

Fig. 1

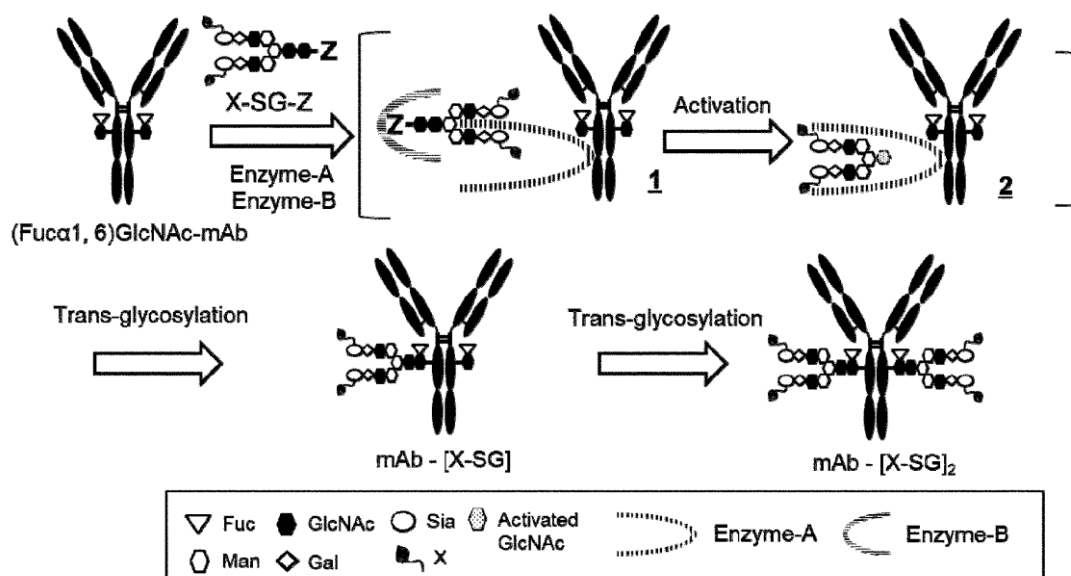


Fig. 2

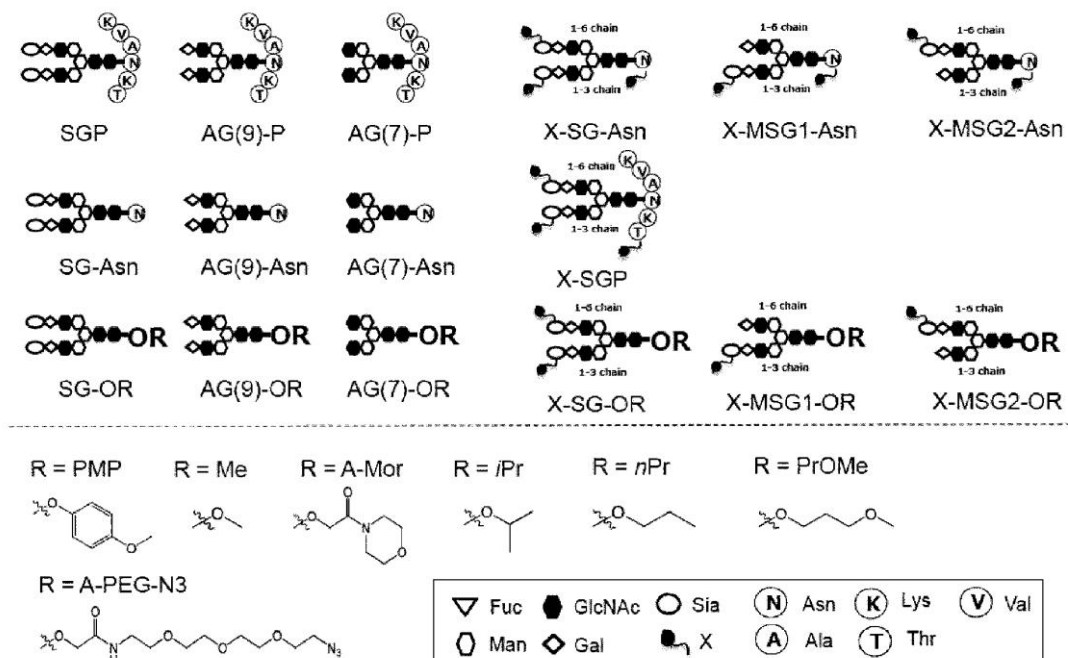


Fig. 3

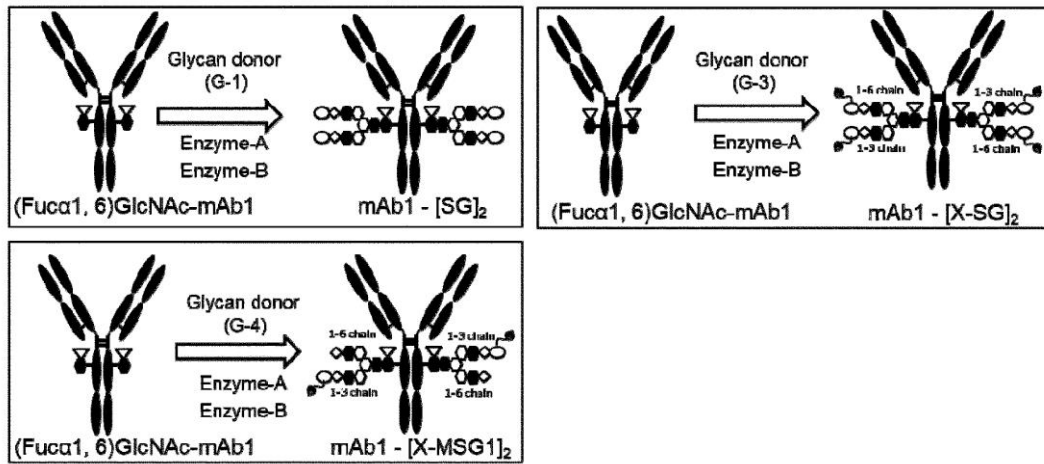


Fig. 4

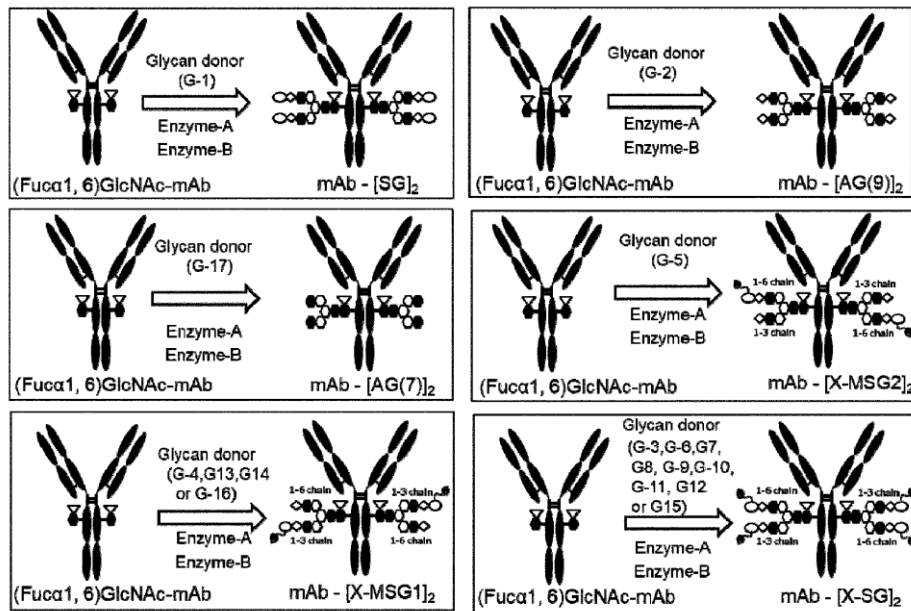


Fig. 5

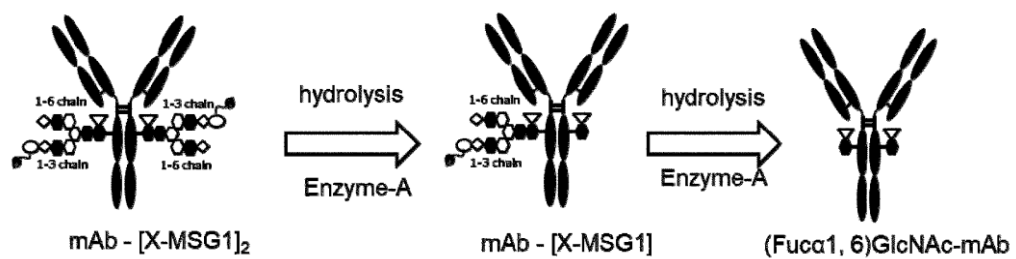


Fig. 6

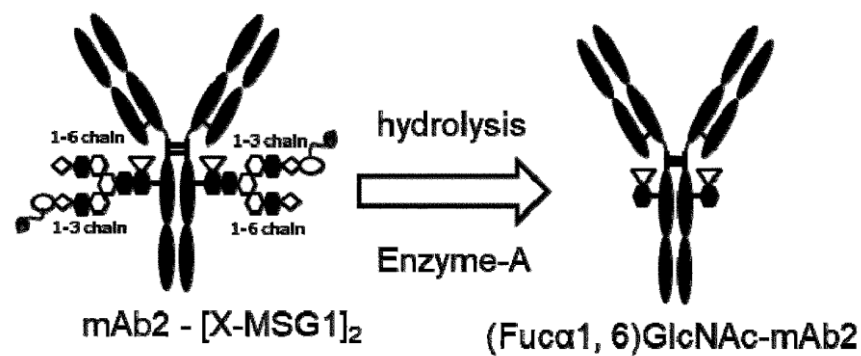


Fig. 7

SEQ ID NO: 69 Amino acid sequence of wild type Endo-S NCBI Accession number: AAK34539.1

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1   MDKHL LVKRT LGCVCAATLM GAALATHHDS LNTVKAEEKT VQVQKGLPSI 50
51  DSLHYLSENS KKEFKHEELSK AGQESQKVKE ILAKAQQADK QAQELAKMKI 100
101 PEKIPMKPLH GPLYGGYFRT WHDKTSDPTE KDKVNSMGEL PKEVDLAFIF 150
151 HDWTKDYSLF WKELATKHVP KLNKQGTRVI RTIPWRFLAG GDNSGIAEDT 200
201 SKYPNTPEGN KALAKAIVDE YVYKYNLDGL DVDVEHDSIP KVDKKEDTAG 250
251 VERSIQVFEE IGKLIGPKGV DKSRLFIMDS TYMADKNPLI ERGAPYINLL 300
301 LVQVYGSQGE KGGWEPVSNR PEKTMEERWQ GYSKYIRPEQ YMIGFSFYEE 350
351 NAQEGNLWYD INSRKDEDKA NGINTDITGT RAERYARWQP KTGGVKGGIF 400
401 SYAIDRDGVA HQPKKYAKQK EFKDATDNIF HSDYSVSKAL KTVMLKDKSY 450
451 DLIIDEKDFPD KALREAVMAQ VGTRKGDLEF FNGTLRLDNP AIQSLEGLNK 500
501 FKKLAQLDLI GLSRITKLDL SVLPANMKPG KDTLETVLET YKKDNKEEPA 550
551 TIPPVSLKVS GLTGLKELDL SGFDRETLAG LDAATLTSLE KVDISGNKLD 600
601 LAPGTENRQI FDTMLSTISN HVGSNEQTVK FDKQKPTGHY PDIYGKTSR 650
651 LPVANEKVLD QSQLLFGTVT NQGTLINSEA DYKAYQNHKI AGRSFVDSNY 700
701 HYNNEFKVSYE NYTVKVTDSF LGTTTDTKTLA TDKEETYKVD FFSPADKTKA 750
751 VHTAKVIVGD EKTMMVNLA E GATVIGGSAD PVNARKVFDG QLGSETDNIS 800
801 LGWDSKQSII FKLKEDGLIK HWRFFNDSAR NPETTNKPIQ EASLQIFNIK 850
851 DYNLDNLLN PNKFDDEKYW ITVDTYSAQG ERATAFSNTL NNITSKYWRV 900
901 VFDTKGDRYS SPVVPQLQIL GYPLPNADTI MKTVTTAKEL SQQKDKFSQK 950
951 MLDELKIKEM ALETSLNSKI FDVTAINANA GVLKDCIEKR QLLKK 995

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Fig. 8

SEQ ID NO: 70 Amino acid sequence of wild type Endo-S2 NCBI Accession number: ACI61688.1

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1   MDKHLVVKRT LGCVCAATLM GAALATHHDS LNTVKAEKKT VQTGKTDQQV 50
51  GAKLVQEIRE GKRGPYAGY FRTWHDRAS GIDGKQQHPE NTMAEVPKEV 100
101 DILFVFDHT ASDSPFWSEL KDSYVHKLHQ QGTALVQTIG VNELNGRTGL 150
151 SKDYPDTPEG NKALAAAIK AFVTDGRVDG LDIDIEHEFT NKRTPEEDAR 200
201 ALNVFKEIAQ LIGKNGSDKS KLLIMDTLS VENNPIFKGI AEDLDYLLRQ 250
251 YYGSQGGAE VDTINSWNQ YQNYIDASQF MIGFSFFES ASKGNLWFDV 300
301 NEYDPNNPEK GKDIEGTRAK KYAEWQPSTG GLKAGIFSIA IDRDGVAHVP 350
351 STYKNRTSTN LQRHEVDNIS HTDYTEVSRKL KTLMTEDKRY DVIDQKDIPD 400
401 PALREQIIQQ VGQYKGDLE YNKTLVLTGD KIQLNLKGLEK LSKLQKLELR 450
451 QLSNVKEITP ELLPESMKKD AELVMVGMTG LEKLNLSGLN RQTLDGIDVN 500
501 SITHLTSFDI SHNSLDLSEK SEDRKLLMTL MEQVSNHQKI TVKNTAFENQ 550
551 KPKGYYPQTY DTKEGHYDND NAEHDILTDF VFGTVTKRNT FIGDEEAFAI 600
601 YKEGAVDGRQ YVSKDYTYEA FRKDYKGYKV HLTASNLGET VTSKVTATTD 650
651 ETYLVVDVSDG EKVVVHHMKLN IGSGAIMMEN LAKGAKVIGT SGDFEQAKKI 700
701 FDGEKSDRFF TWGQTNWIAF DLGEINLAKE WRLFNAETNT EIKTDSSLNV 750
751 AKGRLQILKD TTIDLEKMDI KNRKEYLSND ENWTDVAQMD DAKAIFNSKL 800
801 SNVLSRYWRF CVDGGASSYY PQYTELQILG QRLSNDVANT LKD 843

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Fig. 9

SEQ ID NO: 71 Amino acid sequence of wild type Endo-Si NCBI Accession number: EKB52062.1

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1   MNKRLVVKRT FGCVCAAAIL GVAPLSHPTI VEAREELKMP NGLEQSIADV 50
51  EAKIDALTYL SKNSKDEFKH SMYEIPSNRE HKPVSPKQAL QNAKKADAQA 100
101 ERLAKMTIPK KEELKALEGP LYGGYFRTWQ DKTS DPTETN KVNSFGE LPK 150
151 EVDLAFVFDH YTKDYSLFE ELATKQVPKL NKQGTRVIRT IPWRF LSGAD 200
201 HSDISADKEK FPNTEAGNKA LAKAIVDEYV YKYNLDGLDI DIERDSVPKV 250
251 NDKEDPEALA RTVEVFKEIG KLI GANGADK SRLLIMDTTY TAEENPLIKE 300
301 TAQYLNLLL QVYGFSGENG NYLHHKNILD ETSSMEGRWQ GYSKYIRPEQ 350
351 YMVGF SFYE KDFNNRWKDI NEEDPSDPHI GEKI QGTRAE RYAKWQPKTG 400
401 GLKGGLFSYA IDRDGVAQPK QKTEHPELDK IVKSEYK VSK ALKKLMMTDD 450
451 QYQPIDQSDF PDKALRESII KQVGTRRGDL ERFKGT LRLD NPEIKDLTGL 500
501 NKLKRVAKLE LINLPKITKI DKDDL PQNLK PLTDN QKSNL EIKGTYDDSK 550
551 LYKDIPAFDL VISGLSGLES LDISGHQRDT LSGIDASTLP SLKAINISDN 600
601 HFDLAQGTEN RHILDITLAT LAKNGASTAS FDKQKPKGLY PESYSTAPLH 650
651 LQVGQ GKINV IDDLIFGTRT NQNTLINTEN DFEAYKEQTI QGKPF IAPDY 700
701 LYDNFKVSYK EYSASIVDST LAETTDKTID TAKAETYQVT VSNKDGKTVH 750
751 SVKVIVGDEK PMMVNLAQDA KIIGTDNMTQ SAKVFDGQKD QFLLSWNKDS 800
801 SVIFELKTPG TAKHWRFFDD GKND SVTL SV FKGDASN FET EKDKAENWVE 850
851 ITKDSRKND KVFSSPLEVD NAKYLVKTIK KEAKYIYFNE LQILGYPGVV 900
901 AKKTADDLRP TEADKSDDKS DKNDTEAK 928

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Fig. 10

SEQ ID NO: 72 Amino acid sequence of wild type Endo-M NCBI Accession number: BAB43869.1

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1   MPSLQLQPDD K LAPVSFALK SMNELRDWTP DEKIKFNVSS VALQPRVKNA 50
51  LKPQLLLTHD MAGGYKEDKN IQGNKYKDIY NIQYWHLADT FVYFSHERVS 100
101 IPPVNWTNAC HRNGVKCLGT FLVEGNNQMH EMEALLHGPP LLNNTDDPMR 150
151 LWSPYYADQL VAIKHYGFD GWLFNIECEF FPFPTNPKFK AEELAKFLHY 200
201 FKEKLHNEIP GSQLIWYDSM TNEGEIHWQN QLTWKNELEFF KNTDGIFLNY 250
251 WWKKEYPEMA RRVAEGIGRS GLEVYFGTDV WGRHTYGGGG FKS YKGVKTA 300
301 YSAMTSSALF GMAWTYEHFE KSEFEKMDRL FWCGGKYSDY PPPPPKNPDD 350
351 EKEVESDDSE DELMYGHKKG IADTVESIPV PGTDWFVTNF DRGFGNRFYY 400
401 RGKRLLSQPW SHLSHQAILP NKS YRNPEIY PTDQNIKITS SLDCDHGAFL 450
451 GGTSLLIKGQ RFNHRESHDV ETEISIPLYK LSLDASKGCS LRYIYRTLIM 500
501 KDVKLTVACH FSLKTND SVN FFKVWQPDEN FSFEYDDGMR ATVTTENSTE 550
551 SRCFLLRTE EDTGENDWIT KTINVPAPVE GSQLYITRLE VSVVLDTAGL 600
601 VGLVNQVIAC LGYISITPTI NSGIKTSSR IIQDLFWKDQ KYTKIGKESL 650
651 DDIAQEEVHR YYGTLNWENT ANVVNAWEEI DYNNVFYKES DDSATRIFLG 700
701 TAFCNQFRVS GLDIILSKLP KIVIEAVNKE GYISSSGSID LSLN 744

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Fig. 11

SEQ ID NO: 73 Amino acid sequence of wild type Endo-Rp NCBI Accession number: unregistered*

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1   MPSLELQQAA DTRLFESMPL QTMNELGSWE PSNASRANIA TIPLHQRSNL 50
51  DPAPRLIVT HDMAGGYKED SNIQGN TYDT IYSCQYWQYV DTFIYFSHHR 100
101 VTIPPVNWIN ACHRNGVKTL GTFIVEGAAG MFALERFVYG PEPGQRNSWS 150
151 PYYADKLVDI AEFYGF DGWL LNIESDFFPL YRNPSLKAIH LAKLLRYLKN 200
201 AMHARVPGSE IIWYDSMTTN GSVQWQNNIT PKNSIFFEAA DGIFLNYWWN 250
251 ATPVPLALQV AHRLGRQGS D VYFGTDVWGR GTFGGGGFDS YLAVGTARAF 300
301 KTSSALFGTA WIYEHFGKKD FELMDRLWL GGDQSEYPAQ EGEQNRTVKV 350
351 TSHLGRHPGI ADVSPVRSAP GKTWFATWFD RGYGTGFYYQ GKKLLSQPWS 400
401 HLSHQSI PPN LIARLQREEN HGLSYFLADD DAYIGGTSLL IAAEITQERQ 450
451 LPLYQLEYDV TEGCEVQFIY KSPEPDMQ GK IDIYLNQVT DILPDELAFY 500
501 WQDVTDASSQ ADATTAMRLY LNENTVIY LK PSRKQELAE G WLLCSVRVPP 550
551 TYPLGIATIK ELGIHVDGKE TVLFRLGLLT IIPLGDAPSA LSRTQVQLQ 600
601 RDEDIHSKCP SSSCELWATL SWMMEHNSKE DWDQVDHYMI FFKNVDSKAE 650
651 PIFLGTSFST EYRISGLEIK KHGNSIEIWA VNRLGTVIAR QDIDIQ 696

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Fig. 12

SEQ ID NO: 74 Amino acid sequence of wild type Endo-CC NCBI Accession number: EAU82416.1

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1   MPIAGKKFHP RALPEFWRTF REMDEWRATQ TGPQARPAEG ILKYVPRKIR 50
51  PADIAGKGRL LVSHDYKGGY VEDPFSKSYS FNWWFSTDSF NYFAHHRITI 100
101 PPPEWINAAH RQGVPILGTI IFEGGSDEDI LRMVIGKTPG STSNFHAERN 150
151 AEYTVPVSSY YAELEFADLAV ERGFDGWLLN VEIGLQGGSE QARGLAAWVA 200
201 LLQQEVLKKV GPHGLVIWYD SVTVRGDLWW QDRLNAFNLP FFLNSSGIFT 250
251 NYWWYNDAPQ KQIDFLSRVD PNLTGQTAEP HQYNLQKTIQ DIYIGVDVWG 300
301 RGSHEGGGGFG AYKAIEHADP KGLGFSVALLF AQGWTWETEE EKPGWNWAQF 350
351 WDYDSKLWVG PPGVVEAPDH TVKPGGEYPCV HGPFQPISSF FLTYPPPDPL 400
401 DLFFYTNECP GIGDAWFVEG KEVFRSETGW TDMDKQTTVG DLVWPRPKIY 450
451 DLPSQNASQA TLNAAFNFND AWNGGNSLQI NLTVPGGATT YGAYWVPIQT 500
501 FTFSSRRQYE ASIVYKPGLS GKTRFDAKYE VGIRTITGED QGKIISNTTT 550
551 EVGNGWRKVH ILFEIETPVE GGSIIVPSSI GLVIAVSNSV TTEQFEFPFL 600
601 VGQITIHPhL PDRYKEFKPA LLWLLFTPSA GTNSLDGTLT WDVVAAIERP 650
651 PPVEINNPDQ AQIPWNLQPT KQEWFPDFLY FNVYVLELLD GGGQGPQWI 700
701 GTTGYDGEKK RFFIYDESLP PTSGLRRFTF QIEGVLETGE STHWYDAPAA 750
751 PSATAGGEQK RTRRTSLKSV LSPLRRKSK GDISVAK 787

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Fig. 13

SEQ ID NO: 75 Amino acid sequence of wild type Endo-Om NCBI Accession number: BAN20080.1

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1   MAQSQLLGGA VRPVFFDKLE ELRRWHTQSA NLSRESELDL LNVATEPFSS 50
51  YERAQTGSGS RSSEPVPGDK EDPPIKLMVC HDFKGGYQDY EDAQPLGYFP 100
101 HPTGSRYFLQ YPQLIDQFVY FSHHRVTVPP VNWINFCHRN GIKCFGTVIF 150
151 EGNASKDFEE LDRLVSRDEK GDFVFVDALI KLAHYGFDG YLLNIETTF 200
201 NTKIAADLEP FAEQLKSGH CLDSKNELIW YDSYVFPANK VSYTNGVTES 250
251 NYNFFSLSDA FFSNYWWNIK NLQENIKNVG VLGVSQKKIYV GYDVWGRGTL 300
301 VGKGGFDSSL ACKMIAKFS NVALFAPAWT YESLGPKDFN QNDARFWIGL 350
351 FENESSISST VPPHSSAVYK INESSFIFYT NFSSGEGNRF FSKGSEVYRK 400
401 NWVNGSLQFD LPIDLHRKDK NGLQWALDKS DAFHGGACLE IKYSEIKDEN 450
451 GYQIFNNQMV SDFTLFNFTK ECHFPVTNVK VTYKLNHKT STFKIKIKYI 500
501 IERRFRSVQT VRTGYLTIPL LSTSGKWFTV EESFQINLQT SHEYIVLESA 550
551 HVTYDEDRSA DSFFRSYIVE DSAITSVIDN EEYEKLINSE IYNDDEDEDW 600
601 ILVPSDVSIS SSESQSNDSK TQYLGRKLFG NKSTPKTRTL EGTAPLLRIG 650
651 EFAIISANNY PSSNFLAVTS VKSIESSRLG GDSLVLNMQ VEGHQKQVC 700
701 YIIIVNGAV VGLSVAPKFI YQDTELASEN SASARSNYKK SGLGSSDRK 750
751 SKVRVDSVDK LGNVFTGSEV WV 772

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Fig. 14

Amino acid sequence of anti-CD70 antibody 1 light chain (SEQ ID NO: 1)

DIVMTQSPDSLAVSLGERATINCRASKSVSTSGYSFMHWYQQKPGQPPKLLIYLASNLES
GVPDRFSGSGSGTDFTLTISLQAEDVAVYYCQHSREVPWTFGGGTKVEIKRTVAAPSVF
IFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLS
STLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Amino acid sequence of anti-CD70 antibody 1 heavy chain (SEQ ID NO: 2)

QVQLVQSGAEVKKPGASVKVSCKASGYTFITNYGMNWVRQAPGQGLKWMGWINTYTGPTY
ADAFKGRVTMTRDTSISTAYMELSRLRSDDTAVYYCARDYGDYGM DYWGQGTITVTVSSAS
TKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGL
YSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPEAAGGP
SVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNS
TYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEM
TKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQ
QGNVFSCSVMHEALHNHYTQKSLSLSPGK

(The underline indicates an LALA mutation part.)

Fig. 15

Amino acid sequence of anti-CD70 antibody 2 light chain (SEQ ID NO: 3)

EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDASNRATGIPA
RFSGSGSGTDFTLTITSSLEPEDFAVYYCQQRINWPLTFGGGTKVEIKRTVAAPSVFIFPP
SDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSLT
LSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Amino acid sequence of anti-CD70 antibody 2 heavy chain (SEQ ID NO: 4)

QVQLVESGGGVQPGRSLRLSCAASGFTFSSYIMHWVRQAPGKGLEWVAVISYDGRNKYY
ADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCARDTDGYDFDYWGQGTLLTVSSAS
TKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPTVSWNSGALTSGVHTFPAVLQSSGL
YSLSSVTVTPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPEAAGGP
SVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNS
TYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEM
TKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPPVLDSDGSFFLYSKLTVDKSRWQ
QGNVFSCSVMEALHNHYTQKSLSLSPGK

(The underline indicates an LALA mutation part.)

Fig. 16

Amino acid sequence of anti-TROP2 antibody 1 light chain (SEQ ID NO: 5)

DIQMTQSPSSLSASVGRVTITCKASQDVSTAVAWYQQKPGKAPKLLIYSASYRTGVPS
RFSGSGSGTDFTLTITSSLQPEDFAVYYCQQHYITPLTFGGGKLEIKRTVAAPSVFIFPP
SDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSLT
LSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Amino acid sequence of anti-TROP2 antibody 1 heavy chain (SEQ ID NO: 6)

QVQLVQSGAEVKKPGASVKVSCKASGYFTTAGMQWVRQAPGQGLEWMGWINTHSGVPKY
AEDFKGRVTISADTSTSTAYLQLSSLKSEDTAVYYCARSGFGSSYWFYDVWGQGTLLTVS
SASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPTVSWNSGALTSGVHTFPAVLQS
SGLYSLSSVTVTPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELLG
GPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQY
NSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRE
EMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPPVLDSDGSFFLYSKLTVDKSR
WQGNVFSCSVMEALHNHYTQKSLSLSPGK

Fig. 17

Amino acid sequence of anti- TROP2 antibody 2 light chain (SEQ ID NO: 7)

DIQMTQSPSSLSASVGDRVTITCKASQDVSTAVAWYQQKPGKAPKLLIYSASYRYTGVP
 RFSGSGSGTDFTLTISLQPEDFAVYYCQQHYITPLTFGGGTKLEIKRTVAAPSVFIFPP
 SDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTYSLSSTLT
 LSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Amino acid sequence of anti-TROP2 antibody 2 heavy chain (SEQ ID NO: 8)

QVQLVQSGAEVKKPGASVKVSCKASGYTFTTAGMQWVRQAPGGGLEWMGWINTHSGVPKY
 AEDFKGRVTISADTSTSTAYLQLSSLKSEDTAVYYCARSGFGSSYWFYFDVWGQGTLLVTVS
 SASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQS
 SGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPEAA
 GGPSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQ
 YNSTYRVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSR
 EEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPVLDSDGSFFLYSKLTVDKS
 RWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK

(The underline indicates an LALA mutation part.)

Fig. 18

Amino acid sequence of anti-EGFR antibody 1 light chain (SEQ ID NO: 9)

DIQMTQSPSSLSASVGDRVTITCQASQDISNYLNWYQQKPGKAPKLLIYDASNLETGVPS
RFSGSGSGTDFTFTISSLPEDIAITYFCQHFHDLPLAFGGGKVEIKRTVAAPSVFIFPP
SDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTYSLSSTLT
LSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Amino acid sequence of anti-EGFR antibody 1 heavy chain (SEQ ID NO: 10)

QVQLQESGPGLVKPSSETLSLTCTVSGGSVSSGDYYWTWIRQSPGKGLEWIGHIYYSGNTN
YNPSLKSRLTISIDTSKTQFSLKLSSVTAADTAIYYCVRDRVTGAFDIWGGQTMVTVSSA
STKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSG
LYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPEAAGG
PSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN
STYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREE
MTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPVLDSDGSFFLYSKLTVDKSRW
QQGNVVFSCVMHEALHNHYTQKSLSLSPGK

(The underline indicates an LALA mutation part.)

Fig. 19

Amino acid sequence of anti-EGFR antibody 2 light chain (SEQ ID NO: 11)
 DILMTQSPSSMSVSLGDTVSITCHSSQDINSNIGWLQQRPGKSFKGLIYHGTNLDDDEVPS
 RFSGSGSGADYSLTISSESEDFADYYCVQYAQFPWTFGGGKLEIKRTVAAPSVFIFPP
 SDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKSTYSLSSTLT
 LSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Amino acid sequence of anti-EGFR antibody 2 heavy chain (SEQ ID NO: 12)
 DVQLQESGPSLVKPSQSLSLTCTVTGYSITSDFAWNWIRQFPGNKLEWMGYISYSGNTRY
 NPSLKSRISITRDTSKNQFFLQLNSVTIEDTATYYCVTAGRGFPYWGGTLVTVSAASTK
 GPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS
 LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPEAAGGPSV
 FLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTY
 RVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTK
 NQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQG
 NVFSCSVMEALHNHYTQKSLSLSPGK

(The underline indicates an LALA mutation part.)

Fig. 20

CDRL1 amino acid sequence of anti-CD70 antibody 1 (SEQ ID NO: 13)
 RASKSVSTSGYSFMH

CDRL2 amino acid sequence of anti-CD70 antibody 1 (SEQ ID NO: 14)
 LASNLES

CDRL3 amino acid sequence of anti-CD70 antibody 1 (SEQ ID NO: 15)
 QHSREVPWT

CDRH1 amino acid sequence of anti-CD70 antibody 1 (SEQ ID NO: 16)
 GYTFTNYGMN

CDRH2 amino acid sequence of anti-CD70 antibody 1 (SEQ ID NO: 17)
 WINTYTGEPTYADAFKG

CDRH3 amino acid sequence of anti-CD70 antibody 1 (SEQ ID NO: 18)
 DYGDYGMDY

Fig. 21

CDRL1 amino acid sequence of anti-CD70 antibody 2 (SEQ ID NO: 19)

RASQSVSSYLA

CDRL2 amino acid sequence of anti-CD70 antibody 2 (SEQ ID NO: 20)

DASNRAT

CDRL3 amino acid sequence of anti-CD70 antibody 2 (SEQ ID NO: 21)

QQRTNWPLT

CDRH1 amino acid sequence of anti-CD70 antibody 2 (SEQ ID NO: 22)

SYIMH

CDRH2 amino acid sequence of anti-CD70 antibody 2 (SEQ ID NO: 23)

VISYDGRNKYYADSVKG

CDRH3 amino acid sequence of anti-CD70 antibody 2 (SEQ ID NO: 24)

DTDGYDFDY

Fig. 22

CDRL1 amino acid sequence of anti-TROP2 antibody 1 (SEQ ID NO: 25)

KASQDVSTAVA

CDRL2 amino acid sequence of anti-TROP2 antibody 1 (SEQ ID NO: 26)

SASYRYT

CDRL3 amino acid sequence of anti-TROP2 antibody 1 (SEQ ID NO: 27)

QQHYITPLT

CDRH1 amino acid sequence of anti-TROP2 antibody 1 (SEQ ID NO: 28)

TAGMQ

CDRH2 amino acid sequence of anti-TROP2 antibody 1 (SEQ ID NO: 29)

WINTHSGVPKYAEDFKG

CDRH3 amino acid sequence of anti-TROP2 antibody 1 (SEQ ID NO: 30)

SGFGSSYWYFDV

Fig. 23

CDRL1 amino acid sequence of anti-TROP2 antibody 2 (SEQ ID NO: 31)
KASQDVSTAVA

CDRL2 amino acid sequence of anti-TROP2 antibody 2 (SEQ ID NO: 32)
SASYRYT

CDRL3 amino acid sequence of anti-TROP2 antibody 2 (SEQ ID NO: 33)
QQHYITPLT

CDRH1 amino acid sequence of anti-TROP2 antibody 2 (SEQ ID NO: 34)
TAGMQ

CDRH2 amino acid sequence of anti-TROP2 antibody 2 (SEQ ID NO: 35)
WINTHSGVPKYAEDFKG

CDRH3 amino acid sequence of anti-TROP2 antibody 2 (SEQ ID NO: 36)
SGFGSSYWYFDV

Fig. 24

CDRL1 amino acid sequence of anti-EGFR antibody 1 (SEQ ID NO: 37)
QASQDISNYLN

CDRL2 amino acid sequence of anti-EGFR antibody 1 (SEQ ID NO: 38)
DASNLET

CDRL3 amino acid sequence of anti-EGFR antibody 1 (SEQ ID NO: 39)
QHFDHLPLA

CDRH1 amino acid sequence of anti-EGFR antibody 1 (SEQ ID NO: 40)
SGDYWT

CDRH2 amino acid sequence of anti-EGFR antibody 1 (SEQ ID NO: 41)
GHIYYSGNTNYPNPSLKS

CDRH3 amino acid sequence of anti-EGFR antibody 1 (SEQ ID NO: 42)
DRVTFGAFDI

Fig. 25

CDRL1 amino acid sequence of anti-EGFR antibody 2 (SEQ ID NO: 43)

HSSQDINSNIG

CDRL2 amino acid sequence of anti-EGFR antibody 2 (SEQ ID NO: 44)

HGTNLDD

CDRL3 amino acid sequence of anti-EGFR antibody 2 (SEQ ID NO: 45)

VQYAQFPWT

CDRH1 amino acid sequence of anti-EGFR antibody 2 (SEQ ID NO: 46)

GYSITSDFAWN

CDRH2 amino acid sequence of anti-EGFR antibody 1 (SEQ ID NO: 47)

GYISYSGNTRYNPSLK

CDRH3 amino acid sequence of anti-EGFR antibody 2 (SEQ ID NO: 48)

VTAGRGFPY

Fig. 26

Amino acid sequence of trastuzumab light chain (SEQ ID NO: 49)

DIQMTQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYSASFLYSGVPS
RFGSGRSGTDFTLTISSLPEDFATYYCQQHYTTPPTFGQGTKVEIKRTVAAPSVFIFPP
SDEQLKSGTASVVCLLNFPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSLT
LSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Amino acid sequence of trastuzumab heavy chain (SEQ ID NO: 50)

EVQLVESGGGLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLEWVARIYPTNGYTRY
ADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRWGGDGFYAMDYWGQGLTVTVSS
ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSS
GLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELGG
PSVFLFPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN
STYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREE
MTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPPVLDSDGSFFLYSKLTVDKSRW
QQGNVVFSCSVMHREALHNHYTQKSLSLSPGK

Fig. 27

Amino acid sequence of engineered anti-HER2 antibody light chain (SEQ ID NO: 49)

DIQMTQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYSASFLYSGVPS
RFSGSRSGTDFTLTISSLQPEDFATYYCQQHYTTPPTFGQGTKVEIKRTVAAPSVFIFPP
SDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSLT
LSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Amino acid sequence of engineered anti-HER2 antibody heavy chain (SEQ ID NO: 51)

EVQLVESGGGLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLEWVARIYPTNGYTRY
ADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRWGGDGFYAMDYWGQGTLVTVSS
ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSS
GLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPEAAG
GPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQY
NSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRE
EMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPPVLDSDGSFFLYSKLTVDKSR
WQGGNVFSCSVMHEALHNHYTQKSLSLSPGK

(The underline indicates an LALA mutation part.)

Fig. 28

Amino acid sequence of pertuzumab light chain (SEQ ID NO: 52)

DIQMTQSPSSLSASVGDRVTITCKASQDVSIQVAWYQQKPGKAPKLLIYSASYRTGVPS
RFSGSGSGTDFTLTISSLQPEDFATYYCQQYYIYPYTFGQGTKVEIKRTVAAPSVFIFPP
SDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDYSLSSLT
LSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Amino acid sequence of pertuzumab heavy chain (SEQ ID NO: 53)

EVQLVESGGGLVQPGGSLRLSCAASGFTFTDYTMDWVRQAPGKGLEWVADVNPNSGGSIY
NQRFKGRFTLSVDRSKNTLYLQMNSLRAEDTAVYYCARNLGPSFYFDYWGQGTLVTVSSA
STKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSG
LYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGP
SVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNS
TYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEM
TKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPPVLDSDGSFFLYSKLTVDKSRWQ
QGNVVFSCSVMHEALHNHYTQKSLSLSPGK

Fig. 29

Amino acid sequence of engineered anti-HER2 antibody 2 light chain (SEQ ID NO: 52)

DIQMTQSPSSLSASVGDRVTITCKASQDVSIGVAWYQQKPGKAPKLLIYSASYRTGVPS
RFGSGSGSDFTLTISLQPEDFATYYCQQYYIYPYTFGGGTKVEIKRTVAAPSVFIFPP
SDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSSTLT
LSKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Amino acid sequence of engineered anti-HER2 antibody 2 heavy chain (SEQ ID NO: 54)

EVQLVESGGGLVQPGGSLRLSCAASGFTFTDYMWDVRQAPGKGLEWVADVNPNSGGSIY
NQRFKGRFTLSVDRSKNTLYLQMNSLRAEDTAVYYCARNLGPSFYFDYWGGGLTVTVSSA
STKGPSVFLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSG
LYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPEAAGG
PSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYN
STYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREE
MTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPPVLDSDGSFFLYSKLTVDKSRW
QQGNVVFSCSVMEALHNHYTQKSLSLSPGK

(The underlines indicate K214R mutation and LALA mutation parts.)

Fig. 30

Amino acid sequence of anti-CDH6 antibody light chain (SEQ ID NO: 55)

DIQMTQSPSSLSASVGDRVTITCKASQNIYKNLAWYQQKPGKAPKLLIYDANTLQTVPS
RFGSGSGSGSDFTLTISLQPEDFATYFCQQYYSGWAFGGGTKVEIKRTVAAPSVFIFPPS
DEGLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSSTLT
SKADYEKHKVYACEVTHQGLSSPVTKSFNRGEC

Amino acid sequence of anti-CDH6 antibody heavy chain (SEQ ID NO: 56)

EVQLVQSGAEVKKPGASVKVSCKASGYTFTRNFMHWVRQAPGGGLEWMGWIPGDGETEY
AQKFQGRVTITADTSTSTAYMELSSLRSEDTAVYYCARGVYGGFAGGYFDWGGGLTVTV
SSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQ
SSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPEAA
GGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQ
YNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALGAPIEKTISKAKGQPREPQVYTLPPSR
EEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTPPVLDSDGSFFLYSKLTVDKS
RWQQGNVVFSCSVMEALHNHYTQKSLSLSPGK

Fig. 31

CDRL1 amino acid sequence of pertuzumab (SEQ ID NO: 57)

Q D V S I G

CDRL2 amino acid sequence of pertuzumab (SEQ ID NO: 58)

S A S

CDRL3 amino acid sequence of pertuzumab (SEQ ID NO: 59)

Q Q Y Y I Y P Y T

CDRH1 amino acid sequence of pertuzumab (SEQ ID NO: 60)

G F T F T D Y T

CDRH2 amino acid sequence of pertuzumab (SEQ ID NO: 61)

V N P N S G G S

CDRH3 amino acid sequence of pertuzumab (SEQ ID NO: 62)

A R N L G P S F Y F D Y

Fig. 32

CDRL1 amino acid sequence of anti-CDH6 antibody (SEQ ID NO: 63)

K A S Q N I Y K N L A

CDRL2 amino acid sequence of anti-CDH6 antibody (SEQ ID NO: 64)

D A N T L Q T

CDRL3 amino acid sequence of anti-CDH6 antibody (SEQ ID NO: 65)

Q Q Y Y S G W A

CDRH1 amino acid sequence of anti-CDH6 antibody (SEQ ID NO: 66)

R N F M H

CDRH2 amino acid sequence of anti-CDH6 antibody (SEQ ID NO: 67)

W I Y P G D G E T E Y A Q K F Q G

CDRH3 amino acid sequence of anti-CDH6 antibody (SEQ ID NO: 68)

G V Y G G F A G G Y F D F

Fig. 33

SEQ ID NO: 76 Amino acid sequence of wild type Endo-Sd GenBank Accession number: ANI26082

1	MDKRLLVKRT	LGCVCSATLM	GTILGTHHDS	LISVKAEEKI	TQVSQTSTSI	50
51	DDLHYLSENS	KKEFKEELSK	EKVPEKVKEI	LSKAQQANKQ	AQELAEMKVP	100
101	DKIPMKPLNG	PLYGGYFRTW	HDKTSDFLEK	DKVNSMGELP	KEVDLAFVFH	150
151	DWTKDYSFLW	KELATKHVPK	LNKQCTR VIR	TIPWRFLAGG	DNSGIAEDAS	200
201	KYPNTPEGNK	ALAKAIVDEY	VYKYNLDGLD	V D IEHDSIPK	VNGEASDENL	250
251	KRSIDVFEEI	GKLIGPKGAD	KSRLFIMD ST	YMADKNPLIE	RGAPYIDLLL	300
301	VQVYGSQGEQ	GEFQNDTKSV	TKTPEERWQC	YSKYIRPEQY	MIGFSFYEEK	350
351	AGSGNLWYDI	NARKDEDTAN	GINDDITGTR	AERYARWQPK	TGGVKGGIFS	400
401	YAIRDRGV AH	QPKQIAEKDK	QSVKNNRPLI	SEITDNIFHS	NYSVSKTLKT	450
451	VMLKDKAYDL	IDEKDFPDKA	LREAVMAQVG	TRKGDLERFN	GTLRLDNPAI	500
501	QSLEGLNKFK	KLAQLDLIGL	SRIIKLDQSV	LPANMKPGKD	PLETVLETYK	550
551	KNGKEEPAII	PPVSLTVSGL	TGLKELDLSC	FDRETLAGID	AATLTSLEKV	600
601	DISDNKDLA	PKTENRQIFD	VMLSTVNNNA	GISEQSIKFD	NQKPAGNYPQ	650
651	TYGATNLQLP	VRQEKIDLQH	QLLFGTITNQ	GTLINEADY	KTYRNQKIAG	700
701	RNFVDPDYPY	NNFKVSHDNY	TVKVTDSLGL	TTTDKMLATD	KEETYKVDFF	750
751	SPTDKTKAVH	TAKVIVGDEK	TMMVNLAEGA	TVIKSENDEN	AQKVFNGIME	800
801	YNPLSFNNKS	SIIFEIKDPS	LAKYWRFLND	SSKDKKDYIK	EAKLEVFTGQ	850
851	LNAEADV KTI	LEKPDNWTV	STYSGEEKVF	SHSLDNISAK	YWRVTVDNKK	900
901	DQYGYVSLPE	LQILGYPLPN	ADTIMKT VTV	AKELSQQQDK	FPQQLLDEST	950
951	AKEAVVEASL	NSKLFD TGVI	NTNVEALKNV	VDECLAYEKN	KETAFKATED	1000
1001	YRAAVNGVKA	ESVTVEEMAQ	LKDLIGKAAH	LNSKIDAKLA	DREYDKDLLG	1050
1051	LIGELTNITR	TVKSFVK				1067

Fig. 34

SEQ ID NO: 77 Amino acid sequence of wild type Endo-SzGenBank Accession number: KIS14581.1

1	MEKQVLVKKT	LKCVCAAALM	VAILAAQHDS	LIRVKAEDKL	VQTSPTSVAI	50
51	DALHYLSENS	KKEFKEELSK	VEKAQPEKLE	EIVSKAQQAD	KQAKTLAEMK	100
101	VPEKIPMKPL	KGPLYGGYFR	TWHDKTS DPA	EKDKVNSMGE	LPKEVDLAFV	150
151	FHDWTKDYSL	FWQELATKHV	PTLNKQGTRV	IRTIPWRFLA	GGDHSGIAED	200
201	AQKYPNTPEG	NKALAKAIVD	EYVYKYNLDG	LDV D IERDSI	PKVNKEESKE	250
251	GIERSIQVFE	EIGKLIGPKG	ADKSRLFIMD	ST YMADKNPL	IERGAPYIDL	300
301	LLVQVYGTQG	EKGGF DNANH	KAVDTMEERW	ESYSKYIRPE	QYMGVFSFYE	350
351	E KANSGLNLY	DVNVEDDTNP	NIGSEIKGTR	AERYAKWQPK	TGGVKGGIFS	400
401	YGIDRDGV AH	PKKNGPKTPD	LDKIVKSDYK	VSKALKK VME	NDKSYELIDQ	450
451	KDFPDKALRE	AVIAQVGSRR	GNLERFN GTL	RLDNPDIKSL	EGLNKLK KLA	500
501	KLELIGLSQI	TKLDSSVLPE	NIKPTKDTLV	SVLETYKNDD	RKEEAKAIPQ	550
551	VALTISGLTG	LKELNLAGFD	RDSL AGIDAA	SLTSLEKVDL	SSNKDLAAG	600
601	TENRQILD TM	LATVTKHGGV	SEKTFVFDHQ	KPTGLYPDTY	GTKSLQLPVA	650
651	NDTIDLQAKL	LFGTVTNQGT	LINSEADYKA	YQE QE IAGHR	FVDSSYDYKA	700
701	FAVTYKDYKI	KVTDSTLGVT	DHKDLSTSKE	ETKYVEFFSP	INSTKPVHEA	750
751	KIVVGEEKTM	MVNLAEGATI	IGGDADPTNA	KKVFDGLLNN	DTTTLSTSNK	800
801	ASII FELKEP	GLVKHWRFFN	DSKISKADYI	KEAKLEAFVG	HLEDSSKVKD	850
851	SLEKSTEWVT	VSDYSGEAQE	FSQPLNNIGA	KYWRITIDNK	KSQYGYVSLP	900
901	ELQII GHRLP	EAATVMTTMA	AAEELSQQKD	KFSQEQ LKEL	EVKVAALKAA	950
951	LDNKM FNADT	INASFADVKA	YIDKLLADAA	GKKTLGKATK	EAQPVATDAK	1000
1001	EKA ESENPKA	D				1011

Fig. 35

SEQ ID NO: 78 Amino acid sequence of wild type Endo-Se GenBank Accession number: CAW92602.1

1	MEKQVLVKKT	LKCVCAAALM	VAILAAQHDS	LIRVKAEDKV	VQTSPSVSAI	50
51	DDLHYLSENS	KKEFK EGLSK	AGEVPEKLKD	ILSKAQQADK	QAKVLAEMKV	100
101	PEKIAMKPLK	GPLYGGYFRT	WHDKTS DP AE	KDKVNSMGEL	PKEVDLAFVF	150
151	HDWTKDYSFF	WQELATKHVP	TLNKQGTRVI	RTIPWRFLAG	GDHSGIAEDT	200
201	QKYPNTPEGN	KALAKAIVDE	YVYKYNLDGL	DVDIERDSIP	KVNGKESNEN	250
251	IQRSI AVFEE	IGKLIGPKGA	DKSRLFIMDS	TYMADKNPLI	ERGAQYIDLL	300
301	LVQVYGTQGE	KGDWD PVARK	PEKTMEERWE	SYSKYIRPEQ	YMGVGSFYEE	350
351	NAGSGNLWYD	INERKDDHNP	LNSEIAGTRA	ERYAKWQPKT	GGVKG GIFY	400
401	AIDRDGVAHQ	PKKVSDDEKR	TNKAIKDITD	GIVKSDYKVS	KALKKVMEND	450
451	KSYELIDQKD	FPDKALREAV	IAQVGSRRGD	LERFNGTLRL	DNPDIKSLEG	500
501	LNKLK LAKL	ELIGLSQITK	LD SLVLPANA	KPTKDTLANV	LEAYDSAKKE	550
551	ETKAIPQVAL	TISGLTGLKE	LNLAGFDRDS	LAGIDAASLT	SLEKVDLSSN	600
601	KLDLAAGTEN	RQILD TMLAT	VTKHGGVSEK	TFVFDHQKPT	GLYPDTYGTK	650
651	SLQLPVANDT	IDLQAKLLFG	TVTNQGT LIN	SEADYKAYQE	QEIAGHRFVD	700
701	SSYDYKAF AV	TYKDYKIKVT	DSTLGVT D HK	DLSTSKEETY	KVEFFSPTNS	750
751	TKPVHEAKVV	VGA EKTMMVN	LAEGATVIGG	DADPTNAKKV	FDGLLNNDTT	800
801	ILSTSNKASI	IFELKEPGLV	KYWRFFNDSK	ISKADCIKEA	KLEAFVGHLE	850
851	AGSKVKDSLE	KSSKWVTVSD	YSGEDQEFSQ	PLNNIGAKYW	RITVDTKGGR	900
901	YNWPSLP ELQ	IIGYQLPAAD	LVMAMLATAE	ELSQQKDKFS	QEQLKELEVK	950
951	IAALKAALDS	KMFNADAINA	STADLKAYVD	KLLADRTDQE	KVAKAAKVEQ	1000
1001	PVATDIKENT	EPENPKTD				1018

Fig. 36

SEQ ID NO: 79 Amino acid sequence of Endo-Si D241Q/Q311L_Endo-Rp N172V

1	MREELKMPNG	LEQSIADVEA	KIDALTYLSK	NSKDEFKHS	YEIPSNREHK	50
51	PVSPKQALQN	AKKADAQAER	LAKMTIPKKE	ELKALEGPLY	GGYFRTWQDK	100
101	TSDPTETNKV	NSFGELPKEV	DLAFVFHDYT	KDYSLFWHEEL	ATKQVPEKLNK	150
151	QGTRVIRTIP	WRFLSGADHS	DISADKEKFP	NTEAGNKALA	KAIVDEYVYK	200
201	YNLDGLDIQI	ERDSVPK VND	KEDPEALART	VEVFKEIGKL	IGANGADKSR	250
251	LLIMDTTYTA	EENPLIKETA	QYLNLLLVLV	YGFSGENGNY	LHHKNILDET	300
301	SSMEGRWQGY	SKYIRPEQYM	VGFSFYEEKD	FNNRWKDINE	EDPSDPHIGE	350
351	KIQGTRAERY	AKWQPKTGGL	KGGLFSYAID	RDGVAQPKQK	TEHPELDKIV	400
401	KSEYKVS KAL	KKLMMTDDQY	QPIDQSDFPD	KALRESIIKQ	VGTRRGDLER	450
451	FKGTLRLDNP	EIKDLTG LNK	LKRVAKLELI	NLPKITKIDK	DDL PQNLKPL	500
501	TDNQKSNLEI	KGT YDDSKLY	KDIPAFDLVI	SGLSGLES LD	ISGHQRDTLS	550
551	GIDASTLPSL	KAINISDNHF	DLAQGTENRH	ILDTILATLA	KNGASTASFD	600
601	KQKPKGLYPE	SYSTAPLHLQ	VGQGKINVID	DLIFGTRTNQ	NTLINTENDF	650
651	EAYKEQTIQG	KPFIAPDYLY	DNFKVSYKEY	SASIVDSTLA	ETTDKTIDTA	700
701	KAETYQVTVS	NKDGKTVHSV	KVIVGDEKPM	MVNLAQDAKI	IGTDNMTQSA	750
751	KVFDGQKQDF	LLSWNKDSSV	IFELKTPGTA	KHWRFFDDGK	NDSVTLSVFK	800
801	GDASNFE TEK	DKAENWVEIT	KDSRKNDDKV	FSSPLEVDNA	KYLKVTIKKE	850
851	AKYIYF NELQ	ILGYPGV VAK	KTADDLRPTE	ADKSDDKSDK	NDTEAKGGGG	900
901	SGGGGSGGGG	SHHHHHHEFG	GGGSGGGGSG	GGGSPSLELQ	QAADTRLFES	950
951	MPLQTMNELG	SWEPSNASRA	NIATIP LHQR	SNLDPAE PRL	IVTHDMAGGY	1000
1001	KEDSNIQ GNT	YDTIYSCQYW	QYVDTFIYFS	HHRVTIPPVN	WINACHRNGV	1050
1051	KTLGTFIVEG	AAGMFALERF	VYGPEPGQRN	SWSPYYADKL	VDIAEFYGF D	1100
1101	GWLLVIESDF	FPLYRNPSLK	AIHLAKLLRY	LKNAMHARVP	GSEIIWYDSM	1150
1151	TTNGSVQWQN	NITPKNSIFF	EAADGIFLNY	WWNATVPPLA	LQVAHRLGRQ	1200
1201	GSDVYFGTDV	WGRGTFGGGG	FDSYLAVGTA	RAFKTSSALF	GTAWIYE HFG	1250
1251	KKDFELMDRL	LWLGGDQSEY	PAQEGEQNRT	VKVTSHLGRH	PGIADVSPVR	1300
1301	SAPGKTWFAT	WFDRGYGTGF	YYQGKKLLSQ	PWSHL SHQSI	PPNLIARLQR	1350
1351	EENHGLSYFL	ADDDAYIGGT	SLLIAAEITQ	ERQLPLYQLE	YDVTEGCEVQ	1400
1401	FIYKSPEPDM	QGKIDIY LNL	QVTDILPDEL	AFYWQDVTDA	SSQADATTAM	1450
1451	RLYLNENTVI	YLKPSRKQEL	AEGWLLCSVR	VPPTYPLGIA	TIKELGIHVD	1500
1501	GKETVLFRLG	LLTIIP LGDA	PSALS RITQV	QLQRDEDIHS	KCPSSSCELW	1550
1551	ATLSWMM EHN	SKEDWDQVDH	YMIFFKNVDS	KAEPIFLGTS	FSTEYRISGL	1600
1601	EIKKHGNSIE	IWAVNRLGTV	IARQDIDIQ			1629

Fig. 37

SEQ ID NO: 80 Amino acid sequence of Endo-Rp N172V Endo-Si D241Q/Q311L

1	MPSLELQQAA	DTRLFESMPL	QTMNELGSWE	PSNASRANIA	TIPLHQRSNL	50
51	DPAEPRLIVT	HDMAGGYKED	SNIQGNTRYDT	IYSCQYWQYV	DTFIYFSHHR	100
101	VTIPPVNWIN	ACHRNGVKTL	GTFIVEGAAG	MFALERFVYG	PEPGQRNSWS	150
151	PYYADKLVDI	AEFYGFDGWL	LVIESDFFPL	YRNPSLKAIH	LAKLLRYLKN	200
201	AMHARVPGSE	IIWYDSMTTN	GSVQWQNNIT	PKNSIFFEAA	DGIFLNYWWN	250
251	ATVPPLALQV	AHRLGRQGS	VYFGTDVWGR	GTFGGGGFDS	YLAVGTARAF	300
301	KTSSALFGTA	WIYEHFGKKD	FELMDRLWL	GGDQSEYPAQ	EGEQNRTVKV	350
351	TSHLGRHPGI	ADVSPVRSAP	GKTWFATWFD	RGYGTGFYYQ	GKKLLSQPWS	400
401	HLSHQSIIPP	LIARLQREEN	HGLSYFLADD	DAYIGGTSLL	IAAEITQERQ	450
451	LPLYQLEYDV	TEGCEVQFIY	KSEFPDMQ GK	IDIYLNQVLT	DILPDELAFY	500
501	WQDVTDASSQ	ADATTAMRLY	LNENTVIYLY	PSRKQELAEG	WLLCSVRVPP	550
551	TYPLGIATIK	ELGIHVDGKE	TVLFRLGLLT	IIPLGDAFSA	LSRITQVQLQ	600
601	RDEDIHSCPK	SSSCELWATL	SWMMEHNSKE	DWDQVDHYMI	FFKNVDSKAE	650
651	PIFLGTSFST	EYRISGLEIK	KHGNSIEIWA	VNRLGTVIAR	QDIDIQGGGG	700
701	SGGGGSGGGG	SHHHHHHEFG	GGGSGGGGSG	GGGSREELKM	PNGLEQSIAD	750
751	VEAKIDALTY	LSKNSKDEFK	HSMYEIPSNR	EHKFPVSPQA	LQNAKKADAQ	800
801	AERLAKMTIP	KKEELKALEG	PLYGGYFRTW	QDKTSDPTET	NKVNSFGELP	850
851	KEVDLAFVFH	DYTKDYSLFW	EELATKQVPK	LNKQGTRVIR	TIPWRFLSGA	900
901	DHSDISADKE	KFPNTEAGNK	ALAKAIVDEY	VYKYNLDGLD	IQIERDSVPK	950
951	VNDKEDPEAL	ARTVEVFKEI	GKLIGANGAD	KSRLIMDTT	YTAEENPLIK	1000
1001	ETAQYLNLLL	VLVYGFSGEN	GNYLHHKNIL	DETSSMEGRW	QGYSKYIRPE	1050
1051	QYMGVGSFYE	EKDFNNRWKD	INEEDPSDPH	IGEKIQGTRA	ERYAKWQPKT	1100
1101	GGLKGGLFSY	AIDRDGVAQP	KQKTEHPELD	KIVKSEYKVS	KALKKLMMTD	1150
1151	DQYQPIDQSD	FDPKALRESI	IKQVGTTRGD	LERFKGTLRL	DNPEIKDLTG	1200
1201	LNKLKRVAKL	ELINLPKITK	IDKDDLQNL	KPLTDNQKSN	LEIKGTYYDS	1250
1251	KLYKDIPAFD	LVISGLSGLE	SLDISGHQRD	TLSGIDASTL	PSLKAINISD	1300
1301	NHFDLAQGTE	NRHILDTILA	TLAKNGASTA	SFDKQKPKGL	YPESYSTAPL	1350
1351	HLQVGQGKIN	VIDDLIFGTR	TNQTNLINTE	NDFEAYKEQT	IQGKFFIAPD	1400
1401	YLYDNFKVSY	KEYSASIVDS	TLAETTDKTI	DTAKAETYQV	TVSNKDGKTV	1450
1451	HSVKVIVGDE	KPMNVNLAQD	AKIIGTDNMT	QSAKVFDGQK	DQFLLSWNKD	1500
1501	SSVIFELKTP	GTAKHWRFFD	DGKNDSVTLS	VFKGDASNFE	TEKDKAENWV	1550
1551	EITKDSRKND	DKVFSSPLEV	DNAKYLKVTI	KKEAKYIYFN	ELQILGYPGV	1600
1601	VAKKTADDLR	PTEADKSDDK	SDKNDTEAK			1629

Fig. 38

SEQ ID NO: 81 Amino acid sequence of Endo-Rp N172H Endo-Si D241M/Q311L

1	MPSLELQQA	DTRLFESMPL	QTMNELGSWE	PSNASRANIA	TIFLHQRSNL	50
51	DPAEPRLIVT	HDMAGGYKED	SNIQGNTRYDT	IYSCQYWQYV	DTFIYFSHHR	100
101	VTIPPVNWIN	ACHRNGVKTL	GTFIVEGAAG	MFALERFVYG	PEPGQRNSWS	150
151	PYYADKLVDI	AEFYGFDGWL	LHIESDFFPL	YRNPSLKAIH	LAKLLRYLKN	200
201	AMHARVPGSE	IIWYDSMTTN	GSVQWQNNIT	PKNSIFFEAA	DGIFLNYWWN	250
251	ATVPPLALQV	AHRLGRQGS	VYFGTDVWGR	GTFGGGGFDS	YLAVGTARAF	300
301	KTSSALFGTA	WIYEHFGKGD	FELMDRLLWL	GGDQSEYPAQ	EGEQNRITVKV	350
351	TSHLGRHPGI	ADVSPVRSAP	GKTWFATWFD	RGYGTGFYYQ	GKKLLSQPWS	400
401	HLSHQSIIPP	LIARLQREEN	HGLSYFLADD	DAYIGGTSLL	IAAEITQERQ	450
451	LPLYQLEYDV	TEGCEVQFIY	KSPEPDMQGK	IDIYLNQVLT	DILPDELAFY	500
501	WQDVTDASSQ	ADATTAMRLY	LNENTVIYLY	PSRKQELAEG	WLLCSVRVPP	550
551	TYPLGIATIK	ELGIHVDGKE	TVLFRLLGLT	IIPLGDAFSA	LSRITQVQLQ	600
601	RDEDIHSCPK	SSSCELWATL	SWMMEHNSKE	DWDQVDHYMI	FFKNVDSKAE	650
651	PIFLGTSFST	EYRISGLEIK	KHGNSIEIWA	VNRLGTVIAR	QDIDIQGGGG	700
701	SGGGGSGGGG	SHHHHHHEFG	GGGSGGGGSG	GGGSREELKM	PNGLEQSIAD	750
751	VEAKIDALTY	LSKNSKDEFK	HSMYEIPSNR	EHKPVSPKQA	LQNAKKADAQ	800
801	AERLAKMTIP	KKEELKALEG	PLYGGYFRTW	QDKTSDPTET	NKVNSFGELP	850
851	KEVDLAFVFH	DYTKDYSLEW	EELATKQVPK	LNKQGTRVIR	TIPWRFLSGA	900
901	DHSDISADKE	KFPNTEAGNK	ALAKAIVDEY	VYKYNLDGLD	IMIERDSVPK	950
951	VNDKEDPEAL	ARTVEVFKEI	GKLIGANGAD	KSRLIMDTT	YTAEENPLIK	1000
1001	ETAQYLNLLL	VLVYGFSGEN	GNYLHHKNIL	DETSSMEGRW	QGYSKYIRPE	1050
1051	QYMVGFSFYE	EKDFNNRWKD	INEEDPSDPH	IGEKIQGTRA	ERYAKWQPKT	1100
1101	GGLKGGLFSY	AIDRDGVAQP	KQKTEHPELD	KIVKSEYKVS	KALKKLMMTD	1150
1151	DQYQPIDQSD	FDPKALRESI	IKQVGTRRGD	LERFKGTLRL	DNPEIKDLTG	1200
1201	LNKLKRVAKL	ELINLPKITK	IDKDDLQNL	KPLTDNQKSN	LEIKGTYYDS	1250
1251	KLYKDIPAFD	LVISGLSGLE	SLDISGHQRD	TLSGIDASTL	PSLKAINISD	1300
1301	NHFDLAQGTE	NRHILDTILA	TLAKNGASTA	SFDKQKPKGL	YPESYSTAPL	1350
1351	HLQVGQGKIN	VIDDLIFGTR	TNQTNLINTE	NDFEAYKEQT	IQGKPFIIAPD	1400
1401	YLYDNFKVSY	KEYSASIVDS	TLAETTDKTI	DTAKAETYQV	TVSNKDGKTV	1450
1451	HSVKVIVGDE	KPMNVNLAQD	AKIIGTDNMT	QSAKVFDGQK	DQFLLSWNKD	1500
1501	SSVIFELKTP	GTAKHWRFFD	DGKNDSVTLS	VFKGDASNFE	TEKDKAENWV	1550
1551	EITKDSRKND	DKVFSSPLEV	DNAKYLKVTI	KKEAKYIYFN	ELQILGYPGV	1600
1601	VAKKTADDLR	PTEADKSDDK	SDKNDTEAK			1629