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      10      20      30      40      50      60      70      80      90     100
Human ZIP12 MCFRTKLSVS WVPLFLLLSR VFSTETDKPS AQDSRSRGSS GQPADLLQVL SAGDHPPHNH SRSLIKTLLE KTGCPRRRNG MQGDCNLCFE PDALLLIAGG
Human ZIP1  -----
Yeast ZRT1  -----
Arabidopsis ZIP2 -----
Mouse ZIP4 -MLPKSVTQG LVLALLVGTV AVARPRNLLS LLALG----- --QGALDRLE LDGLLNTLVA RVHCTDG--- --PCEKCLS VENVLALGKF
Mouse ZIP6 -----MAT DLSVIMILTF ALWVTSPLHE LQSTAAFSQT TEKINSNWEF GVNVDLAVTM QRHHLQQLFY RYG-----E NDSLSVEGFR
Mouse ZIP14 ---MKRLHPA LPSCLLLVLF GIWRTAPQTH ASS----- --AGLPPLS ATSFLEDLMD RYG-----K NDSLTLTLQLK
Consensus

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      110     120     130     140     150     160     170     180     190     200
Human ZIP12 NFEDQLREEV VQRVSLLLLY YIIHQBEICS SKLNMSNKEY KFYLHSLLSL RQDEDSFSL S QNETEDILAF TRQYFDTSQS QCMETKTLQK KSGIVSSEGA
Human ZIP1  -----
Yeast ZRT1  -----
Arabidopsis ZIP2 -----
Mouse ZIP4 DKPQPAPESV LESR----- HIIYLSAAAA LYLNNEPKTC KDIQAGLLAS HVDDYLATLE SPEAMTLGLS QLLQKIEAHA ASQPTGEKTC VDLPQLLEEA
Mouse ZIP6 KLLQNIGIDK IKRV----- HIHHDHEHHA DHEHHSDEHE HSDHEHSDH EHHSDHEHHS DHEHHSRSH TVAGKNRKA FCPDLSDNS GKNPRTSLGK
Mouse ZIP14 SLLDHLHVG V GR-----
Consensus

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      210     220     230     240     250     260     270     280     290     300
Human ZIP12 NESTLPQLAA MIITLSLQGV CLGQGNLPSP DYFTEYIFSS LNRTNLRSL ELDQLLNTLW TRSTCIKNEK IHQFQRKQNN IITHDQDYSN FSSSMEKESE
Human ZIP1  -----
Yeast ZRT1  -----
Arabidopsis ZIP2 -----
Mouse ZIP4 EAAGVSKSAG LVLTALLDHV INGSCFQGLP SPQYFVDFVF RLHSSDPPNI TLHELENLMH HLGVGGEDHS DHDDHGDHAD HSHPRDKASH QDSELHTPHN
Mouse ZIP6 GSRPAEHMNG RRNTKESASS SEVTSAVYNA VSEGRTRFVET IETPKPGRRT KDVNPSPTPS ITEKSRVGR L SRLARKKSNE SVSEPRKSFM YSRNTN----
Mouse ZIP14 -----DN VSQPKEGPR-----
Consensus

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      310     320     330     340     350     360     370     380     390     400
Human ZIP12 DGPVSWDQTC FSARQLVEIF LQKGLSLISK EDFKQMSPGI IQQLLSCSCH LPK---DQQA KLPP---TTL EKYGYSTVAV TLLTLGSMGL TALVLFHSCE
Human ZIP1  -----MGPWG EPPELLVWRPE AVASEPPVVP GLEVKLGLAL LLLVLTLLCS LVP----- --ICVLRPPG ---ANHEGS
Yeast ZRT1  -----MS NVTTPWVKQW DPSEVTLADK TPDDVWKTVC LQGVYFGGNE YNG----- --NL GARISSVFI LFVSTFFTMF PLISTKVKRL
Arabidopsis ZIP2 -----IIFLC FSLILAHGGI DDGDEEETN QPPPATGTTT VVNLRSKSLV LVK-----I YCIIILFFST FLAGVSPYFY
Mouse ZIP4 SNSSVWDTLCL LSARDIMAVY GLSEEAGVSP QAWAQLTAL VQQQLSGACS PYP-----T IRIQDQLSQT ERYLYGSLAT LLICLCVAVG LLLLTCAKCS
Mouse ZIP6 ---DNIQEC FNTTKLLTSH GMSIQALLNA TEFNYLCPAI INQIDARACL IHT-ASEKKA EIPPKTYSLQ IAWLGGFIAI SIIISFLSLG -VILVPLMNR
Mouse ZIP14 ---NLSTC FSSGDLFAAH NLSERSQIGA SEFQEFCTPI LQQLDSQACT SENQKSEENE QTEBGKPSAI EVWGFGLSV SLINLASLLG -VLVLPCTEK
Consensus

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      410     420     430     440     450     460     470     480     490     500
Human ZIP12 ENYRLILQLF VGLAVGTLSG DALLHLIPQV LGLHKQEAP EFGHFHESK-- -----GHI WKLMGLIGGI HGFLIEKCF ILLVSPNDK-
Human ZIP1  ASRQKALSLV SCFAGGVFLA TCLLDLDPDY LAIDEALAA LHVTLQFP----- --LQEFILAMGF FLVLVMEQIT LAYKE-----
Yeast ZRT1  RIPLVYVIFA KYFGSGVIVA TAFIHLMDPA YGAIGGTTVC GQTGNWG--- -----LYS WCPAIMLTSL TFTFLTDLFS SVMVERKYG-
Arabidopsis ZIP2 RWNESFLLG TQFSGGIFLA TALIHFLSDA NETFRGLKHK EYP----- --YAFMLAAAGY CLTMLADVAV AFVAAGSNN-
Mouse ZIP4 TATHYIMQTF LSLAVGALTG DALLHLIPKV LGLHTHGEGE HTHBEEVGVG G-----QAT WRLLAVLGGF YIFFLFESFF NLLLPDQDS
Mouse ZIP6 VFFKFLSFL VALAVGTLSG DALLHLLPHS HASHQSHSH EEPAMEMKRG PLFSLHSAQN IEBSYFDST WKGLTALGGL YFMFLVEHVL TLIKQPKDKK
Mouse ZIP14 AFFRSRVLYT IALSIGTLLS NALFQLIPEA FGFNPQDN-- -----YV SKSAVVVGGF YLFFFTEKIL KMLLKQKNEH
Consensus

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      510     520     530     540     550     560     570     580     590     600
Human ZIP12 -----
Human ZIP1  -----
Yeast ZRT1  -----
Arabidopsis ZIP2 -----
Mouse ZIP4 EK-----
Mouse ZIP6 KKNQKPPEND EDVESKQQLS KYDSQLSSNE EKVDPPERPE SYLRADSQEP SPFDSQOPTM LEEEEVMIAH AHPQEVYNEY VPRGCKNKCH SHFHDTLGQS
Mouse ZIP14 HHGHN----- --HFTSETLPS KKDQEEGVTE KLQNGDLDM IPQHCNSELD GKAPGTD---
Consensus

    ....|....| ....|....| ....|....| ....|....| ....|....| ....|....| ....|....| ....|....|
      610     620     630     640     650     660     670     680     690     700
Human ZIP12 -----A STIQLKSPED SQAAEMPIGS MTASNKCKA ISLLAIMILV GDSLHNFDAG LAIGAASFSS SESGVTTTIA ILCHEIPHEM GD--FAVLLS
Human ZIP1  -----ALIGTVNG PQHWDGPGV PQASGAPATP SALRACLVLF SLALHVSFEG LAVGLQRDRA RAMELCLALL LHKGILAVSL SRLLLQSHLR
Yeast ZRT1  -----ANGSHDTKNG VEYEDSDAT SMDVVSQFA QFYAFILIEF GVIFHSMVIG LNLGS--VGD EFSLYPVLV FHQSFEGLGI GARLSAIEFP
Arabidopsis ZIP2 -----EDDDVAVKE EGRREIKSGV DVSQALIRTS GFGDTALLIF ALCFHSIFEG IAIGLSDTKS DAWNRLWTSI LHKVFAAVAM GIALLLKLPK
Mouse ZIP4 -----QTHESSRD LVAEETPELL NPETRRRAE LRLPYLITL GDAVHNFDAG LAVGAASFSS WKTGLATSLA VFHELPHEL GD--FAALLH
Mouse ZIP6 DDLIHHHHDY HHILHHHHQ NHHPHSHSR YSREELKDG ATATLAWMVM GDGLHNFSDG LAIGAFTTEG LSSGLSTVA VFHELPHEL GD--FAVLLK
Mouse ZIP14 -----EKVIVNSMSV QDLQASQAS YWLKGVRYSD IGTLAWMITL SDGLHNFIDG LAIGASFTVS VFQIGISTVA ILCEEPHEL GD--FVILLN
Consensus

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      710     720     730     740     750     760     770     780     790     800
Human ZIP12 SG---LSMKT AILMNFISL TAFMGLYIGL SVSADPC---VQDWIFVT AGMFLYLSLV EMLPEMTHVQ T-----QRPW MMFLQLQFGL ILGWSLSSL
Human ZIP1  AQ---VVAGC GILFSCMTP L GIGLGAALAE SAGPLHLQ-- --AQSVLEGMA AGTFLYITFL EILPQELASS EQ---RILK VILLLAGFAL LTGLLFIQI-
Yeast ZRT1  RSKRWPPWAL CVAYGLTPI CVAIGLVRT RVVSGSYTAL VISGLVDAIS AGILLYTLV ELLARDFIFN PQR---TKDL RELSNFVICT LFGAGIMALI
Arabidopsis ZIP2 RP---FFLTV VYSFAFGISS PIGVIGIGI NATSQAGGD WTYAISMGLA CGVFVYAVN HLISKYKPR E-----ECYF DKPIKPIAV FLGVALLSV
Mouse ZIP4 AG---LSVKR ALLNLASAL TAFAGLYVAL AVGVGEE--- --GEAWILAVA TGLFLYVALC DMLPAMNVR D-----QRPW LFLFLHNVGL LGGWTVLLL
Mouse ZIP6 AG---MTVKQ AVLYNALSAM LAYLGMATGI FIGHYAEN-- --VSMWIFALT AGLFMYVALV DMVPEMLHND ASDHG-CSR GYFFLQNAGI LLGFGIMLLI
Mouse ZIP14 AG---MSIQQ ALFFNFLSAC CCYLGLAFGI LAGSHFS--- --ANWIFALA DMFPEMLNEVC QEDEKNSDFL VPFVILQGLG LTGFSIMLV
Consensus

    ....|....|
      810
Human ZIP12 AIYEQNIKI- ---
Human ZIP1  -----
Yeast ZRT1  GKWA-----
Arabidopsis ZIP2 MIWD-----
Mouse ZIP4 SLYEDNITF- ---
Mouse ZIP6 SIFEHKIVFR INF
Mouse ZIP14 TMYSGQIQIG ---
Consensus

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