

**Figure S1. Spike-like protein in betaCoVs.** Alignment of the spike-like protein of betaOG78 (NC\_025217, bat hp-betacoronavirus/zhejiang2013) (dark gray) with the spike protein N-terminal domain of SARS-CoV and SARS-CoV-2 (blue). Fully conserved residues are shaded in yellow.

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SARS-CoV-2      MEVFLVLLPLVSSQCWNLT--RT-----QLFPAY--T-----NSFTRGVVYEDKVERSSVLHSTQDLFLPFFSN-VVWFHAHVSGTNGTKKFDN---PVL--FENDGVYF---
SARS-CoV        MEIFLLFLTLTSGSDLRCTTFDD-----VQAPNYTQH-----TSSMRGVVYDEIIPRSDTLYLQDLFLPFFSN-VVGFHTIN-----HTFGN---PVI--PKDGIYF---
ORF2-NC_025217  MEVFLVLLFSIASAKLVKPNQHPPTTDDTAAYSNCLRLESEOWHIGLSNLTVNHDTFLIPQPTFNATTLISA--GYYPKIGDVTVITWE-AIVTGDSAENQKFKVDYDNYIPHEFGQGIIVLKVF

SARS-CoV-2      --ASTEKSNIIRGWIFGTTILDskTQSLLVNNAINNVVVKVCEFOFNDFFLVGVYHKNKSWMESEFRVYSSANNCTFEYVSQPFLLMDLEGKQGNFKNLREFVFKNIDGYFKIISKHTPIN
SARS-CoV        --AATEKSNVVRGWVFGSTMNKKSQSVLIINNSINVVIRACNFELCDNFFFAVSKPMGT-----QHTMIFDNFNFCTFEYISDAFSLDVSEKSGNFKHLREFVFKNKDGFVYKGYQPID
ORF2-NC_025217  NRDKASASTPPAFLFGSTFDNTHHTMLAVNTHHRTVAVCRFEFCSTFVVASMINNGNFQQ--YNHSSLFTSAEDCIYVNYQ--NFTMNNMTGDLRRTGTGVYYSFOYLYGYSIYAYRALH

SARS-CoV-2      LVRDLFQGFSAEFLVDLEIGINIRFOTLLALHRSYLTPGDSSSGWTAGAAAIVVGYLQPRFTLLKYNENGLITDAVDCAL-DPSETKCTL-----KSFTEKGIYQTSNFRVQTE
SARS-CoV        VVRDLPSGFNTLKPFIKPLGNIINFRAILTAFS-----PAQDIWGTSAAAVFGYLPKPTTFMLKYDENGITDAVDCSQ-NPFAELKCSV-----KSFEDKGIYQTSNFRVPSG
ORF2-NC_025217  NLTE----PKFISPFMFHFLSIAVINELVPEVWNRNYQNONAQTOARGQVIEYAM--LRLQSMYFDY--QNGTILINYSDDLSCITQTPCSTQAPCPPTSCPTQSTTSV--TTTTPTT

SARS-CoV-2      S--IVRFPNITNL-----CPFGVEFNARFASVYAWNRKRISNCVADYSVLYNSASFST--FKCYGVSPTKLNDLCFTNRYADSEVIRG
SARS-CoV        D--VVRFPNITNL-----CPFGVEFNARKFSSVYAWERKKISNCVADYSVLYNSTFFST--FKCYGVSA TKLNDLCFTSNRYADSEVIRG
ORF2-NC_025217  ISTTIKPTTISSTTSTTTQTTSRTTIAETTT--ITVASTVS-----QGTNETYSTLPPCNYTILITQSPCNDVA--YFWMVETLIIISISILGV

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