

Figure S1. BRAF's amino acid sequence. The protein sequence below is represented in FASTA form and represents BRAF's canonical sequence. The protein contains 766 amino acid residues.

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>sp|P15056|BRAF_HUMAN Serine/threonine-protein kinase B-raf OS=Homo
sapiens OX=9606 GN=BRAF PE=1 SV=4
MAALSGGGGGGAEPGQALFNGDMEPEAGAGAGAAASSAADPAIPEEVWNIQMIKLTQEHIEALLDKFGGEHN
PPSIYLEAYEEYTSKLDALQREQQLLES LGNGTDFSVSSSASMDTVTSSSSSSLSVLPSSLVSVFQNPTDVAR
SNPKSPQKPIVRVFLPNKQRTVVPARCGVTVRDSLKKALMMRGLIPECCAVYRIQDGEKKPIGWDTDISWLTG
EELHVEVLENVPLTTHNFVRKTFFTLAFCDFCRKL LFQGFRCQTCGYKFHQRCSTEVPLMCVNYDQLDLLFVS
KFFEHHPI PQEEASLAETALTSGSSPSAPASDSIGPQILTSPSPSKSIPIQPFRPADEDHRNQFGQDRSSS
APNVHINTIEPVNIDDLIRDQGFRGDGGSTTGLSATPPASLPGSLTNVKALQKSPGPQRERKSSSSSEDNRNM
KTLGRDSSDDWEIPDGQITVGQRIGSGSFGTVYKKGWHDVAVKMLNVTAPTQQQLQAFKNEVGVLKRKTRHV
NILLFMGYSTKPQLAIVTQWCEGSSLYHHLHIIETKFEMIKLID IARQTAQGMDYLHAKSIIHRDLKSNNI FL
HEDLTVKIGDFGLATVKSRWSGSHQFEQLSGSILWMAPEVIRMQDKNPYSFQSDVYAFGIVLYELMTGQLPYS
NINNRDQII FMVGRGYLSPDL SKVRSNCPKAMKRLMAECLKKRDERPLFPQILASI ELLARSLPKIHR SASE
PSLNRAGFQTEDFSLYACASPKTPIQAGGYGAFFVH
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Figure S2. NRas's amino acid sequence. The protein sequence below is represented in FASTA form and represents NRas's canonical sequence. The protein contains 189 amino acid residues.

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>sp|P01111|RASN_HUMAN GTPase NRas OS=Homo sapiens OX=9606 GN=NRAS PE=1
SV=1
MTEYKLVVVGAGGVGKSALTIQLIQNHVDEYDPTIEDSYRKQVVIDGETCLLDILD TAGQEEYSAMRDQYMR
TGEGLFCVFAINNSKSFADINLYREQIKRVKSDDDVPMVLVGNKCDLPTRTVDTKQAH ELAKSYGIPFIETSA
KTRQGVEDAFYTLVREIRQYRMKKLNSSDDGTQGC MGLPCVVM
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Figure S3. C-Kit's amino acid sequence. The protein sequence below is represented in FASTA form and represents c-Kit's canonical sequence. The protein contains 976 amino acid residues.

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>sp|P10721|KIT_HUMAN Mast/stem cell growth factor receptor Kit OS=Homo
sapiens OX=9606 GN=KIT PE=1 SV=1
MRGARGAWDFLCVLLLLLLRVQTGSSQPSVSPGEPSPPSIHPGKSDLIVRVGDEIRLLCTDPGFVKWTFEILDE
TNENKQNEWITEKAEATNTGKYTCTNKHGLSNSIYVFVRDPAKLFLVDRSLYKGEDNDTLVRCPLTDPEVTNY
SLKGCQGKPLPKDLRFIPDPKAGIMIKSVKRAYHRLCLHCSVDQEGKSVLSEKFILKVRPAFAKAVPVVSVSKA
SYLLREGEEFTVTCTIKDVSSSVYSTWKRENSQTKLQEKYNSWHHGDFNYERQATLT ISSARVNDSGVFM CYA
NNTFGSANVT TTLEVDKGFINIFPMINTTVFVNDGENVDLIVEYEAFPKPEHQQWIYMNRTFTDKWEDY PKS
ENESNIRYVSELHLTRLKGTEGGTYTFLVSNSDVNAAIAFNVYVNTKPEILTYDRLVNGMLQCVAAGFPEPTI
DWYFCPGTEQRCSASVLPVDVQTLNSSGPPFGKLVVQSSIDSSAFKHNGTVECKAYNDVGKTSAYFNFAFKGN
NKEQIHPHTLFTPLLIGFVIVAGMMCIIVMILTYKYLQKPMYEVQWKVVEEINGNNYVYIDPTQLPYDHKWEF
PRNRLSFGKTLGAGAFGKVVEATAYGLIKSDAAMTVAVKMLKPSAHLTEREALMSELKVLSYLGNHMNI VNLL
GACTIGGPTLVITEYCCYGDLLNFLRRKRDSFICSKQEDHAEAAALYKNLLH SKESSCSDSTNEYMDMKPGVSY
VVPTKADKRRSVRIGSYIERDVT PAIMEDDELALDLEDLLSFSYQVAKGMAFLASKNCIHRDLAARNILLTHG
RITKICDFGLARDIKNDSNYVVKGNARLPVKWMA PESIFNCVYTFESDVWSYGIFLWELFSLGSSPYPGMPVD
SKFYKMIKEGFRMLSPEHAPAEMYDIMKTCWDADPLKRPTFKQIVQLIEKQISESTNHIYSNLANCSPNRQKP
VVDHSVRINSVGSTASSSQPLL VHDDV
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Figure S4. NF1's amino acid sequence. The protein sequence below is represented in FASTA form and represents NF1's canonical sequence. The protein contains 2,839 amino acid residues.

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>sp|P21359|NF1_HUMAN Neurofibromin OS=Homo sapiens OX=9606 GN=NF1 PE=1
SV=2
MAAHRPVEWVQAVVSRFDEQLPIKTGQQNTHTKVSTEHNKECLINISKYKFSLVISGLTTILKNVNMRI FGE
AAEKNLYLSQLIILD TLEKCLAGQPKDTMRLDETMLVKQLLPEICHFLHTCREGNQHAAELRNSASGVLFSLS
CNNFNAVFSRISTR LQELTVCS EDNVVDVHDI ELLQYINVDCAKLKRL LKETAFKFKALKKVAQLAVINSLEKA
FWNWVENYPDEF TKLYQIPQTDMAECAEKLFDLV DGF AESTKRKAAVWPLQI ILLILCPEIIQDISKDVVDEN
NMNKKLFLDSL RKALAGHGSRQLTESAAIACVK LCKASTYINWEDNSVI FLLVQSMVVDLKNLLFNPSKPF S
RGSQPADVDLMID CLVSCFRISPHNNQHFKI CLAQNSPSTFHYVLVNSLHRIITNSALDWWPKIDAVYCHSVE
LRNMFGETLHKAV QGCGAHPAIRMAPSLTFKEK VTS LKFKEKPTDLETRSYKYL LLSMVKLIHADPKLLLCNP
RKQGPETQGSTA ELITGLVQLVPQSHMPEIAQ EAMEALLVLHQLDSIDLWNP DAPVETFW EISSQMLFYICKK
LTSHQMLSSTEIL KWLREILICRNKFL LKNKQADRSSCHFL LFYGVGCDIPSSGNTS QMSMDHEELLRTPGAS
LRKGKGNSSMDS AAGCSGTPPICRQAQTKLE VALYMF LWNPDTEAVLVAMSCFRHLCEEADIRCGVDEVSVHN
LLPNYNTFMEFAS VSNMMSTGRAALQKRVMA LLRRIEHPTAGNTEAWEDTHAKWEQATK LILNYPKAKMEDGQ
AAESLHKTIVKRR MSHVSGGGSIDLSDTDSLQ EWINMTGFLCALGGVCLQQRSNSGLATYSPPMGPVSERKGS
MISVMSSEGNA DTVPVSKFMDRLLSLMVCNHEK VGLQIRTNVKDLVGL ELSPALYPMLFNK LKNTISKFFDSQG
QVLLTDTNTQFVE QTIAIMKNLLDNHTEGSSE HLGQASIETMMLNLVRYVRVLGNMVHAIQIKTKLCQLVEVM
MARRDDL SFCQEMKFRNKMVEYLTDWVMGTS NQAADDDVKCLTRDL DQASMEAVVSLLAGLPLQPEEGDGV EL
MEAKSQLFLKYFT LFMNLLNDCSEVEDESAQ TGGKRGRMSRRLASLRHCTV LAMSNNL NANVDSGLMH SIGLG
YHKDLQTRATFME VLT KILQQGTEFDTLAETV LADRFR LVELVTMMGDQ GELPIAMALANV VPCSQWDELAR
VLVTLFDSRHLL YQLLWNMFSKEVELADSMQ TLFRGN SLASKIMTFCFKVYGATY LQKLLDPLL RIVITSSDW
QHVSFEVDPTRLE PSESLEENQRNLLQMT EKFFHAI I SSSSEFP PQLRSVCHCLYQAT CHSLLNKATVKEKKE
NKKSVVSQRFPQ NSIGAVGSAMFLRFINPAI VSPYEAGILDKKPPPRI ERGLKLSKILQSI ANHVLFTKEEH
MRPFNDFVKS NFDAARRFFLDIASDCPTSDA VNHSLSFISDGNV LALHRL LWNQEKIGQYLSSNRD HKAVGR
RPFDKMATLLAY LGPPEHKPVADTHWSSLNLT SSKFEEFMTRHQVHEKEEFKALKT LSI FYQAGTSKAGNPI F
YYVARRFKTGQ INGDLLIYHVLLTLKPY YAKPYEIVVDL THTGPSNRFKTDFLSKWFV VFPGFAYDNV SAVYI
YNCNSWVREYTKY HERLLTGLKGSKRLVFIDCP GKLA EHI EHEQQKLPAA TLAL EEDLKV FHNALKLA HKDTK
VSIKVGSTAVQV TSAERTKVLGQSVFLNDI YYASEIEE ICLVDENQFTLTIANQGTPLTFMHQECEAI VQSI I
HIRTRWELSQPDS IPQHTKIRPKDVPGTLLN IALLNLGSSDPSLRSAAYNLLCAL TCTFNLKIEGQLLETSG L
CIPANNTLFIVS ISKTLAANEPHLTLEFLEECIS GFSKSSI ELKHLCL EYMPWLSNLVR FCKHNDDAKRQRV
TAILDKLITMTINE KQMYPSIQAKIWGSLGQ ITDLLDVV LDSFIKTSATGGLGSIKAEVMADTAVALASGNVK
LVSSKVIGRMCKI IDKTCLSPTPTLEQHLMWDDI AILARYMLMLS FNNSLDVAAHLPYLFHV VTFVLVATGPLS
LRASTHGLVINI IHSLCTCSQLHFSEETKQVLR LSLTEFSLPKFYLLFGISKVKSA AVIAFRSSYRDRSFS PG
SYERETFALTSLE TVTEALLEIMEACMRDIPTCKWLDQWTELAQRFAFQYNPSLQPRALV VFGCISKRVSHGQ
IKQII RILSKALESCLKGPDTYNSQVLI EATVIALTKLQPLL NKDSPLHKALFWAVAVLQLDEVNLYSAGTA
LLEQN LH TLDSLRI FNDKSP EEFVMAIRNPLEWHCKQMDH FVGLNFNSNFNFALVGHLLKGYRHPSPAIVART
VRILHTLLTLVN KHRNCDKFEVNTQSVAYLAALLTV SEEVRSRCSLKHRSLLLTDI SMENVPMDTYPIH HGD
PSYRTLKETQPWSS PKGSEGYLAATYPTVGQTS PRARKSMSLDMGQPSQANTKKLLGTRKSF DHLISDTKAPK
RQEMESGITTPPKMRRVAETDYEMETQRISSSQ QHPLRKVSVSESNVLLDEEVLTD PKIQALLLTVLATLVK
YTTDEFDQRILY EYLA EASVVF PKVFPVHNLLDSKINTLLSLCQDPNLLNPIHGIVQSVVYHEESPPQYQTS
YLQSF GFNGLWRFAGPF SKQTQIPDYAELIVKFLDALIDTYLP GIDEETSEESLLTPTSPYPPALQS QLSITA
NLNLSNSMTSLATSQHSPGIDKENVELSPTTGHCNSGRTRHGSASQVQKQRSAGSFKRNSIKKIV
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Figure S5. PTEN's amino acid sequence. The protein sequence below is represented in FASTA form and represents PTEN canonical sequence. The protein contains 403 amino acid residues.

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>sp|P60484|PTEN_HUMAN Phosphatidylinositol 3,4,5-trisphosphate 3-  
phosphatase and dual-specificity protein phosphatase PTEN OS=Homo sapiens  
OX=9606 GN=PTEN PE=1 SV=1  
MTAIIKEIVSRNKRRYQEDGFDLDTYIYPNIIAMGFPAERLEGVYRNNIDDVVRFLDSKHKNHYKIYNLCAE  
RHYDTAKFNCRVAQYPFEDHNPPQLELIKPFCELDQWLSEDDNHVAAIHCKAGKGRTGVMICAYLLHRGKFL  
KAQEALDFYGEVRTRDKKGV TIP SQRRYVYYYSYLLKNHLDYRPVALLFHKMMFETIPMFSGGTCNPQFVVCQ  
LKVKIYSSNSGPTRREDKFM YFEFPQPLPVC GDIKVEFFHKQNKMLKKDKMFHFWVNTFFIPGPEETSEKVEN  
GSLCDQEIDSICSIERADNDKEYLVLT LTKNDLDKANKDKANRYFSPNFKVKLYFTKTVEEPSNPEASSSTSV  
TPDVSDNEPDHYRYS DTTDSDPENEPFDE DQHTQITKV
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