Supplemental materials for

A highly conserved glutamic acid in ALFY inhibits membrane binding to aid in aggregate clearance

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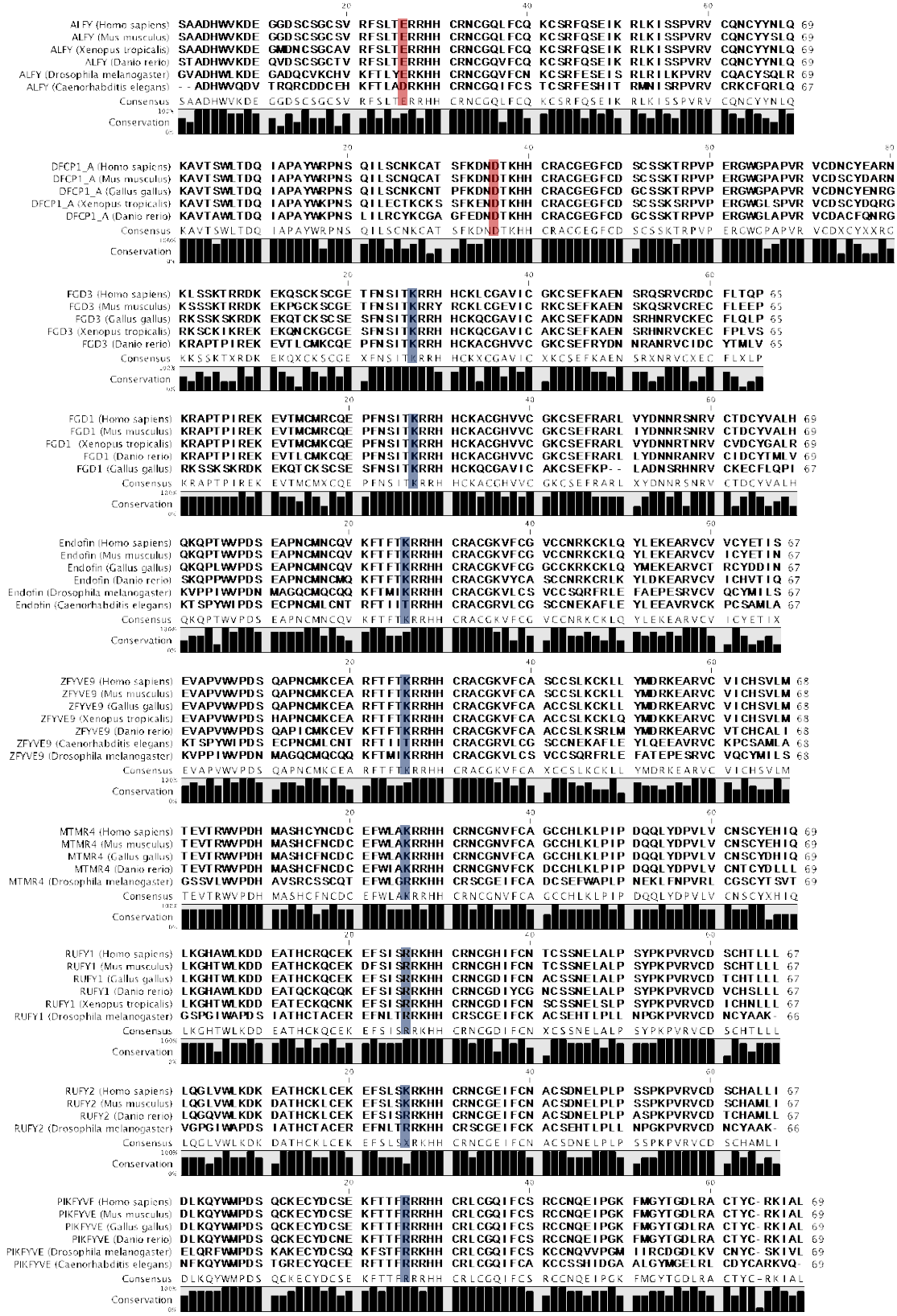
ALFY (Homo sapiens) SAADHWVKDE GGDSCSGCSV RFSLTERRHH CRNCGQLFCQ KCSRFQSEIK RLKISSPVRV CQNCYYNLQ 69
ALFY (Mus musculus) SAADHWVKDE GGDSCSGCSV RFSLTERRHH CRNCGQLFCQ KCSRFQSEIK RLKISSPVRV CQNCYYSLQ 69
ALFY (Xenopus tropicalis) SAADHWVKDE GMDNCSGCAV RFSLTERRHH CRNCGQLFCQ KCSRFQSEIK RLKISSPVRV CQNCYYNLQ 69
ALFY (Danio rerio) STADHWVKDE QVDSCSGCTV RFSLTERRHH CRNCGQVFCQ KCSRFQSEIK RLKISSPVRV CQNCYYNLQ 69
ALFY (Drosophila melanogaster) GVADHWLKDE GADQCVKCHV KFTLYERKHH CRNCGQVFCN KCSRFESEIS RLRILKPVRV CQACYSQLR 69
ALFY (Caenorhabditis elegans) - - ADHWVQDV TRQRCDDCEH KFTLADRKHH CRNCGQIFCS TCSRFESHIT RMNISRPVRV CRKCFQRLQ 67
Consensus SAADHWVKDE GGDSCSGCSV RFSLTERRHH CRNCGQLFCQ KCSRFQSEIK RLKISSPVRV CQNCYYNLQ
Conservation
DFCP1_A (Homo sapiens) KAVTSWLTDQ IAPAYWRPNS QILSCNKCAT SFKDNDTKHH CRACGEGFCD SCSSKTRPVP ERGWGPAPVR VCDNCYEARN 80
DFCP1_A (Mus musculus) KAVTSWLTDQ IAPAYWRPNS QILSCNQCAT SFKDNDTKHH CRACGEGFCD SCSSKTRPVP ERGWGPAPVR VCDSCYDARN 80
DFCP1_A (Gallus gallus) KAVTSWLTDQ IAPAYWRPNS QILSCNKCNT PFKDNDTKHH CRACGEGFCD GCSSKTRPVP ERGWGPAPVR VCDNCYENRG 80
DFCP1_A (Xenopus tropicalis) KAVTSWLTDQ IAPAYWKPNS QILECTKCKS SFKENDTKHH CRACGEGFCD SCSSKSRPVP ERGWGLSPVR VCDSCYDQRG 80
DFCP1_A (Danio rerio) KAVTAWLTDQ IAPAYWKPNS LILRCYKCGA GFEDNDTKHH CRACGEGFCD GCSSKTRPVP ERGWGLAPVR VCDACFQNRG 80
Consensus KAVTSWLTDQ IAPAYWRPNS QILSCNKCAT SFKDNDTKHH CRACGEGFCD SCSSKTRPVP ERGWGPAPVR VCDXCYXXRG
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FGD3 (Homo sapiens) KLSSKTRRDK EKQSCKSCGE TFNSITKRRH HCKLCGAVIC GKCSEFKAEN SRQSRVCRDC FLTQP 65
FGD3 (Mus musculus) KSSSKTRRDK EKPGCKSCGE TFNSITKRRY RCKLCGEVIC RKCSEFKAEN SKQSRVCREC FLEEP 65
FGD3 (Gallus gallus) RKSSKSKRDK EKQTCKSCSE SFNSITKRRH HCKQCGAVIC AKCSEFKADN SRHNRVCKEC FLQLP 65
FGD3 (Xenopus tropicalis) RKSCKIKREK EKQNCKGCGE SFNSITKRRH HCKQCGAVIC AKCSEFKAEN SRHNRVCKEC FPLVS 65
FGD3 (Danio rerio) KRAPTPIREK EVTLCMKCQE PFNSITKRRH HCKACGHVVC GKCSEFRYDN NRANRVCIDC YTMLV 65
Consensus KKSSKTXRDK EKQXCKSCGE XFNSITKRRH HCKXCGAVIC XKCSEFKAEN SRXNRVCXEC FLXLP
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FGD1 (Homo sapiens) KRAPTPIREK EVTMCMRCQE PFNSITKRRH HCKACGHVVC GKCSEFRARL VYDNNRSNRV CTDCYVALH 69
FGD1 (Mus musculus) KRAPTPIREK EVTMCMRCQE PFNSITKRRH HCKACGHVVC GKCSEFRARL IYDNNRSNRV CTDCYVALH 69
FGD1 (Xenopus tropicalis) KRAPTPIREK EVTMCMKCQE PFNSITKRRH HCKACGHVVC GKCSEFRARL VYDNNRTNRV CVDCYGALR 69
FGD1 (Danio rerio) KRAPTPIREK EVTLCMKCQE PFNSITKRRH HCKACGHVVC GKCSEFRARL LYDNNRANRV CIDCYTMLV 69
FGD1 (Gallus gallus) RKSSKSKRDK EKQTCKSCSE SFNSITKRRH HCKQCGAVIC AKCSEFKP- - LADNSRHNRV CKECFLQPI 67
Consensus KRAPTPIREK EVTMCMXCQE PFNSITKRRH HCKACGHVVC GKCSEFRARL XYDNNRSNRV CTDCYVALH
Conservation
Endofin (Homo sapiens) QKQPTWPDS EAPNCMNCQV KFTFTKRRHH CRACGKVFCG VCCNRKCKLQ YLEKEARVCV VCYETIS 67
Endofin (Mus musculus) QKQPTWPDS EAPNCMNCQV KFTFTKRRHH CRACGKVFCG VCCNRKCKLQ YLEKEARVCV ICYETIN 67
Endofin (Gallus gallus) QKQPLWPDS EAPNCMNCQV KFTFTKRRHH CRACGKVFCG GCCKRKCKLQ YMEKEARVCT RCYDDIN 67
Endofin (Danio rerio) SKQPPWPDS EAPNCMNCMQ KFTFTKRRHH CRACGKVYCA SCCNRKCRLK YLDKEARVCV ICHVTIQ 67
Endofin (Drosophila melanogaster) KVPPIWPDN MAGQCMQCQQ KFTMIKRRHH CRACGKVLCS VCCSQRFRLE FAEPESRVCV QCYMILS 67
Endofin (Caenorhabditis elegans) KTSPYWIPDS ECPNCMLCNT RFTIITRRHH CRACGRVLCG SCCNEKAFLE YLEEAVRVCK PCSAMLA 67
Consensus QKQPTWVPDS EAPNCMNCQV KFTFTKRRHH CRACGKVFCG VCCNRKCKLQ YLEKEARVCV ICYETIX
Conservation
ZFYVE9 (Homo sapiens) EVAPVWPDS QAPNCMKCEA RFTFTKRRHH CRACGKVFCA SCCSLKCKLL YMDRKEARVC VICHSVLM 68
ZFYVE9 (Mus musculus) EVAPVWPDS QAPNCMKCEA RFTFTKRRHH CRACGKVFCA SCCSLKCKLL YMDRKEARVC VICHSVLM 68
ZFYVE9 (Gallus gallus) EVAPVWPDS QAPNCMKCEA RFTFTKRRHH CRACGKVFCA ACCSLKCKLL YMDRKEARVC VICHSVLM 68
ZFYVE9 (Xenopus tropicalis) EVAPVWPDS HAPNCMKCEA RFTFTKRRHH CRACGKVFCA ACCSLKCKLQ YMDKKEARVC VICHSVLM 68
ZFYVE9 (Danio rerio) EVAPVWPDS QAPICMKCEV KFTFTKRRHH CRACGKVFCA ACCSLKSRLM YMDRKEARVC VTCHCALI 68
ZFYVE9 (Caenorhabditis elegans) KTSPYWIPDS ECPNCMLCNT RFTIITRRHH CRACGRVLCG SCCNEKAFLE YLQEEAVRVC KPCSAMLA 68
ZFYVE9 (Drosophila melanogaster) KVPPIWPDN MAGQCMQCQQ KFTMIKRRHH CRACGKVLCS VCCSQRFRLE FATEPESRVC VQCYMILS 68
Consensus EVAPVWVPDS QAPNCMKCEA RFTFTKRRHH CRACGKVFCA XCCSLKCKLL YMDRKEARVC VICHSVLM
Conservation
MTMR4 (Homo sapiens) TEVTRWVPDH MASHCYNCDC EFWLAKRRHH CRNCGNVFCA GCCHLKLPIP DQQLYDPVLV CNSCYEHIQ 69
MTMR4 (Mus musculus) TEVTRWVPDH MASHCFNCDC EFWLAKRRHH CRNCGNVFCA GCCHLKLPIP DQQLYDPVLV CNSCYEHIQ 69
MTMR4 (Gallus gallus) TEVTRWVPDH MASHCFNCDC EFWLAKRRHH CRNCGNVFCA GCCHLKLPIP DQQLYDPVLV CNSCYDHIQ 69
MTMR4 (Danio rerio) TEVTRWVPDH MASHCFNCDC EFWIAKRRHH CRNCGNVFCK DCCHLKLPIP DQQLYDPVLV CNTCYDLLL 69
MTMR4 (Drosophila melanogaster) GSSVLWVPDH AVSRCSSCQT EFWLGRRKHH CRSCGEIFCA DCSEFWAPLP NEKLFNPVRL CGSCYTSVT 69
Consensus TEVTRWVPDH MASHCFNCDC EFWLAKRRHH CRNCGNVFCA GCCHLKLPIP DQQLYDPVLV CNSCYXHIQ
Conservation
RUFY1 (Homo sapiens) LKGHAWLKDD EATHCRQCEK EFSISRRKHH CRNCGHIFCN TCSSNELALP SYPKPVRVCD SCHTLLL 67
RUFY1 (Mus musculus) LKGHTWLKDD EATHCKQCEK DFSISRRKHH CRNCGHIFCN TCSSNELALP SYPKPVRVCD SCHTLLL 67
RUFY1 (Gallus gallus) LKGHTWLKDD EATHCKQCEK EFSISRRKHH CRNCGDIFCN ACSSNELALP SYPKPVRVCD TCHTLLL 67
RUFY1 (Danio rerio) LKGHAWLKDD EATQCKQCQK EFSISRRKHH CRNCGDIYCG NCSSNELALP SYPKPVRVCD VCHSLLL 67
RUFY1 (Xenopus tropicalis) LKGHTWLKDD EATECKQCNK EFSISRRKHH CRNCGDIFCN SCSSNELSLP SYPKPVRVCD ICHNLLL 67
RUFY1 (Drosophila melanogaster) GSPGIWAPDS IATHCTACER EFNLTRRKHH CRSCGEIFCK ACSEHTLPLL NPGKPVRVCD NCYAAK- 66
Consensus LKGHTWLKDD EATHCKQCEK EFSISRRKHH CRNCGDIFCN XCSSNELALP SYPKPVRVCD SCHTLLL
Conservation
RUFY2 (Homo sapiens) LQGLVWLKDK EATHCKLCEK EFSLSKRKHH CRNCGEIFCN ACSDNELPLP SSPKPVRVCD SCHALLI 67
RUFY2 (Mus musculus) LQGLVWLKDK DATHCKLCEK EFSLSKRKHH CRNCGEIFCN ACSDNELPLP SSPKPVRVCD SCHAMLI 67
RUFY2 (Danio rerio) LQGQVWLKDK DATHCKLCEK EFSISRRKHH CRNCGEIFCN ACSDNELPLP ASPKPVRVCD TCHAMLL 67
RUFY2 (Drosophila melanogaster) VGPGIWAPDS IATHCTACER EFNLTRRKHH CRSCGEIFCK ACSEHTLPLL NPGKPVRVCD NCYAAK- 66
Consensus LQGLVWLKDK DATHCKLCEK EFSLSXRKHH CRNCGEIFCN ACSDNELPLP SSPKPVRVCD SCHAMLI
Conservation
PIKFYVE (Homo sapiens) DLKQYWMPDS QCKECYDCSE KFTTFRRRHH CRLCGQIFCS RCCNQEIPGK FMGYTGDLRA CTYC-RKIAL 69
PIKFYVE (Mus musculus) DLKQYWMPDS QCKECYDCSE KFTTFRRRHH CRLCGQIFCS RCCNQEIPGK FMGYTGDLRA CTYC-RKIAL 69
PIKFYVE (Gallus gallus) DLKQYWMPDS QCKECYDCSE KFTTFRRRHH CRLCGQIFCS RCCNQEIPGK FMGYTGDLRA CTYC-RKIAL 69
PIKFYVE (Danio rerio) DLKQYWMPDS QCKECYDCNE KFTTFRRRHH CRLCGQIFCS RCCNQEIPGK FMGYTGDLRA CTYC-RKIAL 69
PIKFYVE (Drosophila melanogaster) ELQRFWMPDS KAKECYDCSQ KFSTFRRKHH CRLCGQIFCS KCCNQVVPGM IIRCDGDLKV CNYC-SKIVL 69
PIKFYVE (Caenorhabditis elegans) NFKQYWMPDS TGRECYQCEE RFTTFRRRHH CRLCGQIFCA KCCSSHIDGA ALGYMGELRL CDYCARKVQ- 69
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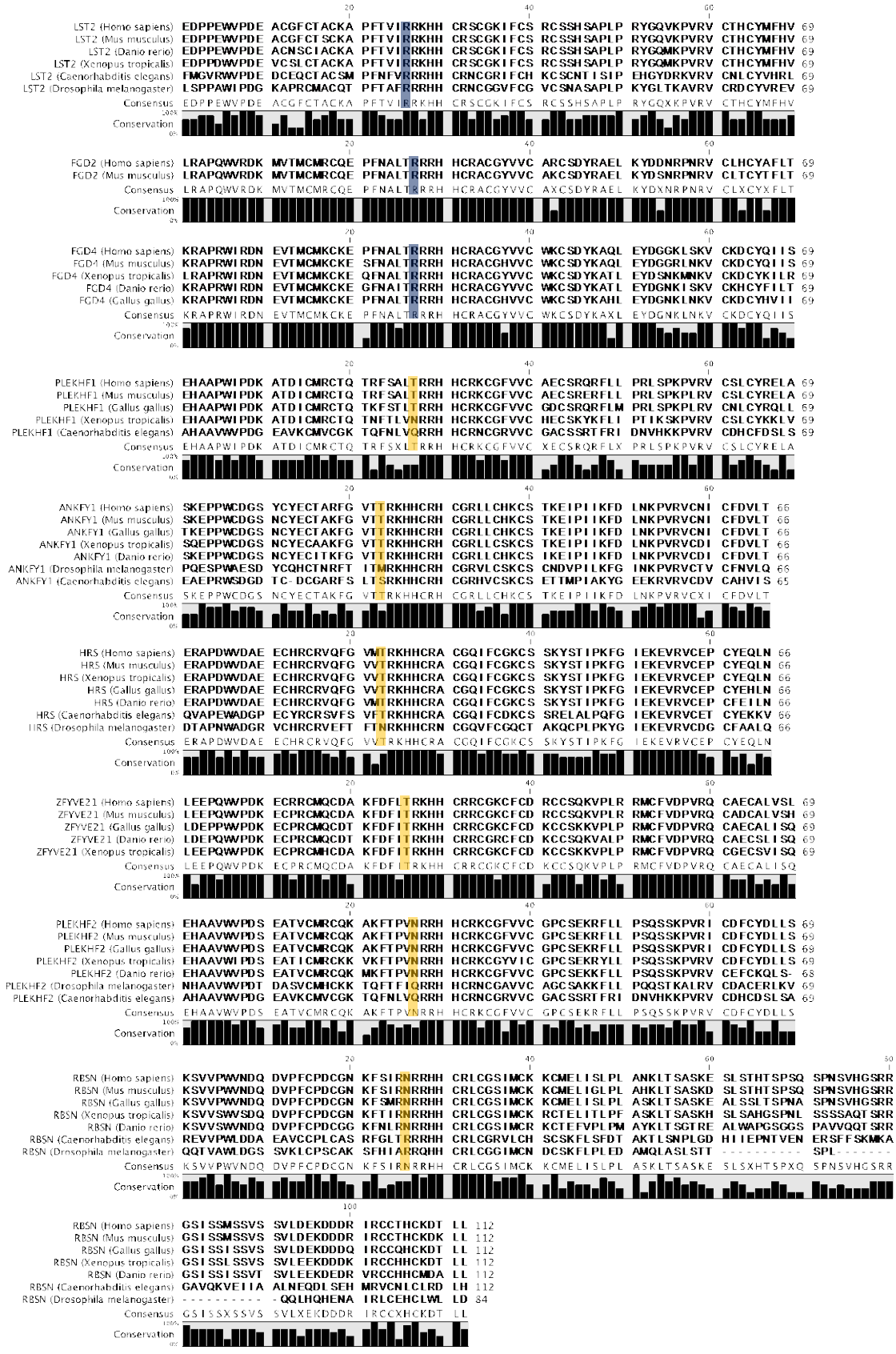
Conservation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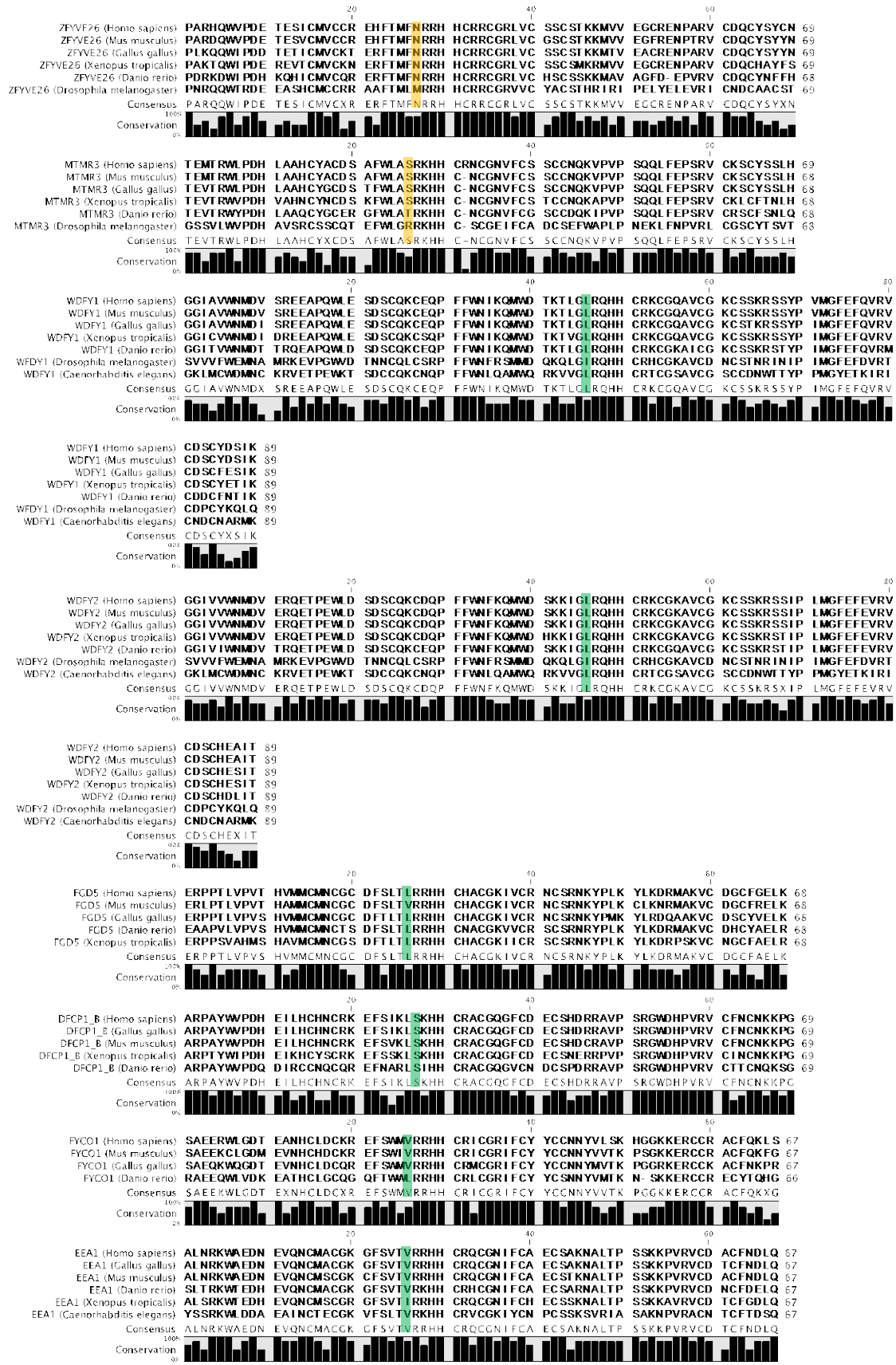
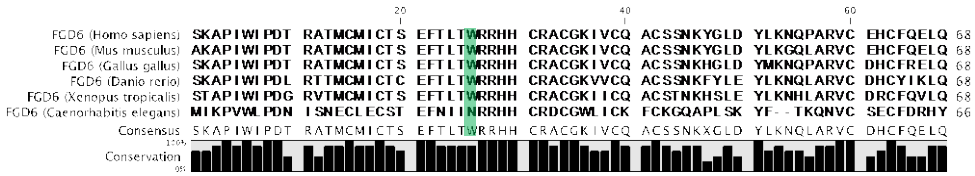
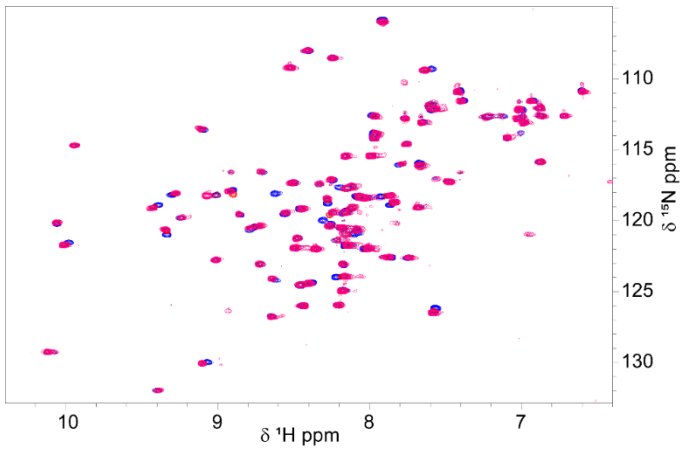
LST2 (Mus musculus) EDPPEWVPDE ACGFCTSCKA PFTVIRRKHH CRSCGKIFCS RCSSHSAPLP RYGQVKPVRV CTHCYMFHV 69
LST2 (Danio rerio) EDPPEWVPDE ACNSCIACKA PFTVIRRKHH CRSCGKIFCS RCSSHSAPLP RYGQMKPVRV CTHCYMFHV 69
LST2 (Xenopus tropicalis) EDPPDWVPDE VCSLCTACKA PFTVIRRKHH CRSCGKIFCS RCSSHSAPLP RYGQMKPVRV CTHCYMFHV 69
LST2 (Caenorhabditis elegans) FMGVRWVPDE DCEQCTACSM PFNFVRRRHH CRNCGRIFCH KCSCNTISIP EHGYDRKVRV CNLCYVHRL 69
LST2 (Drosophila melanogaster) LSPPAWIPDG KAPRCMACQT PFTAFRRRHH CRNCGGVFCG VCSNASAPLP KYGLTKAVRV CRDCYVREV 69
Consensus EDPPEWVPDE ACGFCTACKA PFTVIRRKHH CRSCGKIFCS RCSSHSAPLP RYGQXKPVRV CTHCYMFHV
Conservation
FGD2 (Homo sapiens) LRAPQWVRDK MVTMCMRCQE PFNALTRRRH HCRACGYVVC ARCSDYRAEL KYDDNRPNRV CLHCYAFLT 69
FGD2 (Mus musculus) LRAPQWVRDK MVTMCMRCQE PFNALTRRRH HCRACGYVVC AKCSDYRAEL KYDSNRPNRV CLTCYTFLT 69
Consensus LRAPQWVRDK MVTMCMRCQE PFNALTRRRH HCRACGYVVC AXCSDYRAEL KYDXNRPNRV CLXCYXFLT
Conservation
FGD4 (Homo sapiens) KRAPRWIRDN EVTMCMKCKE PFNALTRRRH HCRACGYVVC WKCSDYKAQL EYDGGKLSKV CKDCYQIIS 69
FGD4 (Mus musculus) KRAPRWIRDN EVTMCMKCKE SFNALTRRRH HCRACGHVVC WKCSDYKAQL EYDGGRLNKV CKDCYQIIS 69
FGD4 (Xenopus tropicalis) LRAPRWIRDN EVTMCMKCKE QFNALTRRRH HCRACGYVVC WKCSDYKATL EYDSNKMNKV CKDCYKILR 69
FGD4 (Danio rerio) KRAPRWIRDN EVTMCMKCKE GFNAITRRRH HCRACGYVVC WKCSDYKATL EYDGNKISKV CKHCYFILT 69
FGD4 (Gallus gallus) KRAPRWIRDN EVTMCMKCKE PFNALTRRRH HCRACGHVVC WKCSDYKAHL EYDGNKLNKV CKDCYHVII 69
Consensus KRAPRWIRDN EVTMCMKCKE PFNALTRRRH HCRACGYVVC WKCSDYKAXL EYDGNKLNKV CKDCYQIIS
Conservation
PLEKHF1 (Homo sapiens) EHAAPWIPDK ATDICMRCTQ TRFSALTRRH HCRKCGFVVC AECSRQRFLL PRLSPKPVRV CSLCYRELA 69
PLEKHF1 (Mus musculus) EHAAPWIPDK ATDICMRCTQ TRFSALTRRH HCRKCGFVVC AECSRERFLL PRLSPKPLRV CSLCYRELA 69
PLEKHF1 (Gallus gallus) EHAAPWIPDK ATDICMRCTQ TKFSTLTRRH HCRKCGFVVC GDCSRQRFLM PRLSPKPLRV CNLCYRQLL 69
PLEKHF1 (Xenopus tropicalis) EHAAPWIPDK ATDICMRCTQ TNFTLVNRRH HCRKCGFVVC HECSKYKFLI PTIKSKPVRV CSLCYKKLV 69
PLEKHF1 (Caenorhabditis elegans) AHAAVWVPDG EAVKCMVCGK TQFNLVQRRH HCRNCGRVVC GACSSRTFRI DNVHKKPVRV CDHCFDSLS 69
Consensus EHAAPWIPDK ATDICMRCTQ TRFSXLTRRH HCRKCGFVVC XECSRQRFLX PRLSPKPVRV CSLCYRELA
Conservation
ANKFY1 (Homo sapiens) SKEPPWCDGS YCYECTARFG VTTRKHHCRH CGRLLCHKCS TKEIPIIKFD LNKPVRVCNI CFDVLT 66
ANKFY1 (Mus musculus) SKEPPWCDGS NCYECTAKFG VTTRKHHCRH CGRLLCHKCS TKEIPIIKFD LNKPVRVCNI CFDVLT 66
ANKFY1 (Gallus gallus) TKEPPWCDGS NCYECTAKFG VTTRKHHCRH CGRLLCHKCS TKEIPIIKFD LNKPVRVCNI CFDVLT 66
ANKFY1 (Xenopus tropicalis) SQEPPWCDGS NCYECAAKFG VTTRKHHCRH CGRLLCSKCS TKEIPIIKFD LNKPVRVCDI CFDVLT 66
ANKFY1 (Danio rerio) SKEPPWCDGS NCYECITKFG VTTRKHHCRH CGRLLCHKCS IKEIPIIKFD LNKPVRVCDI CFDVLT 66
ANKFY1 (Drosophila melanogaster) PQESPWAESD YCQHCTNRFT ITMRKHHCRH CGRVLCSKCS CNDVPILKFG INKPVRVCTV CFNVLQ 66
ANKFY1 (Caenorhabditis elegans) EAEPRWSDGD TC-DCGARFS LTSRKHHCRH CGRHVCSKCS ETTMPIAKYG EEKRVRVCDV CAHVIS 65
Consensus SKEPPWCDGS NCYECTAKFG VTTRKHHCRH CGRLLCHKCS TKEIPIIKFD LNKPVRVCXI CFDVLT
Conservation
HRS (Homo sapiens) ERAPDWVDAE ECHRCRVQFG VMTRKHHCRA CGQIFCGKCS SKYSTIPKFG IEKEVRVCEP CYEQLN 66
HRS (Mus musculus) ERAPDWVDAE ECHRCRVQFG VVTRKHHCRA CGQIFCGKCS SKYSTIPKFG IEKEVRVCEP CYEQLN 66
HRS (Xenopus tropicalis) ERAPDWVDAE ECHRCRVQFG VVTRKHHCRA CGQIFCGKCS SKYSTIPKFG IEKEVRVCEP CYEQLN 66
HRS (Gallus gallus) ERAPDWVDAE ECHRCRVQFG VVTRKHHCRA CGQIFCGKCS SKYSTIPKFG IEKEVRVCEP CYEHLN 66
HRS (Danio rerio) ERAPDWVDAE ECHRCRVQFG VMTRKHHCRA CGQIFCGKCS SKYSTIPKFG IEKEVRVCEP CFEILN 66
HRS (Caenorhabditis elegans) QVAPEWADGP ECYRCRSVFS VFTRKHHCRA CGQIFCDKCS SRELALPQFG IEKEVRVCET CYEKKV 66
HRS (Drosophila melanogaster) DTAPNWADGR VCHRCRVEFT FTNRKHHCRN CGQVFCGQCT AKQCPLPKYG IEKEVRVCDG CFAALQ 66
Consensus ERAPDWVDAE ECHRCRVQFG VVTRKHHCRA CGQIFCGKCS SKYSTIPKFG IEKEVRVCEP CYEQLN
Conservation
ZFYVE21 (Homo sapiens) LEEPQWVPDK ECRRCMQCDA KFDFLTRKHH CRRCGKCFCD RCCSQKVPLR RMCFVDPVRQ CAECALVSL 69
ZFYVE21 (Mus musculus) LEEPQWVPDK ECPRCMQCDA KFDFITRKHH CRRCGKCFCD RCCSQKVPLR RMCFVDPVRQ CADCALVSH 69
ZFYVE21 (Gallus gallus) LDEPPWVPDK ECPRCMQCDT KFDFITRKHH CRRCGKCFCD KCCSKKVPLP RMCFVDPVRQ CAECALISQ 69
ZFYVE21 (Danio rerio) LDEPQWVPDK ECPRCMQCDT KFDFITRKHH CRRCGRCFCD KCCSQKVALP RMCFVDPVRQ CAECSLISQ 69
ZFYVE21 (Xenopus tropicalis) LEEPQWVPDK ECPRCMHCDA KFDFITRKHH CRRCGKCFCD KCCSKKVPLP RMCFVDPVRQ CGECSVISQ 69
Consensus LEEPQWVPDK ECPRCMQCDA KFDFITRKHH CRRCGKCFCD KCCSQKVPLP RMCFVDPVRQ CAECALISQ
Conservation
PLEKHF2 (Homo sapiens) EHAAVWVPDS EATVCMRCQK AKFTPVNRRH HCRKCGFVVC GPCSEKRFLL PSQSSKPVRI CDFCYDLLS 69
PLEKHF2 (Mus musculus) EHAAVWVPDS EATVCMRCQK AKFTPVNRRH HCRKCGFVVC GPCSEKRFLL PSQSSKPVRI CDFCYDLLS 69
PLEKHF2 (Gallus gallus) EHAAVWVPDS EATVCMRCQK AKFTPVNRRH HCRKCGFVVC GPCSEKRFLL PSQSSKPVRI CDFCYDLLS 69
PLEKHF2 (Xenopus tropicalis) EHAAVWIPDS EATICMRCKK VKFTPVNRRH HCRKCGYVIC GPCSEKRYLL PSQSSKPVRV CDFCYDLLS 69
PLEKHF2 (Danio rerio) EHAAVWVPDS EATVCMRCQK MKFTPVNRRH HCRKCGFVVC GPCSEKKFLL PSQSSKPVRV CEFCKQLS- 68
PLEKHF2 (Drosophila melanogaster) NHAAVWVPDT DASVCMHCKK TQFTFIQRRH HCRNCGAVVC AGCSAKKFLL PQQSTKALRV CDACERLKV 69
PLEKHF2 (Caenorhabditis elegans) AHAAVWVPDG EAVKCMVCGK TQFNLVQRRH HCRNCGRVVC GACSSRTFRI DNVHKKPVRV CDHCDSLSA 69
Consensus EHAAVWVPDS EATVCMRCQK AKFTPVNRRH HCRKCGFVVC GPCSEKRFLL PSQSSKPVRV CDFCYDLLS
Conservation
RBSN (Homo sapiens) KSVVPWVNDQ DVPFCPDCGN KFSIRNRRHH CRLCGSIMCK KCMELISLPL ANKLTSASKE SLSTHTSPSQ SPNSVHGSRR 80
RBSN (Mus musculus) KSVVPWVNDQ DVPFCPDCGN KFSIRNRRHH CRLCGSIMCK KCMELIGLPL AHKLTSASKD SLSTHTSPSQ SPNSVHGSRR 80
RBSN (Gallus gallus) KSVVPWVNDQ DVPFCPDCGN KFSMRNRRHH CRLCGSIMCK KCMELISLPL ASKLTSASKE ALSSLTSPNA SPNSVHGSRR 80
RBSN (Xenopus tropicalis) KSVVSWVSDQ DVPFCPDCGN KFTIRNRRHH CRLCGSIMCK RCTELITLPF ASKLTSASKH SLSAHGSPNL SSSSAQTSRR 80
RBSN (Danio rerio) KSVVSWVNDQ DVPFCPDCGG KFNLRNRRHH CRLCGSIMCR KCTEFVPLPM AYKLTSGTRE ALWAPGSGGS PAVVQQTSRR 80
RBSN (Caenorhabditis elegans) REVVPWLDDA EAVCCPLCAS RFGLTRRRHH CRLCGRVLCH SCSKFLSFDT AKTLSNPLGD HIIEPNTVEN ERSFFSKMKA 80
RBSN (Drosophila melanogaster) QQTVAWLDGS SVKLCPSCAK SFHIARRQHH CRLCGGIMCN DCSKFLPLED AMQLASLSTT ---------- SPL------- 63
Consensus KSVVPWVNDQ DVPFCPDCGN KFSIRNRRHH CRLCGSIMCK KCMELISLPL ASKLTSASKE SLSXHTSPXQ SPNSVHGSRR
Conservation
RBSN (Homo sapiens) GSISSMSSVS SVLDEKDDDR IRCCTHCKDT LL 112
RBSN (Mus musculus) GSISSMSSVS SVLDEKDDDR IRCCTHCKDK LL 112
RBSN (Gallus gallus) GSISSISSVS SVLDEKDDDQ IRCCQHCKDT LL 112
RBSN (Xenopus tropicalis) GSISSLSSVS SVLEEKDDDK IRCCHHCKDT LL 112
RBSN (Danio rerio) GSISSISSVT SVLEEKDEDR VRCCHHCMDA LL 112
RBSN (Caenorhabditis elegans) GAVQKVEIIA ALNEQDLSEH MRVCNLCLRD LH 112
RBSN (Drosophila melanogaster) ---------- -QQLHQHENA IRLCEHCLWL LD 84
Consensus GSISSXSSVS SVLXEKDDDR IRCCXHCKDT LL
Conservation

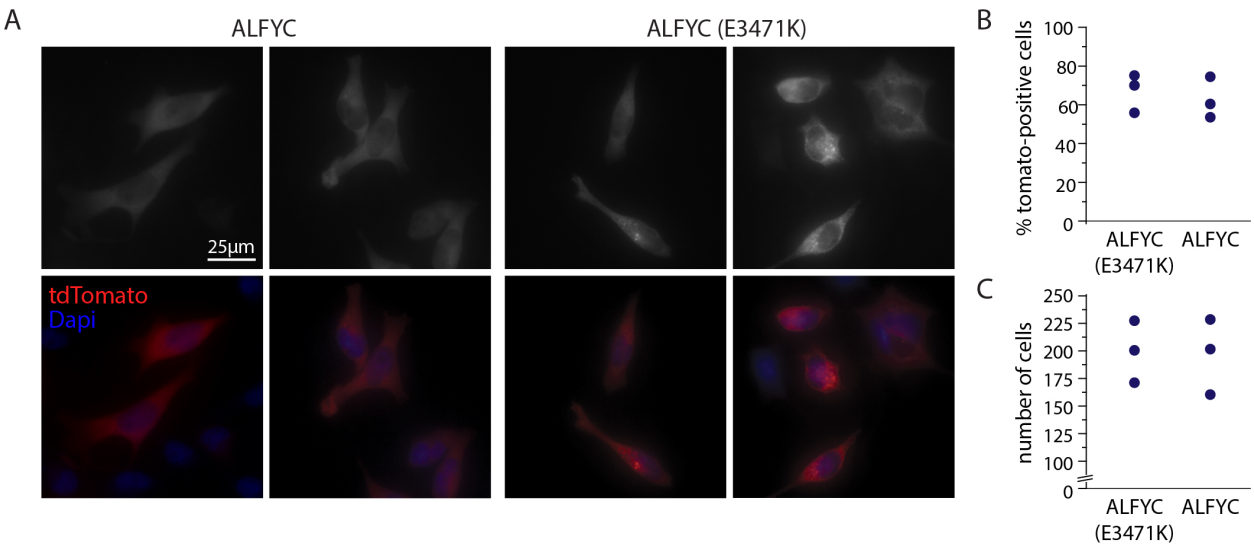

ZFYVE26 (Homo sapiens) PARHQWVPDE TESICMVCCR EHFTMFNRRH HCRRCGRLVC SSCSTKKMVV EGCRENPARV CDQCYSYCN 69
ZFYVE26 (Mus musculus) PARDQWVPDE TESVCMVCCR EHFTMFNRRH HCRRCGRLVC GSCSTKKMVV EGFRENPTRV CDQCYSYYN 69
ZFYVE26 (Gallus gallus) PLKQQWIPDD TETICMVCKT ERFTMFNRRH HCRRCGRLVC SSCSTKKMTV EACRENPARV CDQCYSYYN 69
ZFYVE26 (Xenopus tropicalis) PAKTQWIPDE REVTCMVCKN ERFTMFNRRH HCRRCGRLVC SSCSMKRMVV EGCRENPARV CDQCHAYFS 69
ZFYVE26 (Danio rerio) PDRKDWIPDH KQHICMVCQR ERFTMFNRRH HCRRCGRLVC HSCSSKKMAV AGFD-EPVRV CDQCYNFFH 68
ZFYVE26 (Drosophila melanogaster) PNRQQWIRDE EASHCMCCRR AAFTMLMRRH HCRRCGRVVC YACSTHRIRI PELYELEVRI CNDCAACST 69
Consensus PARQQWIPDE TESICMVCXR ERFTMFNRRH HCRRCGRLVC SSCSTKKMVV EGCRENPARV CDQCYSYXN
Conservation
MTMR3 (Homo sapiens) TEMTRWLPDH LAAHCYACDS AFWLASRKHH CRNCGNVFCS SCCNQKVPVP SQQLFEPSRV CKSCYSSLH 69
MTMR3 (Mus musculus) TEMTRWLPDH LAAHCYACDS AFWLASRKHH C-NCGNVFCS SCCNQKVPVP SQQLFEPSRV CKSCYSSLH 68
MTMR3 (Gallus gallus) TEVTRWLPDH LAAHCYGCDS TFWLASRKHH C-NCGNVFCS SCCNQKVPVP SQQLFEPSRV CKSCYSSLH 68
MTMR3 (Xenopus tropicalis) TEVTRWVPDH VAHNCYNCDS KFWLASRKHH C-NCGNVFCS TCCNQKAPVP SQQLFEPSRV CKLCFTNLH 68
MTMR3 (Danio rerio) TEVTRWYPDH LAAQCYGCER GFWLATRKHH C-NCGNVFCG SCCDQKIPVP SQQLFEPSRV CRSCFSNLQ 68
MTMR3 (Drosophila melanogaster) GSSVLWVPDH AVSRCSSCQT EFWLGRRKHH C-SCGEIFCA DCSEFWAPLP NEKLFNPVRL CGSCYTSVT 68
Consensus TEVTRWLPDH LAAHCYXCDS AFWLASRKHH C-NCGNVFCS SCCNQKVPVP SQQLFEPSRV CKSCYSSLH
Conservation
WDFY1 (Homo sapiens) GGIAVWNMDV SREEAPQWLE SDSCQKCEQP FFWNIKQMWD TKTLGLRQHH CRKCGQAVCG KCSSKRSSYP VMGFEFQVRV 80
WDFY1 (Mus musculus) GGIAVWNMDV SREEAPQWLE SDSCQKCEQP FFWNIKQMWD TKTLGLRQHH CRKCGQAVCG KCSSKRSSYP VMGFEFQVRV 80
WDFY1 (Gallus gallus) GGIAVWNMDI SREEAPQWLE SDSCQKCEQP FFWNIKQMWD TKTLGLRQHH CRKCGQAVCG KCSTKRSSYP IMGFEFQVRV 80
WDFY1 (Xenopus tropicalis) GGICVWNMDI DREEAPQWLE SDSCQKCSQP FFWNIKQMWD TKTVGLRQHH CRKCGQAVCG KCSSKRSSYP IMGFEFQVRV 80
WDFY1 (Danio rerio) GGITVWNMDT TRQEAPQWLD SDSCQKCEQP FFWNIKQMWD TKTLGLRQHH CRKCGKAICG KCSSKRSTYP IMGFEFQVRM 80
WFDY1 (Drosophila melanogaster) SVVVFWEMNA MRKEVPGWVD TNNCQLCSRP FFWNFRSMWD QKQLGIRQHH CRHCGKAVCD NCSTNRINIP IMGFEFDVRT 80
WDFY1 (Caenorhabditis elegans) GKLMCWDMNC KRVETPEWKT SDCCQKCNQP FFWNLQAMWQ RKVVGIRQHH CRTCGSAVCG SCCDNWTTYP PMGYETKIRI 80
Consensus GGIAVWNMDX SREEAPQWLE SDSCQKCEQP FFWNIKQMWD TKTLGLRQHH CRKCGQAVCG KCSSKRSSYP IMGFEFQVRV
Conservation
WDFY1 (Homo sapiens) CDSCYDSIK 89
WDFY1 (Mus musculus) CDSCYDSIK 89
WDFY1 (Gallus gallus) CDSCFESIK 89
WDFY1 (Xenopus tropicalis) CDSCYETIK 89
WDFY1 (Danio rerio) CDDCFNTIK 89
WFDY1 (Drosophila melanogaster) CDPCYKQLQ 89
WDFY1 (Caenorhabditis elegans) CNDCNARMK 89
Consensus CDSCYXSIK
Conservation
WDFY2 (Homo sapiens) GGIVVWNMDV ERQETPEWLD SDSCQKCDQP FFWNFKQMWD SKKIGLRQHH CRKCGKAVCG KCSSKRSSIP LMGFEFEVRV 80
WDFY2 (Mus musculus) GGIVVWNMDV ERQETPEWLD SDSCQKCDQP FFWNFKQMWD SKKIGLRQHH CRKCGKAVCG KCSSKRSSIP LMGFEFEVRV 80
WDFY2 (Gallus gallus) GGIVVWNMDV ERQETPEWLD SDSCQKCDQP FFWNFKQMWD SKKIGLRQHH CRKCGKAVCG KCSSKRSTIP LMGFEFEVRV 80
WDFY2 (Xenopus tropicalis) GGIVVWNMDV ERQETPEWLD SDSCQKCDQP FFWNFKQMWD HKKIGLRQHH CRKCGKAVCG KCSSKRSTIP LMGFEFEVRV 80
WDFY2 (Danio rerio) GGIVIWNMDV TRQETPEWLD SDSCQKCEQP FFWNFKQMWD SKKIGLRQHH CRKCGQAVCG KCSSKRSTIP LMGFEFEVRV 80
WDFY2 (Drosophila melanogaster) SVVVFWEMNA MRKEVPGWVD TNNCQLCSRP FFWNFRSMWD QKQLGIRQHH CRHCGKAVCD NCSTNRINIP IMGFEFDVRT 80
WDFY2 (Caenorhabditis elegans) GKLMCWDMNC KRVETPEWKT SDCCQKCNQP FFWNLQAMWQ RKVVGIRQHH CRTCGSAVCG SCCDNWTTYP PMGYETKIRI 80
Consensus GGIVVWNMDV ERQETPEWLD SDSCQKCDQP FFWNFKQMWD SKKIGLRQHH CRKCGKAVCG KCSSKRSXIP LMGFEFEVRV
Conservation
WDFY2 (Homo sapiens) CDSCHEAIT 89
WDFY2 (Mus musculus) CDSCHEAIT 89
WDFY2 (Gallus gallus) CDSCHESIT 89
WDFY2 (Xenopus tropicalis) CDSCHESIT 89
WDFY2 (Danio rerio) CDSCHDLIT 89
WDFY2 (Drosophila melanogaster) CDPCYKQLQ 89
WDFY2 (Caenorhabditis elegans) CNDCNARMK 89
Consensus CDSCHEXIT
Conservation
FGD5 (Homo sapiens) ERPPTLVPVT HVMMCMNCGC DFSLTLRRHH CHACGKIVCR NCSRNKYPLK YLKDRMAKVC DGCFGELK 68
FGD5 (Mus musculus) ERLPTLVPVT HAMMCMNCGC DFSLTVRRHH CHACGKIVCR NCSRNKYPLK CLKNRMAKVC DGCFRELK 68
FGD5 (Gallus gallus) ERPPTLVPVS HVMMCMNCGC DFTLTLRRHH CHACGKIVCR NCSRNKYPMK YLRDQAAKVC DSCYVELK 68
FGD5 (Danio rerio) EAAPVLVPVS HVMMCMNCTS DFSLTLRRHH CNACGKVVCR SCSRNRYPLK YLKDRMAKVC DHCYAELR 68
FGD5 (Xenopus tropicalis) ERPPSVAHMS HAVMCMNCGS DFTLTLRRHH CHACGKIICR SCSRNKYPLK YLKDRPSKVC NGCFAELR 68
Consensus ERPPTLVPVS HVMMCMNCGC DFSLTLRRHH CHACGKIVCR NCSRNKYPLK YLKDRMAKVC DGCFAELK
Conservation
DFCP1_B (Homo sapiens) ARPAYWVPDH EILHCHNCRK EFSIKLSKHH CRACGQGFCD ECSHDRRAVP SRGWDHPVRV CFNCNKKPG 69
DFCP1_B (Gallus gallus) ARPAYWVPDH EILHCHNCRK EFSIKLSKHH CRACGQGFCD ECSHDRRAVP SRGWDHPVRV CFNCNKKPG 69
DFCP1_B (Mus musculus) ARPAYWVPDH EILHCHNCRK EFSVKLSKHH CRACGQGFCD ECSHDCRAVP SRGWDHPVRV CFNCNKKPG 69
DFCP1_B (Xenopus tropicalis) ARPTYWIPDH EIKHCYSCRK EFSSKLSKHH CRACGQGFCD ECSNERRPVP SRGWDHPVRV CINCNKKPG 69
DFCP1_B (Danio rerio) ARPAYWVPDQ DIRCCNQCQR EFNARLSIHH CRACGQGVCN DCSPDRRAVP SRGWDHPVRV CTTCNQKSG 69
Consensus ARPAYWVPDH EILHCHNCRK EFSIKLSKHH CRACGQGFCD ECSHDRRAVP SRGWDHPVRV CFNCNKKPG
Conservation
FYCO1 (Homo sapiens) SAEERWLGDT EANHCLDCKR EFSWMVRRHH CRICGRIFCY YCCNNYVLSK HGGKKERCCR ACFQKLS 67
FYCO1 (Mus musculus) SAEEKCLGDM EVNHCHDCKR EFSWIVRRHH CRICGRIFCY YCCNNYVVTK PSGKKERCCR ACFQKFG 67
FYCO1 (Gallus gallus) SAEQKWQGDT EVNHCLDCQR EFSWMVRRHH CRMCGRIFCY YCCNNYMVTK PGGRKERCCK ACFNKPR 67
FYCO1 (Danio rerio) RAEEQWLVDK EATHCLGCQG QFTWMLRRHH CRLCGRIFCY YCSNNYVMIK N-SKKERCCR ECYTQHG 66
Consensus SAEEKWLGDT EXNHCLDCXR EFSWMVRRHH CRICGRIFCY YCCNNYVVTK PGGKKERCCR ACFQKXG
Conservation
EEA1 (Homo sapiens) ALNRKWAEDN EVQNCMACGK GFSVTVRRHH CRQCGNIFCA ECSAKNALTP SSKKPVRVCD ACFNDLQ 67
EEA1 (Gallus gallus) ALNRKWAEDN EVQNCMACGK GFSVTVRRHH CRQCGNIFCA ECSAKNALTP SSKKPVRVCD TCFNDLQ 67
EEA1 (Mus musculus) ALNRKWAEDN EVQNCMSCGK CFSVTVRRHH CRQCGNIFCA ECSTKNALTP SSKKPVRVCD ACFNDLQ 67
EEA1 (Danio rerio) SLTRKWIEDH EVQNCMACGK GFSVTVRKHH CRHCGNIFCA ECSARNALTP SSKKPVRVCD NCFDELQ 67
EEA1 (Xenopus tropicalis) ALSRKWIEDH EVQNCMSCGR GFSVTIRRHH CRQCGNIFCH ECSSKNALTP SSKKAVRVCD TCFGDLQ 67
EEA1 (Caenorhabditis elegans) YSSRKWLDDA EAINCTECGK VFSLTVRKHH CRVCGKIYCN PCSSKSVRIA SAKNPVRACN TCFTDSQ 67
Consensus ALNRKWAEDN EVQNCMACGK GFSVTVRRHH CRQCGNIFCA ECSAKNALTP SSKKPVRVCD TCFNDLQ
Conservation



Supplemental Figure 1. ALFY-FYVE contains a highly conserved glutamic acid not found in other human FYVE domains or their homologous. The sequences for the human FYVE domains and their homologues found in *Mus musculus, Gallus gallus, Danio rerio, Xenopus tropicalis, Caenorhabditis elegans,* and *Drosophila melanogaster* were obtained using Proviz. A sequence alignment was performed for each individual human FYVE domains and a consensus sequence as well as a conservation plot produced using CLC sequence viewer 7. The human FYVE domains and their homologues were sorted according to the identity of the residue corresponding to the conserved glutamic residue in ALFY-FYVE. Negatively charged residues are red, positively charged residues and blue, polar residues are yellow, and nonpolar residues are green.



Supplemental Figure 2. ^{1}H-^{15}N HSQC spectra of a buffer titration used to transfer peak assignments. ^{1}H-^{15}N HSQC spectra of 50 μM ALFY-FYVE in the presence of decreasing concentrations of sodium phosphate buffer and increasing concentrations of Bis-Tris buffer.



Supplemental Figure 3. Representative microscopy images and transfection efficiencies of tdTomato-ALFYC and tdTomato-ALFYC E3471K. A) Representative microscopy images of tdTomato-ALFYC and tdTomato-ALFYC E3471K. The mean gray scale intensity of the tdTomato signal (top) per cell was determined using Image J; tdTomato-ALFYC (8704.666 ± 3316.872); tdTomato-ALFYC E3471K (9125.638 ± 5387.893). A pairwise two-tail student t-test revealed no difference between the mean intensities for these two groups (p=0.1121). B) Percent of cells that were positive for tdTomato signal. A pairwise two-tail student t-test revealed that there is no difference between these two groups (p=0.677). C) The total number of cells counted per replicate to determine the transfection efficiencies of tdTomato-ALFYC and tdTomato-ALFYC E3471K. Pairwise two-tail student t-test reveals no difference between these two groups (p=0.427).