDVKPGNLLVSTGGEVKIADFGIARVLPRAGGDDVRCTAYAGTAAYMSPERFDPEAHGGHYDPYAADVWGLGVTVLELLMGRY PLLPAGQRPSWAALMCAICFGETPALSDGEASAELRGFVAACLHKDYRRRASVAELLAHPFVAGRDVAASKCALRKLVTEASMSP
BdMKK10-2	MALVRQRRQLPHLTLPLDHFALRPPPAPAPTVAASTSSEAAGLRLSDFERISLLGQGNGGTVYKARHRRAAAQPPVALKLFVAGDPSAA REAEILRLAADAPHVVRLHAVVPSSSPAAGAEQPPPAALALELLPGGSLAGLLRRLGRSMGERPIAAVARQALLGLDALHALRVVHRD LKPSNLLLGSHGEVKIADFGAGKVLRRRLDPCASYVGTAAYMSPERFDPEAYSGDYDPYAADVWSLGLAILELYLGHFPLLPAGQRPD WAALMCAICFGDAPEAPAAASEEFRDFVARCLEKKAGQRASVAELLEHPFIAERDAEEAKRALAALVAEAELGDL
BdMKK10-3	MALLREKRLQLSLHVPTRAAEALDAVHRRPNPVAATLAASTPAAARSSQFRLADFDKLTVLGRGNGGTVYKVRHRETCELYALKVQH CNGDPTAAAEAEVLSRTASPFIVRCHSVLPGAASGDVAMLLELVDGGSLDSIVKSRRAHAFPFPEEALAEVAAQALSGLAYLHARRIVH LDIKPGNLLVSTGGEVKVADFGIAKVLPRAGADDARCKSYAGTAAYMSPERFDPEAHGGHYDAYAADVWGLGVTVLELLMGRYPLLP AGQRPSWPALMCAICFGETPVLSDGEASAELRGFVAACLRKDHTKRASVAELLAHPFVAGRDVATSKCALRKLVTEASTSP
BdMKK10-4	MASAKERRLPQLHLKLDVPTCAFRCAAPAPAPATAATPATSASRPPHGEFRLNDFDRLSVLGRGNGGSVYKVSHRRTSALYALKIIHGA HARPGAADEEADIVRRVVDSPNVVRCHSVLPTASGDAAALLLELVDGGSLDSLVGGGGFLPEAAVADVAAQALSGLAHLRARRVAHR DIKPANLLLSAAGEVKIADFGIAKVVVSGAGGRARALAYEGTVAYMSPERFDSERHADADPYAADVWGLGVTLLELLMGRYPLLPAG QKPTWAALMCAICFGELPALPEGAASLEFRGFVAACLRKDHRKRASVVELLAHPFVAGRDVAASRRALREAIERRCSC
BdMKK10-5	MALTVRQRRLPQLHISLDLPSCSFRCPNPPVAATASTSGEFRASDFERLAVLGRGNGGTVYKVAHRRTSAQYALKVLHGGGDPGAAAAA EADVLRRAADSPYVVRCHSVFPAASGSGETALLLELVDGGSLDSVRRGVGVSVFFPEAALAEVAAQALAGLAHLHARRVVHRDIKPA

	NLLVSGAGGVKVADFGIAMVLPSRAGGERCAAAYEGTVAYMSPERFDSEGRADADPRGADVWGLGVTVLELLMGRYPLLPAGQKPT WAALMCAICFGELPALPEGAASTELRGFIAACLRKDHTKRASVAELIKHPFVAGRNMAASRLALRRLVAGA
OsMKK1	MGKPGKLALPSHESTIGKFLTQSGTFKDGDLLVNKDGLRIVSQSEEGEAPPIEPLDHNQLSLDDLDAIKVIGKGSSGIVQLVRHKWTGQF FALKVIQLNIQENIRRQIAQELKISLSTQCQYVVACCQCFYVNGVISIVLEYMDSGSLSDFLKTVKTIPEPYLAAICKQVLKGLMYLHHE KHIIHRDLKPSNILINHMGEVKISDFGVSAIIASSSAQRDTFTGTYNYMAPERISGQKHGYMSDIWSLGLVMLELATGEFPYPPRESFYEL LEAVVDHPPPSAPSDQFSEEFCSFVSACIQKNASDRSSAQILLNHPFLSMYDDLNIDLASYFTTDGSPLATFNTSNRYDDR
OsMKK3	MAGLEELKKKLQPLLFDDPDKGGVSSRVPLPEDTCDSYVVSDGGTVNLLSRSLGEYNINEHGFHKRSTGPEESDSGEKAYRCASHDM HIFGPIGNGASSVVQRAVFIPVHRILALKKINIFEKEKRQQILNEMRTLCEACCYIGLVEFQGAFYMPDSGQISIALEYMDGGSLANVIKI KKSIPEPVLAHMLQKVLLGLRYLHEVRHLVHRDIKPANLLVNLKGEAKITDFGVSAGLDNTMAMCATFVGTVTYMSPERIRNENYSYA ADIWSLGLAILECATGKFPYNVNEGPANLMLQILDDPSPTPPKDSYSSEFCSFINDCLQKDADARPSCEQLLSHPFIKRYENTTVDLVAYV KSIVDPTERLKQIAEMLAVHYYLLFNGTDGIWHYMKTFYMEESTFSFSGNVYVGQSDIFDTLSNIRKKLKGDCPREKIVHVVEKLHCR AHGETGIAIRVSGSFIVGNQFLICGEGLQAEGMPSLEELSIDIPSKRVGQFREQFIMEPGSSMGCYYILRQDLYIIQA
OsMKK4	MRPGGPPSLRAGLQQQQQQQPGTPGRSRRRPDLTLPLPQRDLTSLAVPLPLPLPPSSAPSSTSSSGSSSLGGVPTPPNSVGSAPPAPPPLSE LERVRRIGSGAGGTVWMVRHRPTGRPYALKVLYGNHDDAVRRQITREIAILRTAEHPAVVRCHGMYEQAGELQILLEYMDGGSLEGR RIASEAFLADVARQVLSGIAYLHRRHIVHRDIKPSNLLIDSGRRVKIADFGVGRILNQTMDPCNSSVGTIAYMSPERINTDLNDGAYDGY AGDIWSFGLSILEFYMGRFPLGENLGKQGDWAALMCAICYSDSPAPPPNASPEFKSFISCCLQKNPARRPSAAQLLQHRFVAGPQQQQQ PQPQPLAPPPS
OsMKK5	MRAGDMPGRGARRRPDLTLPMPQRDAPTSLAVPLPLPPAATTTTSAPPAGGAMHPLASAGAAPPPPLEELERVRRVGSGAGGTVWMV RHRGTGKEYALKVLYGNHDDAVRRQIAREIAILRTAEHPAVVRCHDMYERGGELQILLEYMDGGSLDGRRIADERFLADVARQVLSGI AYLHRRHIVHRDIKPSNLLIDSARRVKIADFGVGRILNQTMDPCNSSVGTIAYMSPERINTDLNDGAYDGYAGDIWSFGLSILEFYMGKF PFGENLGKQGDWAALMCAICYSDPPEPPAAVSPEFRSFVGYCLQKNPAKRPSAAQLMQHPFVAGPQPQPLAAPPPSS
OsMKK6	MRGKKPHKELKLSVPAQETPVDKFLTASGTFKDGELRLNQRGLQLISEETADEPQSTNLKVEDVQLSMDDLEMIQVIGKGSGGIVQLV RHKWVGTLYALKGIQMNIQEAVRKQIVQELKINQATQNAHIVLCHQSFYHNGVIYLVLEYMDRGSLADIIKQVKTILEPYLAVLCKQVL EGLLYLHHERHVIHRDIKPSNLLVNRKGEVKITDFGVSAVLASSMGQRDTFVGTYNYMAPERISGSSYDYKSDIWSLGLVILECAIGRFP YIPSEGEGWLSFYELLEAIVDQPPPSAPADQFSPEFCAFISSCIQKDPAERMSASELLNHPFIKKFEDKDLDLRILVESLEPPMNISE
OsMKK10-1	MAKLRERRQLRLSVPASPPPFPHLDHPFAALPSTPPGSPVLAELEMLSVVGRGAGGTVYRARHRRTGAALAVKEMRDDGAALREAGA HLRVAAAAPDHPSVVRLHGVCVGHPVAGNRFVYLVLEYLPEGSLSDVLVRGALPEPAIAGVTRCVLRGLSHLHRLGVAHGDVKPSNLL VGHRGEIKIADFGASRVVTGRDEAHHQSPGTWAYMSPEKLHPEGFGGGGGADFSGDVWSLGVVLLECHAGRFPLVAAGERPDWPALV LAVCFAAAPEVPVAASPEFGGFVRRCLEKDWRRRATVEELLGHPFVAGKPSRCERQNEWRTTFQDKTGQVNTSIYGEE
OsMKK10-2	MALVRQRRHLPHLTLPLDHFALRPPPAPQQQQQPAVAPSTSSDVRLSDFERISVLGHGNGGTVYKARHRRGCPAQQPLALKLFAAGDLS AAREAEILRLAADAPHVVRLHAVVPSAAGGVEEPAALALELMPGGSLAGLLRRLGRPMGERPIAAVARQALLGLEALHALRIVHRDLK PSNLLLGADGEVKIADFGAGKVLRRRLDPCASYVGTAAYMSPERFDPEAYSGDYDPYAADVWSLGVAILELYLGHFPLLPVGQRPDW AALMCAICFGEAPEMPAAASEEFRDFVSRCLEKKAGRRASVGELLEHPFIAERDAADAQRSLAALVAEAEQSGDL
OsMKK10-3	MALIREKRFSQMNLSLHVPSRVPFQDAAAAARRQCPPPVAAASTSSTPASRASQFRLADFERVAVLGRGNGGTVYKVRHRETCALYAL KVQHSAGGGELAGVEADILSRTASPFVVRCHAVLPASASASGDVALLLELVDGGSLASVAARAGAFPEAAVAEVAAQALSGLACLHAR RVVHRDIKPGNLLVSVDGEVKIADFGIAKVVPPRRGGEHRAAYEYEGTAAYMSPERFDSELHGDGADPFAADVWGLGVTVLELLMAR YPLLPAGQKPSWAALMCAICFGELPPLPDGAASPELRAFLAACLHKDHTKRPSAAHLLTHQFVAGRNVAASKLALRRLVAGA
AtMAPKKK1	WRKGQLIGRGAFGTVYMGMNLDSGELLAVKQVLIAANFASKEKTQAHIQELEEEVKLLKNLSHPNIVRYLGTVREDDTLNILLEFVP GGSISSLLEKFGPFPESVVRTYTRQLLLGLEYLHNHAIMHRDIKGANILVDNKGCIKLADFGASKQVAELATMTGAKSMKGTPYWMA PEVILQTGHSFSADIWSVGCTVIEMVTGKAPWSQQYKEVAAIFFIGTTKSHPPIPDTLSSDAKDFLLKCLQEVPNLRPTASELLKHPFV
AtMAPKKK2	WRKGQLIGRGAFGTVYMGMNLDSGELLAVKQVLITSNCASKEKTQAHIQELEEEVKLLKNLSHPNIVRYLGTVREDETLNILLEFVPG GSISSLLEKFGAFPESVVRTYTNQLLLGLEYLHNHAIMHRDIKGANILVDNQGCIKLADFGASKQVAELATISGAKSMKGTPYWMAPE VILQTGHSFSADIWSVGCTVIEMVTGKAPWSQQYKEIAAIFHIGTTKSHPPIPDNISSDANDFLLKCLQQEPNLRPTASELLKHPFV
AtMAPKKK3	WKKGKFLGSGTFGQVYLGFNSEKGKMCAIKEVKVISDDQTSKECLKQLNQEINLLNQLCHPNIVQYYGSELSEETLSVYLEYVSGGSI HKLLKDYGSFTEPVIQNYTRQILAGLAYLHGRNTVHRDIKGANILVDPNGEIKLADFGMAKHVTAFSTMLSFKGSPYWMAPEVVMSQ NGYTHAVDIWSLGCTILEMATSKPPWSQFEGVAAIFKIGNSKDTPEIPDHLSNDAKNFIRLCLQRNPTVRPTASQLLEHPFL
AtMAPKKK4	WKKGRLLGMGSFGHVYLGFNSESGEMCAMKEVTLCSDDPKSRESAQQLGQEISVLSRLRHQNIVQYYGSETVDDKLYIYLEYVSGGS IYKLLQEYGQFGENAIRNYTQQILSGLAYLHAKNTVHRDIKGANILVDPHGRVKVADFGMAKHITAQSGPLSFKGSPYWMAPEVIKNS NGSNLAVDIWSLGCTVLEMATTKPPWSQYEGVPAMFKIGNSKELPDIPDHLSEEGKDFVRKCLQRNPANRPTAAQLLDHAFV
AtMAPKKK5	WKKGKLIGRGTFGSVYVASNSETGALCAMKEVELFPDDPKSAECIKQLEQEIKLLSNLQHPNIVQYFGSETVEDRFFIYLEYVHPGSIN KYIRDHCGTMTESVVRNFTRHILSGLAYLHNKKTVHRDIKGANLLVDASGVVKLADFGMAKHLTGQRADLSLKGSPYWMAPELMQ AVMQKDSNPDLAFAVDIWSLGCTIIEMFTGKPPWSEFEGAAAMFKVMRDSPPIPESMSPEGKDFLRLCFQRNPAERPTASMLLEHRFL
AtMAPKKK6	YMLGDEIGKGAYGRVYIGLDLENGDFVAIKQVSLENIGQEDLNTIMQEIDLLKNLNHKNIVKYLGSLKTKTHLHIILEYVENGSLANIIK PNKFGPFPESLVTVYIAQVLEGLVYLHEQGVIHRDIKGANILTTKEGLVKLADFGVATKLNEADFNTHSVVGTPYWMAPEVIELSGVC AASDIWSVGCTIIELLTCVPPYYDLQPMPALYRIVQDDTPPIPDSLSPDITDFLRLCFKKDSRQRPDAKTLLSHPWI
AtMAPKKK7	YMLGDEIGKGAYGRVYKGLDLENGDFVAIKQVSLENIVQEDLNTIMQEIDLLKNLNHKNIVKYLGSSKTKTHLHIILEYVENGSLANII KPNKFGPFPESLVAVYIAQVLEGLVYLHEQGVIHRDIKGANILTTKEGLVKLADFGVATKLNEADVNTHSVVGTPYWMAPEVIEMSG VCAASDIWSVGCTVIELLTCVPPYYDLQPMPALFRIVQDDNPPIPDSLSPDITDFLRQCFKKDSRQRPDAKTLLSHPWI

AtMAPKKK8	WQKGQLLGRGSFGSVYEGISGDGDFFAVKEVSLLDQGSQAQECIQQLEGEIKLLSQLQHQNIVRYRGTAKDGSNLYIFLELVTQGSLL KLYQRYQLRDSVVSLYTRQILDGLKYLHDKGFIHRDIKCANILVDANGAVKLADFGLAKVSKFNDIKSCKGTPFWMAPEVINRKDSD GYGSPADIWSLGCTVLEMCTGQIPYSDLEPVQALFRIGRGTLPEVPDTLSLDARLFILKCLKVNPEERPTAAELLNHPFV
AtMAPKKK9	WQKGQLLRQGSFGSVYEAISEDGDFFAVKEVSLLDQGSQAQECIQQLEGEIALLSQLEHQNILRYRGTDKDGSNLYIFLELVTQGSLLE LYRRYQIRDSLISLYTKQILDGLKYLHHKGFIHRDIKCATILVDANGTVKLADFGLAKVSKLNDIKSRKETLFWMAPEVINRKDNDGY RSPADIWSLGCTVLEMCTGQIPYSDLEPVEALFRIRRGTLPEVPDTLSLDARHFILKCLKLNPEERPTATELLNHPFV
AtMAPKKK10	WLKGQLLGRGSYASVYEAISEDGDFFAVKEVSLLDKGIQAQECIQQLEGEIALLSQLQHQNIVRYRGTAKDVSKLYIFLELVTQGSVQ KLYERYQLSYTVVSLYTRQILAGLNYLHDKGFVHRDIKCANMLVDANGTVKLADFGLAEASKFNDIMSCKGTLFWMAPEVINRKDS DGNGSPADIWSLGCTVLEMCTGQIPYSDLKPIQAAFKIGRGTLPDVPDTLSLDARHFILTCLKVNPEERPTAAELLHHPFV
AtMAPKKK11	WQKGQLLGRGSLGSVYEGISADGDFFAFKEVSLLDQGSQAHEWIQQVEGGIALLSQLQHQNIVRYRGTTKDESNLYIFLELVTQGSLR KLYQRNQLGDSVVSLYTRQILDGLKYLHDKGFIHRNIKCANVLVDANGTVKLADFGLAKVMSLWRTPYWNWMAPEVIVLKSFPLF
AtMAPKKK12	WRKGELIGCGAFGRVYMGMNLDSGELLAIKQVLIAPSSASKEKTQGHIRELEEEVQLLKNLSHPNIVRYLGTVRESDSLNILMEFVPGG SISSLLEKFGSFPEPVIIMYTKQLLLGLEYLHNNGIMHRDIKGANILVDNKGCIRLADFGASKKVVELATVNGAKSMKGTPYWMAPEVI LQTGHSFSADIWSVGCTVIEMATGKPPWSEQYQQFAAVLHIGRTKAHPPIPEDLSPEAKDFLMKCLHKEPSLRLSATELLQHPFV
AtMAPKKK13	WVRGACIGRGCFGAVSTAISKTNGEVFAVKSVDLATSLPTQSESLENEISVFRSLKPHPYIVKFLGDGVSKEGTTTFRNLYLEYLPNGD VASHRAGGKIEDETLLQRYTACLVSALRHVHSQGFVHCDVKARNILVSQSSMVKLADFGSAFRIHTPRALITPRGSPLWMAPEVIRRE YQGPESDVWSLGCTIIEMFTGKPAWEDHGIDSLSRISFSDELPVFPSKLSEIGRDFLEKCLKRDPNQRWSCDQLLQHPFL
AtMAPKKK14	WIRGSCVGRGCFGTVSKALSKIDGGLFAVKSIDLATCLPSQAESLENEIVILRSMKSHPNIVRFLGDDVSKEGTASFRNLHLEYSPEGDV ANGGIVNETLLRRYVWCLVSALSHVHSNGIVHCDVKSKNVLVFNGGSSVKLADFGSAVEFEKSTIHVSPRGSPLWMAPEVVRREYQG PESDVWSLGCTVIEMLTGKPAWEDHGFDSLSRIGFSNDLPFIPVGLSELGRDFLEKCLKRDRSQRWSCDQLLQHPFL
AtMAPKKK15	WIRGPIIGRGSTATVSLGITNSGDFFAVKSAEFSSSAFLQREQSILSKLSSPYIVKYIGSNVTKENDKLMYNLLMEYVSGGSLHDLIKNSG GKLPEPLIRSYTRQILKGLMYLHDQGIVHCDVKSQNVMIGGEIAKIVDLGCAKTVEENENLEFSGTPAFMSPEVARGEEQSFPADVWA LGCTVIEMATGSSPWPELNDVVAAIYKIGFTGESPVIPVWLSEKGQDFLRKCLRKDPKQRWTVEELLQHPFL
AtMAPKKK16	WTRGPIIGRGSTATVSIAISSSGELFAVKSADLSSSSLLQKEQSILSTLSSPHMVKYIGTGLTRESNGLVYNILMEYVSGGNLHDLIKNSG GKLPEPEIRSYTRQILNGLVYLHERGIVHCDLKSHNVLVEENGVLKIADMGCAKSVDKSEFSGTPAFMAPEVARGEEQRFPADVWAL GCTMIEMMTGSSPWPELNDVVAAMYKIGFSGESPAIPAWISDKAKDFLKNCLKEDQKQRWTVEELLKHPFL
AtMAPKKK17	WTRGRILGRGSTATVYAAAGHNSDEILAVKSSEVHRSEFLQREAKILSSLSSPYVIGYRGSETKRESNGVVMYNLLMEYAPYGTLTDA AAKDGGRVDETRVVKYTRDILKGLEYIHSKGIVHCDVKGSNVVISEKGEAKIADFGCAKRVDPVFESPVMGTPAFMAPEVARGEKQG KESDIWAVGCTMIEMVTGSPPWTKADSREDPVSVLYRVGYSSETPELPCLLAEEAKDFLEKCLKREANERWTATQLLNHPFL
AtMAPKKK18	WTRGKTLGRGSTATVSAATCHESGETLAVKSAEFHRSEFLQREAKILSSLNSPYVIGYRGCEITREPFHNNGEATTYSLLMEYAPYGTL TDVATKNGGFIDEARVVKYTRQILLGLEYIHNSKGIAHCDIKGSNVLVGENGEAKIADFGCAKWVEPEITEPVRGTPAFMAPEAARGE RQGKESDIWAVGCTVIEMVTGSQPWIGADFTDPVSVLYRVGYLGELPELPCSLTEQAKDFLGKCLKKEATERWTASQLLNHPFL
AtMAPKKK19	WIRGETIGYGTFSTVSLATRSNNDSGEFPPLMAVKSADSYGAASLANEKSVLDNLGDDCNEIVRCFGEDRTVENGEEMHNLFLEYASR GSLESYLKKLAGEGVPESTVRRHTGSVLRGLRHIHANGFAHCDLKLGNILLFGDGAVKIADFGLAKRIGDLTALNYGVQIRGTPLYMA PESVNDNEYGSEGDVWALGCVVVEMFSGKTAWSLKEGSNFMSLLLRIGVGDEVPMIPEELSEQGRDFLSKCFVKDPKKRWTAEMLL NHPFV
AtMAPKKK20	WVRGETIGFGTFSTVSTATKSRNSGDFPALIAVKSTDAYGAASLSNEKSVLDSLGDCPEIIRCYGEDSTVENGEEMHNLLLEYASRGSL ASYMKKLGGEGLPESTVRRHTGSVLRGLRHIHAKGFAHCDIKLANILLFNDGSVKIADFGLAMRVDGDLTALRKSVEIRGTPLYMAPE CVNDNEYGSAADVWALGCAVVEMFSGKTAWSVKEGSHFMSLLIRIGVGDELPKIPEMLSEEGKDFLSKCFVKDPAKRWTAEMLLNH SFV
AtMAPKKK21	WIRRETIGHGSFSTVSLATTSGSSSKAFPSLMAVKSSGVVCSAALRNERDVLDDLGDCSEIVRCFGEGRTVENGEEIYNLFLEYASGGS LADRIKSSGEALPEFEVRRFTRSIVKGLCHIHGNGFTHCDIKLENVLVFGDGDVKISDFGLAKRRSGEVCVEIRGTPLYMAPESVNHGEF ESPADIWALGCSVVEMSSGKTAWCLEDGVMNNVMSLLVRIGSGDEVPRIPVELSEEGKDFVSKCFVKNAAERWTAEMLLDHPFL
AtCTR1	LNIKEKIGAGSFGTVHRAEWHGSDVAVKILMEQDFHAERVNEFLREVAIMKRLRHPNIVLFMGAVTQPPNLSIVTEYLSRGSLYRLLH KSGAREQLDERRRLSMAYDVAKGMNYLHNRNPPIVHRDLKSPNLLVDKKYTVKVCDFGLSRLKASTFLSSKSAAGTPEWMAPEVLR DEPSNEKSDVYSFGVILWELATLQQPWGNLNPAQVVAAVGFKCKRLEIPRNLNPQVAAIIEGCWTNEPWKRPSFATIMDLLRPLI
AtEDR1	LVIAERIGLGSYGEVYHADWHGTEVAVKKFLDQDFSGAALAEFRSEVRIMRRLRHPNVVFFLGAVTRPPNLSIVTEFLPRGSLYRILHR PKSHIDERRRIKMALDVAMGMNCLHTSTPTIVHRDLKTPNLLVDNNWNVKVGDFGLSRLKHNTFLSSKSTAGTPEWMAPEVLRNEPS NEKCDVYSFGVILWELATLRLPWRGMNPMQVVGAVGFQNRRLEIPKELDPVVGRIILECWQTDPNLRPSFAQLTEVL
AtRaf3	LQIGERIGIGSYGEVYRAEWNGTEVAVKKFLDQDFSGDALTQFKSEIEIMLRLRHPNVVLFMGAVTRPPNFSILTEFLPRGSLYRLLHRP NHQLDEKRRMRMALDVAKGMNYLHTSHPTVVHRDLKSPNLLVDKNWVVKVCDFGLSRMKHHTYLSSKSTAGTPEWMAPEVLRNE PANEKCDVYSFGVILWELATSRVPWKGLNPMQVVGAVGFQNRRLEIPDDIDLTVAQIIRECWQTEPHLRPSFTQLMQSLKRL
AtRaf4	ITVAERIGLGSYGEVYRGDWHGTAVAVKKFIDQDITGEALEEFRSEVRMMRRLRHPNIVLFMGAVTRPPNLSIVTEFLPRGSLYRLIHR PNNQLDERKRLRMALDAARGMNYLHSCNPVIVHRDLKSPNLLVDKNWVVKVCDFGLSRMKVSTYLSSKSTAGTAEWMAPEVLRNE PADEKCDVYSYGVILWELFTLQQPWGKMNPMQVVGAVGFQHRRLDIPEFVDPGIADIIRKCWQTDPRLRPSFGEIMDSL
AtRaf5	ITVGERIGLGSYGEVYRGDWHGTEVAVKKFLDQDLTGEALEEFRSEVRIMKKLRHPNIVLFMGAVTRPPNLSIVTEFLPRGSLYRLIHR PNNQLDERRRLRMALDAARGMNYLHSCNPMIVHRDLKSPNLLVDKNWVVKVCDFGLSRMKHSTYLSSKSTAGTAEWMAPEVLRN EPADEKCDVYSYGVILWELFTLQQPWGKMNPMQVVGAVGFQHRRLDIPDFVDPAIADLISKCWQTDSKLRPSFAEIMASL

AtRaf6	LHIKERVGAGSFGTVHRAEWHGSDVAVKILSIQDFHDDQFREFLREVCKQAVAIMKRVRHPNVVLFMGAVTERPRLSIITEYLPRGSLFRLIHRPASGELLDQRRRLRMALDVVCAIPHYAKGLNYLHCLNPPVVHWDLKSPNLLVDKNWTVKVCDFGLSRFKANTFIPSKSVAGTPEWMAPEFLRGEPTNEKSDVYSFGVVLWELITLQQPWNGLSPAQVVGAVAFQNRRLIIPPNTSPVLVSLMEACWADEPSQRPAFGSIVDTL
AtRaf7	LTIGEQVGQGSCGTVYHGLWFGSDVAVKVFSKQEYSAEVIESFKQEVLLMKRLRHPNVLLFMGAVTSPQRLCIVSEFLPRGSLFRLLQKSTSKLDWRRRIHMALDIARGMNYLHHCSPPIIHRDLKSSNLLVDKNWTVKVADFGLSRIKHETYLTSKSGKGTPQWMAPEVLRNESADEKSDIYSFGVVLWELATEKIPWETLNSMQVIGAVGFMDQRLEIPKDIDPRWISLMESCWHSDTKLRPTFQELMDKL
AtRaf8	LTIGEQIGRGSCGTVYHGIWFGSDVAVKVFSKQEYSESVIKSFEKEVSLMKRLRHPNVLLFMGAVTSPQRLCIVSEFVPRGSLFRLLQRSMSKLDWRRRINMALDIARGMNYLHCCSPPIIHRDLKSSNLLVDRNWTVKVADFGLSRIKHQTYLTSKSGKGTPQWMAPEVLRNESADEKSDIYSFGVVLWELATEKIPWENLNSMQVIGAVGFMNQRLEIPKDTDPDWISLIESCWHR
AtRaf9	LTIGEQIGQGSCGTVYHGLWFGSDVAVKLISKQEYSEEVIQSFRQEVSLMQRLRHPNVLLFMGAVTLPQGLCIVSEFLPRGSLFRLLQRNMSKLDWRRRINMALDIARGMNYLHRCSPPIIHRDLKSSNLLVDKNLTVKVADFGLSRIKHHTYLTSKSGKGMPQWMAPEVLRNESADEKSDIYSFGVVLWELATEKIPWENLNSMQVIGAVGFMNQRLEIPKDIDPDWISLIESCWHRDAKLRPTFQELMERL
AtRaf10	LTIGEQIGQGSCGTVYHGLWFGSDVAVKVFSKQEYSEEIITSFRQEVSLMKRLRHPNVLLFMGAVTSPQRLCIVTEFLPRGSLFRLLQRNTSKLDWRRRIHMASDIARGMNYLHHCTPPIIHRDLKSSNLLVDKNWTVKVADFGLSRIKHETYLTTKTGRGTPQWMAPEVLRNEAADEKSDVYSFGVILWELVTEKIPWESLNAMQVIGAVGFMNQRLEVPKNVDPQWISLMESCWHSEPQDRPSFQEIMEKL
AtRaf11	LTIGEQIGQGSCGTVYHGLWFGSDVAVKVFSKQEYSEEIITSFKQEVSLMKRLRHPNVLLFMGAVASPQRLCIVTEFLPRGSLFRLLQRNKSKLDLRRRIHMASDIARGMNYLHHCSPPIIHRDLKSSNLLVDRNWTVKVADFGLSRIKHETYLTTNGRGTPQWMAPEVLRNEAADEKSDVYSFGVVLWELVTEKIPWENLNAMQVIGAVGFMNQRLEVPKDVDPQWIALMESCWHSEPQCRPSFQELMDKL
AtRaf12	LQLGEEVGRGSFAAVHRGVWNGSDVAIKVYFDGDYNAMTLTECKKEINIMKKLRHPNVLLFMGAVCTEEKSAIIMEYMPRGSLFKILHNTNQPLDKKRRLRMALDVARGMNYLHRRNPPIVHRDLKSSNLLVDKNWNVKVGDFGLSKWKNATFLSTKSGKGTPQWMAPEVLRSEPSNEKCDVFSFGVILWELMTTLVPWDRLNSIQVVGVVGFMDRRLDLPEGLNPRIASIIQDCWQTDPAKRPSFEELISQM
AtRaf13	LTVGTRVGIGFFGEVFRGVWNGTDVAIKLFLEQDLTAENMEDFCNEISILSRVRHPNVVLFLGACTKPPRLSMITEYMELGSLYYLIHMSGQKKKLSWHRRLRMLRDICRGLMCIHRMKIVHRDLKSANCLVDKHWTVKICDFGLSRIMTDENMKDTSSAGTPEWMAPELIRNRPFTEKCDIFSLGVIMWELSTLRKPWEGVPPEKVVFAVAHEGSRLEIPDGPLSKLIADCWAEPEERPNCEEILRGLL
AtRaf14	LKVGASVGSGTSGVVCRGVWNKTEVAIKIFLGQQLTAENMKVFCNEISILSRLQHPNVILLLGACTKPPQLSLVTEYMSTGSLYDVIRTRKKELSWQRKLKILAEICRGLMYIHKMGIVHRDLTSANCLLNKSIVKICDFGLSRRMTGTAVKDTEAAGTPEWMAPELIRNEPVTEKSDIFSFGVIMWELSTLSKPWKGVPKEKVIHIVANEGARLKIPEGPLQKLIADCWSEPEQRPSCKEILHRLK
AtRaf15	LTVGTRVGIGFFGEVFRGIWNGTDVAIKVFLEQDLTAENMEDFCNEISILSRLRHPNVILFLGACTKPPRLSLITEYMEMGSLYYLLHLSGQKKRLSWRRKLKMLRDICRGLMCIHRMGIVHRDIKSANCLLSNKWTVKICDFGLSRIMTGTTMRDTVSAGTPEWMAPELIRNEPFSEKCDIFSLGVIMWELCTLTRPWEGVPPERVVYAIAYEGARLEIPEGPLGKLIADCWTEPEQRPSCNEILSRLL
AtRaf16	LEDLHELGSGTFGTVYYGKWRGTDVAIKRIKNSCFSGGSSEQARQTKDFWREARILANLHHPNVVAFYGVVPDGPGGTMATVTEYMVNGSLRHVLQRKDRLLDRRKKLMITLDSAFGMEYLHMKNIVHFDLKCDNLLVNLRDPQRPICKVGDFGLSRIKRNTLVSGGVRGTLPWMAPELLNGSSNRVSEKVDVFSFGIVMWEILTGEEPYANLHCGAIIGGIVNNTLRPPVPERCEAEWRKLMEQCWSFDPGVRPSFTEIVERL
AtRaf17	FSNAAMIGKGSFGEIVKAYWRGTPVAVKRILPSLSDDRLVIQDFRHEVDLLVKLRHPNIVQFLGAVTERKPLMLITEYLRGGDLHQYLKEKGGLTPTTAVNFALDIARGMTYLHNEPNVIIHRDLKPRNVLLVNSSADHLKVGDFGLSKLIKVQNSHDVYKMTGETGSYRYMAPEVFKHRRYDKKVDVFSFAMILYEMLEGEPPFANHEPYEAAKHVSDGHRPTFRSKGCTPDLRELIVKCWDADMNQRPSFLDILKRL
AtRaf18	LEELKELGSGTFGTVYHGKWRGSDVAIKRIKKSCFAGRSSEQERLTGEFWGEAEILSKLHHPNVVAFYGVVKDGPGATLATVTEYMVDGSLRHVLVRKDRHLDRRKRLIIAMDAAFGMEYLHAKNIVHFDLKCDNLLVNLKDPSRPICKVGDFGLSKIKRNTLVSGGVRGTLPWMAPELLNGSSSKVSEKVDVFSFGIVLWEILTGEEPYANMHYGAIIGGIVNNTLRPTIPSYCDSDWRILMEECWAPNPTARPSFTEIAGRL
AtRaf19	LFIGNKFASGAHSRIYRGIYKQRAVAVKMVRIPTHKEETRAKLEQQFKSEVALLSRLFHPNIVQFIAACKKPPVYCIITEYMSQGNLRMYLNKKEPYSLSIETVLRLALDISRGMEYLHSQGVIHRDLKSNNLLLNDEMRVKVADFGTSCLETQCREAKGNMGTYRWMAPEMIKEKPYTRKVDVYSFGIVLWELTTALLPFQGMTPVQAAFAVAEKNERPPLPASCQPALAHLIKRCWSENPSKRPDFSNIVAVL
AtRaf20	LEELRELGSGTFGTVYHGKWRGSDVAIKRIKKSCFAGRSSEQERLTGEFWGEAEILSKLHHPNVVAFYGVVKDGPGGTLATVTEYMVDGSLRHVLVRKDRHLDRRKRLIIAMDAAFGMEYLHSKNTVHFDLKCDNLLVNLKDPSRPICKVGDFGLSKIKRNTLVSGGVRGTLPWMAPELLNGSSSKVSEKVDVFSFGIVLWEILTGEEPYANMHYGAIIGGIVNNTLRPTIPGFCDDEWRTLMEECWAPNPMARPSFTEIAGRL
AtRaf21	LKIEKKVASGSYGDLHRGTYCSQEVAIKFLKPDRVNNEMLREFSQEVFIMRKVRHKNVVQFLGACTRSPTLCIVTEFMARGSIYDFLHKQKCAFKLQTLLKVALDVAKGMSYLHQNNIIHRDLKTANLLMDEHGLVKVADFGVARVQIESGVMTAETGTYRWMAPEVIEHKPYNHKADVFSYAIVLWELLTGDIPYAFLTPLQAAVGVVQKGLRPKIPKKTHPKVKGLLERCWHQDPEQRPLFEEIIEML
AtRaf22	LNMGPAFAQGAFGKLYKGTYNGEDVAIKILERPENSPEKAQFMEQQFQQEVSMLANLKHPNIVRFIGACRKPMVWCIVTEYAKGGSVRQFLTRRQNRAVPLKLAVKQALDVARGMAYVHGRNFIHRDLKSDNLLISADKSIKIADFGVARIEVQTEGMTPETGTYRWMAPEMIQHRAYNQKVDVYSFGIVLWELITGLLPFQNMTAVQAAFAVVNRGVRPTVPNDCLPVLSDIMTRCWDANPEVRPCFVEVVKLL
AtRaf23	VRKADGISKGIYQVAKWNGTKVSVKILDKDLYKDSDTINAFKHELTLFEKVRHPNVVQFVGAVTQNVPMMIVSEYHPKGDLGSYLQKKGRLSPAKVLRFALDIARGMNYLHECKPEPVIHCDLKPKNIMLDSGGHLKVAGFGLISFAKLSSDKSKILNHGAHIDPSNYCMAPEVYKDEIFDRSVDSYSFGVVLYEMIEGVQPFHPKPPEEAVKLMCLEGRRPSFKAKSKSCPQEMRELIEECWDTETFVRPTFSEIIVRL

AtRaf24	LEELKELGSGTFGTVYHGKWRGTDVAIKRIKRSCFIGRSSEQERLTSEFWHEAEILSKLHHPNVMAFYGVVKDGPGGTLATVTEYMV NGSLRHVLLSNRHLDRRKRLIIAMDAAFGMEYLHSKSIVHFDLKCDNLLVNLKDPARPICKVGDFGLSKIKRNTLVTGGVRGTLPWM APELLSGSSSKVSEKVDVFSFGIVLWEILTGEEPYANMHYGAIIGGIVNNTLRPTVPNYCDPEWRMLMEQCWAPDPFVRPAFPEIARRL
AtRaf25	VRKSDGISKGAYQVAKWNGTRVSVKILDKDSYSDPERINAFRHELTLLEKVRHPNVIQFVGAVTQNIPMMIVVEYNPKGDLSVYLQK KGRLSPSKALRFALDIARGMNYLHECKPDPIIHCDLKPKNILLDRGGQLKISGFGMIRLSKISQDKAKVANHKAHIDLSNYYIAPEVYK DEIFDLRVDAHSFGVILYEITEGVPVFHPRPPEEVARMMCLEGKRPVFKTKSRSYPPDIKELIEKCWHPEAGIRPTFSEIIIRL
AtRaf26	LETSNVIARGTYGTVYKGIYDGQDVAVKVLDWEDDGNETTAKTATNRALFRQEVTVWHKLNHPNVTKFVGASMGTTNLNIRSADS KGSLPQQACCVVVEYLPGGTLKQHLIRHKSKKLAFKAVIKLALDLARGLSYLHSEKIVHRDVKTENMLLDAQKNLKIADFGVARVEA LNPKDMTGETGTLGYMAPEVIDGKPYNRRCDVYSFGICLWEIYCCDMPYPDLSFVDVSSAVVLHNLRPEIPRCCPTALAGIMKTCWD GNPQKRPEMKEVVKML
AtRaf27	FTQSKEITKGTYCMAMWRGIQVAVKKLDDEVLSDDDQVRKFHDELALLQRLRHPNIVQFLGAVTQSNPMMIVTEYLPRGDLRELLK RKGQLKPATAVRYALDIARGMSYLHEIKGDPIIHRDLEPSNILRDDSGHLKVADFGVSKLVTVKEDKPFTCQDISCRYIAPEVFTSEEYD TKADVFSFALIVQEMIEGRMPFAEKEDSEASEAYAGKHRPLFKAPSKNYPHGLKTLIEECWHEKPAKRPTFREIIKRL
AtRaf28	LHMGPAFAQGAFGKLYRGTYNGEDVAIKLLERSDSNPEKAQALEQQFQQEVSMLAFLKHPNIVRFIGACIKPMVWCIVTEYAKGGSV RQFLTKRQNRAVPLKLAVMQALDVARGMAYVHERNFIHRDLKSDNLLISADRSIKIADFGVARIEVQTEGMTPETGTYRWMAPEMIQ HRPYTQKVDVYSFGIVLWELITGLLPFQNMTAVQAAFAVVNRGVRPTVPADCLPVLGEIMTRCWDADPEVRPCFAEIVNLL
AtRaf29	LKIEKKVACGSYGELFRGTYCSQEVAIKILKPERVNAEMLREFSQEVYIMRKVRHKNVVQFIGACTRSPNLCIVTEFMTRGSIYDFLHK HKGVFKIQSLLKVALDVSKGMNYLHQNNIIHRDLKTANLLMDEHEVVKVADFGVARVQTESGVMTAETGTYRWMAPEVIEHKPYD HRADVFSYAIVLWELLTGELPYSYLTPLQAAVGVVQKGLRPKIPKETHPKLTELLEKCWQQDPALRPNFAEIIEML
AtRaf30	LKFGHKIASGSYGDLYKGTYCSQEVAIKVLKPERLDSDLEKEFAQEVFIMRKVRHKNVVQFIGACTKPPHLCIVTEFMPGGSVYDYLH KQKGVFKLPTLFKVAIDICKGMSYLHQNNIIHRDLKAANLLMDENEVVKVADFGVARVKAQTGVMTAETGTYRWMAPEVIEHKPY DHKADVFSYGIVLWELLTGKLPYEYMTPLQAAVGVVQKGLRPTIPKNTHPKLAELLERLWEHDSTQRPDFSEIIEQL
AtRaf31	LFIGSKIGEGAHGKVYQGRYGRQIVAIKVVNRGSKPDQQSSLESRFVREVNMMSRVQHHNLVKFIGACKDPLMVIVTELLPGMSLRK YLTSIRPQLLHLPLALSFALDIARALHCLHANGIIHRDLKPDNLLLTENHKSVKLADFGLAREESVTEMMTAETGTYRWMAPELYSTV TLRQGEKKHYNNKVDVYSFGIVLWELLTNRMPFEGMSNLQAAYAAAFKQERPVMPEGISPSLAFIVQSCWVEDPNMRPSFSQIIRLLN EFL
AtRaf32	LFVGPKIGEGAHAKIYEGKYKNKTVAIKIVKRGESPEEIAKRESRFAREVSMLSRVQHKNLVKFIGACKEPIMVIVTELLLGGTLRKYL VSLRPGSLDIRVAVGYALDIARAMECLHSHGVIHRDLKPESLILTADYKTVKLADFGLAREESLTEMMTAETGTYRWMAPELYSTVT LRHGEKKHYNHKVDAYSFAIVLWELIHNKLPFEGMSNLQAAYAAAFKNVRPSADDLPKDLAMIVTSCWKEDPNDRPNFTEIIQMLLR CL
AtRaf33	LIIKTVLARGTFGTVHRGIYDGQDVAVKLLDWGEEGHRSEAEIVSLRADFAQEVAVWHKLDHPNVTKFIGATMGASGLQLQTESGPL AMPNNICCVVVEYLPGGALKSYLIKNRRRKLTFKIVVQLALDLARGLSYLHSQKIVHRDVKTENMLLDKTRTVKIADFGVARVEASN PNDMTGETGTLGYMAPEVLNGNPYNRKCDVYSFGICLWEIYCCDMPYPDLTFSEVTSAVVRQNLRPDIPRCCPSALAAVMKRCWDA NPDKRPEMDEVVPML
AtRaf34	LFVGPKIGEGAHAKVYEGKYKNQTVAIKIVHRGETPEEIAKRDSRFLREVEMLSRVQHKNLVKFIGACKEPVMVIVTELLQGGTLRKY LLNLRPACLETRVAIGFALDIARGMECLHSHGIIHRDLKPENLLLTADHKTVKLADFGLAREESLTEMMTAETGTYRWMAPELYSTVT LRLGEKKHYNHKVDAYSFAIVLWELLHNKLPFEGMSNLQAAYAAAFKNVRPSAESLPEELGDIVTSCWNEDPNARPNFTHIIELL
AtRaf35	LEEIRELGHGTYGSVYHGKWKGSDVAIKRIKASCFAGKPSERERLIEDFWKEALLLSSLHHPNVVSFYGIVRDGPDGSLATVAEFMVN GSLKQFLQKKDRTIDRRKRLIIAMDTAFGMEYLHGKNIVHFDLKCENLLVNMRDPQRPICKIGDLGLSKVKQKTLVSGGVRGTLPWM APELLSGKSNMVSEKIDVYSFGIVMWELLTGEEPYADMHCASIIGGIVNNALRPKIPQWCDPEWKGLMESCWTSEPTERPSFTEISQKL
AtRaf36	LFFGLKFAHGLYSRLYHGKYEDKAVAVKLITVPDDDDNGCLGARLEKQFTKEVTLLSRLTHPNVIKFVGAYKDPPVYCVLTQYLPEG SLRSFLHKPENRSLPLKKLIEFAIDIARGMEYIHSRRIIHRDLKPENVLIDEEFHLKIADFGIACEEEYCDMLADDPGTYRWMAPEMIKRK PHGRKADVYSFGLVLWEMVAGAIPYEDMNPIQAAFAVVHKNIRPAIPGDCPVAMKALIEQCWSVAPDKRPEFWQIVKVL
AtRaf37	ISIGDFIGEGSSSTVYRGLFRRVVPVSVKIFQPKRTSALSIEQRKKFQREVLLLSKFRHENIVRFIGACIEPKLMIITELMEGNTLQKFMLS VRPKPLDLKLSISFALDIARGMEFLNANGIIHRDLKPSNMLLTGDQKHVKLADFGLAREETKGFMTFEAGTYRWMAPELFSYDTLEIG EKKHYDHKVDVYSFAIVFWELLTNKTPFKGKNNIFVAYAASKNQRPSVENLPEGVVSILQSCWAENPDARPEFKEITYSLTNLLRSL
AtRaf38	LIIKSVIARGTFGTVHRGIYDGQDVAVKLLDWGEEGHRSDAEIASLRAAFTQEVAVWHKLDHPNVTKFIGAAMGTSEMSIQTENGQM GMPSNVCCVVVEYCPGGALKSFLIKTRRRKLAFKVVIQLSLDLARGLSYLHSQKIVHRDVKTENMLLDKSRTLKIADFGVARLEASNP NDMTGETGTLGYMAPEVLNGSPYNRKCDVYSFGICLWEIYCCDMPYPDLSFSEVTSAVVRQNLRPEIPRCCPSSLANVMKRCWDANP EKRPEMEEVVAML
AtRaf39	LEMRNVIARGAYGIVYKGIYDGQDVAVKVLDWGEDGYATTAETSALRASFRQEVAVWHKLDHPNVTRFVGASMGTANLKIPSSAET ENSLPQRACCVVVEYIPGGTLKQYLFRNRRKKLAFKVVVQLALDLSRGLSYLHSERIVHRDVKTENMLLDYQRNLKIADFGVARVEA QNPKDMTGETGTLGYMAPEVLDGKPYNRRCDVYSFGICLWEIYCCDMPYPDLSFADVSSAVVRQNLRPDIPRCCPTALATIMKRCWE ANPEKRPEMEEVVSLLEAV
AtRaf40	LEDLTELGSGTYGTVYHGTWRGTDVAIKRIRNSCFAGRSSEQERLTKDFWREAQILSNLHHPNVVAFYGIVPDGTGGTLATVTEFMV NGSLRHALLKKDRLLDTRKKIIIAMDAAFGMEYLHSKNIVHFDLKCENLLVNLRDPQRPICKVGDLGLSRIKRNTLVSGGVRGTLPWM APELLNGSSTRVSEKVDVFSYGISLWEILTGEEPYADMHCGAIIGGIVKNTLRPPIPKSCSPEWKKLMEQCWSVDPDSRPPFTEITCRL
AtRaf41	LFVGPKIGEGAHAKVYEGKYRNQTVAIKIIKRGESPEEIAKRDNRFAREIAMLSKVQHKNLVKFIGACKEPMMVIVTELLLGGTLRKY

	LVSLRPKRLDIRLAVGFALDIARAMECLHSHGIIHRDLKPENLILSADHKTVKLADFGLAREESLTEMMTAETGTYRWMAPELYSTVT LRQGEKKHYNHKVDAYSFAIVLWELILNKLPFEGMSNLQAAYAAAFKNLRPSAEDLPGDLEMIVTSCWKEDPNERPNFTEIIQMLLRY L
AtRaf42	LEELRELGSGTFGTVYHGKWRGTDVAIKRINDRCFAGKPSEQERMIDDFWNEAQNLAGLHHPNVVAFYGVVLDSPGGSVATVTEYM VNGSLRNALQKNVRNFDRCKRQLIAMDIAFGMEYLHGKKIVHFDLKSDNLLVNLRDPHRPICKVGDLGLSKVKCQTLISGGVRGTLP WMAPELLNGTSSLVSEKVDVFSFGIVLWELFTGEEPYADLHYGAIIGGIVSNTLRPQIPDFCDMDWKLLMERCWSAEPSERPSFTEIVN EL
AtRaf43	LSYGDRFAHGKYSQIYHGEYEGKAVALKIITAPEDSDDIFLGARLEKEFIVEATLLSRLSHPNVVKFVGVNTGNCIITEYVPRGSLRSYL HKLEQKSLPLEQLIDFGLDIAKGMEYIHSREIVHQDLKPENVLIDNDFHLKIADFGIACEEEYCDVLGDNIGTYRWMAPEVLKRIPHGR KCDVYSFGLLLWEMVAGALPYEEMKFAEQIAYAVIYKKIRPVIPTDCPAAMKELIERCWSSQTDKRPEFWQIVKVL
AtRaf44	IMRGEMIGEGGNSIVYKGRLKNIVPVAVKIVQPGKTSAVSIQDKQQFQKEVLVLSSMKHENIVRFVGACIEPQLMIVTELVRGGTLQRF MLNSRPSPLDLKVSLSFALDISRAMEYLHSKGIIHRDLNPRNVLVTGDMKHVKLADFGLAREKTLGGMTCEAGTYRWMAPEVCSREP LRIGEKKHYDQKIDVYSFALIFWSLLTNKTPFSEIPSISIPYFVNQGKRPSLSNIPDEVVPILECCWAADSKTRLEFKDITISL
AtRaf45	VVVGEMIGEGAYSIVYKGLLRNQFPVAVKIMDPSTTSAVTKAHKKTFQKEVLLLSKMKHDNIVKFVGACIEPQLIIVTELVEGGTLQR FMHSRPGPLDLKMSLSFALDISRAMEFVHSNGIIHRDLNPRNLLVTGDLKHVKLADFGIAREETRGGMTCEAGTSKWMAPEVYSPEPL RVGEKKEYDHKADIYSFAIVLWQLVTNEEPFPDVPNSLFVPYLVSQGRRPILTKTPDVFVPIVESCWAQDPDARPEFKEISVML
AtRaf46	VRKVDGISKGTYQVAKWNGTRVSVKIFDKDSYSDPERVNAFTNELTLLAKARHPNIVQFVGAVTQNLPMMIVVECNPKGDLSVYLQ KKGRLSPSKALRFALDIARGMNYLHECKPDPIIHCELMPKNILLDRGGQLKISGFGLIKLSKIGEDSAKVVNHEAQIDKSNYYIAPEIYK DEVFDKRADVHSFGVILYELTEGVSLFHPKPPEEVAESICIEGKRPTIRTKSKSYPPELKELIEECWHPEISVRPIFSEIIIRL
AtRaf47	FSNSVKISKGTFNKASWRGIDVAVKTFGEEMFTDEDKVNAFRDELALLQKIRHPNVVQFLGAVTQSTPMMIVTEYLPKGDLRQYLDR KGPLMPAHAVKFALEIARGMNYLHEHKPEAIIHCDLEPPNILRDDSGHLKVADFGVSKLLVVKKTVKKDRPVVTCLDSSWRYMAPEV YRNEEYDTKVDVFSFALILQEMIEGCEPFHEIEDREVPKAYIEDERPPFNAPTKSYPFGLQELIQDCWDKEASKRPTFRVIISTLELI
AtRaf48	LDMKHVLAHGTYGTVYRGVYAGQEVAVKVLDWGEDGYATPAETTALRASFEQEVAVWQKLDHPNVTKFIGASMGTSDLRIPPAGD TGGRGNGAHPARACCVVVEYVAGGTLKKFLIKKYRAKLPIKDVIQLALDLARGLSYLHSKAIVHRDVKSENMLLQPNKTLKIADFGV ARVEAQNPQDMTGETGTLGYMAPEVLEGKPYNRKCDVYSFGVCLWEIYCCDMPYADCSFAEISHAVVHRNLRPEIPKCCPHAVANI MKRCWDPNPDRRPEMEEVVKLLEAI
AtZIK1	GRFREVLGKGAMKTVYKAFDQVLGMEVAWNQVKLNEVFRSPEPLQRLYSEVHLLKNLNHESIIRYCTSWIDVNRRTFNFITELFTSGT LREYRRKYQKVDIRAIKSWARQILNGLAYLHGHDPPVIHRDLKCDNIFVNGHLGQVKIGDLGLAAILRGSQNAHSVIGTPEFMAPELY EEDYNELVDIYSFGMCVLEMLTGEYPYSECTNPAQIYKKVTSGKLPDSFHLIQHTEAQRFVGKCLETVSRRLPAKELLADPFL
AtZIK2	GRFAEILGRGAMKTVYKAIDEKLGIEVAWSQVKLKEVLRSSVDLQRLYSEVHLLSTLNHKSIIRFYTSWIDVHNHTLNFITELFTSGTLR QYKNKYLRIDIRAIKSWARQILEGLVYLHEHDPPVIHRDLKCDNIFVNGHLGQVKIGDLGLARMLRDCHSAHSIIGTPEFMAPELYEEN YNELIDVYSFGMCFLEMITSEFPYSECNHPAQIYKKVVGGKLPGAFYRVGDIEAQRFIGKCLVSASKRVSAKELLQDPFL
AtZIK3	GRYDEILGKGASKTVYRAFDEYEGIEVAWNQVKLRNFTRNPEELEKFFREIHLLKTLNHQNIMKFYTSWVDTNNLSINFVTELFTSGTL RQYRLRHRRVNIRAVKQWCKQILKGLLYLHSRSPPIIHRDLKCDNIFINGNQGEVKIGDLGLAAILRKSHAVRCVGTPEFMAPEVYDEE YNELVDVYAFGMCVLEMVTFDYPYSECTHPAQIYKKVTSGKKPEAFYLVKDPEVREFVEKCLANVTCRLTALELLQDPFL
AtZIK4	GRYNEVLGKGASKTVYRAFDEYEGIEVAWNQVKLYDFLQSPEDLERLYCEIHLLKTLKHKNIMKFYTSWVDTANRNINFVTELFTSG TLRQYRLRHKRVNIRAMKHWCRQILRGLHYLHSHDPPVIHRDLKCDNIFVNGNQGEVKIGDLGLAAILRKSHAAHCVGTPEFMAPEV YEEAYNELVDIYSFGMCILEMVTFDYPYSECTHPAQIYKKVMSGKKPDALYKVKDPEVKCFIEKCLATVSLRVSARELLDDPFL
AtZIK5	IRYKEVIGKGAFKTVYKAFDEVDGIEVAWNQVRIDDVLQSPNCLERLYSEVRLLKSLKHNNIIRFYNSWIDDKNKTVNIITELFTSGSLR HYRKKHRKVNMKAVKNWARQILMGLRYLHGQEPPIIHRDLKCDNIFINGNHGEVKIGDLGLATVMEQANAKSVIGTPEFMAPELYD ENYNELADIYSFGMCMLEMVTFDYPYCECKNSAQIYKKVSSGIKPASLSRVKDPEVKQFIEKCLLPASERLSAKELLLDPFL
AtZIK6	IRYDDVLGRGAFKTVYKAFDEVDGIEVAWNLVSIEDVMQMPGQLERLYSEVHLLKALKHENIIKLFYSWVDEKNKTINMITELFTSGS LRVYRKKHRKVDPKAIKNWARQILKGLNYLHSQNPPVIHRDLKCDNIFVNGNTGEVKIGDLGLATVLQQPTARSVIGTPEFMAPELYE EEYNELVDIYSFGMCMLEMVTCEYPYNECRNQAQIYKKVTSNIKPQSLGKVDDPQVRQFIEKCLLPASSRPTALELSKDPFL
AtZIK7	TQLVDIFGFKGFDEVDGIEVAWNQVRIDDLLQSPDCLERLYSEVRLLKSLKHKNIIRFYNSWIDDKNKTVNIITELFTSGSLRQYRKKHR KVNMKAVKCWARQILTGLKYLHSQDPPIIHRDIKCDNIFINGNHGEVKIGDLGLATVMEQANAKSVIGTPEFMAPELYDENYNELADI YSFGMCMLEMVTFEYPYCECRNSAQIYKKVSSGIKPASLSKVKDPEVMKFIEKCLLPASERLSAEELLLDSFL
AtZIK8	GRYGELLGSGAVKKVYRAFDQEEGIEVAWNQVKLRCFSDDPAMTERLYSEVRLLKNLKNSNIITLYKVWRDERNNTLNFITEICTSGN LREYRKKHRHVSMRALKKWSKQILKGLDYLHTHDPCIIHRDLNCSNIFVNGNIGQVKIGDLGLAAIVGKNHLAHSILGTPEFMAPELY EENYTEMVDIYSYGMCVLELVSLEIPYSECDSVAKIYKRVSKGLKPEALNKVNDPEAKAFIEKCIAQPRARPSAAELLCDPFF
AtZIK9	MKFYASWVDTDNRNINFVTEMFTSGTLRQYRLKHKRVNIRAVKNWCRQILRGLNYLHTHDPPVIHRDLKCDNIFINGNQGEVKIGDL GLAACLQHSHAAHCVGTPEFMAPEVYKEEYNQLVDIYSFGMCVLEMVTFDYPYSECSHPAQIYKRVISGKKPDGLDKVKDPEVRGFI EKCLATVSLRLSACELLDDH
AtZIK10	IRYNDVLGRGAFKTVYKAFDEVEGIEVAWNLMSIEDVLQMPGQLDRLYSEVHLLNSLKHDNIIKLFYSWVDDHNKSINMITELFTSGS LTLYRKKHRKVDPKAIMNWARQILKGLHYLHSQTPPVIHRDLKCDNIFVNGNTGKVKIGDLGLAAVMQQPTARSVIGTPEFMAPELY EEEYNELVDIYSFGMCMLEMVTCEYPYRECRNQAQIYKKVTSGIKPQSLSKVDDPQVKQFIEKCLLPAPSRPTALELLKDQLL
AtZIK11	GRYKEVLGKGAFKEVYRAFDQLEGIEVAWNQVKLDDKFCSSEDLDRLYSEVHLLKTLKHKSIIKFYTSWIDHQHMTINLITEVFTSGN LRQYRKKHKCVDLRALKKWSRQILEGLVYLHSHDPPVIHRDLKCDNIFINGNQGEVKIGDLGLAAILHRARSAHSVIGTPEFMAPELY

	EEDYNVLVDIYAFGMCLLELVTFEYPYSECTNAAQIYRKVTSGIKPAALLNVTDPQVRAFIEKCIAKVSQRLSAKELLDDPFL
BdMAPKKK1	YMLGDEIGKGAYGRVYKGLDLENGDFVAIKQVSLENIPQEDLNIIMQEIDLLKNLNHKNIVKYLGSLKTKSHLHIILEYVENGSLANIIK PNKFGPFPESLAAVYIAQVLEGLVYLHEQGVIHRDIKGANILTTKEGLVKLADFGVATKLTEADVNTHSVVGTPYWMAPEVIEMSGV CAASDIWSVGCTVIELLTCVPPYYELQPMPALFRIVQDVQPPIPEGFSPEINDFLRQCFQKDAIQRPDAKTLLMHPWL
BdMAPKKK2	LEELRELGSGTFGTVYHGKWRGSDVAIKRIKKSCFTGRSSELERLANEFWREAEILSKLHHPNVVAFYGVVKDGPGGTLATVTEFMV NGSLRHVLQRNKNLDRRKRLIIAMDAAFGLEYLHSKNIVHFDLKCDNLLVNLKDQSRPICKVGDFGLSKIKRNTLVSGGVRGTLPWM APELLNGGSNKVSEKVDVFSFGIVMWEILTGEEPYANMHYGAIIGGIVNNTLRPHVPASCDPEWRRLMEQCWAPDPAQRPAFTEIAGR L
BdMAPKKK3	LEEIRELGSGTYGAVFHGKWRGCDVAIKRIKASCFAGRPSERERLIADFWKEAQILSSLHHPNVVSFYGVVRDGPDGSLATVTEFMING SLKQFLRKKDRTIDRRKRVILAMDAAFGMEYLHGKNIVHFDLKCENLLVNMRDPQRPICKIGDLGLSKVKQHTLVSGGVRGTLPWM APELLSGKSNMVSDKIDVYSFGIVMWELLTGDEPYSDMRAAEIIGGIVNNSLRPQIPSWCDPEWKSLMEGSWAGEPAERPSFTEISQRL
BdMAPKKK4	LEELRELGSGTFGTVYHGKWRGSDVAIKRINDRCFAGKASEEQRMKTDFWNEARKLASLHHPNVVAFYGVVLDGPGGSVATVTEY MANGSLRQALQRHDKIFDRRRRLVIVMDVAFGMEYLHGKNIVHFDLKSDNLLVNLRDPQRPICKVGDLGLSKVKCQTLISGGVRGTL PWMAPELLNGSSSLVSEKVDVFSFGIVMWELLTGEEPYADLHYGAIIGGIVNNTLRPEVPESCDPQWRSLMEQCWSAEPSERPSFTEV VKRL
BdMAPKKK5	IAIGERIGLGSFGEVYRGEWHGTEVAVKKFLQQDISSDALDEFRAEVRIMKRLRHPNVVLFMGAITRVPNLSIVTEFLPRGSLFRLIHRP NNQLDEKRRLRMALDVARGMNYLHNCTPVIVHRDLKSPNLLVDKNWVVKVCDFGLSRMKNNTFLSSRSTAGTAEWMAPEVLRNEP SDEKCDVFSYGVILWELCTLQQPWEGMNAMQVVGAVGFQSRRLDIPDNTDPAVAEIITQCWQTDPRKRPSFADIMAAL
BdMAPKKK6	VIGERIGLGSYGEVYRADWNGTEVAVKKFLDQDFYGDALDEFRSEVRIMRRLRHPNIVLFMGAVTRPPNLSIVSEYLPRGSLYKILHRP SCQIDEKRRIKMAIDVAKGMNCLHTSVPTIVHRDLKSPNLLVDNNWTVKVCDFGLSRLKHSTFLSSKSTAGTPEWMAPEVLRNEQSN EKCDVYSFGVILWELATLRMPWSGMNPMQVVGAVGFQDRRLDIPKEVDPLVARIIWECWQKDPNLRPSFAQLTSAL
BdMAPKKK7	ITLGERVGLGSFGEVYRGEWHGTEVAVKKFLQQDISSDILEELKAEVRIMKRLRHPNVVLFMGAVTRVPNLSILTEFLPRGSLFRLIRRP NNQLDERKRIRMALDVARGMNYLHNCTPVVVHRDLKSPNLLVDKNWVVKVCDFGLSRIKHSTFLSSRSTAGTAEWMAPEVLRNEPS DEKCDVFSYGVILWELCTLLQPWEGMNPMQVVGAVGFQQRRLDIPADVDPAVAEIIQRCWQTDPKMRPSFSEIMAAL
BdMAPKKK8	WKKGKLIGRGTFGHVYVGFNSDSGEMCAMKEVTLFLDDSKSKESAKQLGQEISLLSRLQHPNIVRYYGSETVDDKLYIYLEYVSGGSI HKLLQEYGQLGEPAMRSYTQQILSGLAYLHAKNTVHRDIKGANILVDPSGRVKLADFGMAKHINGHQCPFSFKGSPYWMAPEVIKSS NGGCNLAVDIWSLGCTVLEMATSKPPWSQYEGIAAMFKIGNSKELPPIPDHLSEQGKDFIRKCLQRDPSQRPTAMELLQHPFI
BdMAPKKK9	LEELQELGSGTFGTVYHGKWRGSDVAIKRINDRCFAGKPSEQEKMRNDFWNEASNLADLHHPNVVAFYGVVLDGPGGSIATVTEYM VNGSLRTALLKNAKSLDRRKRLIIAMDTAFGMEYLHNKNIVHFDLKSDNLLVNLRDPQRPICKVGDLGLSKVKCQTLISGGVRGTLP WMAPELLNGSSSLVSEKVDVFSFGIVLWELLTGEEPYADLHYGVIIGGIVSNTLRPPVPDSCDLEWKSLMEQCWATEPSERPSFTQIAV RL
BdMAPKKK10	LTIGTRVGIGFFGEVFRGIWNGTDVAIKVFLEQDLTTENMEDFCNEIYILSRLRHPNVILFLGACMVPPHLSMVTEYMEMGSLYYLIHM SGQKKKLSWRRRLKIIRDICRGLMCIHRMKIVHRDLKSANCLVNKHWTVKICDFGLSRAMTDSPMTDNSSAGTPEWMAPELIRNEPFS EKCDIFSLGVIMWELCTLSRPWDGISPVQVVYAVANEGSRLEIPEGPLGKLIADCWAEPQDRPSCQEILTRL
BdMAPKKK11	WKKGKLIGHGTFGHVYVGFNSDRGEMCAMKEVTLFSDDPKSKESARQLGQEILVLSRLQHPNIVRYYGSETVDNKLYIYLEYVSGGS IHKLLQEYGRFGEQAIRSYTKQIRLGLAYLHAKNTVHRDIKGANILVDPNGRVKLADFGMAKHINGQQCPFSFKGSPYWMAPEVIKNS TGCNLAVDVWSLGCTVLEMATSKPPWSQYEGIAAMFKIGNSKELPPIPDHLSEEGKDFIRQCLQRDPSSRPTAVDLLQHSFI
BdMAPKKK12	LVIDERIGIGSYGEVYHADWNGTEVAVKKFLDQEFYGDALDEFRCEVRIMRRLRHPNIVLFMGAVTRPPHLSIVSEYLPRGSLYKIIHR PNCQIDEKRRIRMALDVARGMNCLHTSVPTIVHRDLKSPNLLVDDNWTVKVCDFGLSRLKHSTFLSSRSTAGTPEWMAPEVLRNEQS NEKCDIYSFGVILWELATLRKPWQGMNQMQVVGAVGFQDRRLDIPKEVDPIVASIIRDCWQKDPNLRPSFSQLTSYL
BdMAPKKK13	ITVGTRVGIGFFGEVFRGVWNGTDVAIKVFLEQDLTMENMEDFCNEISILSRLRHPNVILFLGACMKPPHLSLVTEYMEMGSLYYLIHT SGNKGKLSWRRKLKMLRDICRGLMCMHRLKIVHRDLKSANCLVNKYWTVKLCDFGLSRVMLDSAMRDNSSAGTPEWMAPELIRNE PFTEKCDIFSLGVIMWELCTLSRPWAGKPPVQVVYSVANEGARLEIPDGPLRSLISDCWAEPDKRPSCQEILTRL
BdMAPKKK14	LQIGERIGLGSYGEVYHADWNGTEVAVKKFLDQDLSGVALEQFKCEVRIMSRLRHPNVVLFLGYVTQPPNLSILTEYLPRGSLFRLLH RPNSKVDETRRLKMALDVAKGMNYLHASHPTIVHRDLKSPNLLVDKNWVVKVSDFGMSRLKHHTFLSSKSTAGTPEWMAPEVLRN EPANEMCDVYSFGVILWELATMRVPWSGLNPMQVVGAVGFQNRRLDIPKEVDPVVASIILSCWDNDPSKRPSFSQLLSPL
BdMAPKKK15	LVIGEQVGQGSCGTVYHALWYGSDVGVKVFSRQEYSEEVIQAFRQEVSLMKKLRHPNILLFMGAVTSPHRLCIVTEFLPRGSLFRLLQ RSTTKLDWRRRVHMALDVARGMNYLHHYSPPIIHRDLKSSNLLVDKNWTVKVADFGLSRLKRETYLTTKTGKGTPQWMAPEVLRN EPSDEKSDVYSYGVILWELVTQKIPWENLNSMQVIGAVGFMNQRLEIPSETDPYWTSLILSCWETDPQSRPSFQELLEKL
BdMAPKKK16	GRYNDVLGKGASKTVYRAFDEYQGMEVAWNQVKLHDFLQSPEDLERLYCEIHLLKTLKHRNIMKFYTSWVDVSGRNINFITEMFTS GTLRQYRQRHRKVNIWAVKHWCRQILSGLLYLHSHDPPIIHRDLKCDNIFVNGNQGEVKIGDLGLAAILRKSHAVHCVGTPEFMAPE VYEEEYNELVDIYSFGMCVLEMVTFEYPYSECTHPVQIYKKVISGTKPEALYKVKDPMVRQFVEKCLTTASRRLPARELLNDP
BdMAPKKK17	LVLKEKIGAGSFGTVHRADWHGSDVAVKILMEQDYHLDRFREFMREVAIMKSLRHPNIVLFMGAVTEPPNLSIVTEYLSRGSLYKLLH RSGAREVLDERRRLNMAFDVAKGMNYLHRRSPPIVHRDLKSPNLLVDKKYTVKVCDFGLSRLKANTFLSSKSLAGTPEWMAPEVLR DEPSNEKSDVYSFAVILWELMTLQQPWCNLNPAQVVAAVGFKGRRLEIPKDLNPQVAALIESCWANEPWRRPSFANIMETL
BdMAPKKK18	LAVREKIGAGSFGTVHRADWNGSDVAVKILMDQDLHPERLKEFLREVAIMKSLRHPNIVLLMGAVTQPPNLSIVTEYLSRGNLYRLLH RHGARENLDERRRLSMAFDVAKGMNYLHKRNPPIVHRDLKSPNLLVDKKYTVKVCDFGLSRLKANTFLSSKTAAGTPEWMAPEVLR

	DEPSNEKSDVYSFAVILWELMTLQQPWSNLNPAQVVAAVGFRGRRPEIPSSVDPKVAAIIESCWAKEPWRRPSFTSIMESL
BdMAPKKK19	WQKRKLIGSGTYGCVYEATNRHTGALCAMKEVNIIPDDAKSVESMKQLDQEIKFLSQFKHENIVQYYGSETIDDRFYIYLEYVHPGSI NKYINQHCGAMTESVVRNFTRHILKGLAFLHSQKIMHRDIKGANLLVDVNGVVKLADFGMAKHLSTAAPNLSLKGTPYWMAPEVV QATLVKDVGYDLAVDIWSLGCTIIEMFTGKPPWSGLEGPAAMFKVLNKDPSVPDNLSPEGKDFLRGCFKRNPSERPTASKLLEHPFV
BdMAPKKK20	LELKERVGAGSFGTVHRADWHGSDVAVKVLTDQDVGEAQLKEFLREISIMKRVRHPNVVLFMGAVTKCPHLSIVTEYLPRGSLFRLI NKAAGGEMLDLRRRLRMALDVAKGINYLHCLNPPIVHWDLKTPNMLVDKNWSVKVGDFGLSRFKATTFISSKSVAGTPEWMAPEFL RGEPSNEKCDVYSFGVILWELVTMQQPWSGLGPAQVVGAVAFQNRRLPIPKDTIPELAALVESCWDDDPRQRPSFSSIVDTL
BdMAPKKK21	LNFGNKVASGSYGDLYRGTYCSQDVAIKVLKPERVNADMQREFAQEVYIMRKVRHKNVVQFIGACTKPPRLCIVTEYMSGGSVYDY LHKHKGVFKLPALVGVAIDVSKGMSYLHQNNIIHRDLKTANLLMDENGMVKVADFGVARVKVQSGVMTAETGTYRWMAPEVIEH KPYDHKADVFSFGILMWELLTGKIPYEYLTPLQAAVGVVQKGLRPTVPKNAHAKLGELLQKCWQQDPTQRPDFSEILETL
BdMAPKKK22	LRFYRQSYKAFDQLEGLEVAWNQIKVGDILRNNDDLERLRSEVRLLKTLKHKNVIKFYNSWLDKKNNNINFITEVFTSGTLRQYRIKH KKVDIRALKKWSRQILSGLVYLHSHDPPIIHRDLKCDNIFVNGNQGEVKIGDLGLATILDNARSAHSIIGTPEFMAPELYDEEYNELVDI YAFGMCLLELVTFEYPYCECSNAAQIYKKVSDGEKPGSLAKIEDPEVKFFIEKCITQASQRLSAEELLVDPF
BdMAPKKK23	WRKGEMIGSGAFGQVYLGMNLDTGELLAVKQVLIGSSNATREKAQAHIRELEEEVKLLKNLSHPNIVRYLGTVREEDTLNILLEFVPG GSIQSLLGKLGSFPEAVIRKYTKQILQGLEYLHNNAIIHRDIKGANILVDNKGCIKLADFGASKQVAKLATMTAAKTMKGTPHWMAPE VIVGSGHTFSADIWSVGCTVIEMATGKPPWSQQYQEVALLFHVGTTKSHPPIPEHISPEAKDFLLKCLQKEPELRSTASDLLKHPFV
BdMAPKKK24	LEDLREMGSGAFGTVFHGKWRGTDVAIKRIKNSCFSHPSSQADKLITEFWREAAIISKLHHPNILALYGIVKNGPGGTLGTVTEFMVNG SLKKVLSRKDKYLDWRKRILVAMDAAIGMEYLHSKDIVHFDLKCDNLLVNIKDPSRPICKVADFGLSKMKQATLVSGGMRGTLPWM APELLTMSGTKVSEKVDVYSFGVVMWEILTGEDPYDGMHYGGVIGGILSNTLRPPVPTSCKPEWRKLMEQCWSTEPGRRPSFSEVAT GL
BdMAPKKK25	WRKGDLIGSGAFGQVYLGMDLDSGELLAVKQVLIGSSNSTRDKAQAHIRELEDEVKLLKNLSHLNIVRYIGTVREEDSLNILLEFVPG GSIQSLLGRLGAFPEPVIRKYTKQILHGLEYLHRNGIIHRDIKGANILVDNKGCIKLADFGASKQVEKLATAAKTMKGTPYWMAPEVIV GSGHDFSADIWSVGCTVIEMATGKTPWNQEIQEVSLLYYVGTTKSHPPIPEHLSPEAKDFLLKCLQKEPELRSSASNLLQHPFV
BdMAPKKK26	WQKGKLLGSGTFGCVYEATNRNTGALCAMKEVNIIPDDAKSAESLKQLEQEIKFLSQFKHENIVQYYGSDTIEDRFYIYLEYVHPGSIN KYVKQHYGAITESVVRNFTRHILRGLAFLHGQKIMHRDIKGANLLVDINGVVKLADFGMATHLSTAAPNLSLKGTPYWMAPEMVQA TLSKDVGYDLAVDIWSLGCTIIEMFDGKPPWSDLEGPAAMFKVLHKDPPIPENLSHEGQDFLQCCFKRNAAERPAAIELLDHPFI
BdMAPKKK27	WKKGKLLGSGTFGQVYLGFNSEGGQMCAIKEVKVIADDSNSKECLRQLNQEMLLLNQLSHPNIVQYYGSELSSETLSVYLEFVSGGSI HKLLQEYGPFGETVLRNYTAQILSGLAYLHGRNTVHRDIKGANILVDPNGDIKLADFGMAKHISAYTSIKSFKGSPYWMAPEVIMNTN GYSLSVDIWSLGCTILEMATARPPWSQYEGVAAIFKIGNSKDIPDVPDHLSSEAKSFLKLCLQRDPAARPTAAQLIDHPWV
BdMAPKKK28	MRYNEVLGRGAFKTVYKAFDEVEGIEVAWNQVNIDEVMQCPDNLERLYSEVHLLKSLKHKNVMKFCNYWFDDQKKTINVITELFTS GSLRHYRRKHPRVDLKAIKNWARQILHGLDYLHSHQPPVIHRDLKCDNIFVNGNHGEVKIGDLGLATIMRTPKARSVIGTPEFMAPEL YDENYDELVDIYSFGMCMLEMFTLEYPYSECKNPAQIFKKVSKGVKPAALSKIANPEVKHFIEKCLVPSSERLSAKELLQDSF
BdMAPKKK29	WMRGALLGSGSFGMVYEGISDEGAFFAVKEVSLLDQGSNAQQSILALEQEIALLSQFEHENIVQYYGTDKEESKLYIFIELVTQGSLSS LYQKYKLRDSQVSAYTRQILNGLVYLHERNVVHRDIKCANILVHANGSVKLADFGLAKEMSKINMLRSCKGSVYWMAPEVVNPRKT YGPAADMWSLGCTVLEMLTRQIPYPDVEWTNAFFMIGRGERPPIPSYLSKEAQDFISQCVRVDPEERPSASQLLAHPFV
BdMAPKKK30	LKFGNMVASGSNGDLYRGSYCSQDVAIKVVRPERISADMYRDFAQEVYIMRKVRHKNVVQFIGACTRQPNLYIITDFMSGGSVYDCL HKNSAFKLPEILRVATDISKGMNYLHQNNIIHRDLKTANLLMDENKVVKVADFGVSRVKDQSGVMTAETGTYRWMAPEVIEHRPYD HKADVYSFGIVLWELLTGKIPYGQLTPMQAAVGVVQKGIRPIIPKDTHPKLADLVQKCWHGDSAERPEFSQILEIL
BdMAPKKK31	LLVGHRFASGAYSRLYKGVYDDKPVAIKFIRQPDDDDNGKIAAKLEKQYNTEINALSHLYHKNVIKLVAAYKCEPVFYILTEFLPGGS LRSYLHSTQHHPIPLEKIISIALDIARGLEYIHSQGVVHRDIKPENILFDENFNVKIADFGIACEETLCDLLVQDEGTYRWMAPEMLKRK AYNRKVDVYSFGLILWEMVSGRLPYDNMIPFQVAFAVAHYNMKPILAPDCPKALRPLITQCCAFHPDKRPDFWHIVKIL
BdMAPKKK32	LLIGHRFASGAYSRLFHGIYKEQPVAVKFIRLPDDGEDTELAARLEKQFTTEVTILSRLDHHNVIKLVGACSCPPVYCVITEFLSGGSLR AFLRKLECKSLPLEKIISIALDIAHGMEYIHSQGVIHRDVKPENILFDGEYCAKVVDFGVAFEDVYCNTLEDDPGTYRWMAPEMCKRK PYGRKVDVYSFGLLLWELVSGSIPYEEMTPVQAAFAVVNKNLRPVVPSSCPAPLRQLMEQCWSSQPDKRPEFSEVVPIL
BdMAPKKK33	FRRGEEVTKGYYIAKWYGSKVFVKILDKESFSDCDSIDSFKHELTLLEKARHPNLVQFVGAVTQNVPLMIVSEYHQNGDLASYLETKG RLQSYKAIRFALDIARGLNYLHECKPEPIIHGDLSPKNIVRDDEGTLKVAGFGSFGLIKVSEDKLRMARPVSKFDSVYVAPEIYRNETFD RSVDTFAFGLILYEMIEGTPAFHPKPPEEAAKMICLEGLRPLFKNKPKSYPEDVKELIQECWDTTPSVRPTFSDIIERL
BdMAPKKK34	WNRGVLLGSGSFGTVYEGISDEGVFFAVKEVCVSDQGSNAQQCIFQLEQEIALLSQFEHENIVHYYGTDKEDSKLYIFLELVTQGSLVS LYQKYRLRDTHVSAYTRQILNGLTYLHERNIVHRDIKCANILVHANGSVKLADFGLAKEATKLNMLKSCKGTVYWMAPEVVNPKKT YGPAADIWSLGCTVLEMLTRQLPYPDLEWTQALYRIGKGEPPQIPNVLSRDARDFISQCVKPNPEDRPSASKLLDHPFV
BdMAPKKK35	LLIGHRFASGAHSRLFHGIYQEQPVAVKFIRLPDDEEEAELSAQLEKQFSTEITMLSHLHHRNVIKLVGACSSPPVFCVLTEFLSGGSLR AFLHKQEHKSLPLEKIISVGLDIAHGMAYIHSQGVVHRDVKPENIIFDGECCAKIVDFGIACEEAYCDPLANDPGTFRWMAPEMMKHK PYGRKVDVYSFGLILWEMLTGSVPYDDLTPFQAAFAVFDKNVRPTIPVSCPAALRLLIEQCWALQPDKRPEFWQIVQLL
BdMAPKKK36	FRKGDEVLTGTYQVAKWNGTKVSVKILDRESYCDQEAINSFRHELTVFEKVRHPNVVQFVGAVTQNIPMMIVSEYHANADLASYIQR KGRLHAQKVLRYALDIARGMTYLHQCKPDPIIHCDLKPKNIFLDNGGQMKVGGFGLTRLLKIAPDKVKLANHEALVDTFSYYTAPEL HRNELFDSSVDAYAFGFILFEMVEGLPHANGKASEESSHMQPRYDGMRPSLKNKLKGYPADFKALIEECWDTHTMARPTFSEIIIRL

BdMAPKKK37	LDMGAPFAQGAFGKLYRGTYIGEDVAVKLLEKPENDTERARSLEQQFVQEVMMLSTLRHPNIVRFIGACRKSIVWCIVTEYAKGGSV RQFLARRQNKAVPLRLAVKQALDVARGMAYVHALGFIHRDLKSDNLLIAADRSIKIADFGVARIEVKTEGMTPETGTYRWMAPEMIQ HRPYDHKVDVYSFGIVLWELITGMLPFTKMTAVQAAFAVVNKGARPVIPHDCLPSLSHIMTRCWDANPEVRPPFTEIVCML
BdMAPKKK38	LHMGMPFAQGAFGKLYRGTYNGMDVAIKLLERPEAAPVQAQLLEQQFVQEVMMLATLRHPNIVKFIGACRKPMVWCIVTEYAKGG SVRNFLTRRQNRSVPLKLAVKQALDVARGMAYVHGLGFIHRDLKSDNLLISGDKSIKIADFGVARIEVKTEGMTPETGTYRWMAPEM IQHRPYNQKVDVYSFGIVLWELITGTLPFAKMTAVQAAFAVVNKGVRPTIPHDCLPALGEIMTRCWDANPDVRPPFTDVVRML
BdMAPKKK39	LKFEQKLAAGSFGDLYHGTYCSQDVAIKVLKPERVSVDMLREFAQEVYIMKKVRHKNVVQFIGACTRPPILCIVTEFMRGGSIFDYIY NHRGTFQLVDVLRIASDVSKGMSYLHQINIIHRDLKTANLLMDDKVVKVADFGVARVKDQSGVMTAETGTYRWMAPEVIEHSPYDH RADVFSFGVVLWELLAGKLPYEDMTPLQAAVAVVQKDLRPTIPADTHPMLIGLLQKCWQRDPALRPTFAEILDIL
BdMAPKKK40	FTNGKDLSKGTFRKATWRGIPVAVKKLDDDVINDENKVQAFRDELDVLQLIRHPNVVQFLGAVTQSNPMMIVMEFMPKGDLRKHLN KKGALEPSYAVKLALDIARGMSYLHEHKPQSIIHRDLEPSNILRDDTGHLKVADFDLCKMLKWRRKVREEKPVTSVGNACRYVAPEV LRTEEYDNKVDVFSFGLILQEMIEGCLPFYDKKIDEIEKAHSSKERPAFRAPPKHYAHGLKELIEQCWSENPADRPDFRVVIDRL
BdMAPKKK41	LEIRYVIAQGTYGTVYRGTYDGQDVAVKLLDWGEDGFATEAETAALRTSFKQEVAVWHKLSHPNVTKFVGASMGTADLKIPANDSG ARANLPARACCVVVEYLAGGTLKQYLIKNRRRKLAYKVVVQLALDLSRGLSYLHSRKIVHRDVKTENMLLDTQRNLKIADFGVARV EAQNPKDMTGATGTLGYMAPEVLDGKPYNRKCDVYSFGICLWEIYCCDMPYPDLSFADVSSAVVHQNLRPDVPRCCPSAFANIMRK CWDANPDKRPDMDEVVQLM
BdMAPKKK42	LFIGNKFAAGANSRIYRGIYKQRAVAVKMVRIPERDEARRALLEDQFNSEVAFLSRLYHPNIVQFIAACKKPPVYCIITEYMSQGTLRM YLNKKDPYSLSPETILKLALDISRGMEYLHAQGVIHRDLKSQNLLLNDEMRVKVADFGTSCLETRCQATKGNKGTYRWMAPEMIKE KPYTRKVDVYSFGIVLWELTTCLLPFQGMTPVQAAYAASEKNLRPPLSSSCPPVLNNLIKRCWSANPARRPEFSYIVSVL
BdMAPKKK43	MFVGSKIGEGAHGKVYKGKYGDKIVAIKVLNSGSTPEERATLEARFIREVNMMCRVKHDNLVKFIGACKEPLMVIVSELLPGMSLKN YLNSIRPSQLDIHTAIGYALNIARALECLHANGIIHRDLKPDNLLLTANRKKVKLTDFGLAREETVTEMMTAETGTYRWMAPELYSTV TLQRGEKKHYTNKVDVYSFGIVLWELLTNKMPFEGMSNLQAAYAAAFKQVRPPFPEETPQELVFIVQSCWVEDPTLRPSFSQIIRMLD AFL
BdMAPKKK44	WKRGKLLGSGTFGQVYLGFNSENGQFCAIKEVQVISDDPHSKERLKQLNQEIDMLKQPSHPNIVQYYGSEMTEDTLSIYLEYVSGGSI HKLLREYGPFKEPVIRNYTGQILSGLAYLHGKNTVHRDIKGANILVGPNGEVKLADFGMAKHISSFAEIRSFKGSPYWMAPEVIMNSK GYSLAVDIWSLGCTIIEMATARPPWHQYEGVAAIFKIANSKDIPEIPDIFSEEGKSFLQMCLKRDPAARASASQLMDHPFV
BdMAPKKK45	LFVGPRIGEGGHAKVYEGKYKNQNVAIKIVHKGDTPEEVVKRQGRFLREVTMLSRVQHKNLVKFIGACLEPVMVVVTELLVGGSLR KYLVSLRPRNLEPRTAVGFALDIARAMECLHAHGIIHRDLKPENLLLTADQRTVKLVDLGLAREETLTEMMTAETGTYRWMAPELYS TVTLRHGEKKHYNHKVDVYSFAIVLWELLHNRLPFEGMSNLQAAYAAAFKNIRPSADNLPEELSEILTSCWKEDPNERPNFTQIVQML
BdMAPKKK46	LVIKGVIARGTFGTVHRGVYDGQDVAVKLLDWGEDGHRSEQEITALRSAFAQEVAVWHKLDHPNVTKFIGAIMGARDLNVQTEHGH LGMPSNICCVVVEYLAGGALKNFLIKNRRRKLAFKVVVQLALDLARGLSYLHSEKIVHRDVKTENMLLDKTRTVKIADFGVARVEAS NPSDMTGETGTLGYMAPEVLNGHPYNRKCDVYSFGICLWEIYCCDMPYPDLSFSEVTSAVVRQNLRPEIPRCCPSALANVMKRCWDA NPDKRPEMAEVVSLI
BdMAPKKK47	LVVRGVIARGTFGTVHRGVYDGHDVAVKLLDWGEDGHRSEQEVTAVRAAFSQEVTVWHKLDHPNVTKFIGAIMGARDLNIQTENG NIGMPTNVCCVVVEYLPGGALKTFLIKNRRRKLAFKVVVQIALDLARGLSYLHSKKIVHRDVKTENMLLDKTRTVKIADFGVARHEA ANPSDMTGETGTLGYMAPEVLNGNPYNRKCDVYSYGICLWEVYCCDMPYADLSFSEVTSAVVRQNLRPEIPRCCPSSFANVMKRCW DANPDKRPEMAEVVSML
BdMAPKKK48	LEIRAKFASGRHSRVYSGRYAGREVAIKMVSQPEEDAALAAELERQFASEVALLLRLRHQNIISFVAACKKPPVFCIITEYMAGGSLRK YLHQQEPYSVPIELVLKLALDIARGMSYLHSQGILHRDLKSENILLGEDMSVKVADFGISCLESQCGSGKGFTGTYRWMAPEMIKEKN HTRKVDVYSFGIVLWEILTSLVPFSEMTPEQAAIAVALKNARPPLPASCPLAMSHLISQCWATNPERRPQFDDIVAIL
BdMAPKKK49	FTKAIIIGKGSFGEILKANWRGTPIAVKRILPSLSDDRLVIQDFKHEVNLLIKLRHPNIVQFLGAVTETKPLMLITEFLRGGDLHQYLKEK GSLSPVTAVNFALDIARGMAYLHNEPNVIIHRDLKPRNILLVNTAANHLKVGDFGLSKIIKSQHANDVYKMTGETGSYRYMAPEVFK HRKYDRKVDIFSFAMILYEMLEGDPPFSNYEPYEAAKYVADGHRPAFRSKGHISELKDLTELCWDADINLRPSFLEILKRL
BdMAPKKK50	TKLEELLGKGAMKTVYKGFDEVRGVEVAWNQANLADVLRTPDALHRIYSEVHLLSTLRHDSIIAFHASWLSTTTSSSSSSPRAGAGGG RTFNFITELFSSGTLRSYRLRYPRVSLRAVRGWARQILRGLAYLHGHDPPVIHRDLKCDNLFVNGHQGTVKIGDLGLAAVLRGARASA HSVIGTPEFMAPEMYDEDYGVLVDVYSFGMCVLEMLTAEYPYSECCNPAQIYKKVTSGKLPDAFYRVEDDEARRFIGRCLVAASARP SAQELLLDPF
BdMAPKKK51	LRRLRTLGRGASGAVVWLASDDASGELLAVKSGSAARLQREGRVLAGLCSPHIVPCLGSRAAPGGEYQLFLEFAPRGSLADEAARST GGRLAERAIQGYAADVARGLAYLHGNSLVHGDVKARNVMVGADGRAKLADFGCARSTTATDSGRPIGGTPAFMAPEVARGEEQGP AADVWALGCTVVEMATGRAPWSDMDDVFAAVHRIGYTDAVPELPGWLSPDAKDFLGKCLARNPRHRPTAAQLLEHPFL
BdMAPKKK52	WTRLRTLGCGASGAVVSLATDAASGELFAVKSVRGAADADLLSREQGILSGLSSPHIVRCIGGLGEDRDGSYHLFLEFAPGGSLADEV ARNGGFLEEHAIRAYAADVLRGLAYIHGESLVHGDVKARNVVIGVDGRAKIADFGCARALDSTRPIGGTPAFMAPEVARGEEQGPAA DVWALGCTIIEMATGRAPWSDMDDVLAAVHRIGYTDAVPEVPMWMSAEAKNFLAMCFARNARDRCTAEQLLEHPFV
BdMAPKKK53	WTRVRTLGRGASGAVVSLAAADLSGALFAVKSARAAGAEQLRREGDILSGLSSPHVLPCLGFRADSGECQLFLEFAPGGSVADVAER SGGRLEECAIRAYAADVARGLAYLHGMSLVHGDLKGRNVVVGADGRAKLADFGCARTVDSDRPIGGTPAFMAPEVARGEEQGPAA DVWALGCTVVEMATGRAPWSDMDDVLAAMHRIGYTDAVPEVPGWLSAEAKHFLAMCFARDARNRCTAAQLLEHPFL
BdMAPKKK54	GRYADVLGLGSVKKVYRAFDQEEGIEVAWNRVRLRALADRDPGMVDRLHAEVRLLRSLSHDHIIGFHKVWLDRDAGVLSFITEVCN SGSLREYRARHRHVSVKALKKWARQILLGLHHLHTHDPCIIHRDLNCSNVFINGNTGQVKIGDLGLAAIVDKTHVAHTILGTPEFMAP

	ELYTETYTESVDIYSYGMCVLEMVTREMPYAECESVVQIYHSVTRGVPPAALRRLKDPELRGFIDRCIGQPRNRPTAAELLLDPF
BdMAPKKK55	LRRVRTLGRGASGAVVWLASDEASGELLAVKSAAAAGGAARLLEREGCVLTGLCSPHIVPCLGSRAAEECGEYQLFLEFAPGGSLAD EAAKSAGGRLPEPAIRAYAGDVARGLEYLHARSLVHGDVKARNVVIGGDGRARLTDFGCARPVDSLLPMGGTPAFMAPEVARGEEQ GTASDVWALGCTVVEMATGRAPWSDMSDLFAAVHRIGYTADVPEVPGWLSAEAKDFLDGCFRRTPGDRSTAAQLLDHPFI
BdMAPKKK56	MGSSKKMAQLNTEIQLLKTLKHQNIEKSFASWIDEDNKTVNIITELFTSGSLRQYRKKHKKVSIKAMRRWAVQILTGLEYLHSQEPAII HRDLKCDNIFINGNGGTVKIGDFGLATFLQQQKTKSIKGTLEFMAPELFTGVYNELVDIYSFGMCMLEMVTCEYPYSECQGMGHIYK KISEGKKPAALSKVEDAELRSFIEICLAPVAERLPASELLRSSF
BdMAPKKK57	WRRGPVIGRGASATVSIATDALTGEAFAVKSVGIALAGALRREQSVLSALSSPYVVSCVGSSGASDDGRSYELFLELAPGGSLADEMK RCGGRCEEALVASRAGDVLRGLAHVHGAGIAHCDVKARNVLLGADGRAKLADFGCARWTTKAKEDGIGNAIMGTPMFMSPEAAR GEAQGAAADIWALGCTVIEMATGGAPWRFSSPVAALHHVAHSGDVPEAPSWFSEQGKDFLARCLVRDPAQRWTAEQLLEHPFV
BdMAPKKK58	WKRVRTLGRGASGAEVFLAADDVSGELFAVKSAGAGATLRREQEIMAGLRSPNVLSCIGGRVGHDGSYQLFLEFAPGGSLADAVRS GAGGRLEERVVRAYAEDMAAGLAYLHGAGLVHGDVKPRNVVIGGDGRAKLADFGCSRKTDSRGPILGGTPAFMAPEVARGEEQGP AADIWALGCTVVEMATGRAPWNGTGMEDDGVLAALHRIGYTDDAVPEVPKWLSADAKDFLARCLTRRPSDRCTAAQLLEHPFL
BdMAPKKK59	LTRLRTLGRGSSGAVVSLFAADGELLAVKSAATGGAAQLRREGGILASLCSPYVLPCLGSRAAAGGEYQLLLEFAPGGSLADEVARN GGRLEEPAVRAYAGHVARGLAYLHGESMVHGDVKARNVVIGADGWAKLADFGCARRCPGPGPGPILGGTPAFMAPEVARGEEQGP AADVWALGCIIIEMATGRAPWADMDAGCGAADVISAVRRIGYTDAVPEAPERMSPDAKDFLDKCLRRSAGERWTAAQLLEHPFL
BdMAPKKK60	WTRGKCIGKGAFGTVHSAVDRATGRAFAVKSVDAKQGGAMAMACLESEIRILRRLRSPYVVAYLGDDATAASRNLHMELVPGGTA ADAAKGGLGERAARRVLRRVASALQYLHDVAGVVHGDVKGRNVLLGSGIDSTKLADFGAARLVSEPAPRGPRGTPAWMAPEVARG GAPTPASDVWSLGCTAVELLTGKRPWSETGGWLEVGAMLLLIGFGGKRPEFPAAACVSDSCRDFLDKCLRRDAGERWSCEQLL
BdMAPKKK61	WTRGPAIGRGSSAVVSLAVDRVTGVVFAVKSVGAGRAAELRREQSILRGLSSPYVVRCLGYVADGSGEMLMEYAAGGSLADEIRRC GGRCPEALIRCRARDVLRGLAHAHGAGVAHCDVKARNVLVGSHGRAMLADFGCARRIVASSREPQLMGMGGTPMFMAPEAARGEE RGAAADVWAVGCTVIEMATGGAPWRSRFADPVAALHHVAFSGEAPELPPWLSEAGKEFLGRCLRQDPRERWTAEQLLEHPWF
BdMAPKKK62	LALGEQVGHGSCGTVYHALWYGSDVAVKVFSKQDYSEEMIQTFRQEVSLMKKLRHPNIILFMGAVASQQRLCIVTEYLPRGSLFSLL RRTTGKLDPRRRIHMAIDIARGMNYLHNCSPTIVHRDLKSSNLLVDKNWNVKVADFGLSRLKVETFLSTKTGKGTPQWMAPEVLRNE PSNEKSDVYSFGVVLWELVTEKIPWDNLNIMQVIGAVGFMDQRLEIPSGMDPQWASMIESCWDSDPQRRPSFQELLERL
BdMAPKKK63	LVIGEQVGQGSCGTVYHALWYGSDVAVKVFSKQEYSEEMINTFRQEVSLMKKLRHPNIILFMGAAASQQQLCIVTEFLPRGSLFRLLQ KNTGKLDPRRRVNMAIDIARGMNYLHNSIPTVVHRDLKSSNLLVDKNWTVKVADFGLSRLKLETFLTTKTGKGTPQWMAPEVLRSE PSNEKSDVYSYGVVLWELITQKVPWDTLNTMQVIGAVGFMDHRLEIPSDADPQWSSMIESCWVSDPQRRPSFRELLERL
BdMAPKKK64	LEELRELGSGTFGTVYHGKWRGTDVAIKRIKKSCFAGRSSEQEKLTKDFWREAQILSKLHHPNVVAFYGVVPDGTGGTLATVAEFMV NGSLRNVLLRKDRTLDRRRKLIIAMDAAFGMEYLHSKSIVHFDLKCDNLLVNLRDPQRPICKVGDFGLSRIKRNTLVSGGVRGTLPW MAPELLNGSSSRVSEKVDVFSFGIVLWEILTGEEPYANMHCGAIIGGIVNNSLRPPIPETCEPEWRSLMEQCWSANPDVRPSFTKVTDR L
BdMAPKKK65	LEELRELGSGTFGTVYHGKWRGTDVAIKRIKKSCFTGRSSEQERLAHEFWREAEILSKLHHPNVVAFYGVVKDGPGGTLATLTEFMV NGSLRHVLQRKDKSPDLRKRLIIAMDAAFGMEYLHSKNIVHFDLKCDNLLVNLRDPSRPICKVS
BdMAPKKK66	LEIRYVIAQGTYGTVYRGTYDGQDVAVKLLDWGEDGFATEAETAALRSSFKQEVAVWHKLSHPNVTKFVGASMGTTDLKIPANDTG ARANLPVRACCVVVEYLAGGTLKQYLIKNRRRKLAYKVVVQLALDLSRGLSYLHSQKIVHRDVKTENMLLDTQRNLKIADFGVARV EAQNPKDMTGATGTLGYMAPEVLDGKPYNRKCDVYSFGICLWEIYCCDMPYPDLSFADVSSAVVHQNLRPDVPRCCPSAFANIMRK CWDANPDKRPDMDEVVQLM
BdMAPKKK67	WKKGKLLGSGTFGQVYLGFNSESGHFCAIKEVQVILDDPHSKERLRQLNQEVDLLRQLSDRNIVQYYGSQLTDEALSIYLEYVSGGSI HKLLRDYGPFKEPVIRNYTRQILSGLAYLHGRNTMHRDIKGANILVGPTGDVKLADFGLAKDITSFAEISSFRGSPYWMAPEAVMHSK GYSLAVDIWSLGCTVIEMATARHPWHPLEDVPALFKIANSKDIPEIPESISKEGKDFLSLCLKRDPLERPSATQLLDHPFV
BdMAPKKK68	WTRVRTLGRGASGAEVFLAADDASGELFAVKSASAAAMGAAAALRREQGIMAGLRSPNVLSCIGGRGGRDGSYQLFLEFAPGGSLA DGGRLEESAVRAYAADLATGLAYLHGAGLVHGDVKPRNVVIGGDGCAKLADFGCSRKADSCAPILGGTPAFMAPEVARGEEQGPA ADIWALGCTVVEMATGRAPWNGTGMDDDGVLAALHRIGYTYAVPQVPQWLTAEAKDFLSRCLVRRPGDRCTAAQLLEHPFL
BdMAPKKK69	WTRVRTLGRGASGAEVFLAADDASGELFAVKSASAAARGAAATLRREQGIMAGLRSPNVLSCIGGRGGHDGSYQLFLEFAPGGSLA DGGRLEERAVRAYAADVATGLAYLHGVGLVHGDVKPRNVVIGSDGRAKLADFGCSRKAGSCMPILGGTPAFMAPEVARGEEQGPA ADIWALGCTVVEMATGRAPWNGTGMDDDGVLAALHRIGYTDAVPQVPQWLSADAKDFLARCLIRRPSDRCTAAQLLEHPFL
BdMAPKKK70	WVKGGHIGSGSFGSVYEAMSDDGFFFAVKEVSLIDQGINAKQRIIQLEHEVSLLSRLEHDNIVQYYGTDKEDGKLYIFLELVSQGSLAA LYQRYCLQDSQVSAYTRQILNGLNYLHQRNVLHRDIKCANILVDANGSVKLADFGLAKEMSILSQARSSKGTVFWMAPEVAKAKPH GPPADIWSLGCTVLEMLTCKVPYPDMEWTHALLKIGRGIPPKIPDKLSEDARDFIAKCVQANPKDRPSAAQLFDHPFV
BdMAPKKK71	LDIAENLASGSRGDTLRGTYGGEEVFVKFVSSEDPSQIVSKEFKQEILMLREVDHANIIRLIGSCTKEPQFCMMTEYMSGGSLFDFLKNE HNVLDLPMILKFALDICRGMAYLHQKGIIHRDLKSANLLIDKYQVVKVAHFGLSRYQDQEGVMTAETGTYRWMAPEVMNHQHYGH AADVYSFAIVLWELMTRKIPYDTLTTLQAAVEVLKGMRPPLPENAHPRLLTLMQRCWDASPSKRPSFSDAITEL
BdMAPKKK72	LSIIKKLASGSCGHTFLGTYGGEEVSVKVLRSADATQILWKEFKQEILMLREVYHANIIRSIGSCIKPPHFYIITEYMSGGSLFDFLHNKH NVLDLPMILKFALDICRGMAYLHQKGIIHRDLKSANLLMDKDHVVKVADFGLSRYQDREGVMTAETGTYRWMAPEVMKHQQYGP AADVYSFAIVLWELMTSKMPYDTINPIQAAFNVWQGMRPQIPKNAHPRLLTLMQRCWDASPSKCPPFSDAIAEL

BdMAPKKK73	LTKGERIASGTSADLIVNHENIIKYYGACTNHPNYCIVTEYMPEGNLYEFLHKQKHLLDLREILRIAISISKGMEYLHRNNIIHRDLKTAN VLKGYGQALKIEGFNVAILGSQEDQMTAETGTYRWMAPEVINHKPYDHKADVFSFAIVLWELVTLKVPYDKMTPLQAALGVRQGFR LEIPPRVHPGLSKLIQQCWDEDPNARPVFGEIIIQL
BdMAPKKK74	FLFHRYRGTYKGSDVAIKMLRVAHLNNASEVEFLQEVLILRSVNHENILQFYGASTRHPNCCIVTEYMPEGNLYEFLHKQNDLLEINEI LRIAISISKGMEYLHRNNIIHRDLKTANVLKGYGQVLKIADFGVSRIGSQEGQMTAETGTYRWMAPEIIDHKPYDHKADVFSFAIVLWE LITLKVPYDDMTPLQAALGVRQGFRLQIPSGTHPGLSKLIRQCWDEDPEIRPAFGEIITQL
BdMAPKKK75	LKMGDMIASGSCGDLFHGTYFGEDVAVKVLKAEHLNKNVWNEFTQEVYILREVCHTNVVRFIGACTKPPKFCIITEYMSGGSLYDFV HKQRNVLDLPTLLKFACDVCRGMCYLHQRGIIHRDLKTANLLMDKDHVVKVADFGVARFQDQGGIMTAETGTYRWMAPEVINHQP YDNKADVFSFAIVLWELIASKIPYDTMTPLQAAVGVRQGLRPGLPENTHPKLLDLLQRCWETIPSNRPSFPDILTEL
OsMAPKKK1	LVIGERIGLGSYGEVYRADWNGTEVAVKKFLDQDFYGDALDEFRSEVRIMRRLRHPNIVLFMGAVTRPPNLSIVSEYLPRGSLYKILHR PNCQIDEKRRIKMALDVAKGMNCLHISVPTIVHRDLKSPNLLVDNNWNVKVCDFGLSRLKHSTFLSSKSTAGTPEWMAPEVLRNEQS NEKCDVYSFGVILWELATLRMPWSGMNPMQVVGAVGFQDKRLDIPKEIDPLVARIIWECWQKDPNLRPSFAQLTSAL
OsMAPKKK2	LLIGERIGLGSYGEVYHADWNGTEVAVKKFLDQEFYGDALAEFRCEVRIMRRLRHPNIVLFMGAVTRPPHLSIVSEYLPRGSLYTIIHR PDCQIDEKCRIKMALDVARGMNCLHTSVPTIVHRDLKSPNLLVDNNYIYRSVILDFHV
OsMAPKKK3	LVLKEKIGAGSFGTVHRADWNGSDVAVKILMEQDFHPERLKEFLREVAIMKSLRHPNIVLFMGAVTQPPKLSIVTEYLSRGSLYRILHK HGARENLDEKRRLSMAFDVAKGMNYLHKRNPPIVHRDLKSPNLLVDKKYTVKVCDFGLSRLKANTFLSSKTAAGTPEWMAPEVIRD EPSNEKSDVYSFGVILWELMTLQQPWSTLNPAQVVAAVGFNGRRLEIPSSVDPKVAAIMESCWTKEPWRRPSFASIMESL
OsMAPKKK4	LHIGERIGLGSYGEVYHADWNGTEVAVKKFLDQDLSGVALDQFKCEVGIMSRLRHPNVVLFLGYVTQPPNLSILTEYLPRGSLYRLLH RPNSQIDETRRLKMALDVAKGMNYLHASHPTIVHRDLKSPNLLVDKNWVVKVSDFGMSRLKHHTFLSSKSTAGTPEWMAPEVLRNE PSNEKCDVYSFGVILWELATMRVPWSGLNPMQVVGAVGFQNRRLEIPKEIDPLVATIISSCWENDPSKRPSFSQLLSPL
OsMAPKKK5	LVIGEQIGQGSCGTVYHALWYGSDVAVKVFSKQEYSEEVIQTFRQEVSLMKKLRHPNILLFMGAVTSPQRLCIVTEFLPRGSLFRLLQR NNTKLDWRRRVHMALDIARGMNYLHHFSPLIIHRDLKSSNLLVDKNWTVKVADFGLSRLKRETFLTTKTGKGTPQWMAPEVLRNEP SDEKSDVYSYGVILWELVTQKIPWENLNSMQVIGAVGFMNHRLEIPSETDPQWTSLILSCWETDSQLRPSFQQLLERL
OsMAPKKK6	ITIGERIGLGSFGEVYRGEWHGTEVAVKKFLQQDISSDALEEFRTEVRIIKRLRHPNVVLFMGAITRVPNLSIVTEFLPRGSLFRLIHRPN NQLDERKRLRMALDVARGMNYLHNCTPVIVHRDLKSPNLLVDKNWVVKVCDFGLSKMKNKTFLSSRSTAGTAEWMAPEVLRNEPS DEKCDVFSYGVILWELCTLLQPWEGMNAMQVVGAVGFQNRRLDIPDNTDPAIAEIIAKCWQTDPKLRPSFADIMASL
OsMAPKKK7	ITLGERVGLGSFGEVYKGEWHGTEVAVKKFLQQDISSDALDEFRTEFQIMKRLRHPNVVLFMGAVTRVPNLSIVTEFLPRGSLFRLIHR PNNQLDERRRLRMALDVARGMNYLHNCSPVVVHRDLKSPNLLVDKNWVVKVCDFGLSRMKNSTFLSSRSTAGTAEWMAPEVLRN EPSDEKCDVFSYGVILWELFTLLQPWEGMNPMQVVGAVGFQQRRLDIPAHVDPTIAEIIRRCWQTDPKMRPSFSEIMSSL
OsMAPKKK8	WKKGKLLGSGTFGQVYQGFNSEGGQMCAIKEVKVISDDSNSKECLRQLHQEIVLLSQLSHPNIVQYYGSDLSSETLSVYLEYVSGGSI HKLLQEYGAFGEAVLRNYTAQILSGLAYLHGRNTVHRDIKGANILVDPNGDIKLADFGMAKHISAHTSIKSFKGSPYWMAPEVIMNT NGYSLSVDIWSLGCTIIEMATARPPWIQYEGVAAIFKIGNSKDIPDIPDHLSFEAKNFLKLCLQRDPAARPTAAQLMEHPFV
OsMAPKKK9	WKKGKLVGRGTFGHVYIGFNSDKGEMCAMKEVTLFSDDPKSKESAKQLCQEILLLNRLQHPNIVRYYGSEMVDDKLYIYLEYVSGG SIHKLLQEYGQFGEPAIRSYTKQILLGLAYLHAKNTVHRDIKGANILVDPNGRVKLADFGMAKHINGQQCAFSFKGSPYWMAPEVIKN SNGCNLAVDIWSLGCTVLEMATSKPPWSQYEGIAAVFKIGNSKELPPIPDHLSEEGRDFIRQCLQRNPSSRPTAVDLLQHSFI
OsMAPKKK10	WKKGKLIGRGTFGHVYVGFNSDSGEMCAMKEVTLFLDDPKSKESAKQLGQEISLLSRLQHPNIVQYYGSETVDDKLYIYLEYVSGGSI HKLLQEYGQLGEQAIRSYTQQILSGLAYLHAKNTVHRDIKGANILVDPSGRVKLADFGMAKHINGQQCPFSFKGSPYWMAPEVIKNS NGCNLAVDIWSLGCTVLEMATSKPPWSQYEGIAAMFKIGNSKELPPIPDHLSEPGKDFIRKCLQRDPSQRPTAMELLQHPFV
OsMAPKKK11	WQKGRLLGSGTFGCVYEATNRQTGALCAMKEVNIIPDDAKSAESLKQLEQEIKFLSQFKHENIVQYYGSDTFEDRFYIYLEYVHPGSIN KYVKQHYGAMTESVVRNFTRHILRGLAFLHGQKIMHRDIKGANLLVDVSGVVKLADFGMAKHLSTAAPNLSLKGTPYWMAPEMVQ ATLNKDVGYDLAVDIWSLGCTIIEMFNGKPPWSDLEGPAAMFRVLHKDPPIPDNLSHEGKDFLQFCFKRNPAERPTASELLEHPFI
OsMAPKKK12	LILKEKIGAGSFGTVHRADWNGSDVAVKILMEQDFHPDRFREFMREVAIMKSLRHPNIVLFMGAVTEPPNLSIVTEYLSRGSLYKLLH RSGAKEVLDERRRLNMAFDVAKGMNYLHKRSPPIVHRDLKSPNLLVDKKYTVKVCDFGLSRLKANTFLSSKSLAGTPEWMAPEVLR DEPSNEKSDVYSFGVILWELMTMQQPWCNLNPAQVVAAVGFKGRRLDIPKDLNPQVAALIESCWAKIILSGYRLL
OsMAPKKK13	WRKGELIGSGAFGQVYLGMNLDTGELLAVKQVLIGSNNATREKAQAHIRELEEEVKLLKNLSHPNIVKRYLGTVREEDTLNILLEFVP GGSIQSLLGKLGSFPEAVIRKYTKQILQGLEYLHNNAIIHRDIKGANILVDNKGCIKLADFGASKQVAKLATITAAKTMKGTPHWMAPE VIVGSGHNFSADIWSVGCTVIEMATGKPPWSQQYQEVALLFHVGTTKSHPPIPEHLSPEAKDFLLKCLQKEPELRSTASDLLKHPFV
OsMAPKKK14	IELKERVGAGSFGTVYRADWHGSDVAVKVLTDQDVGEAQLKEFLREIAIMKRVRHPNVVLFMGAVTKCPHLSIVTEYLPRGSLFRLIN KASAGEMLDLRRRLRMALDVAKGINYLHCLNPPIVHWDLKTPNMLVDKNWSVKVGDFGLSRFKANTFISSKSVAGTPEWMAPEFLR GEPSNEKCDVYSFGVILWELMTMQQPWNGLSPAQVVGAVAFQNRRLPIPQETVPELAALVESCWDDDPRQRPSFSSIVDTL
OsMAPKKK15	WRKGDLLGSGAFGSVFLGMDLDSGELLAVKQVLIGSSNATREKAQGHIRELEDEVKLLKNLSHPNIVRYIGTVREENSLNILLEFVPGG SIQSLLGRLGSFPEAVIRKYTKQILHGLEYLHRNGIIHRDIKGANILVDNKGCIKLADFGASKQVEKLATTAKTMKGTPYWMAPEVIVG SGHDFSADIWSVGCTVIEMATGKTPWNQEIQEVSLLYYVGTTKSHPPIPEHLSPEAKDFLLKCLQKEPELRSTASDLLLHPFV
OsMAPKKK16	WKKGKLLGSGTFGQVYLGFNSENGQFCAIKEVQVISDDPHSKERLKQLNQEIDMLRQLSHPNIVQYYGSEMTDDALSIYLEFVSGGSI HKLLREYGPFKEPVIRNYTGQILSGLAYLHGRNTVHRDIKGANILVGPNGEVKLADFGMAKHISSFAEIRSFKGSPYWMAPEVIMNGR GYHLPVDIWSLGCTIIEMATAKPPWHKYEGVAAIFKIANSKEIPEIPDSFSEEGKSFLQMCLKRDPASRFTATQLMDHPFV
OsMAPKKK17	LKFGNKVASGSYGDLYRGTYCSQDVAIKVLKPERINADMQREFAQEVYIMRKVRHKNVVQFIGACTKPPNLCIVTEYMSGGSVYDYL HKHKGVFKLPALLGVVMDVSKGMSYLHQNNIIHRDLKTANLLMDENGTVKVADFGVARVKAQSGVMTAETGTYRWMAPEVIEHK

	PYDHKADVFSFGILMWELLTGKIPYEYLTPLQAAVGVVQKGLRPTIPKNAHAKLSELLQKCWQQEPAERPDFSEILETL
OsMAPKKK18	WQKGKLIGSGTFGCVYEAANRHTGALCAMKEVNIIPDDAKSAESLKQLEQEIKFLSQFKHENIVQYYGSEYIEDRFYIYLEYVHPGSIN KYVNQHCGAMTESVIRSFTRHILKGLAFLHSQKIMHRDIKGANLLVDVNGVVKLADFGMAKHLSTAAPNLSLKGTPYWMAPEVVQA TLVKDVGYDLAVDIWSLGCTIIEMFTGKPPWSGLEGPAAMFKVLHKDPSIPDSLSPEGKEFLRCCFRRNPAERPTASKLLEHPFV
OsMAPKKK19	WKRGKLLGSGTFGQVYLGFNSENGQFCAIKEVQVFLDDSHSKERLRQLNQEIDMLKQLSHQNIVQYYGSELADEALSIYLEYVSGGSI HKLLREYGPFKEPVIRNYTRQILSGLAYLHGRNTVHRDIKGANILVGPNGEVKLADFGMAKHVTSFAEIRSFRGSPYWMAPEVVMNN KGYNLAVDIWSLGCTIIEMATAKHPWYPYEDVAAIFKIANSKDIPEIPDCFSKEGKDFLSLCLKRDPVQRPSAASLLGHPFV
OsMAPKKK20	GRYNDVLGKGASKTVYRAFDEYQGMEVAWNQVKLHDFLQSPEDLERLYCEIHLLKTLKHRNIMKFYTSWVDVSRRNINFITEMFTS GTLRQYRQKHMRVNIWAVKHWCRQILSGLLYLHSHDPPIIHRDLKCDNIFVNGNQGEVKIGDLGLAAILRKSHAVHCVGTPEFMAPE VYEEEYNELVDIYSFGMCVLEMVTFEYPYSECTHPVQIYKKVISGTKPEALYKVKDPMVRQFVEKCLATASRRLSARELLKDPFL
OsMAPKKK21	LEELRELGSGTFGTVYHGKWRGSDVAIKRIKKSCFTGRSSELERLANEFWREAEILSKLHHPNVVAFYGVVKDGPGGTLATVTEFMV NGSLRHVLQRKDKYLDRRKRLIIAMDAAFGLEYLHSKNIVHFDLKCDNLLVNLKDQSRPICKVGDFGLSKIKRNTLVSGGVRGTLPW MAPELLNGSSNKVSEKVDVFSFGIVMWEILTGEEPYANMHYGAIIGGIVNNTLRPPVPASCDPEWRRLMEQCWAPDPSQRPAFTEIAG RL
OsMAPKKK22	WMRGALLGSGSFGMVYEGISDEGAFFAVKEVSLLDQGSNAQQSILALEQEIALLSQFEHENIVQYYGTDKEESKLYIFIELVTQGSLSS LYQKYKLRDSQVSAYTRQILNGLVYLHERNVVHRDIKCANILVHANGSVKLADFGLAKEMSKINMLRSCKGSVYWMAPEVVNPKK TYGPQADIWSLGCTVLEMLTRNIPYPNVEWTNAFFMIGKGERPQIPSYLSKDAQDFISQCVQVDPEQRPSASQLMSHPFV
OsMAPKKK23	LEELRELGSGTFGTVYHGKWRGTDVAIKRIKKSCFAGRSSEQEKLTKDFWREAQILSKLHHPNVVAFYGVVPDGTGGTLATVTEFMV NGSLRNVLLRKDRMLDRRKRLIIAMDAAFGMEYLHSKSIVHFDLKCDNLLVNLRDPQRPICKVGDFGLSRIKRNTLVSGGVRGTLPW MAPELLNGSSSRVSEKVDVFSFGIALWEILTGEEPYANMHCGAIIGGIVNNTLRPPIPKNCEPEWRQLMEQCWSADPDIRPSFTEVTDRL
OsMAPKKK24	YMLGDEIGKGAYGRVYKGLDLENGDFVAIKQVSLENIPQEDLNIIMQEIDLLKNLNHKNIVKYLGSLKTRSHLHIILEYVENGSLANIIK PNKFGPFPESLVAVYIAQVLEGLVYLHEQGVIHRDIKGANILTTKEGLVKLADFGVATKLTEADINTHSVVGTPYWMAPEVIEMSGVC AASDIWSVGCTVIELLTCAPPYYDLQPMPALFRIVQDVHPPIPEGLSPEITDFLRQCFQKDSIQRPDAKTLLMHPWL
OsMAPKKK25	LFVGPRIGEGAHAKVYEGKYKNQNVAIKIVHKGDTPEEMVKREGRFLREVTMLSRVQHKNLVKFIGACLEPVMVVVTELLVGGSLR KYLVGLRPRSLEPRVAVGFALDIARAMECLHAHAIIHRDLKPENLLLTADQRTVKLVDLGLAREETLTEMMTAETGTYRWMAPELYS TVTLRHGEKKHYNHKVDVYSFAIVLWELLHNRLPFEGMSNLQAAYAAAFKNIRPSADNLPEELSEILTTCWKEEPNERPNFTQIVQML
OsMAPKKK26	LKFERKLASGSFGDLYHGTYCSQDVAIKVLKPERVSVDMLREFAQEVYIMKKVRHKNVVQFIGACTRPPILCIVTEFMRGGSIFDFLYN FRGTFQLPDVLRIASDVSKGMNYLHQINIVHRDLKTANLLMDDQVVKVADFGVARVKDQSGVMTAETGTYRWMAPEVIEHLPYDQ RADVFSFGIVIWELLTGKLPYEDMTPLQAAVAVVQKDLRPIIPADTHPMLAGLLQKCWQKDPALRPTFSEILDIL
OsMAPKKK27	LEIRYVIAQGTYGTVYRGTYDGQDVAVKLLDWGEDGFATEAETAALRTSFKQEVAVWHKLSHPNVTKFVGASMGTTDLKIPTNNSN AGARTNLPARACCVVVEYLAGGTLKQYLIKNSRRKLAYKVVVQLALDLARGLSYLHSRKIVHRDVKTENMLLDTQRNLKIADFGVA RVEAQNPKDMTGATGTLGYMAPEVLDGKPYNRKCDVYSFGICLWEIYCCDMPYPDLSFADVSSAVVHQNLRPDVPRCCPSAFANIM RKCWDANPDKRPDMDEVVQLLEAL
OsMAPKKK28	WNRGMLLGSGSFGTVFEGISDEGVFFAVKEVCLCDQGSNAQQCIFQLEQEIALLSQFEHENIVQYYGTDKEDSKLYIFLELVTQGSLAS LYQKYRLRDTHVSAYTRQILNGLTYLHERNIVHRDIKCANILVHANGSVKLADFGLAKEITKFNVLKSCKGTVYWMAPEVVNPKTTY GPEADIWSLGCTVLEMLTRQLPYPGLEWTQALYRIGKGEPPAIPNCLSRDARDFISQCVKPNPQDRPSAAKLLEHPFV
OsMAPKKK29	IRYNEVLGRGAMKTVYKAFDEVEGIEVAWSQVEIDEVMQSPDNLERLYSEVHLLKSLKHENVMKFYNYWVDDQKKTINVITELFTS GSLRQYRQKHPRVDLKAIKNWARQVLRGLDYLHTHQPPIIHRDLKCDNIFVNGNHGEVKIGDLGLATVMLTPRAKSVIGTPEFMAPEL YDENYDELVDIYSFGMCMLEMFTLEYPYSECTNAAQIFKKVSKGVKPAALAKITNIQAKQFIDKCLVPASERLSAKELLQDPFL
OsMAPKKK30	LKFGTKVASGSNGDLFRGSYCSQDVAIKVVRPERISADMYRDFAQEVYIMRKVRHRNVVQFIGACTRQPNLYIVTDFMSGGSLHDYL HKKNNSFKLSEILRVATDISKGMNYLHQNNIIHRDLKTANLLMDENKVVKVADFGVARVKDQSGVMTAETGTYRWMAPEVIEHKPY DHKADVFSFGIVLWELLTGKIPYEYLTPLQAAIGVVQKGLRPTIPKDTHPKLSELLQKCWHRDPAERPDFSQILEIL
OsMAPKKK31	LVIRGVIARGTFGTVHRGVYDGQDVAVKMLDWGEDGHRSEREISSLRAAFAQEVAVWHKLDHPNVTKFIGAIMGARDLNIQTEHGH FGMPSNICCVVVEYLAGGALKNFLIKNRRRKLAYKVVVQLALDLARGLSYLHSKKIVHRDVKTENMLLDKSRTVKIADFGVARIEAS NPSDMTGETGTLGYMAPEVLNGHPYNRKCDVYSFGICLWEIYCCDMPYPDLSFSEVTSAVVRQNLRPEIPRCCPSSLANVMKRCWDA NPDKRPAMAEVVSML
OsMAPKKK32	LHIGMPFAQGAFGKLYRGTYNGGDVAIKLLERPEADPEKAQLLEQQFVQEVMMLATLRHSNIVKFVGACRKPMVWCIVTEYAKGGS VRNFLNRRQNRSVPLKLAVKQALDVARGMAYVHGLGFIHRDLKSDNLLISGDKSIKIADFGVARIEVKTEGMTPETGTYRWMAPEVI QHRPYDQKVDVYSFGIVLWELVTGNLPFANMTAVQAAFAVVNKGVRPAIPHDCLPALAEIMTRCWDANPDARPPFTEVVRML
OsMAPKKK33	LDMGVPFAQGAFGKLYRGTYNGEDVAIKLLEKPENDPERAQALEQQFVQEVMMLSRLRHPNIVRFIGACRKSIVWCIITEYAKGGSV RQFLARRQNKSVPLRLAVKQALDIARGMAYVHALGFIHRDLKSDNLLIAADKSIKIADFGVARIEVKTEGMTPETGTYRWMAPEMIQ HRPYDHKVDVYSFGIVLWELITGMLPFTNMTAVQAAFAVVNKGARPVIPQDCLPALSHIMTLCWDANPEVRPAFTDIVCML
OsMAPKKK34	LVVRGVIARGTFGTVHRGVYDGHDVAVKLLDWGEDGHRSEQDIAALRAAFSQEVSVWHKLDHPNVTKFIGAIMGARDLDIQTESGH LAMPSNICCVVVEYLAGGSLKGFLIKNRRKKLAFKVVVQIALDLARGLSYLHSKKIVHRDVKTENMLLDKTRTVKIADFGVARLEAS NPSDMTGETGTLGYMAPEVLNGSPYNRKCDVYSFGICLWEIYCCDMPYPDLSFSEVTSAVVRQNLRPEMPRCCPSSLANVMKRCWD ANPDKRPEMAEVVSML

OsMAPKKK35	LEEIRELGSGTYGAVYHGKWRGCDVAIKRIKASCFAGRPSERERLIADFWKEAQILSSLHHPNVVSFYGVVRDGPDGSLATVTEFMIN GSLKQFLRKKDRTIDRRKRVILAMDAAFGMEYLHGKNIVHFDLKCENLLVNMRDPQRPICKIGDLGLSKVKQHTLVSGGVRGTLPW MAPELLSGKSNMVSEKIDVYSFGIVMWELLTGEEPYSDMRAAAIIGGIVNNSLRPQIPSWCDPEWKSLMENCWASEPADRPSFTEISQR L
OsMAPKKK36	GRYTEVLGKGAFKTVYKAFDQLEGLEVAWNQIKVGDILRNNDDLERLRSEVRLLKTLKHKNIIKFYNSWLDKKNNNINFITEVFTSGT LRQYRIKHKKVDVRALKKWSRQILSGLVYLHSHDPPVIHRDLKCDNIFVNGNQGEVKIGDLGLATILDNARSAHSIIGTPEFMAPELYD EEYNELVDIYAFGMCLLELVTFEYPYCECSNAAQIYKKVSDGEKPSSLAKIEDPEVRFFIEKCIAKASQRLSAQELLMDPFL
OsMAPKKK37	LHMGMPFAQGAFGKLYKGTYNGEDVAIKLLERPEADPERAGLMEQQFVQEVMMLATLRHPNIVKFIGACRKPMVWCIVTEYAKGG SVRQFLMKRQNRSVPLKLAVKQALDVARGMAYVHALGFIHRDLKSDNLLISGDKSIKIADFGVARIEVKTEGMTPETGTYRWMAPE MIQHRPYDQKVDVYSFGIVLWELITGMLPFANMTAVQAAFAVVNKGVRPAIPQDCLPVLSEIMTRCWDPNPDVRPPFTEVVRML
OsMAPKKK38	LDMGAPFAQGAFGKLYRGTYNGEDVAIKLLEKPENDPERAQLMEQQFVQEVMMLSTLRHPNIVRFIGACRKSIVWCIITEYAKGGSV RQFLARRQNKSVPLGLAVKQALDVARGMAYVHALRFIHRDLKSDNLLISADKSIKIADFGVARIEVQTEGMTPETGTYRWMAPEMIQ HRPYDHKVDVYSFGIVLWELITGMLPFTNMTAVQAAFAVVNRGSRPAIPQDCVDSLSKIMTCCWDANPEVRPSFAEIVVML
OsMAPKKK39	LEELRELGSGTFGTVYHGKWRGSDVAIKRINDRCFAGKASEQERMRTDFWNEADKLASLHHPNVVAFYGVVLDGPGGSVATVTEY MANGSLRQALQRHEKIFDRRRRLLIAMDVAFGMEYLHEKNIVHFDLKSDNLLVNLRDPQHPICKVGDLGLSKVKCQTLISGGVRGTL PWMAPELLNGSSSLVSEKVDVFSFGIVMWELLTGEEPYAELHYGAIIGGIVNNTLRPPVPESCDPRWRSLMEQCWSSEPSERPSFTEVG KRL
OsMAPKKK40	LTIGTRVGIGFFGEVFRGIWNGTDVAIKVFLEQDLTTENMEDFCNEIYILSRLRHPNVILFLGACMVPPHLSMVTEYMEMGSLYYLIHM SGQKKKLSWRRRLKIVRDICRGLMCIHRMKIVHRDLKSANCLVNKHWTVKICDFGLSRVMTDSPMTDNSSAGTPEWMAPELIRNEPF TEKCDIFSLGVIMWELCTLSRPWDGISPVQVVYTVANEGSRLEIPEGPLGKLIADCWAEPQDRPSCQEILTRLL
OsMAPKKK41	LEELQELGSGTFGTVYHGKWRGSDVAIKRINDRCFAGKPSEQDKMRNDFWNEASKLADLHHPNVVAFYGVVLDGPGGSIATVTEYM VNGSLRTALLKNAKTLDKRKRLIIAMDTAFGMEYLHNKNIVHFDLKSDNLLVNLRDPQRPICKVGDLGLSKVKCQTLISGGVRGTLP WMAPELLNGSSSLVSEKVDVFSFGIVLWELLTGEEPYADLHYGVIIGGIVSNTLRPAVPDSCDPEWRSLMEQCWSTEPSERPTFTEIAG RL
OsMAPKKK42	LFIGSKIGEGAHGKVYKGKYGEQIVAIKVLNNGTTPEEKATLEARFIREVNMMCKVKHDNLVKFIGACKEPLMVIVSELLPGMSLKNY LNSLRPSQLDIHTAIGYALDIAHAMECLHANGIIHRDLKPDNLLLTANRKKLKLTDFGLAREETVTEMMTAETGTYRWMAPELYSTVT LQRGEKKHYTNKVDVYSFGIVLWELLTNKMPFEGMSNLQAAYAAAFKQARPPLPEETPQELVFIVQSCWVEDPAMRPSFSQIIRMLD AFL
OsMAPKKK43	LDIQEKVASGTYGDLYRGTYFGEDVAIKVLKSDRLNENMQEEFNEEVFIMRKIRHKNIVRFLGACTKSPTLCIVTEFMKNGSVYDYLH KRKGSFKLPSLLKAAVDISKGMNYLHQNKIIHRDLKTANLLMDEHELIKVADFGVARVKAESGIMTAETGTYRWMAPEVIEHKPYDS KADVFSFGVVLWELLTGKIPHEFLTPLQAAIGVVQEGLRPVIPKATDPKLALLLESCWQQNAVNRPDFVQILQKL
OsMAPKKK44	ITVGTRVGIGFFGEVFRGIWNGTDVAIKLFLEQDLTTENMEDFCNEISILSRLRHPNVILFLGACMKPPHLSLVTEYMEMGSLYYLIHAS GQKGKLSWRRRLKMLRDICRGLMCMHRLKIVHRDLKSANCLVNKHWAVKLCDFGLSRVMSNSAMNDNSSAGTPEWMAPELIRNEP FTEKCDIFSLGVIMWELCTLSRPWEGIPSVQVVYNVANEGARLEIPDGPLGSLIADCWAEPDKRPGCQEILTRLL
OsMAPKKK45	LFIGNKFASGANSRIYRGIYKQRAVAVKMVRIPERDEARRAVLEDQFNSEVAFLSRLYHPNIVQFIAACKKPPVYCIITEYMSQGTLRM YLNKKDPYSLSSETILKLALDISRGMEYLHAQGVIHRDLKSQNLLLNDEMRVKVADFGTSCLETACQATKGNKGTYRWMAPEMTKE KPYTRKVDVYSFGIVLWELTTCLLPFQGMTPVQAAYAASEKNLRPPLSTSCSPVLNNLIKRCWSANPARRPEFSYIVSVL
OsMAPKKK46	LRYREIIGSGSSKTVYKAFDAVDGIEVAWGKVEINERIMGSSKELQRLRTEIQLLKSLQHKHILKLYASWVDTNRRTVNIVTELFTSGN LREYRTKHKKVDMKAMRRWAKQILTGLEYLHSQKPPIIHRDLKCDNIFINGNHGKVKIGDFGLAMVMQQRKTRSIQGTIEFMAPELF GENYNELVDIYSFGMCMLEMVTCECPYSECKGFIQIYKKITEGVKPAALSKVKDAEVRGFIESCLASVSDRLPASELLKSPFL
OsMAPKKK47	GRFNEILGKGSSKIVYRGFDEWRGVEVAWNQVRLRDVVRGGGELERFYGEVHLLAALRHRGIVRLHAYWVDAPRRALNFVTELFVS GTLRQYRERHRRVSAAAVRRWCAQILDGLAYLHAHSPPIIHRDLKCDNIFVNGNQGEVKIGDLGLAAFRRGGGHARCVGTPEFMAPE VYDESYDELADVYSFGMCVLEMVTLDYPYSECSNPIQIYKRVISGIKPAALYRVSDPVVRQFIERCLAPAARRPAARELLDDPFL
OsMAPKKK48	LEIRTKFATGRHSRVYSGRYAARDVAIKMVSQPEEDAALAAELERQFASEVALLLRLRHPNIISFVAACKKPPVFCIITEYMAGGSLRK YLHQQEPHSVPIELVLKLSLEIARGMSYLHSQGILHRDLKSENILLDGDMSVKVADFGISCLESQCGSGKGFTGTYRWMAPEMIKEKH HTRKVDVYSFGIVLWEILTALVPFSEMTPEQAAVAVALKNARPPLPPSCPVAISHLITQCWATNPDRRPQFDDIVAIL
OsMAPKKK49	LLIGQRFASGAYSRLFHGIYKEQPVAVKFIRQPDEEEDAELAAKLEKQFTAEVTILARLHHRNVIKLIGACNAPPVFCVITEFLCGGSLR AFLRKLQRQKLPLEKIICIALDIAHGLEYIHSQRVIHRDVKPENILFDGECCAKVVDFGVACEEVYCNSLEDDPGTYRWMAPEMYKRK PYGRKVDVYSFGLVLWELFSGSIPYEEMTPLQAAFAVVNKNLRPVVPSSCPAQLRLLIEQCWSCQPEKRPEFSQVVQIL
OsMAPKKK50	GRLSEVLGKGAMKTVYRGFDELRGVEVAWNQATISDVLRTPDALHRMYAEVSLLADLRHDAIIAFHASWVHPSRRTFNFITELFSSGT LRSYRLRYPRVSRRAVAAWARAILRGLAYLHSRGVIHRDLKCDNIFVNGHLGQVKIGDLGLAAVLRGCTSARSVIGTPEFMAPEMYD ECYGVGVDVYSFGMCMLEMLTNEYPYSECDNPAQIYKKVTAGKLPDAFYLLTDADARRFIGRCLVDAAHRPSAEELLLDPFL
OsMAPKKK51	LLIGHRFASGAHSRLFHGIYKEQPVAVKFIRQPEDEEDAELAAQLEKQFNTEVTTLSRLNHPNVIKLIGACSSPPVFCVITEFLSGGSLRT FLHKQEHKSLPLEKIISIGLDIANGIGYIHSQGVVHRDVKPENIIFDSEFCAKIVDFGISCEEAECDPLANDTGTFRWMAPEMMKHKPYG RKVDVYSFGLILWEMFTGSVPYEDLNPFQAAFAVFDKNERPVIPSSCPAPLRLLIEQCWASQPDKRPEFWQIVQIL
OsMAPKKK52	IRYDEIVGSGAVKTVYKAFDKLEGVEVAWSQSRIDDSVMGSSKKMKQLNTEIQLLKTLKHKNIEKMFASWVDGEKKTVNIITELFTSG SLTQYRRKHKKVNMKAMKRWAIQILTGLEYLHSQKPAIIHRDLKCDNIFINGNHGKVKIGDFGLATFMQQQKKSIKGTLEFMAPELLT GHYNELVDIYSFGMCMLEMVTCEYPYSECQGMAHIFKKIDEGKKPAAFYKIKDAEVRSFIENCLAPVENRMSATELLKSSFL

OsMAPKKK53	GRLSEVLGKGAMKTVYRGFDELRGVEVAWNQATISDVLRTPDALHRMYAEVSLLADLRHDAIIAFHASWVHPSRRTFNFITELFSSGT LRSYRLRYPRVSRRAVAAWARAILRGLAYLHARGVIHRDLKCDNIFVNGHLGQVKIGDLGLAAVLRGCASARSVIGTPEFMAPEMYD ECYGVGVDVYSFGMCMLEMLTNEYPYSECDNPAQIYKKVTAGKLPDAFYRLTDADARRFIGRCLVDAAHRPSAEELLLDPFL
OsMAPKKK54	LEDLREIGSGSFGTVFHGRWKGTDVAIKRIKNSCFMYPSSQADKLITEFWREAAIISKLHHPNVLALYGIVNNGPGGTLATVTEFMING SLKKVLLHKNKYLDWRKRIMVAKDAAIGMEYLHSKDIVHFDLKCDNLLVNIKDPSRPICKVADFGLSKMKQATLVSGGMRGTLPW MAPELLTMSGTKVSEKIDVYSFGIVMWEILTGEDPYDGMHYGGVIGGILSNTLRPLVPTSCNLEWRKLMEQCWSTEPERRPSFAEVAT RL
OsMAPKKK55	WTRVRTLGRGASGAVVSLAADDRSGALFAVKSAAAAAAAEQLVREGRILSGLRSPHVLPCLGFRAEAGGECQLFLEFAPGGSLADVV ARSGGRLDECAIRAYAADVARGLAYLHGMSLVHGDVKGRNVVVGADGRAKIADFGCARTVGSDRPIGGTPAFMAPEVARGEEQEP AADVWALGCTVIEMATGRAPWSDMEDILSAVRRIGYTDAVPEVPEWLSAEAKDFLARCFARNPRERWTSSQLLEHPFL
OsMAPKKK56	GRYTEVLGKGAFKTVYKAFDQLEGLEVAWNQIKVGDILRNNDDLERLRSEVRLLKTLKHKNIIKFYNSWLDKKNNNINFITEVFTSGT LRQYRIKHKKVDVRALKKWSRQILSGLVYLHSHDPPVIHRDLKCDNIFVNGNQGEVKIGDLGLATILDNARSAHSIIGTPEFMAPELYD EEYNELVDIYAFGMCLLELVTFEYPYCECSNAAQIYKKVSDGEKPSSLAKIEDPEVRFFIEKCIAKASQRLSAQELLMDPFL
OsMAPKKK57	LTRVRTLGRGASGAVVSLFAAGDDELLAVKSAAGPAGAAQLRREAGILASLCSPHVLPCFGFGAVAGGEYGLLLEFAPGGSLADEVA RNGGRLEEDDVRAYAADVASGLAYLHGVGMVHGDVKGRNVVIGANGRAKLADFGCARRADSAGPIGGTPAFMAPEVARGEEQGP AADVWALGCTVIEMATGRAPWSGVDDVVAAVRLIGFTDAVPEPPEWLSPEANDFLDKCLRRRAGERWTAAQLLEHPFL
OsMAPKKK58	LLLGPKIASGSNSRIHRGMYGEQPVAVKIMHAPVGDDDDDVQVRREMEAQFDAEVSLLSRLRHPNVVRLVGVCREPEVYWIITELMR RGTLSAYLHGREPYSLPPETIVRLALDVARGMEYLHARGVVHRDLKPENLMLDGGGRVKVADLGTSCLEATCRGDKCSSKAGTFRW MAPEMIHDKRCNRKVDVYSFGLVLWELTTCLVPFQNLSPVQVAYSVCDRDARPPLSPSCPPAINSLIKRCWSTEPARRPEFKQIVSVL
OsMAPKKK59	LEIGHVVEHGDHGTLFRGKYYSQDVAVKLLDWGAEGDSSEDQIAHFRTSLKEVVAVWHEFNHPNITKFIGASMGTTNLNIPKDIPDHS SRKGARTDLPDRACCVVVEYLTGGTLKQHLIKHYRKNKKLLYEEVVRLALDLARGLSFLHSKKIVHRDVKSENMLLDPQLNLKIADF GVARLVEAQDPKDLTRTTGTLGYMAPEVLDGKPYNRKCDVYSFGICLWETYCCDMPYGPYSDLSFADFSSFVVHKNLRPEIPDCCPS AMASIMRRCWDANPEVRPEMEEVVRLLESL
OsMAPKKK60	LDIQNQVAHGTFGVVYRGTYDGHDVAVKVLDWGQEGQESTAKHREAFEKEVAVWQKLDHPNVTKFVGASMGTSHLKIPSAKAESR SSSVGGGSAGGGGGQRCVVVVEYQHGGTLKTLLYKHRDKKLPYKKVVQLALDMARGLRYLHGEKIVHRDVKAENMLLDRKKTLK IADFGVARVEAGADGDDMTGQTGTIGYMAPEVLQGRAYDHKCDVYSFGVLLWETYCCAMAYPNYSLADISYHVDKLGIRPDIPRCC PKAMADIMARCWDANPDNRPEMSEVVALL
OsMAPKKK61	LLVGHKFASGAYSRLYKGLYDDKPVAIKFIRQPDDDDNGKMAAKLEKQYNSEVNALSHLYHKNVIKLVAAYKCPPVFYIITEFLPGG SLRSYLNSTEHHPIPLEKIISIALDVACGLEYIHSQGVVHRDIKPENILFDENFCVKIADFGIACEESMCDVLVEDEGTYRWMAPEMIKR KAYNRKVDVYSFGLLLWEMISGRIPFDDLTPLQAAYAVATRHARPVIPPECPMALRPLIEQCCSLQPEKRPDFWQIVKIL
OsMAPKKK62	LRRLRTLGRGASGAVVWLASDDASGELLAVKSAAGEGGAEQLRREGRVMSGLCSPHIVPCLGSRAAAGGEYQLFLEFAPGGSLADE AARSGGRLAERAISAYAADVARALAYLHGNSLVHGDVKARNIMVGADGRAKLADFGCARRTDSERPIGGTPAFMAPEVARGEEQGP AADVWALGCTIIEMATGRVPWSDMDDVFSAVHRIGYTDAVPEIPEWLSPEAKNFLSRCFTRNPSDRPTAAQLLEHPFL
OsMAPKKK63	WTRLRTLGRGASGAVVSLAEDGASGELFAVKTAAAAEAAMLRRERGMMSGLSSPHVVPCIGGGDGPDGSYNLFLEFAPGGSLANEV ARDGGRLEERAIRVYAADVLRGLTYLHGMSLVHGDVKADNIVIGVDGLAKLADFGCAKTMDSERPVSGTPAFMAPEVARGEEQGPA ADVWALGCTVIEMATGRAPWSDMDDVLAAVHRIGYTDAVPEVPVWLSAEAKDFLAMCFARNAGDRSTAAQLLEHPFV
OsMAPKKK64	GRYADVLGLGSVKKVYRGFDQEEGIEVAWNRVRLRALADRDPAMVERLHAEVRLLRSLHHEHIIGFHKVWLDRDAGVLNFITEVCT SGSLREYRDRHRHVSVKALKKWARQILLGLDHLHTHDPCIIHRDLNCSNVFINGNTGQVKIGDLGLAAIVDKTHVAHTILGTPEFMAP ELYTETYTESVDIYSYGMCVLEMVTREMPYAECDSVVQIYHSVTRGVPPAALKRIRDPELRAFIERCIGQPRNRPSAAELLRDPFF
OsMAPKKK65	FSKAVIIGKGSFGEILKANWRGTPIAVKRILPSLSDDRLVIQDFKHEVNLLIKLRHPNIVQFLGAVTETKPLMLVTEFLRGGDLHQYLKE KGALAPATAVNFALDIARGMAYLHNEPNVVIHRDLKPRNILLVNSAANHLKVGDFGLSKIIKAQHANDVYKMTGETGSYRYMAPEV FKHRKYDKKVDVFSFAMILYEMLEGDPPFSNYEPYEAAKYVGEGHRPPFRSKGFTNELKELIELCWSGDIHLRPSFLEILKRL
OsMAPKKK66	WTRLRSIGHGASGATVSLAADDASGELFVVKSAGDAVAATARQQLRREWSVMSGLSSPHVLRCLGFVQAAAGAGGEHQLLLEYAP GGSLADVVARNGDRLDESAFRAYAADVLRGLDYLHEKLVVHGDVKGSNVLVGADGRAKLADFGCARVVMPGGSKQPVLGGTPAF MAPEVARGEEQGPAADVWALGCTVIEMATGRAPWSDMDDVLAALRMIGYTDAVPDLPPWLSPEAKDFLRRCMQRRAGDRPTAAQ LLQHPFV
OsMAPKKK67	WTRLRSVGRGASGAVVSLAANDVSGELFVIKSAGEGAARQQLRREWSVMSGLSSPHVLKCLGFVQASGGCGGGEHQLFLEYAPGGS LADVVARNGGRLDEGAVRTYAADVLRGLDYLHGKLVVHGDVKGSNVLVGADGRAKLTDFGCARVAMPGGSKQPVLGGTPAFMA PEVARGEEQGLAADVWALGCTVIEMATGRAPWSDMDNVLPALHKIGYTDAVPDLPRWLSPEAKDFLRGCLQRRAGDRPTAAQLLQ HPFI
OsMAPKKK68	LSIRSVVAQGYHGTLFRADYGGHDVAVKVLDWREDGYSTPEQIAHLRASLADLAAVWHSFEHPNVARFFGASMGTTDLNIPAAASA AGGGEQRNTGEKPPADRACCVVVEFLGGGTLKKYLIEHYRSKLPYGEVVRLALSMARGLSFLHANNIVHRDVKTENMLFLGGGGGG DLKIADFGVARVEARDPREMTGATGTVGYMAPEVLVGKPYNRKCDVYSFGICLWETYCCEMPFTFGLSVAEASAAVAQRGMRPPIP PCCPPAMARVMARCWDADPAARPEMEEVVRMLEAL
OsMAPKKK69	WTRVRTLGRGASGAEVFLAADDASGELFAVKSVGAAGAAALRREQGVMAGLSSPHVVPCIGGRVGRDGSYQMFLEFAPGGSLADV AARCGGRMEECAVGEYAVDVARGLAYLHGMGLVHGDVKARNVVIGGDGRAKLADFGCARWADSGRPIGGTPAFMAPEVARGEEQ SPAADVWALGCTVIEMATGRAPWSDMDDVLAAVHRIGYTEAVPEVPGWLSADAKDFLARCLQRRPIDRSTAAQLLEHPFV
OsMAPKKK70	LRRVRTLGRGASGAVVWLASDDDSGELMAVKSASAGGAAAQLRREGRVLSGLCSPHIVPCLGSRAAAGGEYQLFLEFAPGGSLADE

	AARNGGCLPEPAIRAYAADVARGLAYLHGNSLVHGDVKARNVVIGSDGRARLTDFGCARVMDSAGPIGGTPAFMAPEVARGEEQGP AADVWALGCTIIEMATGRAPWSDMDDILAAVHRIGYTNAVPEVPGWLSAEAKDFLDGCFERNASDRSTAAQLLEHPFV
OsMAPKKK71	WRRGPVIGRGATATVSIATDRRTGGVFAVKSVDVARAGALRREQGMLSALASPFVVPCVGSGVSAAVDGSGGACYDLFLEYAPGGS LADEIKRCGGRCEEPLIRSRVGDVLRGLAYVHAAGIAHCDVKGRNVLVGADGRAMLADFGCARWMAAEDCNAGGVTIRGTPMFLA PEAARGEAQGTAADIWALGCTVIEMATGGAPWPRFADPVAALHHVAHSVDVPESPAWFSAEGKDFLARCLIRDPAKRWTAEQLLEH PFV
OsMAPKKK72	FTNGNGISKGTFRKATWRGILVAVKKLDDDLIMDENKVQAFRDELDVLQLIRHPNVVQFLGAVTQSSPMMIVMEFMPKGDLRKHLS RKGALEPSYAVKLALDIARGMNYLHEHKPQAIIHRDLEPSNILRDDTGHLKVADFDLCKMLKWRRKVREEKAVTSPGNACRYVAPE VLRNEEYDTKVDVFSFALILQEMIEGCLPFYDKKNNEIEKAHNSKERPPFRAPPKHYAYGLRELIEQCWSENPASRPDFRTIIEQLSYI
OsMAPKKK73	WVRGKCVGRGAFGAVHVAVDRATGRAFAVKSVEAKGGAPAAAMACLESEIRILRRLSSPYVVEYLGDDGDAATTRNLHMELVPGG SAAAAAAMGGLGERGARGVVRRVAAALRYLHDVAGVVHGDVKGRNVLVGCDGDGRGAKLADFGAARLVSDAAVSRGPRGTPA WMAPEVARGGAPTPASDVWSLGCTAVELITGKRPWSELGGASEVGELLFLIGFGGKRPELPACASDSCRDFLDKCLRRDAGERWTCD QLLRHPFL
OsMAPKKK74	FKKGDEVVKGVYQVAKWNGTKVHVKILDRECYCDQEVINSFRHELTVLEKVRHPNVVQFVGAVTQNIPMMIISEYLPNGDLSSCIPR KGKLHGQKVLKYGLEIARGMTYLHQCKPDPIIHCDLKPKNIFLDSGGQLKIAGFGLTRLSKISPGRVKLADHESMVDSFSHYTAPELYR NEIFDASVDAFSFGFILYEMVEGTHTVHGKSSEESGHTIRYDGMRPSLKNKLRGYPPDFKALIEECWDTQGIARPTFSEIIIRL
OsMAPKKK75	FRRGEEVTKGHYVARWYGSKVFVKILDKDSFSDANSINEFKHELTLLEKARHPNLVQFVGAVTQNVPMMIVSEYHQKGDLASYLET KGRLQPYKAIRFSLDIARGLNYLHECKPEPIIHGNLSTKSIVRDDEGKLKVAGFGSRSLIKVSEDNPQMDQTTSKFNSVYTAPEMYRNG TFDRSVDVFAFGLILYEMIEGTHAFHPKPPEEAAKMICLEGMRPPFKNKPKYYPDDLRELIQECWDPTPSVRPTFEEIIVRLNKISTSF