

Consensus M GS WLLLSLVA-VTAAQSTTEE AKTFLKFN EAEDLSYQSSLASWNYNTITDENVQKMEAA AKWSAFYEEQS AKTY L'EIQMLT KRQL AQ
Zebraphis-ACE2
Zebraphis-ACE2-1
Zebraphis-ACE2-2
Chicken-ACE2
Guinea-pig-ACE2
Rabbit-ACE2
Hamster-ACE2
Mouse-ACE2
Rat-ACE2
Pangolin-ACE2
Ferret-ACE2
Otter-ACE2
Tiger-ACE2
Cat-ACE2
Cat-ACE2-1
Panda-ACE2
Dog-ACE2
Dog-ACE2-1
Dog-ACE2-2
Dog-ACE2-1
Bat-ACE2
Monkey-ACE2
Human-ACE2-3
Human-ACE2-1
Human-ACE2-2
Bufflo-ACE2
B.hybrid-ACE2
B.hybrid-ACE2-3
B.hybrid-ACE2-1
B.taurus-ACE2-1
B.taurus-ACE2-2
B.indicus-ACE2-1
B.indicus-ACE2-2
B.taurus-ACE2
B.hybrid-ACE2-2
Bison-ACE2
Sheep-ACE2
Goat-ACE2-1
Goat-ACE2-2
Horse-ACE2
Camel-ACE2
Alpaca-ACE2
Pig-ACE2-2
Pig-ACE2-1
Pig-ACE2-3

Consensus S GSS LSADKSKRLNTILN MSTIYSTGKVC PNNPQECV LEPGLDDIMENS DYN RLWAWEGWRAEVGKQLRPLYEEYVVLKNEAARA--NNYEDYGDYWRGDYEV
Zebraphis-ACE2
Zebraphis-ACE2-1
Zebraphis-ACE2-2
Frog-ACE2
Chicken-ACE2
Guinea-pig-ACE2
Rabbit-ACE2
Hamster-ACE2
Mouse-ACE2
Rat-ACE2
Pangolin-ACE2
Ferret-ACE2
Otter-ACE2
Tiger-ACE2
Cat-ACE2
Cat-ACE2-1
Panda-ACE2
Dog-ACE2
Dog-ACE2-1
Dog-ACE2-2
Bat-ACE2
Monkey-ACE2
Human-ACE2-3
Human-ACE2-1
Human-ACE2-2
Bufflo-ACE2
B.hybrid-ACE2
B.hybrid-ACE2-3
B.hybrid-ACE2-1
B.taurus-ACE2-1
B.taurus-ACE2-2
B.taurus-ACE2-1
B.indicus-ACE2-1
B.indicus-ACE2-2
B.taurus-ACE2
B.hybrid-ACE2-2
Bison-ACE2
Sheep-ACE2
Goat-ACE2-1
Goat-ACE2-2
Horse-ACE2
Camel-ACE2
Alpaca-ACE2
Pig-ACE2-2
Pig-ACE2-1
Pig-ACE2-3

Consensus

Zebrafish-ACE2	IDDPKYSYSDQVIEDARRIYKELPLYKELHAYVRAKLDQVYYP-HIGSDAALPAHLLGDMWGRFNTLNLVLP	317
Zebrafish-ACE2-1	IDDPKYSYSDQVIEDARRIYKELPLYKELHAYVRAKLDQVYYP-HIGSDAALPAHLLGDMWGRFNTLNLVLP	317
Zebrafish-ACE2-2	IDDPKYSYSDQVIEDARRIYKELPLYKELHAYVRAKLDQVYYP-HIGSDAALPAHLLGDMWGRFNTLNLVLP	317
Frog-ACE2	LATDMVAYSRDLKIDVERTFQEIPLKYLHAFVRRNQVYVSRISDSGCLPAHLLGDMWGRFNTLNLVLP	320
Chicken-ACE2	DYPEYKYSRDLQVVDKVFTEIKPLYLHAYVRRKLVQYVSELINPTGCLPAHLLGDMWGRFNTLNLVLP	318
Guinea-pig-ACE2	EDMDGYNYSRNLIDVERTFAIKPLYLHAYVRRKLMETYPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	326
Rabbit-ACE2	EGADGYSYRDLIDVERTFSEIKPLYLHAFVRRKLMETYPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Hamster-ACE2	EGADGYNYSRNLIDVERTFSEIKPLYLHAYVRRKLMETYPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Mouse-ACE2	EGADGYNYSRNLIDVERTFAIKPLYLHAYVRRKLMETYPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Rat-ACE2	EGVGEYYSRNLIDVERTFAIKPLYLHAYVRRKLMETYPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Pangolin-ACE2	EGANGYYSRDLIDVERTFQIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Ferret-ACE2	EWADGYSYRNLIDVERTFQIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Otter-ACE2	EWADGYSYRNLIDVERTFQIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Tiger-ACE2	EMTDGYSYRDLIDVERTFQIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	310
Cat-ACE2	EMTDGYSYRDLIDVERTFQIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Cat-ACE2-1	EMTDGYSYRDLIDVERTFQIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	320
Cat-ACE2-2	EMTDGYSYRDLIDVERTFQIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Dog-ACE2	EWENGYSYRNLIDVERTFQIKPLYLHAYVRRKLMETYPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	317
Dog-ACE2-2	EWENGYSYRNLIDVERTFQIKPLYLHAYVRRKLMETYPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	317
Dog-ACE2-1	EWENGYSYRNLIDVERTFQIKPLYLHAYVRRKLMETYPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	317
Bat-ACE2	EGSPDLEYSRDLIDVERTFAIKPLYLHAYVRRKLMETYPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	317
Monkey-ACE2	NGVDGYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Human-ACE2-3	NGVDGYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Human-ACE2	NGVDGYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Human-ACE2-1	NGVDGYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Human-ACE2-2	NGVDGYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Bufflo-ACE2	TGAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	315
B.hybrid-ACE2	TGAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	317
B.hybrid-ACE2-3	TGAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	256
B.hybrid-ACE2-1	TGAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	317
B.taurus-ACE2-1	TGAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	317
B.taurus-ACE2-2	TGAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	256
B.indicus-ACE2-1	TGAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	317
B.indicus-ACE2-2	TGAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	317
B.taurus-ACE2	TGAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	317
B.hybrid-ACE2-2	TGAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	317
Bison-ACE2	TGAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	317
Sheep-ACE2	TGAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	317
Goat-ACE2-1	TGAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	317
Goat-ACE2-2	TGAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	256
Horse-ACE2	EGSPDLEYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Camel-ACE2	MWAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Alpaca-ACE2	MWAGDYSRDLIDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Pig-ACE2-2	TGTGDYSRNLQMEDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Pig-ACE2-1	TGTGDYSRNLQMEDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	318
Pig-ACE2-3	TGTGDYSRNLQMEDVERTFAIKPLYLHAYVRAKLMNTPY-RISPTGCLPAHLLGDMWGRFNTLNLVLP	196

Consensus

Zebrafish-ACE2	GLP MTQGFVNSMLTEPGDGRKVVCHPTAWDLGK-GDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
Zebrafish-ACE2-1	NMPAFDNNFNNNSMFIKPE-ERDVVCHPTAWDMGNRRKDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
Zebrafish-ACE2-2	NMPAFDNNFNNNSMFIKPE-ERDVVCHPTAWDMGNRRKDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
Frog-ACE2	DLFALNENFNNNSMFIKPE-ERDVVCHPTAWDMGNRRKDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	429
Chicken-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Guinea-pig-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Rabbit-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Hamster-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Mouse-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Rat-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Pangolin-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Ferret-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Otter-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Tiger-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Cat-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Cat-ACE2-1	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	429
Panda-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
Dog-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
Dog-ACE2-2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	305
Dog-ACE2-1	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
Bat-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Monkey-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Human-ACE2-3	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Human-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Human-ACE2-1	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Human-ACE2-2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Bufflo-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	425
B.hybrid-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
B.hybrid-ACE2-3	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	365
B.hybrid-ACE2-1	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
B.taurus-ACE2-1	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
B.taurus-ACE2-2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	365
B.indicus-ACE2-1	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
B.indicus-ACE2-2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
B.taurus-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
B.hybrid-ACE2-2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
Bison-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
Sheep-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
Goat-ACE2-1	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	426
Goat-ACE2-2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	365
Horse-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Camel-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Alpaca-ACE2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Pig-ACE2-2	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Pig-ACE2-1	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	427
Pig-ACE2-3	GLPMTQGFWNSMLTEPGDGRKVVCHPTAWDLGK-NDFRIKMTKVTMDDFLTAHHEMGIQYDMAYAQP	405

Consensus

EWNNDNYLFRSSVAYAMR YFS KNQTI FGEENVVSDLKPRISF FVFTSP NVSDIIPRTEVE AIR SR RINDAFRLDDNSLEFLGIQPTLGGPPPEPVTIWL

Table with 2 columns: Species (e.g., Zebrafish-ACE2, Human-ACE2-1) and Sequence (aligned amino acid sequences). Includes a color-coded bar above the sequences.

Consensus

I FGVVGMVVVGVVLLVIFLTIPTGIR RRRK QA EEN PY SVDL KGENN GFQN DD QT SF

Table with 2 columns: Species (e.g., Zebrafish-ACE2, Human-ACE2-1) and Sequence (aligned amino acid sequences). Includes a color-coded bar above the sequences.

Consensus	
Zebrafish-ACE2	----- 785
Zebrafish-ACE2-1	----- 807
Zebrafish-ACE2-2	----- 818
Frog-ACE2	TMNNTTF 862
Chicken-ACE2	----- 808
Guinea-pig-ACE2	----- 813
Rabbit-ACE2	----- 805
Hamster-ACE2	----- 805
Mouse-ACE2	----- 805
Rat-ACE2	----- 805
Pangolin-ACE2	----- 805
Ferret-ACE2	----- 805
Otter-ACE2	----- 805
Tiger-ACE2	----- 797
Cat-ACE2	----- 805
Cat-ACE2-1	----- 807
Panda-ACE2	----- 805
Dog-ACE2	----- 804
Dog-ACE2-2	----- 683
Dog-ACE2-1	----- 804
Bat-ACE2	----- 805
Monkey-ACE2	----- 805
Human-ACE2-3	----- 694
Human-ACE2	----- 805
Human-ACE2-1	----- 786
Human-ACE2-2	----- 772
Bufflo-ACE2	----- 803
B.hybrid-ACE2	----- 811
B.hybrid-ACE2-3	----- 750
B.hybrid-ACE2-1	----- 811
B.taurus-ACE2-1	----- 811
B.taurus-ACE2-2	----- 750
B.indicus-ACE2-1	----- 811
B.indicus-ACE2-2	----- 804
B.taurus-ACE2	----- 804
B.hybrid-ACE2-2	----- 804
Bison-ACE2	----- 431
Sheep-ACE2	----- 804
Goat-ACE2-1	----- 804
Goat-ACE2-2	----- 743
Horse-ACE2	----- 805
Camel-ACE2	----- 805
Alpaca-ACE2	----- 805
Pig-ACE2-2	----- 792
Pig-ACE2-1	----- 805
Pig-ACE2-3	----- 683

Supplemental Fig. S1: Multiple sequence alignment of vertebrate ACE2 orthologs/paralogs. Sequence of ACE2 protein precursors were extracted from NCBI Gene and relevant databases (<https://www.ncbi.nlm.nih.gov/gene>). The protein sequences were aligned using the multiple sequence alignment tools of ClustalW or Muscle through an EMBL-EBI port (<https://www.ebi.ac.uk/>) under the default parameters.