```
human_Kaiso          1 MESRKLISATDIQYSGSLLNSLNEQRGHGLFCDVTVIVEDRKFRAHKNILSASSTYFHQL
chimpanzee Kaiso     1 MESRKLISATDIQYSGSLLNSLNEQRGHGLFCDVTVIVEDRKFRAHKNILSASSTYFHQL
rhesus monkey Kaiso  1 MESRKLISATDIQYSGSLLNSLNEQRGHGLFCDVTVIVEDRKFRAHKNILSASSTYFHQL
horse Kaiso          1 MESRKLISATDIQYSGSLLNSLNEQRGHGLFCDVTVIVEDRKFRAHRNILSASSTYFHQL
mouse Kaiso          1 MESRKLISATDIQYSASLLNSLNEQRGHGLFCDVTVIVEDRKFRAHRNILSASSTYFHQL
rat_Kaiso            1 MESRKLISATDIQYSASLLNSLNEQRGHGLFCDVTVIVEDRKFRAHRNILSASSTYFHQL
chicken_Kaiso        1 MEGEKLISATDTQYSSSLLQSLNEQRGHGLFCDVTVIVEDRKFRAHRNILSASSTYFHQL
frog Kaiso           1 METKKLITATDTQYSGILLNALNDQRIQGLYCDVTVIVEDRKFRAHRNILSACSTYFHQL
zebrafish Kaiso      1 MSKLKLISVVDTQYPGSLLKNINDERHNGLFCDVTIVVQDRKFRAHKCVLSASSTYFRQL
consensus            1 *...***...*.**...**...*..*..**.****..*.*******...***.****.**
                                   <            BTB/POZ domain                    .

human_Kaiso         61 FSVAGQVVELSFIRAEIFAEILNYIYSSKIVRVRSDLLDELIKSGQLLGVKFIAELGVPL
chimpanzee Kaiso    61 FSVAGQVVELSFIRAEIFAEILNYIYSSKIVRVRSDLLDELIKSGQLLGVKFIAELGVPL
rhesus monkey Kaiso 61 FSVAGQVVELSFIRAEIFAEILNYIYSSKIVRVRSDLLDELIKSGQLLGVKFIAELGVPL
horse Kaiso         61 FLVAGQVVELSFIRAEIFAEILNYIYSSKIVRVRSDLLDELIKSGQLLGVKFIAELGVPL
mouse Kaiso         61 FSVAGQVVELSFIRAEIFAEILNYIYSSKVVRVRADLLDELIKSGQLLGVKFIAELGVPL
rat_Kaiso           61 FSVAGQVVELSFIRAEIFAEILNYIYSSKIVRVRADLLDELIKSGQLLGVKFIAELGVPL
chicken_Kaiso       61 LSVAGQVVELSFVRADIFAEILNYMYSSKIISVRADLIDELIKSGQQLGVKFLADLSVAP
frog Kaiso          61 FSVAGQVVELNFVKADIFAEILNYIYSSKIVRVRQDMLEELIKSGKLLGVPFIAELGIPL
zebrafish Kaiso     61 FSVAGKVVELNFIKADIFDMVLNYIYTSQMFRVRSDRLEDLINAGQILGVTFIANLAIPL
consensus           61 ..***.****.*..*.**...***.*.*.....**.*....**..*..***.*.*.*....
                       .                        BTB/POZ domain                    >

human_Kaiso        121 SQVKSISGTAQDGNTEPLPPDSGDKNLVIQKSKDE------AQDNGAT-IMPIITESFSL
chimpanzee Kaiso   121 SQVKSISGTAQDGNTEPLPPDSGDKNLVIQKSKDE------AQDNGAT-IMPIITESFSL
rhesus monkey Kaiso 121 SQVKSISGTAQDGNTEPLPPDSGDKNLVIQKSKDE------AQDNGAT-IMPIITESFSL
horse Kaiso        121 SQVKSISGTAQDGNTDTLPPGSSDKNLEIQKSKDE------AQDNGAT-IMPIITESFSL
mouse_Kaiso        121 SQVKSISGTEQDGTAETLPSSSSDKSLDMEKSKDE------AQDNGAT-VMPIITESFSL
rat_Kaiso          121 SQVKSISGTVQDGTAETLPSSSNDKSPEIEKSKDE------AQDNGAP-VMPIITESFSL
chicken Kaiso      121 SDGRSVPGEVKDGASGTSGSAPTQKDAETQVPAIR------QEGREVTGWMPVITESFSL
frog Kaiso         121 SQVKSISGAGGKDGGTDAPSNPDHKAPEPQKSSDSPLPCTVKIKADVKTEMPVITESFSL
zebrafish Kaiso    121 AQVKGLPGLSKDGDNNIVSS--------PEKPEDG----------GVN--MPIITETFSL
consensus          121 .......*..... .. ... . .. .........      ....... .**.***.***
                                                                          <  CD1   .

human Kaiso        174 SAEDYEMKKIIVTD----SDDDDDD-VIFCSEILPTKETLPSNNTVAQVQSNPGPVAISD
chimpanzee Kaiso   174 SAEDYEMKKIIVTD----SDDDDDD-VIFCSEILPTKETLPSNNTVTQVQSNPGPVAISD
rhesus monkey Kaiso 174 SAEDYEMKKIIVTD----SDDDDDD-VIFCSEILPTKETLPSNNTVAQVQSNPGPVAISD
horse Kaiso        174 SAEDYETKKIIVTD----SDDDDDD-VIFCSEILPAKETLPSTNAVAQVQPNPGAVAISD
mouse_Kaiso        174 SAEDNEMKKIIVTD----SDDDDDDDVIFCSEILPAKEDLPSNNTATQVQPNPASVAISE
rat_Kaiso          174 SAEDYEMKKIIVTD----SDDDDDDDVIFCSEILPAKEDLPSNNTATQVQPNPASVAISE
chicken Kaiso      175 HGIAYETPKITVTD----SDD-DDD-VIFCSEIVPPKECTKDSSAAIQNQPCPNASGASD
frog Kaiso         181 SSDDYKDKKASGSQDHNSEKEDDDDDVIFCSEIVSSKQAPAERKEAAQTQIPPDNEQVPE
zebrafish Kaiso    161 SAEEFNMTGANTEK-----EDSDSDDVLFVSKTEAP---QAQKTKISDVHKNIEGAPETK
consensus          181 .............    ....*.* *.*.*.... .. ......... ... ... .....
                       .        CD1                    >            <        SA1    .

human Kaiso        229 VAPSASNNSPPLTNITPTQKLPTPVNQATLSQTQGS-EKLLVSSAPTHLTPNIILLNQTP
chimpanzee Kaiso   229 VAPSASNNSPPLTNITPTQKLPTPVNQATLSQTQGS-EKLLVSSAPTHLTPNIILLNQTP
rhesus monkey Kaiso 229 VAPSASNNSPPLTNITPTQKLPTPVNQATLSQTQGS-EKLLVSSAPTHLTPNIILLNQTP
horse_Kaiso        229 VAPCVSNNSPPLTNITPTQKLPTSANQATLSQTQGS-EKLLVSSAPTHLTPNIILLNQAS
mouse_Kaiso        230 VTPCASNNSPPVTNITPTQ-LPTPVNQATLSQTQGS-EELLVSSASTHLTPNIILLNQAP
rat Kaiso          230 VTPCTSSNSPPVTNITPPQ-LPTPVNQSTLSQAQGS-EELLVSSASTHLTPNIILLNQAP
chicken Kaiso      229 QKSCGSGGSPLLTSTTSTQKLTSSANQLNPNQTLSS-AESLVPVAPQHSTTELILLNRPP
frog Kaiso         241 VKKVTPSSQVQLTQNSLPTNQQSSKNTSSTTQKFTPPVNANISKNPTPAANGFLSPTAQK
zebrafish Kaiso    213 KQKVTNEEG-VAPKSSIPQEKKSSERNASLQNNLDP--DVVILSSPEKSSSILTSPVGTG
consensus          241 . . ..................................  . ................. .
                       .          SA1                        >

human Kaiso        288 LSTPPNVSSSLPNHMPSSINLLVQNQQTPNSAILTGNKANEEEEEIIDDDDDTISSSPD
chimpanzee Kaiso   288 LSTPPNVSSSLPNHMPSSINLLVQNQQTPNSAILTGNKANEEEEEIIDDDDDTISSSPD
rhesus monkey Kaiso 288 LSTPPNVSSSLPNHIPSSINLLVQNQQTPNSAILTGNKANEEEEEIIDDDDDTISSSPD
horse_Kaiso        288 HTTPPNVSSSLPNHMSPSINLLVQNQPTPNSAVLTGNKANEEEEEIIDDDDDTISSSPD
mouse_Kaiso        288 LTAPPSASSSLPNHMSSSVNVLVQNQQTPNSAVLTGNKA--EEEEEIIDDDDDIISSSPD
rat Kaiso          288 LTAPPSVSSSLPNHMSSSVNVLVQNQQAPNSAV-TGNKA--EEEEEILDDDDDIISSSPD
chicken Kaiso      288 VNAPP--SSSHQTHVPPTIDLVEESQKPSDKCSSTERGTAAVDVEEVVEDSDDVISSSSP
frog Kaiso         301 QGTPNAVQNQHSQNITSGNALPQQKPVVNFSSIKPQQISAIKPKTEVIIHGNGLSPPSS-
zebrafish_Kaiso    270 -------SNSNPKPPACPDSVPSD----------PQNVSLPSDNIEVLG-----------
consensus          301 ..... ......... ........................  ....*....... .....
                                                                             <   .

human Kaiso        348 SAVSNTSLVPQADTSQNTSFDGSLIQKMQIPTLLQEPLSNS----LKISDIITRNTN--D
chimpanzee Kaiso   348 SAVSNTSLVPQADTSQNTSFDGSLIQKMQIPTLLQEPLSNS----LKISDIITRNTN--D
rhesus monkey_Kaiso 348 SAVSNTSLVPQADTSQNTSFDGSLIQKMQIPTLLQEPLSNS----LKISDIITRNTN--D
horse_Kaiso        348 SAVSNTSLVPQADIPQNTTFDGSLIQKMQIPTLLQEPLSNS----LKISDIITRNTN--D
mouse Kaiso        346 SAVSNTSLVPQADNSKSTTLDGSLTQKMQIPVLPQEPPSNS----LKISDVITRNTN--D
rat Kaiso          345 SAVSNTSLVPQADASKSTTFDGSLTQKMQAPILPQEPPSNS----LKISDVITRNTN--D
chicken Kaiso      346 SSVSNSSSV-QPSVPKAAPSEGSGVQKKQVVTFPQEQSSKPGEFKIKISDVLSGNNKEFG
frog Kaiso         360 ---SVIPLGQQPVTPKHISFDG--VQKKQVVTFTQGSPSKPGEFKIKIADVVSGSSLDSF
zebrafish_Kaiso    302 -----------------------VQKK--KVLLEHSPDHPG--KITLSDVRSSCSS-SN
consensus          361 ............ .  ........**.......... ...    ....*.......  .
                       .                          SA2                              .
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human_Kaiso          402 PGVGSKHLMEGQKIITLDTATEIEGLSTGCKVYANIGEDTYDIVIPVKDDPDEG-----E
chimpanzee Kaiso     402 PGVGSKHLMEGQKIITLDTATEIEGLSTGCKVYANIGEDTYDIVIPVKDDPDEG-----E
rhesus monkey Kaiso  402 PGLGSKHLMEGQKIITLDTATEIEGLSTGCKVYANIGEDTYDIVIPVKDDPDEG-----E
horse Kaiso          402 PGLGSKHLMEGQKIITLDTATEIEGLSTGCKVYANIGEDTYDIVIPVKDDPDEG-----E
mouse Kaiso          400 PGLRSKHVMEGQKIITLDTATEIEGLSTGCKVYANIGEDTYDIVIPVKDDPDGG-----E
rat_Kaiso            399 PGLRSKHVMEGQKIITLDTATEIEGLSTGCKVYANIGEDTYDIVIPVKDDPDGG-----E
chicken_Kaiso        405 PGIASKHAGEGQKIITLDTATEIEGLSTGCKVYANIGEDTYDIVIPIKDDPEEG-----E
frog Kaiso           415 KDSEPRRIIDGKKIITLDTASEIEGLSTGCKVYANIGEDTYDIVIPIKEDPEEG-----E
zebrafish Kaiso      333 GPTNVIPALSVKKTITLDKASEIDSLSPGCKVYANIGENTYDIVP-VKDDPGEGAAPGCK
consensus            421 ............*.****.*.**..**.**********.*****...*.**..*     .
                         .                          CD2                              .

human_Kaiso          457 ARLENEIPKTS-GSEMANKRMKVKHDDHYELIVDGRVYYICIVCKRSYVCLTSLRRHFNI
chimpanzee Kaiso     457 ARLENEIPKTS-GSEMANKRMKVKHDDHYELIVDGRVYYICIVCKRSYVCLTSLRRHFNI
rhesus monkey Kaiso  457 ARLENEIPKTS-GSEMANKRMKVKHDDHYELIVDGRVYYICIVCKRSYVCLTSLRRHFNI
horse Kaiso          457 ARLENETPKTS-SSETANKRMKVKHDDHYELIVDGRVYYICIVCKRSYVCLTSLRRHFNI
mouse Kaiso          455 AKLDNEIPKTS-GSEPPNKRMKVKHDDHYELIVDGRVYYICIVCKRSYVCLTSLRRHFNI
rat_Kaiso            454 AKLENELPKTS-GSEPSNKRMKVKHDDHYELIVDGRVYYICIVCKRSYVCLTSLRRHFNI
chicken_Kaiso        460 AK-PNEAPRTSDGDSTSRKRMKVKHDDHYELIVDGRVYYICIVCKRSYVCLTSLRRHFNV
frog Kaiso           470 AKLDLDG-------LPNRKRMKLKHDDHYELIVDGRVYYICIVCKRSYVCLTSLRRHFNV
zebrafish Kaiso      392 SQIQPDSPNTASLSPKSKKKFKPDQEDHYEIIMDGKTFFVCIVCKRPYVCLTSLRRHFNT
consensus            481 ........... ...  .*..*....****.*.**....******.************.
                         .  SA2              NLS                ><                   .

human Kaiso          516 HSWEKKYPCRYCEKVFPLAEYRTKHEIHHTGERRYQCLACGKSFINYQFMSSHIKSVHSQ
chimpanzee Kaiso     516 HSWEKKYPCRYCEKVFPLAEYRTKHEIHHTGERRYQCLACGKSFINYQFMSSHIKSVHSQ
rhesus monkey Kaiso  516 HSWEKKYPCRYCEKVFPLAEYRTKHEIHHTGERRYQCLACGKSFINYQFMSSHIKSVHSQ
horse Kaiso          516 HSWEKKYPCRYCEKVFPLAEYRTKHEIHHTGERRYQCLACGKSFINYQFMSSHIKSVHSQ
mouse_Kaiso          514 HSWEKKYQCRYCDKVFPLAEYRTKHEIHHTGERRYQCLTCGKSFINYQFMSSHIKSVHSQ
rat_Kaiso            513 HSWEKKYQCRYCDKVFPLAEYRTKHEIHHTGERRYQCLACGKSFINYQFMSSHIKSVHSQ
chicken Kaiso        519 HSWEKKYPCRYCDKVFPLAEYRTKHEIHHTGERRYQCLTCGKSFINYQIMASHIRSVHSQ
frog Kaiso           523 HSWEKKYPCRYCERVFPLAEYRTKHEIHHTGERRYQCLTCGSSFINYQVMASHIRSVHSL
zebrafish Kaiso      452 HSWERKYPCHYCNKVFALAEYRTKHEISHTGERRYQCLLCNEMFINYQILSTHCKQAHNQ
consensus            541 ****.**.*.**..**.**********.**********.*...*.***....*....*..
                         .                3 x C2H2 Zinc finger domains              >

human Kaiso          576 DPSG-------DSKLYRLHPCRSLQIRQYAYLSDRSS-------------------TIPA
chimpanzee Kaiso     576 DPSG-------DSKLYRLHPCRSLQIRQYAYLSDRSS-------------------TIPA
rhesus monkey Kaiso  576 DPSG-------DSKLYRLHPCRSLQIRQYAYLSDRSS-------------------TMPA
horse Kaiso          576 DPSG-------DSKLYRLHPCRSLQIRQYAYLSDRSG-------------------TMPV
mouse_Kaiso          574 DPSG-------DSKLYRLHPCKSLQIRQYAYLSNKSS-------------------AMPV
rat_Kaiso            573 DPSG-------DSKLYRLHPCKSLQIRQYAYLSNKPS-------------------AMPV
chicken Kaiso        579 DPSG-------DNKLYRLHPCKSLQIRQYAYTSDRSS-------------------SLPV
frog Kaiso           583 DPSG-------DSKLYRLNPCKTLQIRQYAYWNNSTNGTVINDGAINVPVITDGGINVPV
zebrafish Kaiso      512 DPSGRKEKDDSANNLYRLLPCKTVQFKPYSFVSDESG-------------------GSPV
consensus            601 ****       ...****.**...*...*........                    ..*.

human Kaiso          610 MKDDGIGYKVDTG---KEPPVGTTTST-QNKPMTWEDIFIQQEND--------SIFKQNV
chimpanzee Kaiso     610 MKDDGIGYKVDTG---KEPPVGTTTST-QNKPMTWEDIFIQQEND--------SIFKQNV
rhesus monkey Kaiso  610 MKGDGIGYKVDTG---KEPPVGTTTST-QNKPMTWEDIFIQQEND--------SIFKQNV
horse Kaiso          610 MKDDGIGYKVDAG---KEPPVGTTSTP-QNKPMTWEDIFIQQEND--------SIFKQNV
mouse_Kaiso          608 MKDDAVGYKVDAG---KEPPVGTTSTPPQNKSTFWEDIFIQQEND--------SIFKQNV
rat_Kaiso            607 MKDDAVGYKVDAG---KEPPVGTTSAPPQNKSTFWEDIFIQQEND--------SIFKQNV
chicken Kaiso        613 INENRIVYRVDAA---KDGTEGTTSNS-PGKQMSWDDIFVPQGND--------AIFKQNQ
frog Kaiso           636 INDGGIVYDIDPDEPQQPASEGNHANS-ATKPVNWDNIFIQQSNQ--------NMFKLNT
zebrafish Kaiso      553 IGEDGTIQYVNSE---KEHCTNQPLPSNQSKALNWDDIFVESEGQNARPAPPPQPVDQIN
consensus            661 ........... .   ........... ..*...*..**......        .......

human_Kaiso          658 TDGSTEFEFIIPESY
chimpanzee Kaiso     658 TDGSTEFEFIIPESY
rhesus monkey Kaiso  658 TDGSTEFEFIIPESY
horse Kaiso          658 TDGSTEFEFIIPESY
mouse Kaiso          657 TDGSTEFEFIIPESY
rat_Kaiso            656 TDGSTEFEFIIPESY
chicken_Kaiso        661 SEGSTEFEFVIPESY
frog Kaiso           687 SEGGTEFEFVIPESY
zebrafish Kaiso      610 APARNEFEFVIPETY
consensus            721 .....****.***.*
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Suppl. Fig. S1: Alignment of Kaiso proteins of various species reveals two conserved domains, CD1 and CD2, in addition to the BTB/POZ and zinc finger domains. Multiple sequence alignment of Kaiso protein sequences from mammals (human, chimpanzee, rhesus monkey, horse, mouse, rat) and other vertebrates (chicken, the frog *Xenopus laevis*, zebrafish). RefSeq sequences were obtained from the Entrez Gene database [1] by searching for "Kaiso OR Zbtb33" and aligned with ClustalX2 using default parameters [2]. The shaded background was created with the BoxShade server. The line below every alignment block denotes the type of conservation: "*" for identical residues, ":" for high similarity and "." for weak similarity. Annotation of the BTB/POZ domain (cyan background) and zinc fingers (green background; red: C and H residues) was based on, respectively, CD-Search [3] and InterPro [4] analyses. Other conserved regions, CD1, CD2 and NLS, are indicated by yellow background. The novel Spindle-Associated domains 1 and 2 (SA1 and SA2) are highlighted in pink. See also Fig. 1 for domain organization.

References

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