

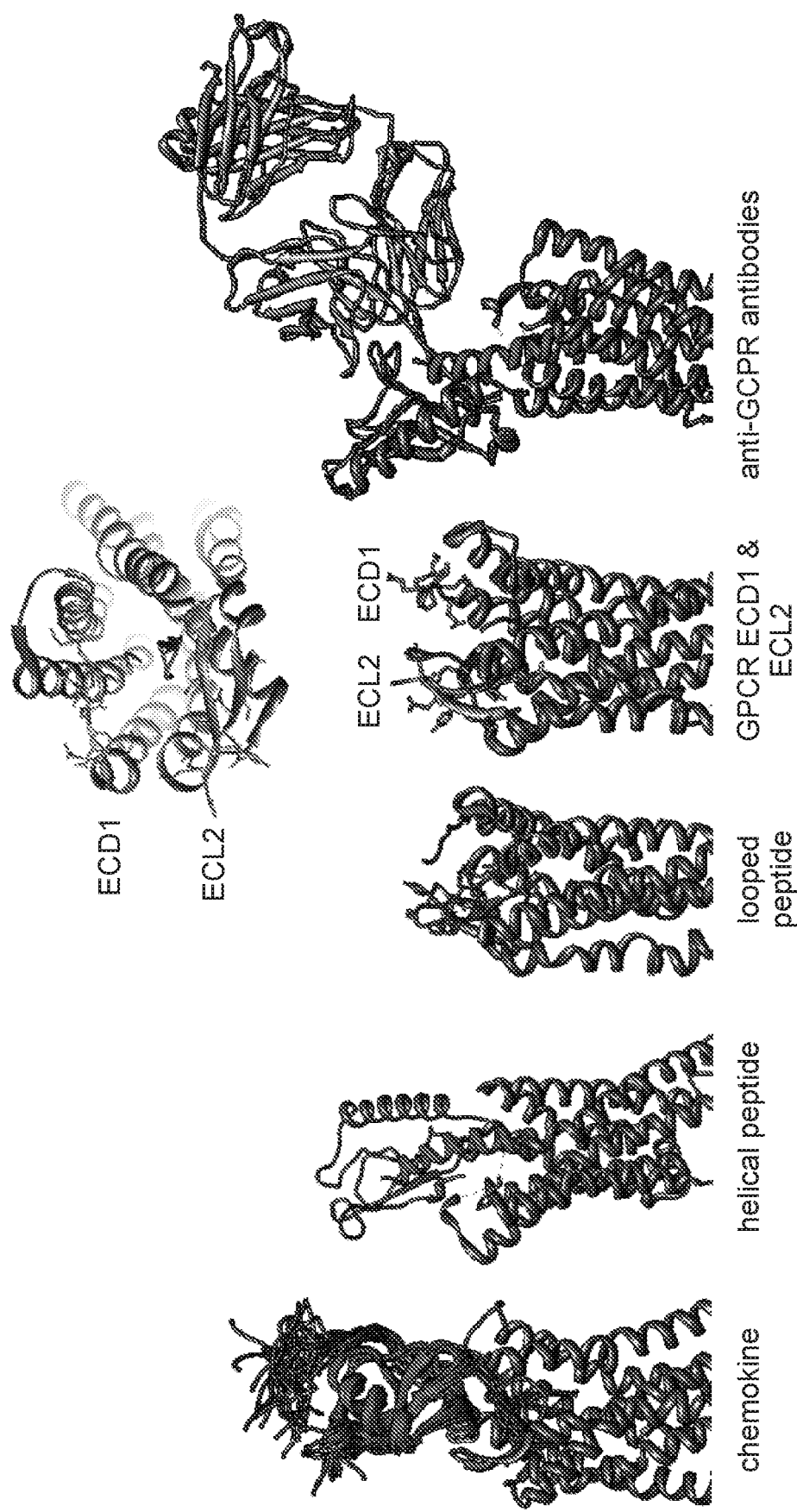


FIG. 1

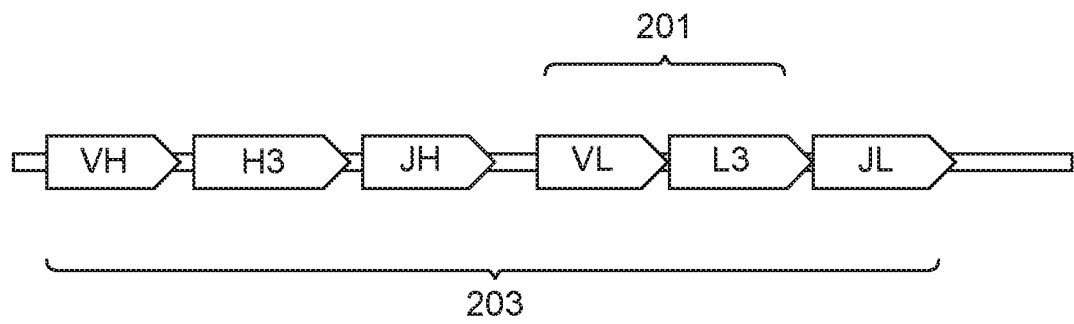


FIG. 2A

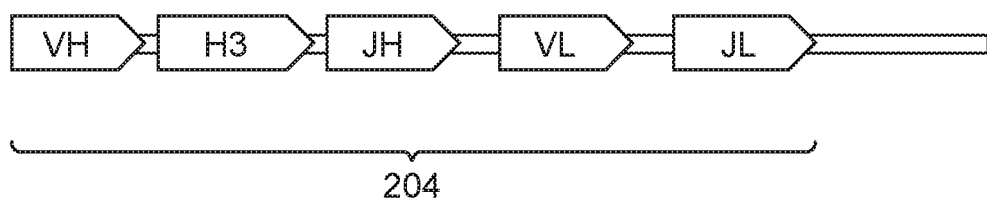


FIG. 2B

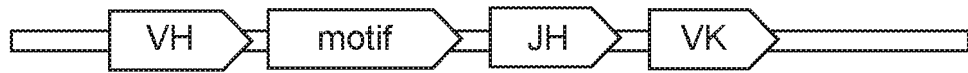
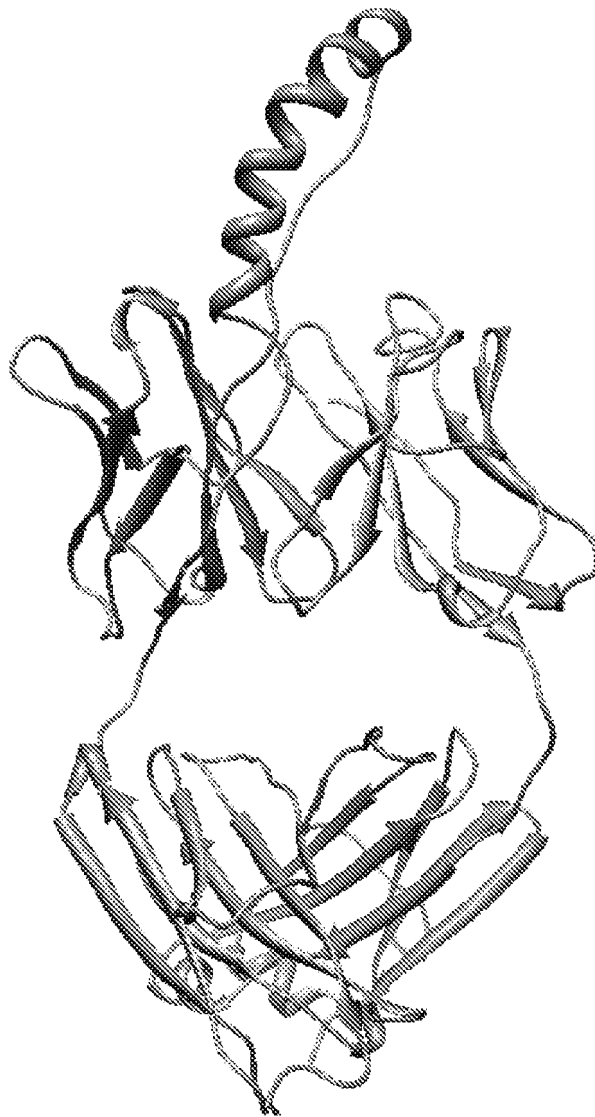


FIG. 3

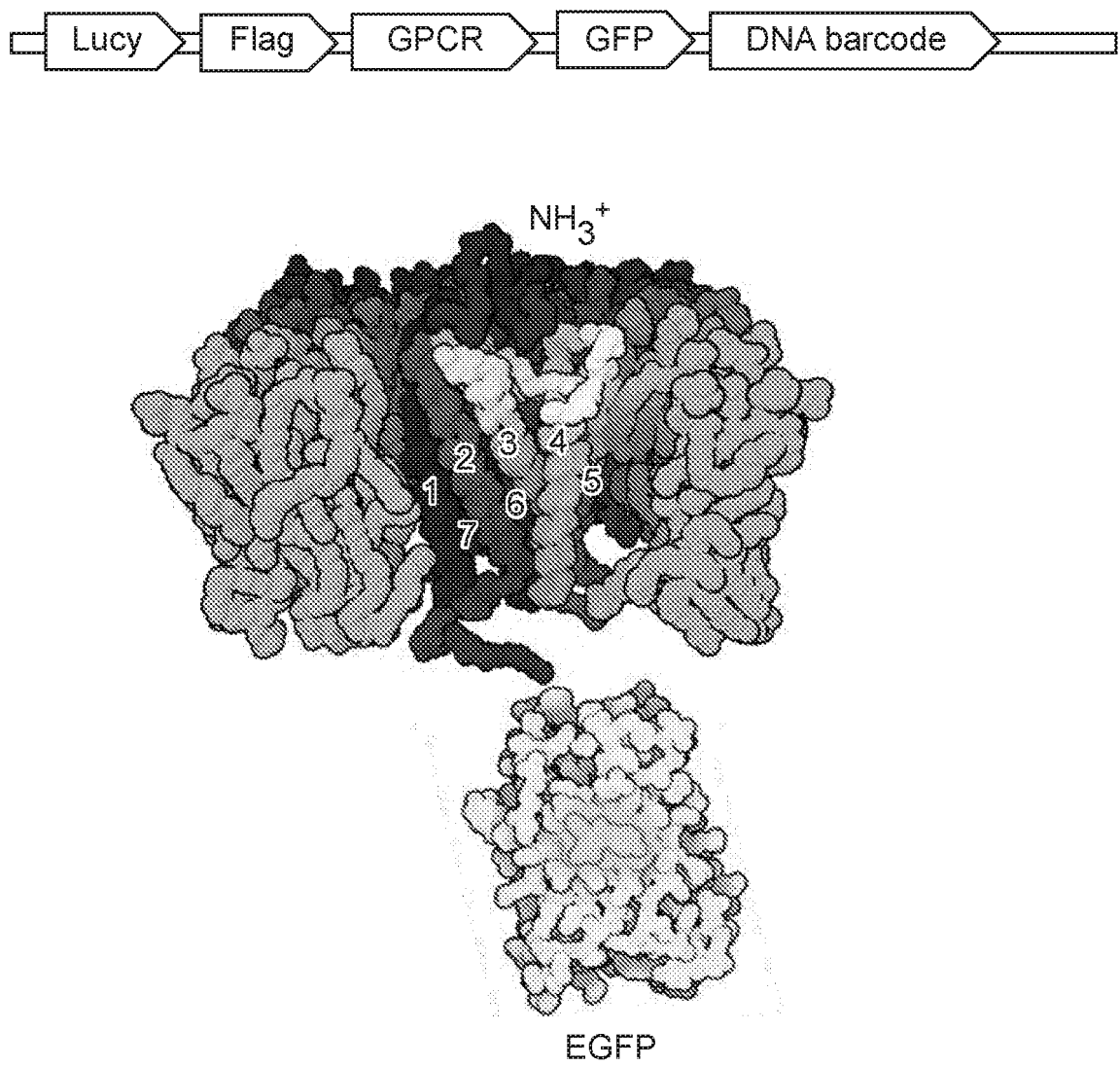


FIG. 4

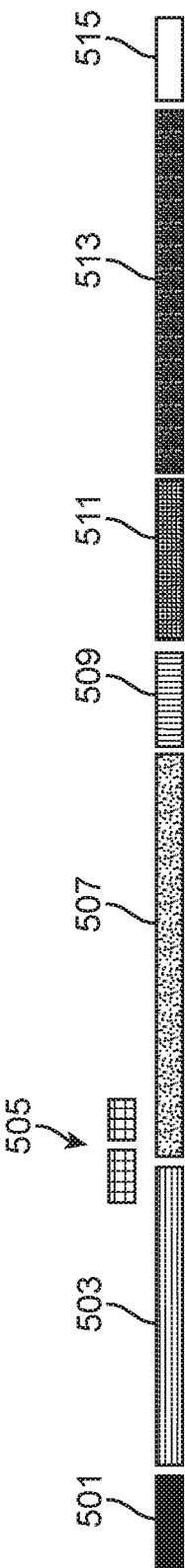


FIG. 5

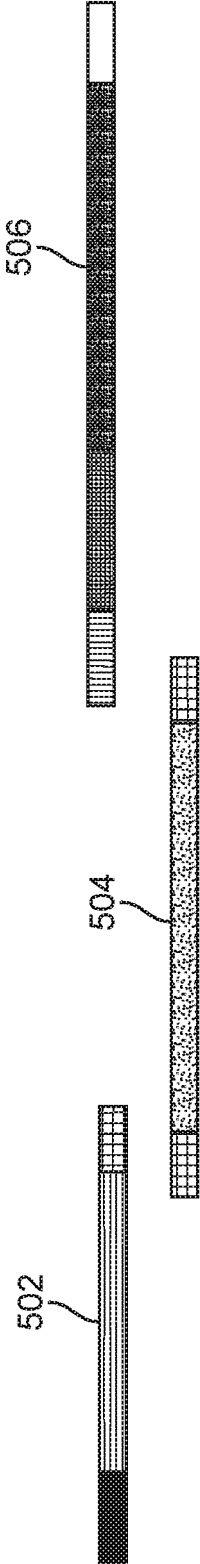


FIG. 6

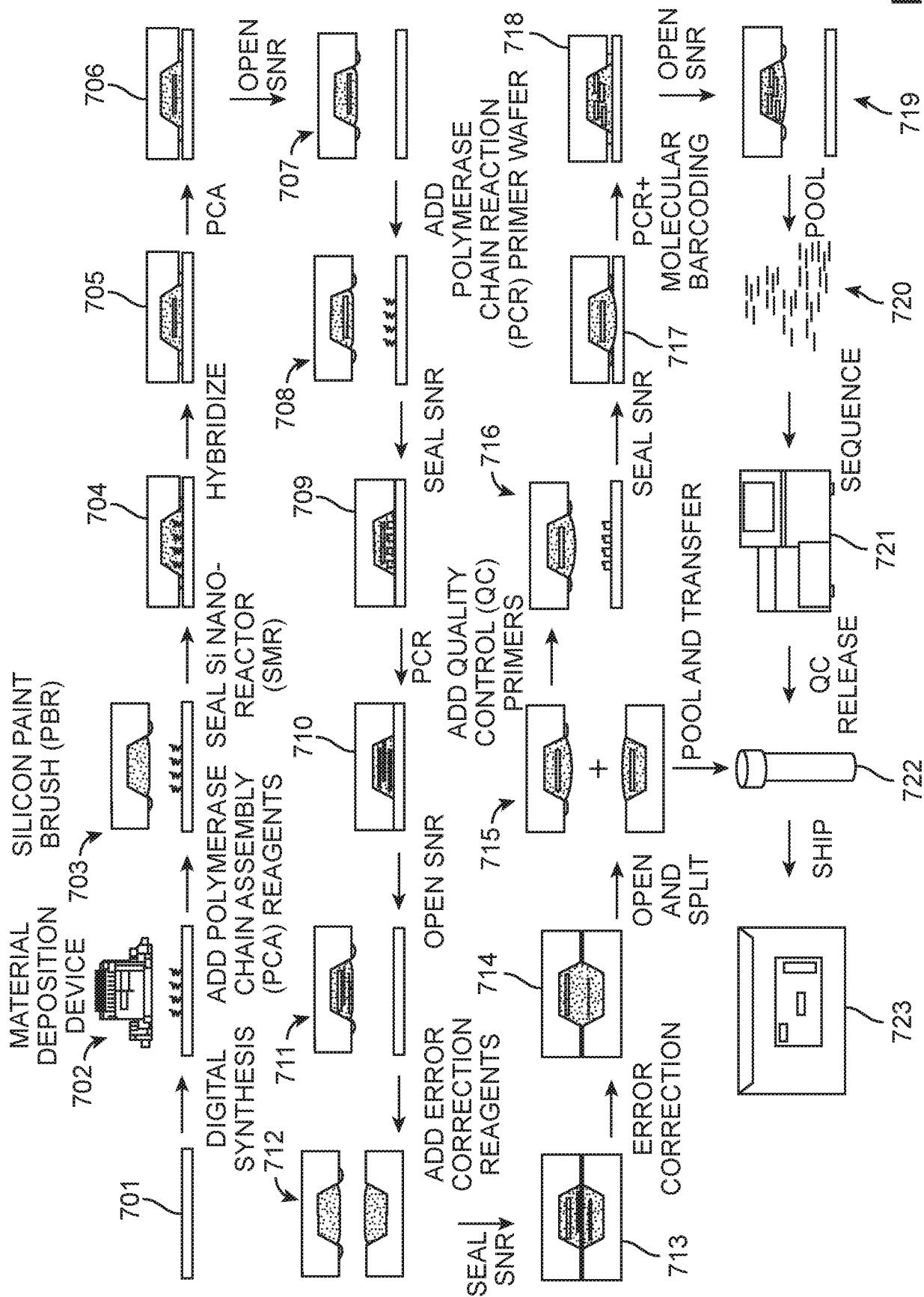


FIG. 7

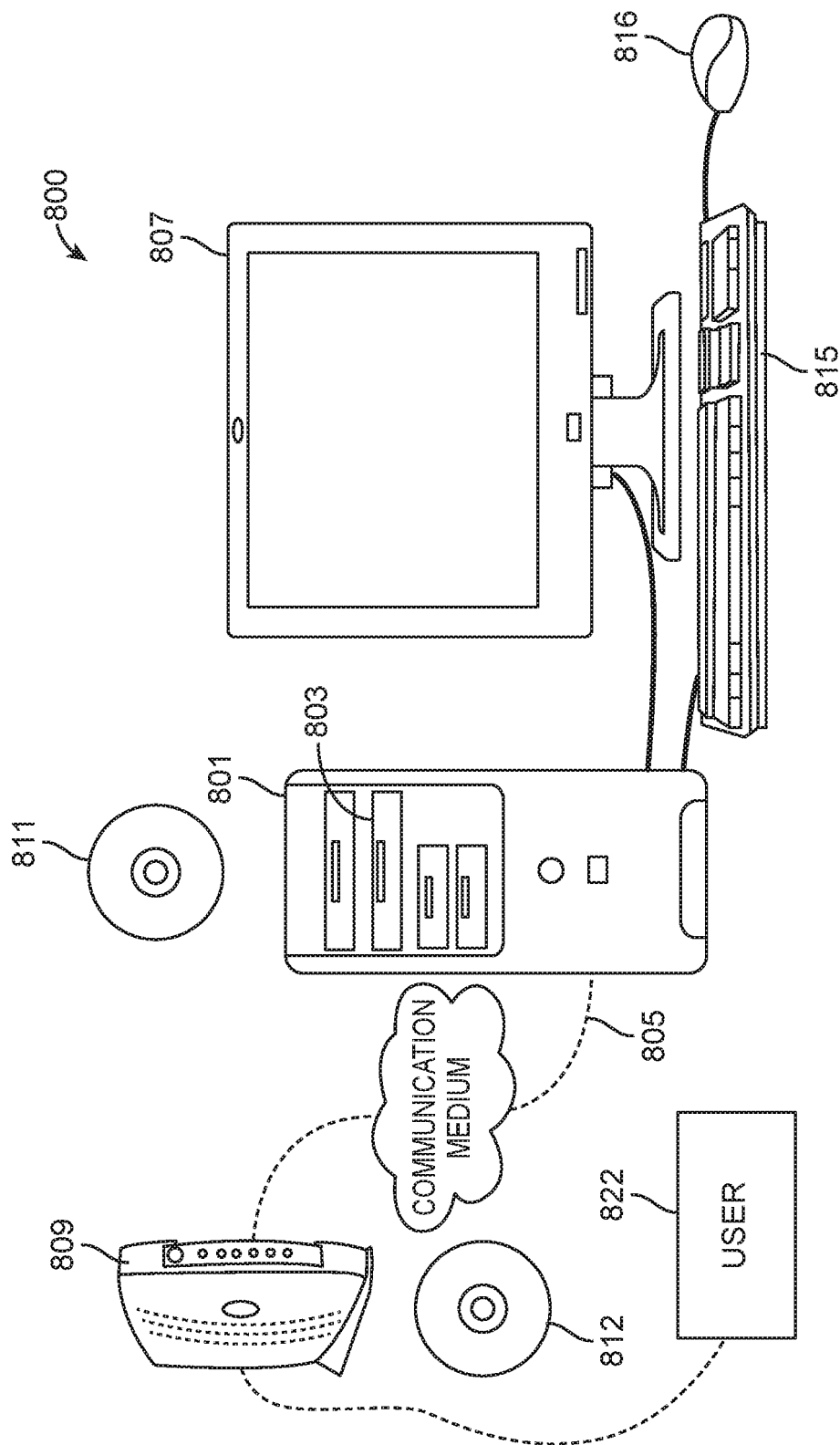


FIG. 8

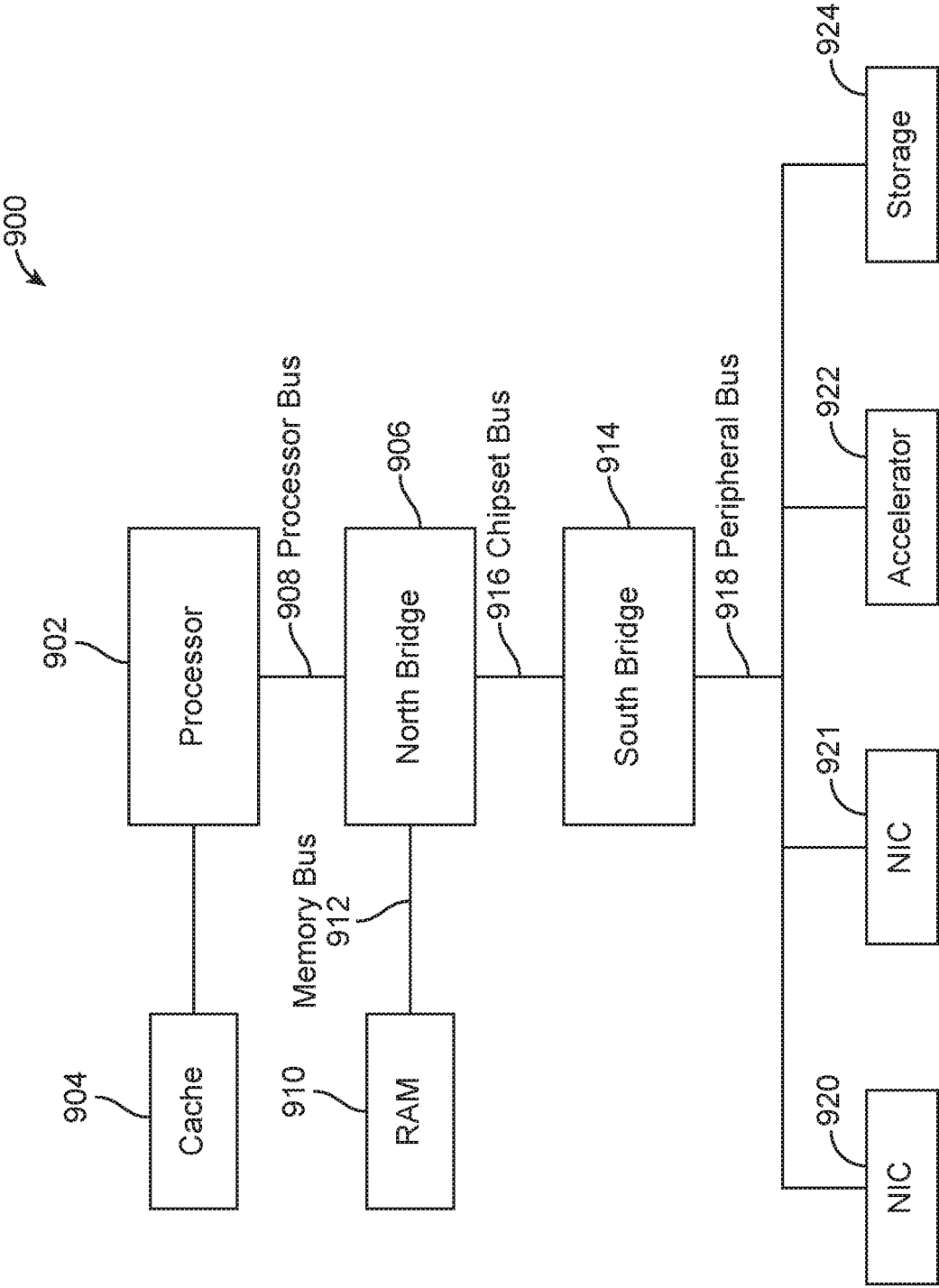


FIG. 9

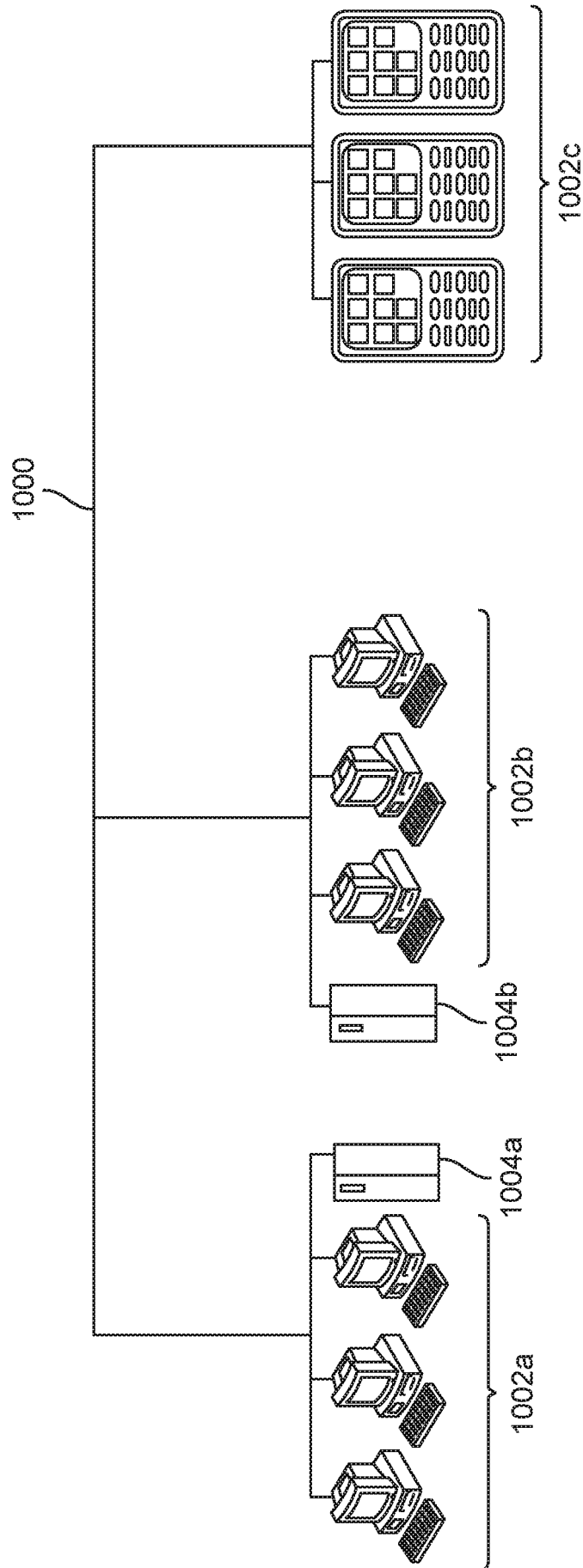


FIG. 10

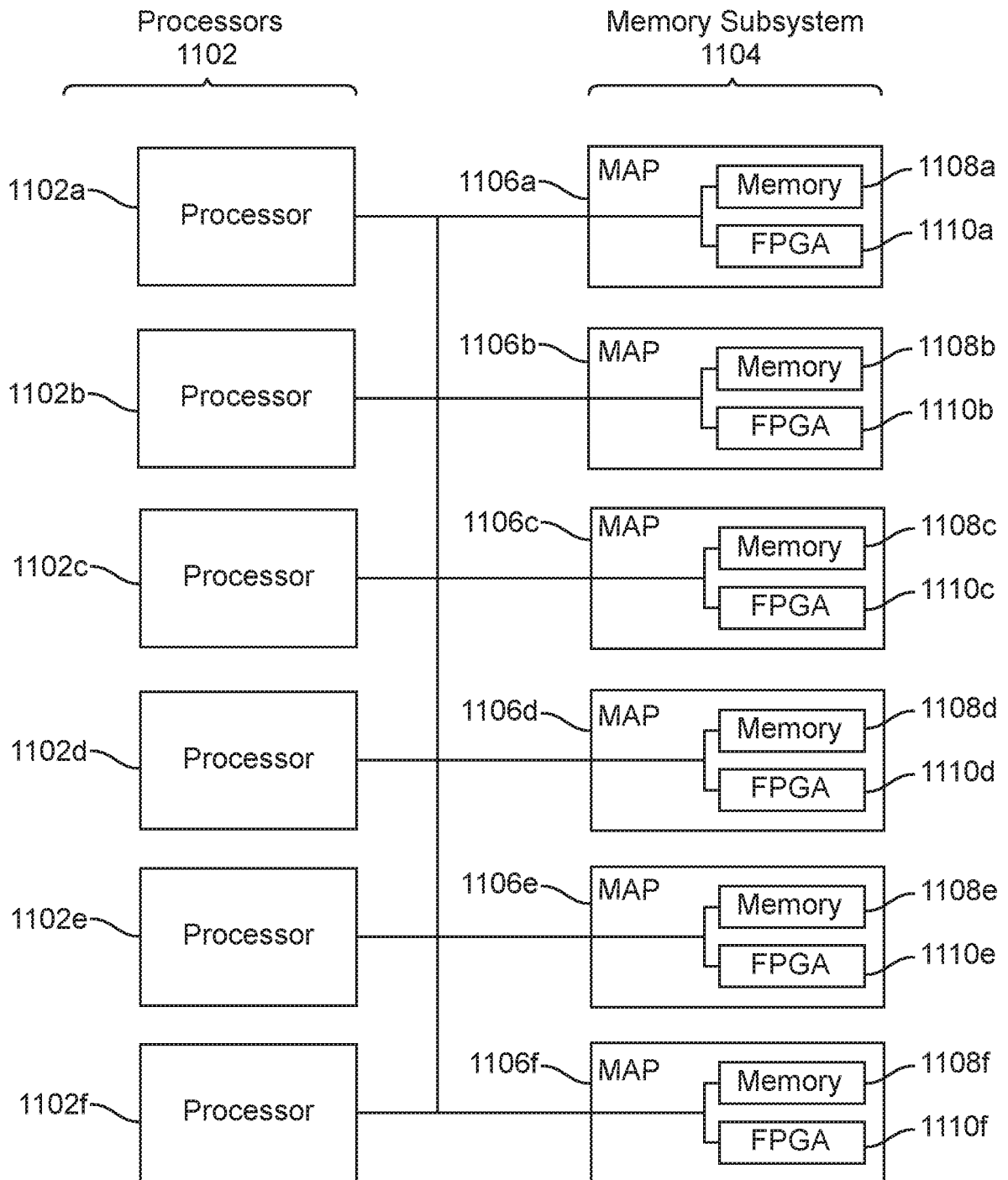


FIG. 11

9 IGHV1-69; IGV3-20 *

IGHV1-69; CAMQFTSFYIWGSYPAAENYNNEMDVM;
 IGHV1-69; CARAVNYGSGTSLSDSYYYYYYMEVW;
 IGHV1-69; CARGAALQSMGVYTRSNYFSGMDVM;
 IGHV1-69; CARGPRWARDIAEGRPGYHYHLYDVM;
 IGHV1-69; CARVNCSTSTQYLRRAPTYYYGMDVM;
 IGHV1-69; CASGLLYQFDTSSLTYNKKFFYGMDVM;
 IGHV1-69; CASGPLYGFDTSSLTYSQLFYGMDVM;
 IGHV1-69; CATQSTNDEYDGLLGDDSYFFMDVM;
 IGHV1-69; CAVAFNNDYLRGNYSRSPCRSWLESW;

7 IGHV1-69; IGV2-28

IGHV1-69; CAGGKHRRIRIVVENAISDYYYGMDVM;
 IGHV1-69; CARDRGQSYVWGSYRYLEYGMDVM;
 IGHV1-69; CARDRSVRGVVSEVSPPFHHGMDVM;
 IGHV1-69; CARWSRWKQAGATSVGAKPPGNQRFYYGMDVM;
 IGHV1-69; CASAVVIDIPGKPGKSRGNFGYYGLDVM;
 IGHV1-69; CASAVVIEIPGKPGKTRGNFGYYGLDVM;
 IGHV1-69; CASLPDSSDWYVSSPGGEYYGLDVM;

5 IGHV1-69; IGV4-1

IGHV1-69; CAGGIWAGELYPSLPGYYNYGMDVM;
 IGHV1-69; CARDSDHDLTLVGGVIDYHYGMDVM;
 IGHV1-69; CARERTDTSGDIGDSNLVYYNYGMDVM;
 IGHV1-69; CARGEDLKKDSSGHYYWDRI PYSYFDSW;
 IGHV1-69; CARGGFSPRITMVRILISYYYYYMDVM;

8 IGHV3-30/33rn; IGV2-28

IGHV3-30/33rn; CAKAMCQSGTQSVSWGYFYALDVM;
 IGHV3-30/33rn; CAKDRAREDRLFDWSPFPHYMDVM;
 IGHV3-30/33rn; CAKGEENLVLSPAKIYPRKSASIHVALDVM;
 IGHV3-30/33rn; CAKGEHLVLSPAKIYPRKSASIHVALDVM;
 IGHV3-30/33rn; CAKGDDQSSASQAGVYYYGMDVM;
 IGHV3-30/33rn; CARALCQGGTSQSVSWGYYVALEVM;
 IGHV3-30/33rn; CARGSMHACLSTQSHYYYGMDVM;
 IGHV3-30/33rn; CARGIGGCQNSPTQYPPGGYYGLEVM;

CQYSSFPITF; ATFSYAEN; GRIIPALGVTVNYA; RASPNVGSRSIA; GASGRPT; IGV3-20
 CQYGRSQTF; DTFSDYAIT; GCIVIPFGTSKKA; RASQSVTSCHLA; GASSRAT; IGV3-20
 CQYGDTPPTF; GGFSNYALS; GCTIPFDTHYA; RASRSVTSNYLA; GASSRAT; IGV3-20
 CQYGCSSPRTF; DTLSYIIT; GDIIPLTGTTDYE; RASQTVSGKFVA; GASNRAT; IGV3-20
 CQYGCSSPLTF; GTFSSYALS; GGIIPFGTVNYA; RASQSVSSSYLA; GASSRAT; IGV3-20
 CQYGDSTGTF; GSFLTAYALS; GRITPVNGKANHA; RASQSVSDTSIA; AASTRVT; IGV3-20
 CQYGDSTGTF; GTLVTHAIT; GRITPINGKANHA; RASQSVRSTSLA; AASTRAT; IGV3-20
 CQYGTHTTF; GGFNFGVS; GCIIFLGGIPSYA; RASQSFSDVILA; ATSSRAP; IGV3-20
 CQYGTSTPTF; GTFSSYALS; GCIIPFGSADYA; RASQSSISSTSLA; GASSRAT; IGV3-20

CMQALQTPPYTF; GLFYSYGIN; GGIIPFLGPANYA; RSSQSLQHSNGNNYLD; LGSNRAS; IGV2-28
 CMQALQTPRLTF; GTFSTYGIN; GGIIPLFNITHA; RSSQSLHSHNGNNYLD; LGSNRAS; IGV2-28
 CMQALQTPWTF; ASFQSYTIN; GRITPLLGSIHLA; RSSQSLRHSNGHYVD; SASNRAS; IGV2-28
 CMQALQPAHTE; GTFSTYSL; GMVIPALRITNLA; KSSQSLDSDNGYNYLD; LGSNRAS; IGV2-28
 CMQALQTPMYTF; GTFSNYAIT; GCIIPFDVTKSS; RSSQSLHSHSGYNYLD; LASNRAS; IGV2-28
 CMQALQNPMTF; GTFTNYGIS; GAIIPFDTIRSA; RSSQSLHSHSGYNYLD; LASNRAS; IGV2-28
 CMQALQTPPTF; GTFSSYALS; GCIIPVFGTVHYA; RSSQSLHSHNGYNYLD; LGSNRAS; IGV2-28

CHQYSSPYSE; DTFSRYSLI; GGIIPMSATANYA; KSSQTLVSLNNKNYLA; WASTRGS; IGV4-1
 CQYFSTPPTF; GTFSTYVIT; GRVPTLDKADYA; KSSQSLHSSSSKSXYLT; WASTRES; IGV4-1
 CQYVNSPRTF; DTFSRHAYS; GGIIPYDAANYA; KASQSVLHSSNHKNYLG; WASTRES; IGV4-1
 CQYVITPQTF; GTENTYALS; GCIIPFGKPDYA; KSSQSLFYSSNNKTYLA; WASTRES; IGV4-1
 CQYVSLPTF; GTFSGHAYS; GCIIPLEDTSNYA; KSSQSVLYSSNNKNYLA; WASTRES; IGV4-1

CMQALQTPPYTF; FTLSGYGMH; AVISPNGSNKYA; RSSQSLLYANRYNYLD; LGSNRAS; IGV2-28
 CMQALQTPPTF; FSKNFAMH; SLISYDGKKSYV; RSSQSLLESNGYNYLN; LASNRAS; IGV2-28
 CMQALQTPPTF; VTFSGEGLH; ALISNDGNKHFHA; RSSQSLHSHNGNNYLD; LGSTRAS; IGV2-28
 CMQALQTPPTF; VSFSAAYGLH; ALISSDGSFTQYG; RSSQSLHSHNGYNYVD; LGSNRAS; IGV2-28
 CMQALEIPTF; FSVSSYAMN; SVISYDGRSEHYV; RSSQSLLSRKNYLYLD; FGSNFRAS; IGV2-28
 CMQALQSPYTF; FTLSGYGMH; AVISPNGNNKYA; RSSQSLLYRNRNYNYLD; LGSTRAS; IGV2-28
 CMQALETPPTF; FMFNMYGIH; ALISHDGNKYA; RSSQSLHSHNGYNYLD; LGSNRAS; IGV2-28
 CMQSLQTPPTF; FTFSNYPMH; AVISYDGNKYA; RSSQSLHSHNGYNYVD; LGSTRAS; IGV2-28

FIG. 12A

5 IGHV4-59/61; IGHV1-39
 IGHV4-59/61; CARDNLIDIVVPAAMEPDANYYHYHGMVDW;
 IGHV4-59/61; CARDSLITDIVVPADQRYYYHYHGMVDW;
 IGHV4-59/61; CARCAKERVVMVRGVKSDYGLDWM;
 IGHV4-59/61; CARIHYSGLYLSWAGESIIDYHYHGMVDW;
 IGHV4-59/61; CARSWGKLAGELTPYSTSAIGHFDFW;
 IGHV4-59/61; IGHV3-20
 IGHV4-39; CARHNIPIFWASVTGTAGTGLIDFW;
 IGHV4-39; CARVGYNSANQPVGVWFGQFYGLDWM;
 IGHV4-39; CEKHASAYYDFWGSYNNHYHGMVDW;
 IGHV4-39; CVRHPVGNIDFFSGAQRGQYDFDW;
 IGHV4-39; CVRSRKAGVILGHQSGGVQNYIPGYFDWM;
 IGHV3-23; IGHV3-11
 IGHV3-23; CAKEGFVLTLSGGITLLRGPI SAYYDGMVDW; CQRRSF
 IGHV3-23; CAKNLEKSKIVVPAANPPHAFDIW;
 IGHV3-23; CAKSVSYSHLSPDPSNFWYSDLM;
 IGHV3-23; CARDILGKEMPKVYVGVWYEDLW;
 IGHV3-23; CVGWPCQNEHQQSVWLQCYSLDWM;
 IGHV3-23; IGHV2-28
 IGHV3-23; CAKAGCSGGSCHREMGFYVYAMAVW;
 IGHV3-23; CAKGGDYPGQSPSCYRHFYVYGLDWM;
 IGHV3-23; CAKGGLMTILRGPAIVNVYGYHGMVDW;
 IGHV3-23; CAKLGATRPNIAPVAVDMKKATVKVRGSEATDWM;
 IGHV3-23; CARSSPVNYQSTTYQHYVYVANGLDWM;
 IGHV3-21; IGHV3-20
 IGHV3-21; CARDLFTPGRLFSGVVEVYHYHGMVDW;
 IGHV3-21; CARDLKSWYTTSGVRVVPNYDFAMVDW;
 IGHV3-21; CARDNVGHYDSSGYHAYVYHGMVDW;
 IGHV3-21; CARENLFILSGASGLLVDRDYNGLDWM;
 IGHV3-21; CASLFTWREVIPQGHYVYHGMVDW;
 IGHV4-39; IGLV2-14
 IGHV4-39; CARQPLASIFGVVLMGHGGYVDFHW;
 IGHV4-39; CARDQLGGDFWSGHNLIIFYYAMVDW;
 IGHV4-39; CARRVFGYYDRSGHYRVVHDAFDIW;
 IGHV4-39; CASGHSAYYDFWSGYLELNDAFDIW;
 COOSYNTPLTF; GSINSGSYWVN; GRIYTSGDINYN; RASQSINNLYN; AASSLOS; IGHV1-39
 CQOYSTPRAF; GSISSYWVS; GYIYSGSTNYN; RASQSISSYLN; AASSLOS; IGHV1-39
 CQOQSHIPRTE; ASIRTYFWS; GYIYGGKTDYN; RASQSVSNLYN; AALSLOS; IGHV1-39
 CQOQSVLPPLTF; GSVTSDSYWVS; GHIYYSNTNYH; RASESISDYLH; GAYLLOS; IGHV1-39
 CQOQFSLYVTF; GSVSSGNIFWS; GYIHHTGTTKEN; RSSQKISESIN; GTSNLOQ; IGHV1-39
 CQOYGSSPLTF; GSISNNYFWG; GTIYYTGRTYYN; RASQSVSGSYLA; GASSRAT; IGHV3-20
 CQOYGTSVWTF; GSITDYSYWG; GRINNHGRTYYS; RASQSVNSNSLA; GASNRAT; IGHV3-20
 CQOYGSSPLYSE; GSISSSNYWG; GCIIYSGTYYN; RASQSISSNSLA; GASSRAT; IGHV3-20
 CQOYSDSPPTF; GSVSSRGYQWG; GTVYISGNTYYT; RASQRISSSYLA; GASSRAT; IGHV3-20
 CQHYGTSSRDTE; GSISSPNFWG; GSVHYNGNTHYN; RASQRTVSRYLA; GASTRAT; IGHV3-20
 ; ITFNSYAMG; SSISSPSDSTYYA; RASQSVGSDLA; DASSRAT; IGHV3-11
 ; FTFSYAMS; SAISGGGSTYYA; RASQSVSSSYLA; DASNRAT; IGHV3-11
 ; FTFSGYAMS; SGISASGDKAISA; RISQITNNYLA; DAFNRAT; IGHV3-11
 ; FTFSNHAMY; SAIAGFSSSSYYA; RASQSVCTFLA; DASSRAT; IGHV3-11
 ; ISENTYVMT; AGVSGCATCTYYA; RASNIDFHILA; DASNRAT; IGHV3-11
 ; FMFGSYAMS; SVISGGDGTYYA; RSSQSLLYNNEYNLYD; LSSTRAS; IGHV2-28
 ; FTFSYAMS; SGISGGGSTYYA; RSSQSLHSHNGYNLYD; LGSNRAS; IGHV2-28
 ; FAFSSDPMs; SVISSSGSSTDYA; RSSQSLHSHNGYNLYD; LGSNRAS; IGHV2-28
 ; FTLTSDAMS; SSISDSGDKTDYA; RSSQSLHDLGYNLYD; LGSNRAS; IGHV2-28
 ; FIFSNYPMS; SAISNSGTFYYA; RSSQSLHSHNEYNLYD; LASNRAS; IGHV2-28
 ; FLSLSNYSLN; SSSSAGRYHIDYA; RASQSVGSTYYA; GASSRAT; IGHV3-20
 ; FTFNDFSMN; SSISSGSTFIYYA; RASESVSSTYLA; GSSRRAT; IGHV3-20
 ; FTFSYSYMN; SSISSSSYIYYA; RASQSVSSSYLA; GASSRAT; IGHV3-20
 ; FIFSSYGMT; SSINDTSTYNYA; RASQSVSRAYLA; GASNRAT; IGHV3-20
 ; FTFSYSYMN; SSISSSSYIYYA; RASQSVSSSYLA; GASSRAT; IGHV3-20
 ; DSISNNHYWG; GSLSSSTGSTYHK; TGTSIDLNNYQFVS; EVSSRPS; IGLV2-14
 ; GSITSTTNFWA; GHIYYDGTTHYN; TGTSSDVGGFNYYVS; EVSHRPS; IGLV2-14
 ; GSISSSSFHWG; GNIFYTGSTYYN; TGTSSDVGGFNYYVS; DVSNRPS; IGLV2-14
 ; GSIVYSYWG; GSVYYSYSTYYN; TGTSSDIGGKYVS; AVNNRPS; IGLV2-14

FIG. 12C

<u>PDB ID</u>	<u>CDR-H3</u>	<u>CDR-H3 length</u>
4ocw_H_mol	CARDLRELECEEWTLNYYDFGSRGPCVDPRGVAGSFDVW	40 VRC26
4od3_H_mol	CAKDLREDECEEWSDYYDFGKKLPCRKS RGVAGVFDKW	39 VRC26
4ocs_H_mol	CAKDMREYECEYWTSDYYDFGRPQPCIDRRGVVGIFDMW	39 VRC26
4odl_H_mol	CAKDLREDECEEWSDYYDFGKQLPCRKS RGVAGIFDGW	39 VRC26
4odh_H_mol	CAKDLGESENEEWATDYYDFSIGYPGQDPRGVVGAFDIW	39 VRC26
3uls_H_mol	CLTGSKHRLRDYFLYNEYGNPYEEWGDYLATLDVW	35 VRC26
3mug_H_mol	CAREAGGPIWHDDVKYYDFNDGYNNYHYMDVW	32 PG16
3lrs_E_mol	CAREAGGPIWHDDVKYYDFNDGYNNYHYMDVW	32 PG16
3mme_C_mol	CAREAGGPIWHDDVKYYDFNDGYNNYHYMDVW	32 PG16
3u36_H_mol	CVREAGGPDYRNGNYYDFYDGYNNYHYMDVW	32 PG16
3u36_C_mol	CVREAGGPDYRNGNYYDFYDGYNNYHYMDVW	32 PG16
3mme_A_mol	CAREAGGPIWHDDVKYYDFNDGYNNYHYMDVW	32 PG16
3lrs_C_mol	CAREAGGPIWHDDVKYYDFNDGYNNYHYMDVW	32 PG16
3mug_J_mol	CAREAGGPIWHDDVKYYDFNDGYNNYHYMDVW	32 PG16
3mug_D_mol	CAREAGGPIWHDDVKYYDFNDGYNNYHYMDVW	32 PG16
3mug_B_mol	CAREAGGPIWHDDVKYYDFNDGYNNYHYMDVW	32 PG16
3u4e_A_mol	CVREAGGPDYRNGNYYDFYDGYNNYHYMDVW	32 PG16
3u2s_H_mol	CVREAGGPDYRNGNYYDFYDGYNNYHYMDVW	32 PG16
3u4e_H_mol	CVREAGGPDYRNGNYYDFYDGYNNYHYMDVW	32 PG16
3lrs_H_mol	CAREAGGPIWHDDVKYYDFNDGYNNYHYMDVW	32 PG16
3mme_H_mol	CAREAGGPIWHDDVKYYDFNDGYNNYHYMDVW	32 PG16
3mug_F_mol	CAREAGGPIWHDDVKYYDFNDGYNNYHYMDVW	32 PG16
3u2s_A_mol	CVREAGGPDYRNGNYYDFYDGYNNYHYMDVW	32 PG16
3lrs_A_mol	CAREAGGPIWHDDVKYYDFNDGYNNYHYMDVW	32 PG16
3u36_A_mol	CVREAGGPDYRNGNYYDFYDGYNNYHYMDVW	32 PG16
3u36_E_mol	CVREAGGPDYRNGNYYDFYDGYNNYHYMDVW	32 PG16
3mug_L_mol	CAREAGGPIWHDDVKYYDFNDGYNNYHYMDVW	32 PG16
4dgo_H_mol	CAREAGGPIWHDDVKYYDFNDGYNNYHYMDVW	32 PG16
4nuj_B_mol	CARMFQESGPPRFDSWSGRNYYYYSGMDVW	30 PGT152
4nug_H_mol	CARMFQESGPPRLDRWSGRNYYYYSGMDVW	30 PGT152
3q6g_l_mol	CARDVVITSHEDDFGDYTTGEYYGLDSW	29 rmAb
3q6g_H_mol	CARDVVITSHEDDFGDYTTGEYYGLDSW	29 rmAb
1rzf_H_mol	CASN SIAGVAAAGDYADYDGGYYDMDVW	29 loop-d-loop
1jto_A_mol	CAADSTIYASYIECGBGLSTGGYGYDSW	28
4fqr_c_mol	CAKHMSMQQVVSAGWERADLVGDAFDVW	28
4fqr_m_mol	CAKHMSMQQVVSAGWERADLVGDAFDVW	28
4fqr_i_mol	CAKHMSMQQVVSAGWERADLVGDAFDVW	28
4fqr_k_mol	CAKHMSMQQVVSAGWERADLVGDAFDVW	28
4fqr_u_mol	CAKHMSMQQVVSAGWERADLVGDAFDVW	28
4fnl_l_mol	CAKHMSMQQVVSAGWERADLVGDAFDVW	28
4fqr_w_mol	CAKHMSMQQVVSAGWERADLVGDAFDVW	28

FIG. 13

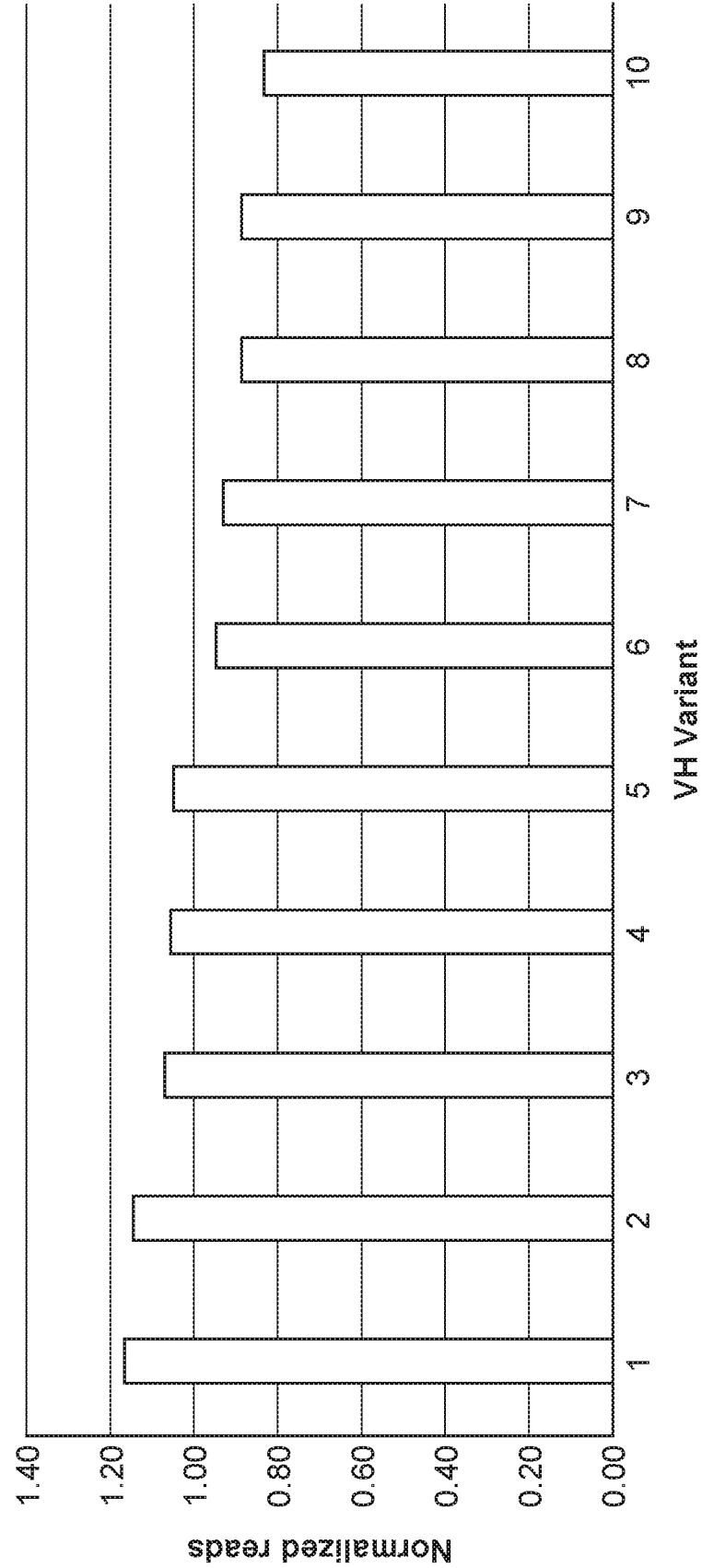


FIG. 14

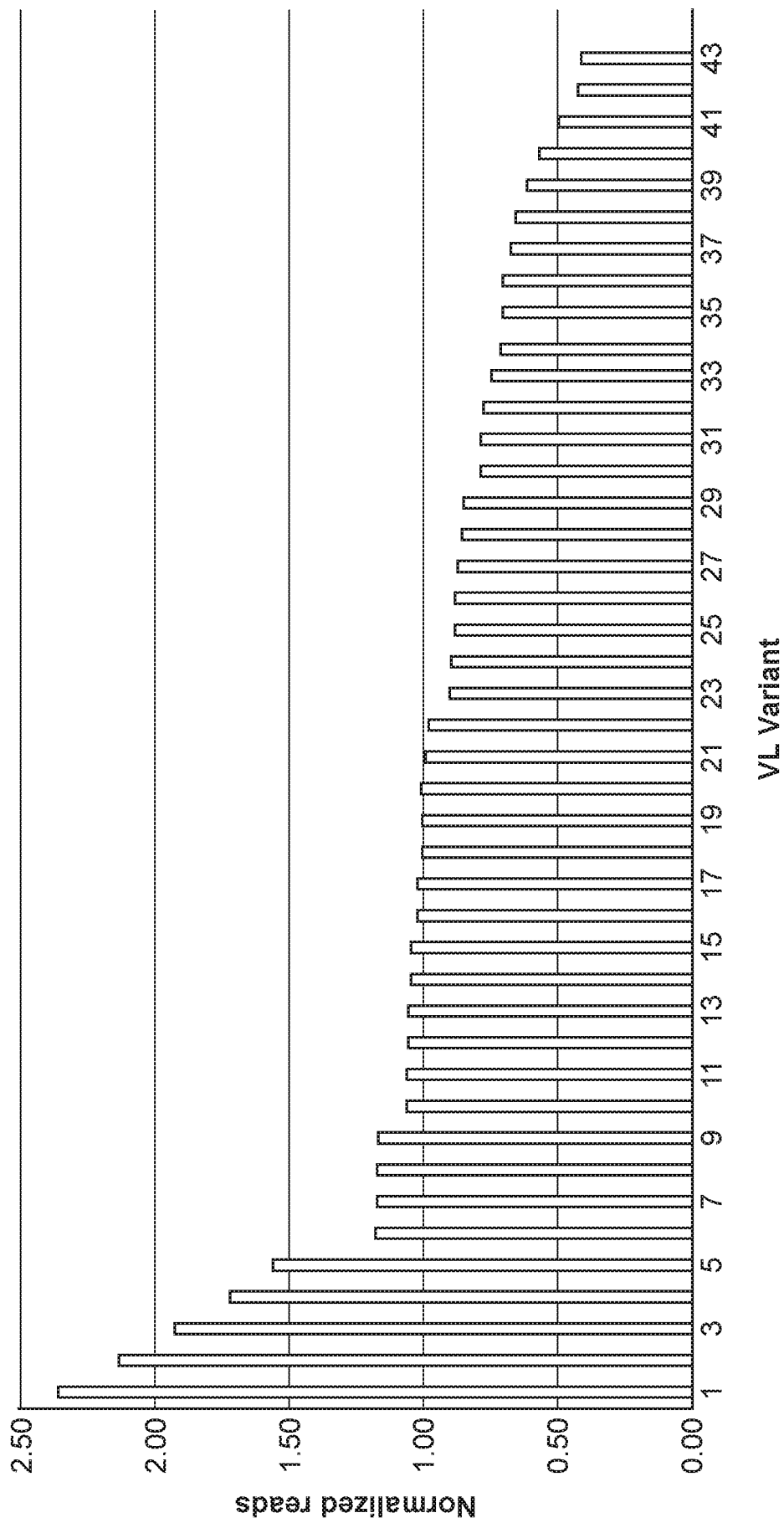


FIG. 15

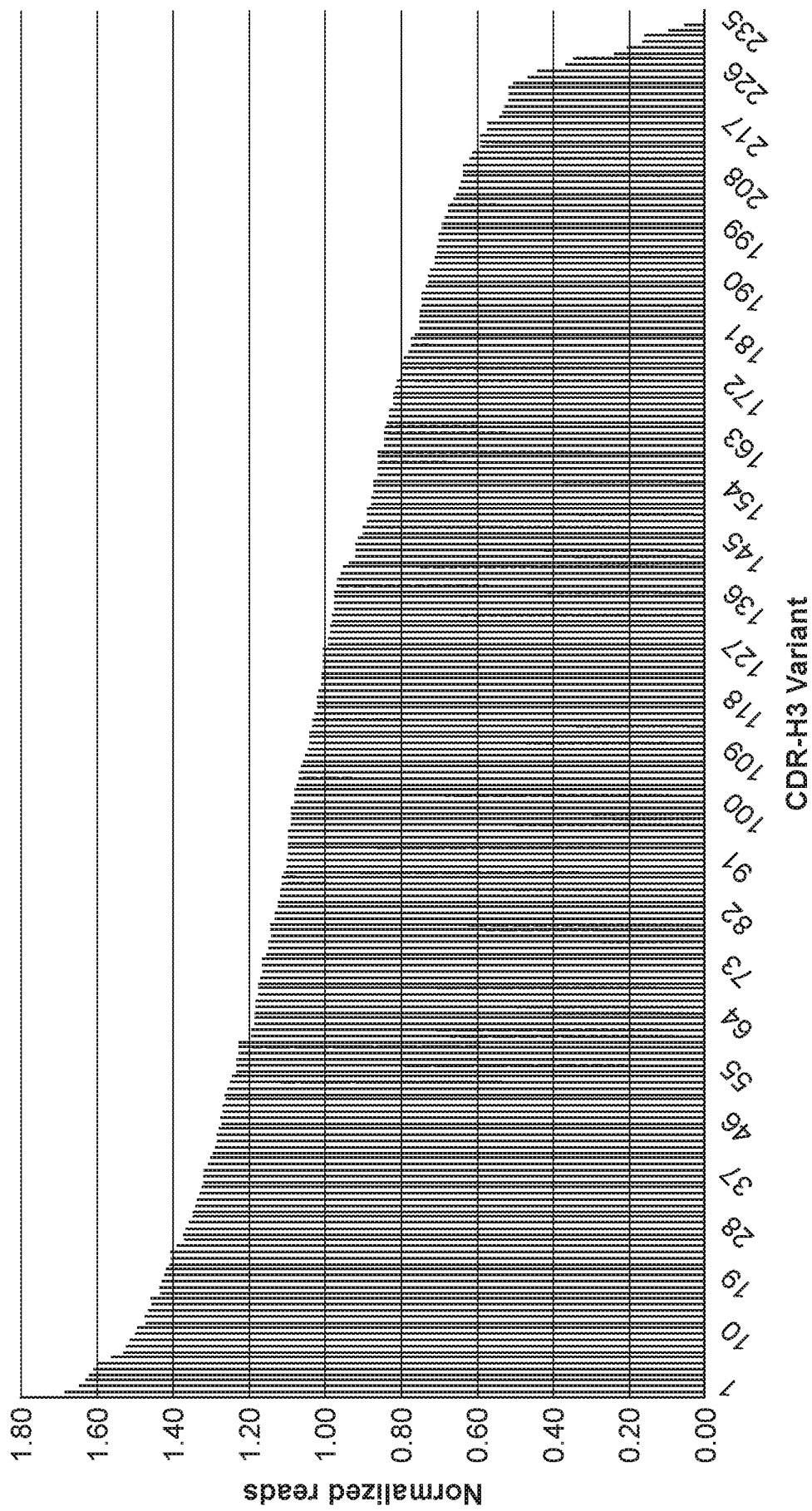


FIG. 16

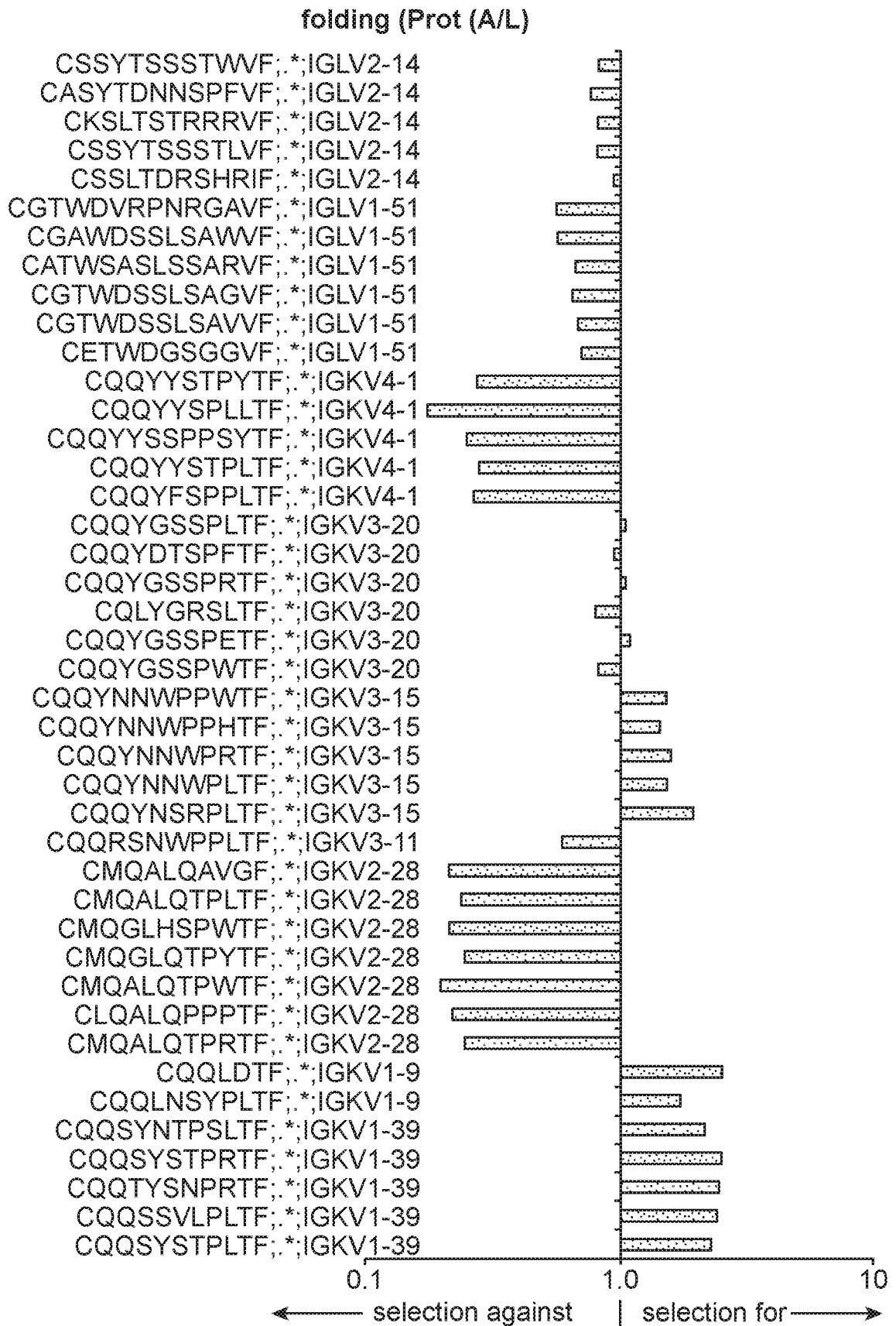


FIG. 17A

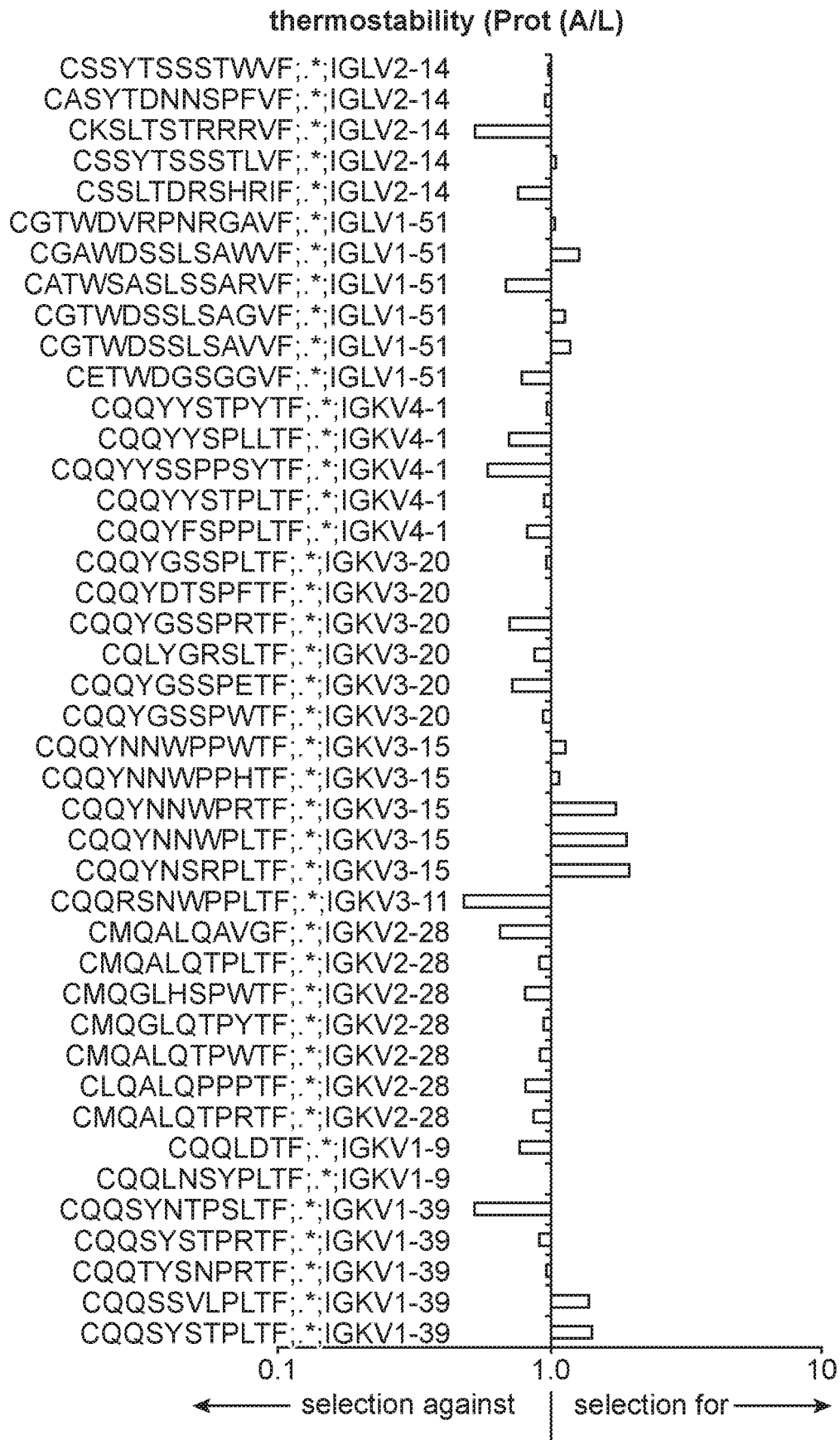


FIG. 17B

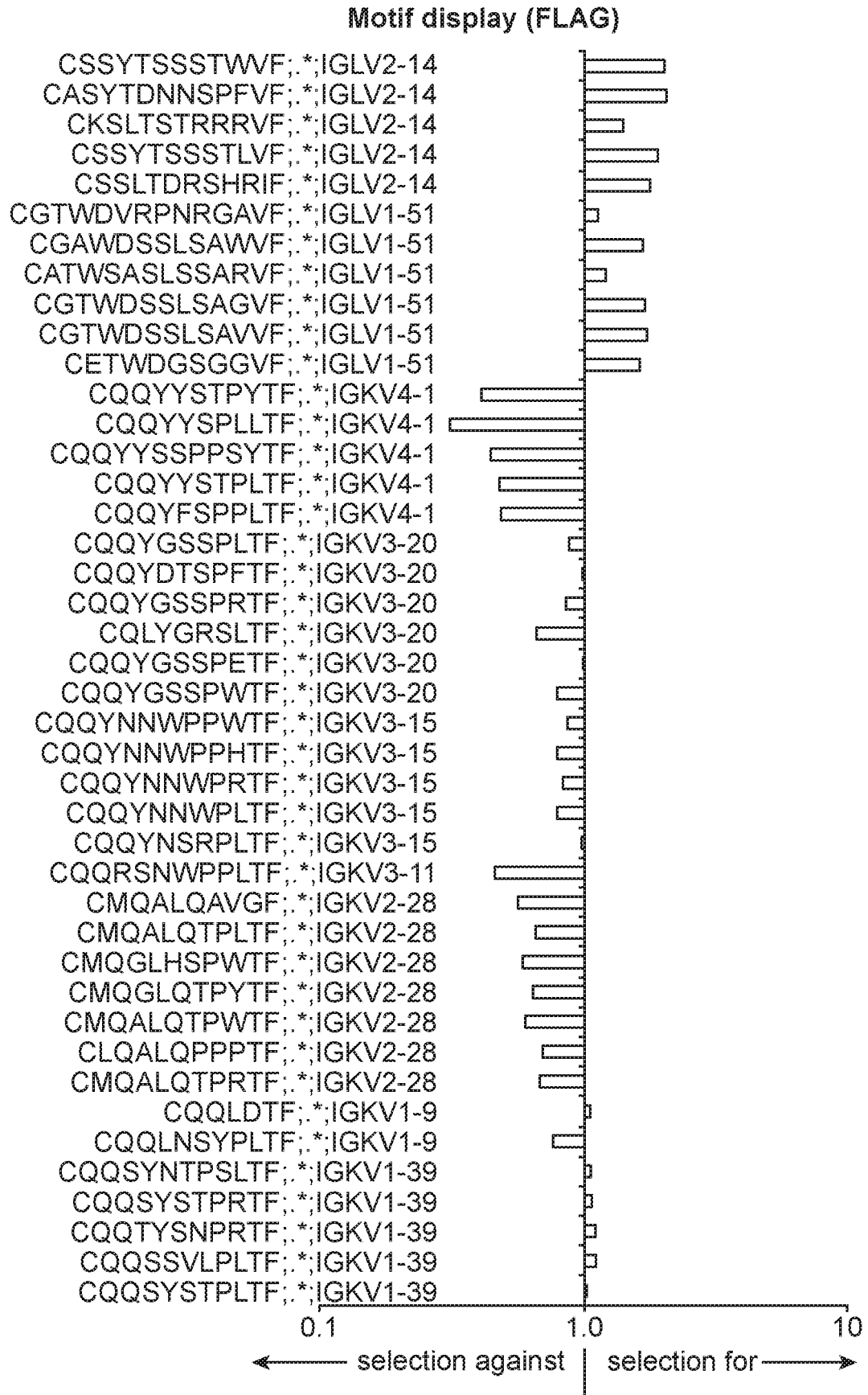


FIG. 17C

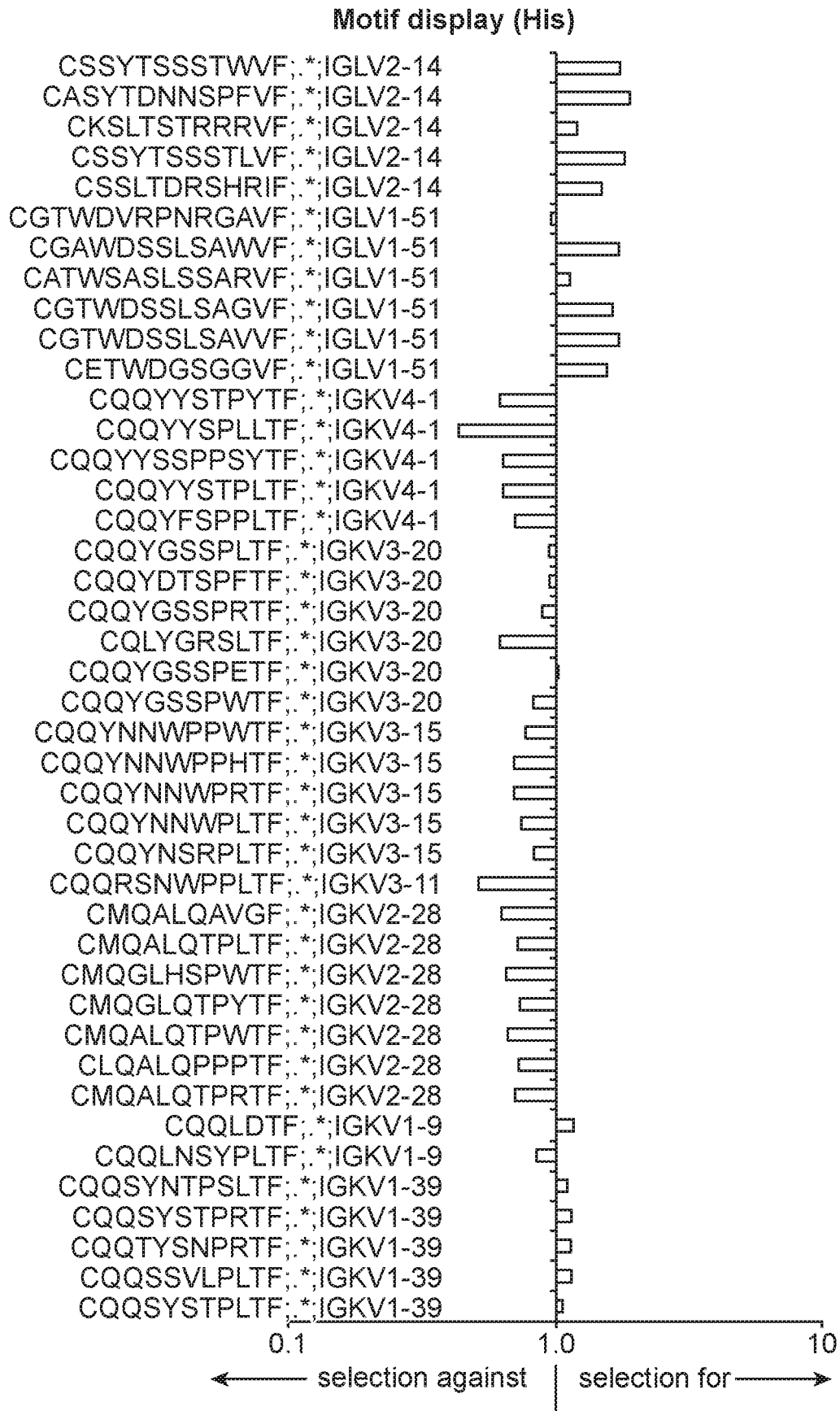


FIG. 17D

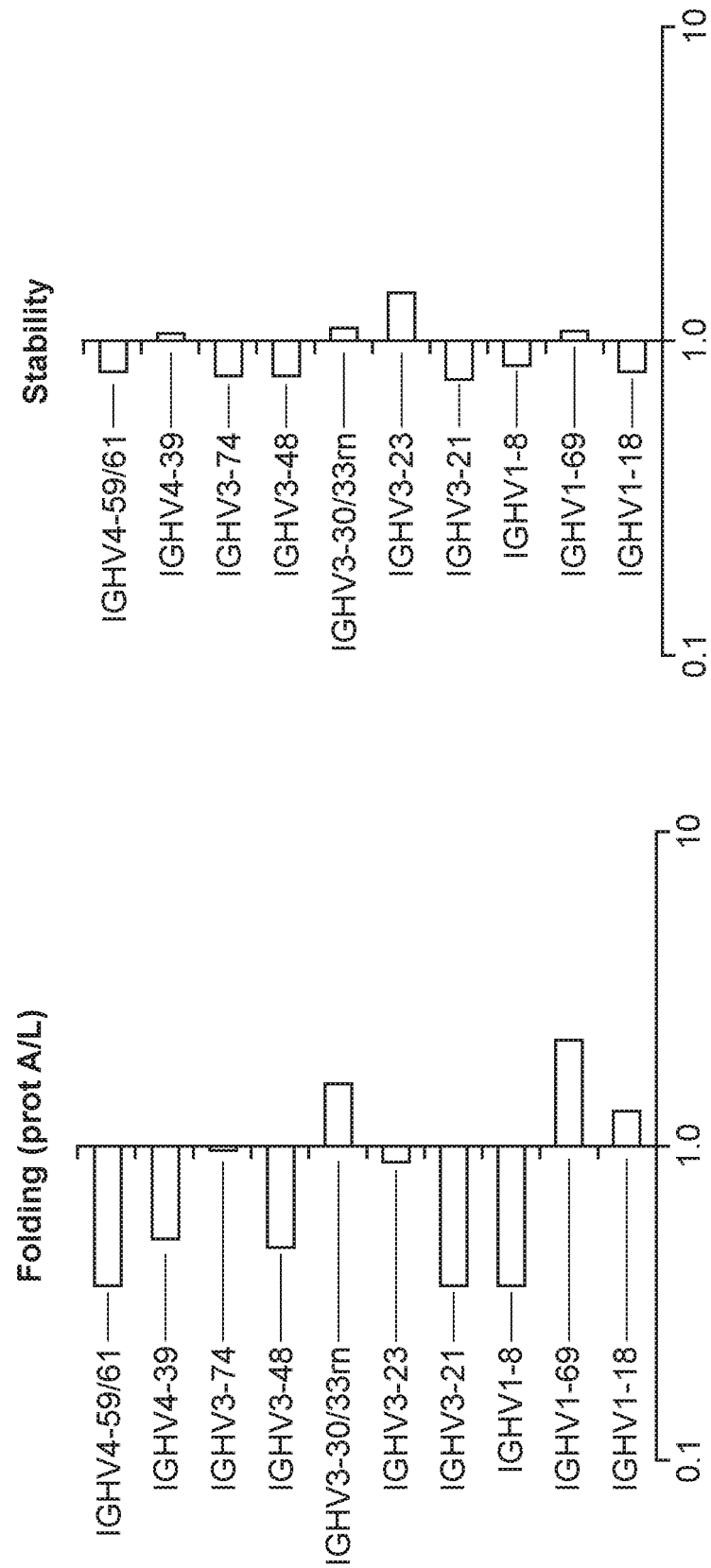


FIG. 18B

FIG. 18A

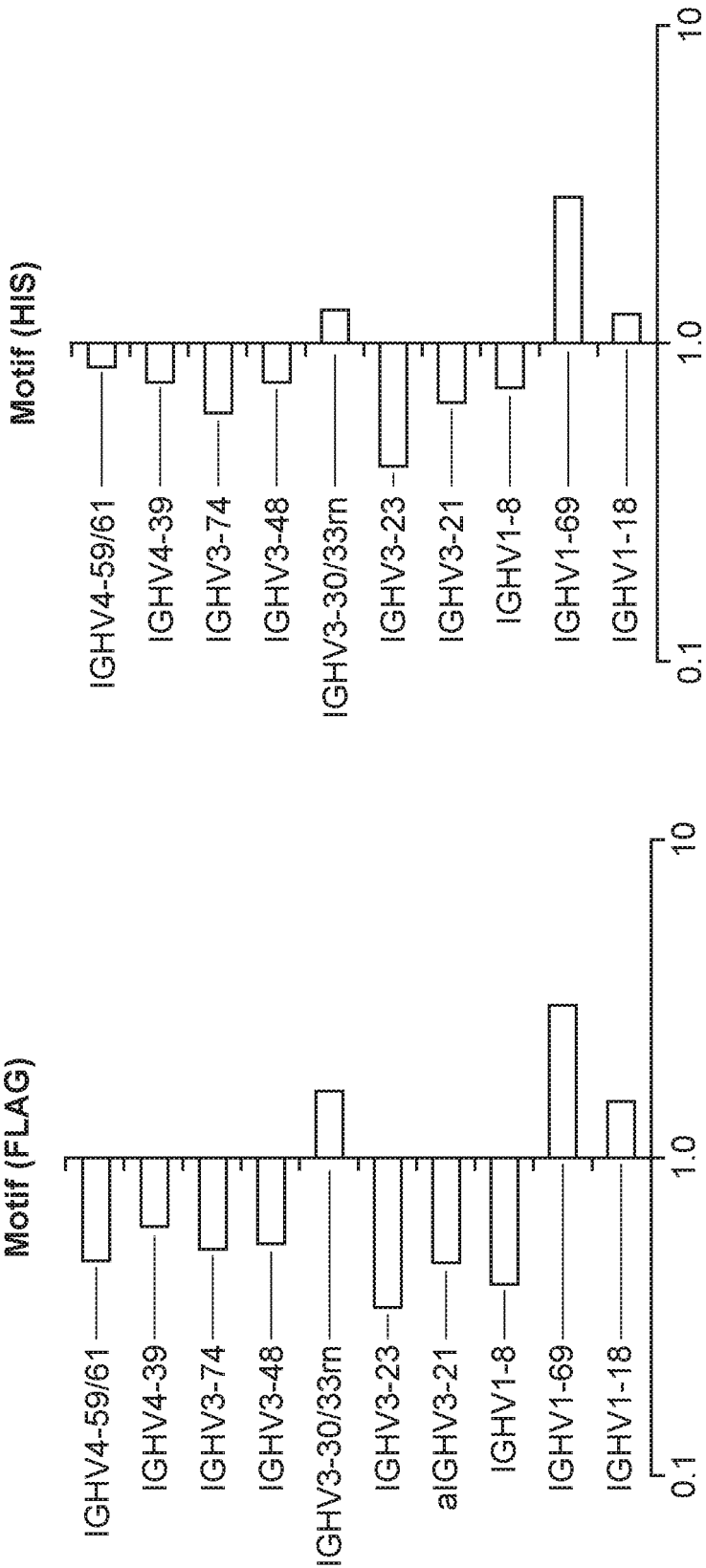


FIG. 18D

FIG. 18C

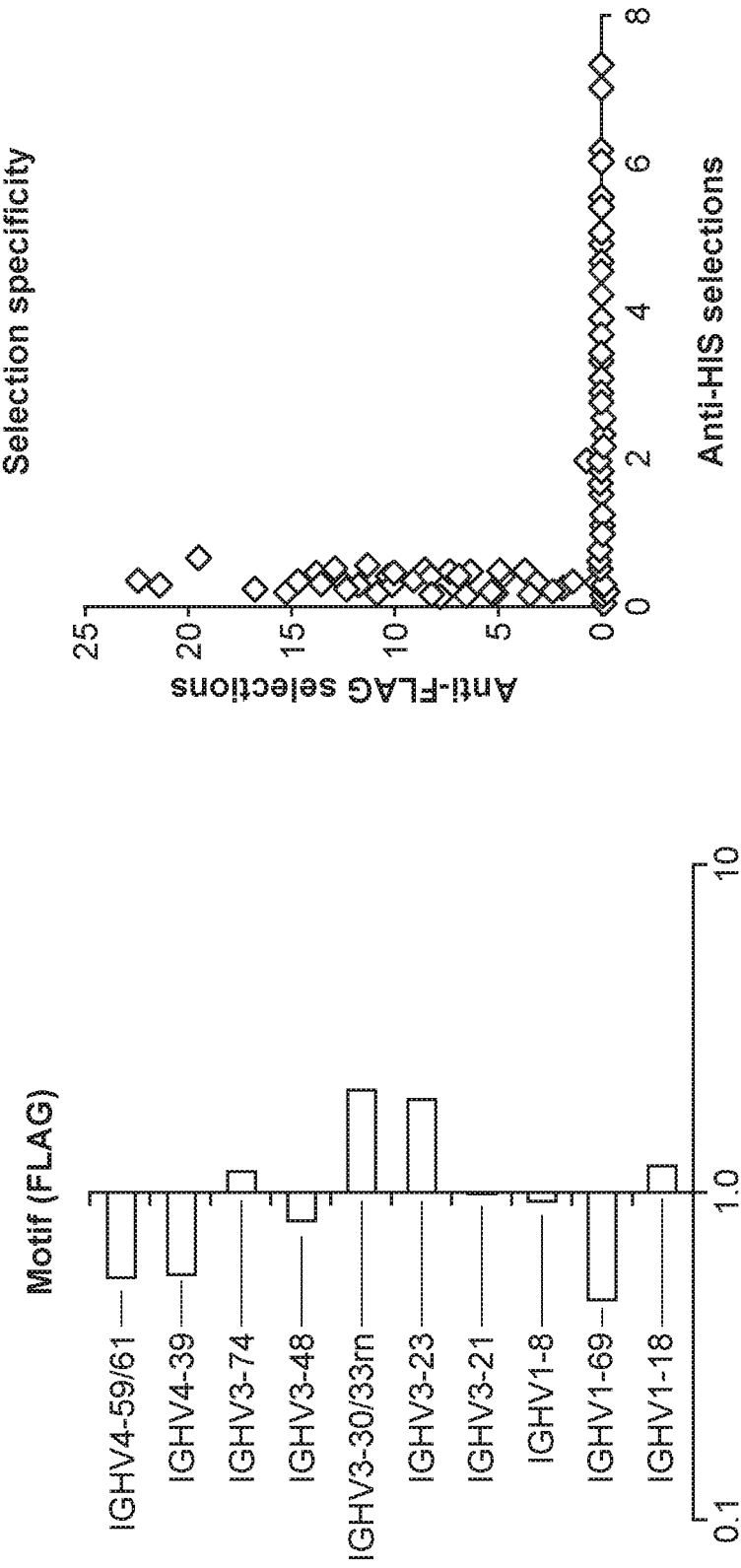


FIG. 18F

FIG. 18E

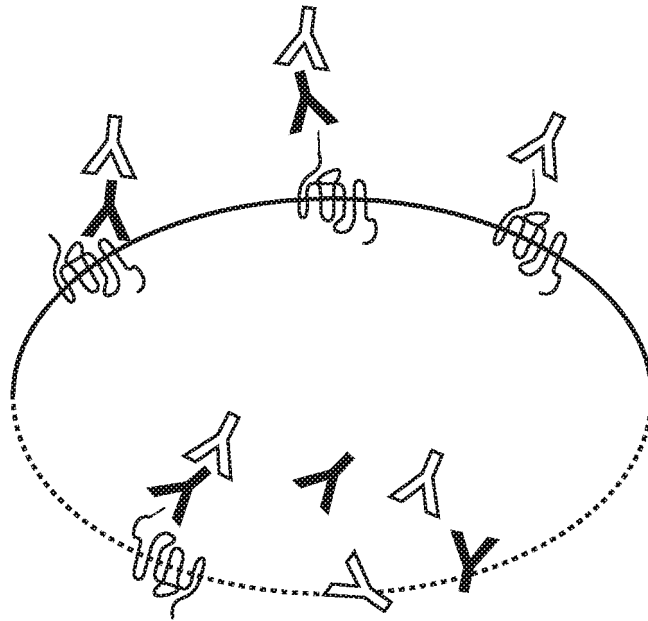


FIG. 19A

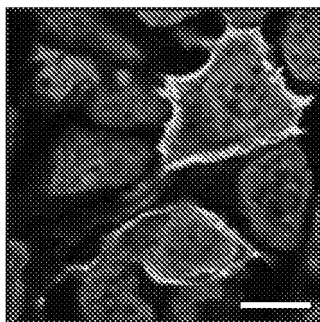


FIG. 19B

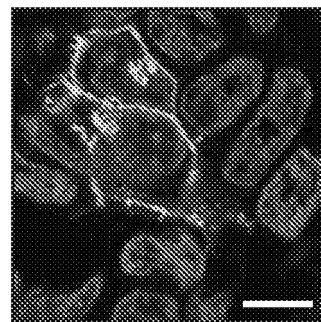


FIG. 19C

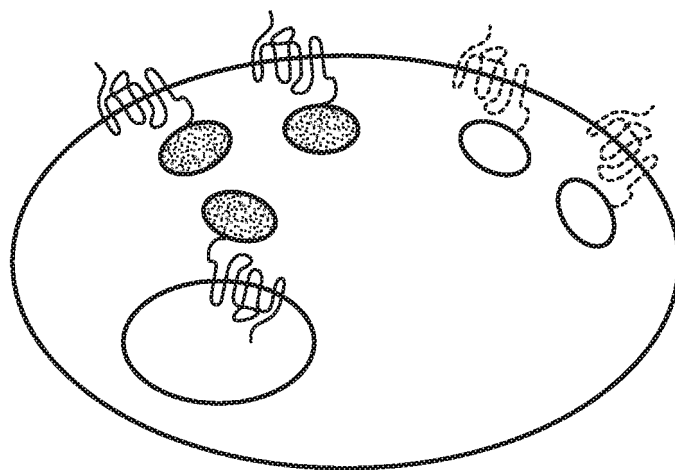


FIG. 20A

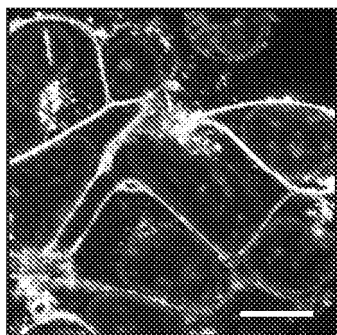


FIG. 20B

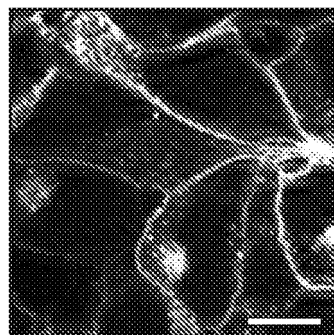


FIG. 20C

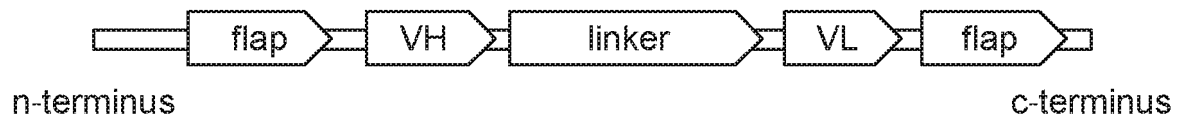


FIG. 21A

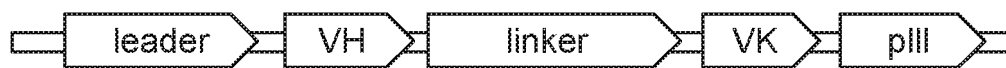


FIG. 21B

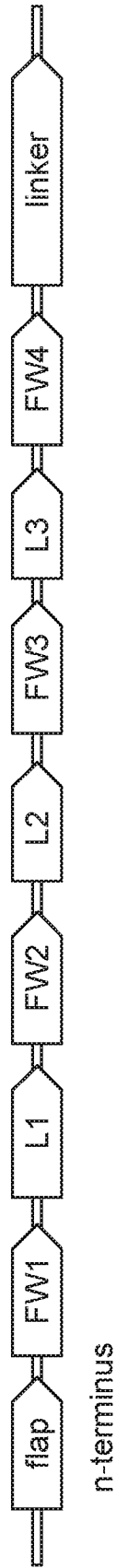


FIG. 21C