

Figure 1A  
Antibody Heavy chain Protein features

| Sequence Name | FR1                            | CDR1  | FR2            | CDR2              |
|---------------|--------------------------------|-------|----------------|-------------------|
| Ab10          | QSVESGGRLVTPGTPLTLTCTVSGIDLN   | SYMT  | WVRQAPGKGLEWIG | FIDAGDAYYASWAKG   |
| Ab20          | QSVESGGRLVTPGTPLTLTCTVSGIDLN   | SYMS  | WVRQAPGKGLEWIG | FIDTGSAYYATWAKG   |
| Ab21          | QSVESGGRLVTPGTPLTLTCTVSGIDLN   | SYMT  | WVRQAPGKGLEWVG | FIDAGSAYYATWAKG   |
| Ab22          | QEQLVESGGGLVQPEGSLTLTCTASGFDFS | SNAMC | WVRQAPGKGLEWIG | SIYNADGKNYYAIWAKG |
| Ab23          | QSVESGGRLVTPGTPLTLTCTVSGFSLN   | NYAMS | WVRQAPGKGLEWIG | IMGVNDITYYASWAKG  |
| Ab10.H        | EVQLVESGGGLVQPGGSLRLSCAASGIDLN | SYMT  | WVRQAPGKGLEWIG | FIDAGDAYYASWAKG   |
| Ab21.H        | EVQLVESGGGLVQPGGSLRLSCAASGIDLN | SYMT  | WVRQAPGKGLEWIG | FIDAGSAYYATWAKG   |
| Ab10.H2       | EVQLVESGGGLVQPGGSLRLSCAASGIDLN | SYMT  | WVRQAPGKGLEWIG | FIDAGDAYYASWAKG   |
| Ab10.H3       | EVQLVESGGGLVQPGGSLRLSCAASGIDLN | SYMT  | WVRQAPGKGLEWIG | FIDAGDAYYASWAKG   |
| Ab10.H4       | EVQLVESGGGLVQPGGSLRLSCAASGIDLN | SYMT  | WVRQAPGKGLEWIG | FIDAGDAYYASWAKG   |
| Ab10.H5       | EVQLVESGGGLVQPGGSLRLSCAASGIDLN | SYMT  | WVRQAPGKGLEWIG | FIDAGDAYYASWAKG   |
| Ab10.H6       | EVQLVESGGGLVQPGGSLRLSCAASGIDLN | SYMT  | WVRQAPGKGLEWIG | FIDAGDAYYASWAKG   |
| Ab21.H2       | EVQLVESGGGLVQPGGSLRLSCAASGIDLN | SYMT  | WVRQAPGKGLEWIG | FIDAGSAYYATWAKG   |
| Ab21.H3       | EVQLVESGGGLVQPGGSLRLSCAASGIDLN | SYMT  | WVRQAPGKGLEWIG | FIDAGSAYYATWAKG   |
| Ab21.H4       | EVQLVESGGGLVQPGGSLRLSCAASGIDLN | SYMT  | WVRQAPGKGLEWIG | FIDAGSAYYATWAKG   |

Figure 1B  
Antibody Heavy chain Protein features

| Sequence Name | FR3                             | CDR3        | FR4          |
|---------------|---------------------------------|-------------|--------------|
| Ab10          | RFTISKSTTVDLKITSPTTEDTATYFCAR   | DLDL        | WGQGTLLVTVSS |
| Ab20          | RFTISKSTTVDLKITSPTTEDTATYFCAR   | DLDL        | WGPGLVTVSS   |
| Ab21          | RFTISKASTTVDLKITSPTTEDTATYFCAR  | DLDL        | WGPGLVTVSS   |
| Ab22          | RFTISRTSSTTVTLQMTSLTAADTATYFCAR | DFDL        | WGQGTLLVTVSS |
| Ab23          | RFTISKSTTVDLKMTSLTTEDTATYFCTR   | EIRDDGSDSKL | WGPGLVTVSS   |
| Ab10.H        | RFTISRDNKNTVYLQMNLSRAEDTAVYFCAR | DLDL        | WGQGTLLVTVSS |
| Ab21.H        | RFTISRDNKNTVYLQMNLSRAEDTAVYFCAR | DLDL        | WGQGTLLVTVSS |
| Ab10.H2       | RFTISRDNKNTVYLQMNLSRAEDTAVYFCAR | DLDL        | WGQGTLLVTVSS |
| Ab10.H3       | RFTISRDNKNTVYLQMNLSRAEDTAVYFCAR | DLDL        | WGQGTLLVTVSS |
| Ab10.H4       | RFTISRDNKNTVYLQMNLSRAEDTAVYFCAR | DLDL        | WGQGTLLVTVSS |
| Ab10.H5       | RFTISRDNKNTVYLQMNLSRAEDTAVYFCAR | DLDL        | WGQGTLLVTVSS |
| Ab10.H6       | RFTISRDNKNTVYLQMNLSRAEDTAVYFCAR | DLDL        | WGQGTLLVTVSS |
| Ab21.H2       | RFTISRDNKNTVYLQMNLSRAEDTAVYFCAR | DLDL        | WGQGTLLVTVSS |
| Ab21.H3       | RFTISRDNKNTVYLQMNLSRAEDTAVYFCAR | DLDL        | WGQGTLLVTVSS |
| Ab21.H4       | RFTISRDNKNTVYLQMNLSRAEDTAVYFCAR | DLDL        | WGQGTLLVTVSS |

Figure 1C

## Antibody Heavy chain Protein features

## Sequence

| Name    | Constant region                                                            |
|---------|----------------------------------------------------------------------------|
| Ab10    | ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVMNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSL |
| Ab20    | ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVMNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSL |
| Ab21    | ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVMNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSL |
| Ab22    | ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVMNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSL |
| Ab23    | ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVMNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSL |
| Ab10.H  | ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVMNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSL |
| Ab21.H  | ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVMNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSL |
| Ab10.H2 | ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVMNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSL |
| Ab10.H3 | ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVMNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSL |
| Ab10.H4 | ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVMNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSL |
| Ab10.H5 | ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVMNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSL |
| Ab10.H6 | ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVMNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSL |
| Ab21.H2 | ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVMNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSL |
| Ab21.H3 | ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVMNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSL |
| Ab21.H4 | ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVMNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSL |

Figure 1D

## Antibody Heavy chain Protein features

## Sequence

| Name    | Constant region                                                               |
|---------|-------------------------------------------------------------------------------|
| Ab10    | GTQTYICNVNHHKPSNTKVDARVEPKSCDKTHTCTPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVWVDVSH |
| Ab20    | GTQTYICNVNHHKPSNTKVDKKVEPKSCDKTHTCTPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVWVDVSH |
| Ab21    | GTQTYICNVNHHKPSNTKVDKKVEPKSCDKTHTCTPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVWVDVSH |
| Ab22    | GTQTYICNVNHHKPSNTKVDARVEPKSCDKTHTCTPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVWVDVSH |
| Ab23    | GTQTYICNVNHHKPSNTKVDARVEPKSCDKTHTCTPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVWVDVSH |
| Ab10.H  | GTQTYICNVNHHKPSNTKVDKKVEPKSCDKTHTCTPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVWVDVSH |
| Ab21.H  | GTQTYICNVNHHKPSNTKVDKKVEPKSCDKTHTCTPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVWVDVSH |
| Ab10.H2 | GTQTYICNVNHHKPSNTKVDKKVEPKSCDKTHTCTPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVWVDVSH |
| Ab10.H3 | GTQTYICNVNHHKPSNTKVDKKVEPKSCDKTHTCTPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVWVDVSH |
| Ab10.H4 | GTQTYICNVNHHKPSNTKVDKKVEPKSCDKTHTCTPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVWVDVSH |
| Ab10.H5 | GTQTYICNVNHHKPSNTKVDKKVEPKSCDKTHTCTPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVWVDVSH |
| Ab10.H6 | GTQTYICNVNHHKPSNTKVDKKVEPKSCDKTHTCTPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVWVDVSH |
| Ab21.H2 | GTQTYICNVNHHKPSNTKVDKKVEPKSCDKTHTCTPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVWVDVSH |
| Ab21.H3 | GTQTYICNVNHHKPSNTKVDKKVEPKSCDKTHTCTPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVWVDVSH |
| Ab21.H4 | GTQTYICNVNHHKPSNTKVDKKVEPKSCDKTHTCTPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVWVDVSH |

Figure 1E

## Antibody Heavy chain Protein features

| Sequence Name | Constant region                                                           |
|---------------|---------------------------------------------------------------------------|
| Ab10          | EDPEVKFNWYVDGVEVHNAKTKPREEQYASTYRVSVLTVLHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQP |
| Ab20          | EDPEVKFNWYVDGVEVHNAKTKPREEQYASTYRVSVLTVLHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQP |
| Ab21          | EDPEVKFNWYVDGVEVHNAKTKPREEQYASTYRVSVLTVLHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQP |
| Ab22          | EDPEVKFNWYVDGVEVHNAKTKPREEQYASTYRVSVLTVLHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQP |
| Ab23          | EDPEVKFNWYVDGVEVHNAKTKPREEQYASTYRVSVLTVLHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQP |
| Ab10.H        | EDPEVKFNWYVDGVEVHNAKTKPREEQYASTYRVSVLTVLHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQP |
| Ab21.H        | EDPEVKFNWYVDGVEVHNAKTKPREEQYASTYRVSVLTVLHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQP |
| Ab10.H2       | EDPEVKFNWYVDGVEVHNAKTKPREEQYASTYRVSVLTVLHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQP |
| Ab10.H3       | EDPEVKFNWYVDGVEVHNAKTKPREEQYASTYRVSVLTVLHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQP |
| Ab10.H4       | EDPEVKFNWYVDGVEVHNAKTKPREEQYASTYRVSVLTVLHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQP |
| Ab10.H5       | EDPEVKFNWYVDGVEVHNAKTKPREEQYASTYRVSVLTVLHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQP |
| Ab10.H6       | EDPEVKFNWYVDGVEVHNAKTKPREEQYASTYRVSVLTVLHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQP |
| Ab21.H2       | EDPEVKFNWYVDGVEVHNAKTKPREEQYASTYRVSVLTVLHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQP |
| Ab21.H3       | EDPEVKFNWYVDGVEVHNAKTKPREEQYASTYRVSVLTVLHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQP |
| Ab21.H4       | EDPEVKFNWYVDGVEVHNAKTKPREEQYASTYRVSVLTVLHQDWLNGKEYCKVSNKALPAPIEKTISKAKGQP |

Figure 1F

## Antibody Heavy chain Protein features

| Sequence Name | Constant region                                                              |
|---------------|------------------------------------------------------------------------------|
| Ab10          | REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQ |
| Ab20          | REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQ |
| Ab21          | REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQ |
| Ab22          | REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQ |
| Ab23          | REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQ |
| Ab10.H        | REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQ |
| Ab21.H        | REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQ |
| Ab10.H2       | REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQ |
| Ab10.H3       | REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQ |
| Ab10.H4       | REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQ |
| Ab10.H5       | REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQ |
| Ab10.H6       | REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQ |
| Ab21.H2       | REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQ |
| Ab21.H3       | REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQ |
| Ab21.H4       | REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTTPPVLDSDGSFFLYSKLTVDKSRWQ |

Figure 1G

## Antibody Heavy chain Protein features

## Sequence

| Name    | Constant region                                 |
|---------|-------------------------------------------------|
| Ab10    | QGNVFCSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 401)  |
| Ab20    | QGNVFCSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 441)  |
| Ab21    | QGNVFCSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 841)  |
| Ab22    | QGNVFCSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 881)  |
| Ab23    | QGNVFCSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 921)  |
| Ab10.H  | QGNVFCSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 961)  |
| Ab21.H  | QGNVFCSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 1201) |
| Ab10.H2 | QGNVFCSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 1281) |
| Ab10.H3 | QGNVFCSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 1321) |
| Ab10.H4 | QGNVFCSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 1361) |
| Ab10.H5 | QGNVFCSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 1401) |
| Ab10.H6 | QGNVFCSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 1441) |
| Ab21.H2 | QGNVFCSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 1481) |
| Ab21.H3 | QGNVFCSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 1521) |
| Ab21.H4 | QGNVFCSCVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 1561) |

Figure 2A

## Antibody Light chain Protein features

## Sequence

| Name    | FR1                      | CDR1          | FR2             | CDR2    |
|---------|--------------------------|---------------|-----------------|---------|
| Ab10    | AAVLTQTSPSPVSAAVGGTVTINC | QSSSVYGNLYA   | WFQQKPGQPPKLLIY | EASKLES |
| Ab20    | AAVLTQTSPSPVSAAVGGTVSISC | QSSSVYSNYLA   | WFQQKPGQPPKFLIY | EASKLAS |
| Ab21    | AAVLTQTSPSPVSAAVGGTVSISC | KSSSVYGDYLA   | WFQQKPGQPPKQLIY | DASTLAS |
| Ab22    | AAVLTQTSPSPVSAAVGGTVTINC | QSSQSVYDNDWLA | WFQQKPGQPPKLLIY | LTSTLAS |
| Ab23    | AIKMTQTSPSSVSAAVGGTVTINC | QASEDIYTNLA   | WYQQKPGQPPNLLIY | DASDLAS |
| Ab10.H  | DAQLTQSPSTLSASVGDRVTITC  | QSSSVYGNLYA   | WFQQKPGKAPKFLIY | EASKLES |
| Ab21.H  | DAQLTQSPSTLSASVGDRVTITC  | KSSSVYGDYLA   | WFQQKPGKAPKQLIY | DASTLAS |
| Ab10.H2 | AVLTQSPSTLSASVGDRVTITC   | QSSSVYGNLYA   | WFQQKPGKAPKFLIY | EASKLES |
| Ab10.H3 | DIQLTQSPSTLSASVGDRVTITC  | QSSSVYGNLYA   | WFQQKPGKAPKFLIY | EASKLES |
| Ab10.H4 | DIVLTQSPSTLSASVGDRVTITC  | QSSSVYGNLYA   | WFQQKPGKAPKFLIY | EASKLES |
| Ab10.H5 | QLTQSPSTLSASVGDRVTITC    | QSSSVYGNLYA   | WFQQKPGKAPKFLIY | EASKLES |
| Ab10.H6 | QVL TQSPSTLSASVGDRVTITC  | QSSSVYGNLYA   | WFQQKPGKAPKFLIY | EASKLES |
| Ab21.H2 | AVLTQSPSTLSASVGDRVTITC   | KSSSVYGDYLA   | WFQQKPGKAPKQLIY | DASTLAS |
| Ab21.H3 | DIQLTQSPSTLSASVGDRVTITC  | KSSSVYGDYLA   | WFQQKPGKAPKQLIY | DASTLAS |
| Ab21.H4 | DIVLTQSPSTLSASVGDRVTITC  | KSSSVYGDYLA   | WFQQKPGKAPKQLIY | DASTLAS |

Figure 2B  
Antibody Light chain Protein features

| Sequence | Name                             | FR3            | FR4         |
|----------|----------------------------------|----------------|-------------|
| Ab10     | GVPSRFGSGSGTGQFTLTISDLQCDDAATYYC | CDR3           | FR4         |
| Ab20     | GVPSRFGSGSGTGQFTLTISDVQCDDAGTYYC | AGGDI SEGVA    | FGGTEVVVVKR |
| Ab21     | GVPSRFGSGSGTGQFTLTISGVQCDDAATYYC | AGGYS SEGVA    | FGGTEVVVVKR |
| Ab22     | GVPSRFGSGSGTGQFTLTISGVQCDDAATYYC | AGGYV SAGVA    | FGGTEVVVVKR |
| Ab23     | GVPSRFGSGSGTGQFTLTISAVQCDDAATYYC | LGGYDEDGDTHV   | FGGTEVVVVKR |
| Ab10.H   | GVPSRFGSGSGTGQFTLTISLQPDDFATYYC  | QGVAWSSNTGYGSA | FGGTEVVVVKR |
| Ab21.H   | GVPSRFGSGSGTGQFTLTISLQPDDFATYYC  | AGGDI SEGVA    | FGGTEVVVVKR |
| Ab10.H2  | GVPSRFGSGSGTGQFTLTISLQPDDFATYYC  | AGGYV SAGVA    | FGGTEVVVVKR |
| Ab10.H3  | GVPSRFGSGSGTGQFTLTISLQPDDFATYYC  | AGGDI SEGVA    | FGGTEVVVVKR |
| Ab10.H4  | GVPSRFGSGSGTGQFTLTISLQPDDFATYYC  | AGGDI SEGVA    | FGGTEVVVVKR |
| Ab10.H5  | GVPSRFGSGSGTGQFTLTISLQPDDFATYYC  | AGGDI SEGVA    | FGGTEVVVVKR |
| Ab10.H6  | GVPSRFGSGSGTGQFTLTISLQPDDFATYYC  | AGGDI SEGVA    | FGGTEVVVVKR |
| Ab21.H2  | GVPSRFGSGSGTGQFTLTISLQPDDFATYYC  | AGGYV SAGVA    | FGGTEVVVVKR |
| Ab21.H3  | GVPSRFGSGSGTGQFTLTISLQPDDFATYYC  | AGGYV SAGVA    | FGGTEVVVVKR |
| Ab21.H4  | GVPSRFGSGSGTGQFTLTISLQPDDFATYYC  | AGGYV SAGVA    | FGGTEVVVVKR |

Figure 2C  
Antibody Light chain Protein features

| Sequence | Name                                                                   | Constant region |
|----------|------------------------------------------------------------------------|-----------------|
| Ab10     | TVAAPSVEFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSKA |                 |
| Ab20     | TVAAPSVEFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSKA |                 |
| Ab21     | TVAAPSVEFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSKA |                 |
| Ab22     | TVAAPSVEFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSKA |                 |
| Ab23     | TVAAPSVEFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSKA |                 |
| Ab10.H   | TVAAPSVEFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSKA |                 |
| Ab21.H   | TVAAPSVEFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSKA |                 |
| Ab10.H2  | TVAAPSVEFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSKA |                 |
| Ab10.H3  | TVAAPSVEFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSKA |                 |
| Ab10.H4  | TVAAPSVEFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSKA |                 |
| Ab10.H5  | TVAAPSVEFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSKA |                 |
| Ab10.H6  | TVAAPSVEFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSKA |                 |
| Ab21.H2  | TVAAPSVEFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSKA |                 |
| Ab21.H3  | TVAAPSVEFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSKA |                 |
| Ab21.H4  | TVAAPSVEFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSSTLSKA |                 |

Figure 2D  
Antibody Light chain Protein features

| Sequence | Name                           | Constant region   |
|----------|--------------------------------|-------------------|
| Ab10     | DYEKHKVYACEVTHQGLSSPVTKSFNRGEC | (SEQ ID NO: 421)  |
| Ab20     | DYEKHKVYACEVTHQGLSSPVTKSFNRGEC | (SEQ ID NO: 461)  |
| Ab21     | DYEKHKVYACEVTHQGLSSPVTKSFNRGEC | (SEQ ID NO: 861)  |
| Ab22     | DYEKHKVYACEVTHQGLSSPVTKSFNRGEC | (SEQ ID NO: 901)  |
| Ab23     | DYEKHKVYACEVTHQGLSSPVTKSFNRGEC | (SEQ ID NO: 941)  |
| Ab10.H   | DYEKHKVYACEVTHQGLSSPVTKSFNRGEC | (SEQ ID NO: 981)  |
| Ab21.H   | DYEKHKVYACEVTHQGLSSPVTKSFNRGEC | (SEQ ID NO: 1221) |
| Ab10.H2  | DYEKHKVYACEVTHQGLSSPVTKSFNRGEC | (SEQ ID NO: 1301) |
| Ab10.H3  | DYEKHKVYACEVTHQGLSSPVTKSFNRGEC | (SEQ ID NO: 1341) |
| Ab10.H4  | DYEKHKVYACEVTHQGLSSPVTKSFNRGEC | (SEQ ID NO: 1381) |
| Ab10.H5  | DYEKHKVYACEVTHQGLSSPVTKSFNRGEC | (SEQ ID NO: 1421) |
| Ab10.H6  | DYEKHKVYACEVTHQGLSSPVTKSFNRGEC | (SEQ ID NO: 1461) |
| Ab21.H2  | DYEKHKVYACEVTHQGLSSPVTKSFNRGEC | (SEQ ID NO: 1501) |
| Ab21.H3  | DYEKHKVYACEVTHQGLSSPVTKSFNRGEC | (SEQ ID NO: 1541) |
| Ab21.H4  | DYEKHKVYACEVTHQGLSSPVTKSFNRGEC | (SEQ ID NO: 1581) |

Figure 3A  
Antibody Heavy chain DNA features

| Sequence | Name                                                                             | FR1 |
|----------|----------------------------------------------------------------------------------|-----|
| Ab10     | cagtcggtggaggagtcggtgggtgcctgggtcacgcctgggacacccctgacactcacctgcacagtcctctggaa    |     |
| Ab20     | cagtcggtggaggagtcggtgggtgcctgggtcacgcctgggacacccctgacactcacctgcacagtcctctggaa    |     |
| Ab21     | cagtcggtggaggagtcggtgggtgcctgggtcacgcctgggacacccctgacactcacctgcacagtcctctggaa    |     |
| Ab22     | caggagcagctggtggagtcggtgggtgcctgggtcacgcctgggacacccctgacactcacctgcacagtcctctggaa |     |
| Ab23     | cagtcggtggaggagtcggtgggtgcctgggtcacgcctgggacacccctgacactcacctgcacagtcctctggaa    |     |
| Ab10.H   | gaggtgcagcttgaggagtcggtgggtgcctgggtcacgcctgggacacccctgacactcacctgcacagtcctctggaa |     |
| Ab21.H   | gaggtgcagcttgaggagtcggtgggtgcctgggtcacgcctgggacacccctgacactcacctgcacagtcctctggaa |     |
| Ab10.H2  | gaggtgcagcttgaggagtcggtgggtgcctgggtcacgcctgggacacccctgacactcacctgcacagtcctctggaa |     |
| Ab10.H3  | gaggtgcagcttgaggagtcggtgggtgcctgggtcacgcctgggacacccctgacactcacctgcacagtcctctggaa |     |
| Ab10.H4  | gaggtgcagcttgaggagtcggtgggtgcctgggtcacgcctgggacacccctgacactcacctgcacagtcctctggaa |     |
| Ab10.H5  | gaggtgcagcttgaggagtcggtgggtgcctgggtcacgcctgggacacccctgacactcacctgcacagtcctctggaa |     |
| Ab10.H6  | gaggtgcagcttgaggagtcggtgggtgcctgggtcacgcctgggacacccctgacactcacctgcacagtcctctggaa |     |
| Ab21.H2  | gaggtgcagcttgaggagtcggtgggtgcctgggtcacgcctgggacacccctgacactcacctgcacagtcctctggaa |     |
| Ab21.H3  | gaggtgcagcttgaggagtcggtgggtgcctgggtcacgcctgggacacccctgacactcacctgcacagtcctctggaa |     |
| Ab21.H4  | gaggtgcagcttgaggagtcggtgggtgcctgggtcacgcctgggacacccctgacactcacctgcacagtcctctggaa |     |

Figure 3B

## Antibody Heavy chain DNA features

| Sequence | FR1            | CDR1            | FR2                                      |
|----------|----------------|-----------------|------------------------------------------|
| Name     |                |                 |                                          |
| Ab10     | tcgacctcaat    | agctactacatgacc | tgggtccgccaggctccagggaagggtggaatggatcgga |
| Ab20     | tcgacctcagt    | agctactacatgacc | tgggtccgccaggctccagggaagggtggaatggatcgga |
| Ab21     | tcgacctcagt    | agctactacatgacc | tgggtccgccaggctccagggaagggtggaatggatcgga |
| Ab22     | gattcgacttcagt | agcaatgcaatgtgc | tgggtccgccaggctccagggaagggtggaatggatcgga |
| Ab23     | tctccctcaat    | aactatgcaatgacc | tgggtccgccaggctccagggaagggtggaatggatcgga |
| Ab10.H   | gaatcgacctcaat | agctactacatgacc | tgggtccgtcaggctccagggaagggtggaatggatcgga |
| Ab21.H   | gaatcgacctcagt | agctactacatgacc | tgggtccgtcaggctccagggaagggtggaatggatcgga |
| Ab10.H2  | gaatcgacctcaat | agctactacatgacc | tgggtccgtcaggctccagggaagggtggaatggatcgga |
| Ab10.H3  | gaatcgacctcaat | agctactacatgacc | tgggtccgtcaggctccagggaagggtggaatggatcgga |
| Ab10.H4  | gaatcgacctcaat | agctactacatgacc | tgggtccgtcaggctccagggaagggtggaatggatcgga |
| Ab10.H5  | gaatcgacctcaat | agctactacatgacc | tgggtccgtcaggctccagggaagggtggaatggatcgga |
| Ab10.H6  | gaatcgacctcaat | agctactacatgacc | tgggtccgtcaggctccagggaagggtggaatggatcgga |
| Ab21.H2  | gaatcgacctcagt | agctactacatgacc | tgggtccgtcaggctccagggaagggtggaatggatcgga |
| Ab21.H3  | gaatcgacctcagt | agctactacatgacc | tgggtccgtcaggctccagggaagggtggaatggatcgga |
| Ab21.H4  | gaatcgacctcagt | agctactacatgacc | tgggtccgtcaggctccagggaagggtggaatggatcgga |

Figure 3C

## Antibody Heavy chain DNA features

| Sequence | CDR2                                                 | FR3                        |
|----------|------------------------------------------------------|----------------------------|
| Name     |                                                      |                            |
| Ab10     | ttcattgatgctggtggtgacgcatactacgcgagctgggcgaaaggg     | cgattcaccatctccaaaacctcga  |
| Ab20     | ttcattgatactgatggtgacgcatactacgcgacctgggcgaaaggg     | cgattcaccatctccaaaacctcga  |
| Ab21     | ttcattgatgctggtggtgacgcatactacgcgacctgggcgaaaggg     | cgattcaccatctccaaaagcctcga |
| Ab22     | tccatttataatgctgatggtgaagaattattacgcgatttgggcgaaaggg | cgattcaccatctccagaacctcgt  |
| Ab23     | atcatgggtgttaatgatatacacatactacgcgagctgggcgaaaggg    | cgattcaccatctccaaaacctcga  |
| Ab10.H   | ttcattgatgctggtggtgacgcatactacgcgagctgggcgaaaggg     | cgattcaccatctccagagacaatt  |
| Ab21.H   | ttcattgatgctggtggtgacgcatactacgcgacctgggcgaaaggg     | cgattcaccatctccagagacaatt  |
| Ab10.H2  | ttcattgatgctggtggtgacgcatactacgcgagctgggcgaaaggg     | cgattcaccatctccagagacaatt  |
| Ab10.H3  | ttcattgatgctggtggtgacgcatactacgcgagctgggcgaaaggg     | cgattcaccatctccagagacaatt  |
| Ab10.H4  | ttcattgatgctggtggtgacgcatactacgcgagctgggcgaaaggg     | cgattcaccatctccagagacaatt  |
| Ab10.H5  | ttcattgatgctggtggtgacgcatactacgcgagctgggcgaaaggg     | cgattcaccatctccagagacaatt  |
| Ab10.H6  | ttcattgatgctggtggtgacgcatactacgcgagctgggcgaaaggg     | cgattcaccatctccagagacaatt  |
| Ab21.H2  | ttcattgatgctggtggtgacgcatactacgcgacctgggcgaaaggg     | cgattcaccatctccagagacaatt  |
| Ab21.H3  | ttcattgatgctggtggtgacgcatactacgcgacctgggcgaaaggg     | cgattcaccatctccagagacaatt  |
| Ab21.H4  | ttcattgatgctggtggtgacgcatactacgcgacctgggcgaaaggg     | cgattcaccatctccagagacaatt  |

Figure 3D

## Antibody Heavy chain DNA features

| Sequence | FR3                                                                      |
|----------|--------------------------------------------------------------------------|
| Name     |                                                                          |
| Ab10     | ccacggtgatctgaaatcaccagtcgacaaaccgagacacgcccacatttctgtgccaga             |
| Ab20     | ccacggtgatctgaaatcaccagtcgacaaaccgagacacgcccacatttctgtgccaga             |
| Ab21     | ccacggtgatctgaaatcaccagtcgacaaaccgagacacgcccacatttctgtgccaga             |
| Ab22     | cgaccacggtgactctgcaaatgaccagtctgacagccgagacacgcccacatttctgtgccaga        |
| Ab23     | ccacggtgatctgaaatgaccagtctgacaaaccgagacacgcccacatttctgtactaga            |
| Ab10.H   | ccaagaacacccgtgtatcttcaaatgaacagcctgagagctgaggacactgctgtgtatttctgtgctaga |
| Ab21.H   | ccaagaacacccgtgtatcttcaaatgaacagcctgagagctgaggacactgctgtgtatttctgtgctaga |
| Ab10.H2  | ccaagaacacccgtgtatcttcaaatgaacagcctgagagctgaggacactgctgtgtatttctgtgctaga |
| Ab10.H3  | ccaagaacacccgtgtatcttcaaatgaacagcctgagagctgaggacactgctgtgtatttctgtgctaga |
| Ab10.H4  | ccaagaacacccgtgtatcttcaaatgaacagcctgagagctgaggacactgctgtgtatttctgtgctaga |
| Ab10.H5  | ccaagaacacccgtgtatcttcaaatgaacagcctgagagctgaggacactgctgtgtatttctgtgctaga |
| Ab10.H6  | ccaagaacacccgtgtatcttcaaatgaacagcctgagagctgaggacactgctgtgtatttctgtgctaga |
| Ab21.H2  | ccaagaacacccgtgtatcttcaaatgaacagcctgagagctgaggacactgctgtgtatttctgtgctaga |
| Ab21.H3  | ccaagaacacccgtgtatcttcaaatgaacagcctgagagctgaggacactgctgtgtatttctgtgctaga |
| Ab21.H4  | ccaagaacacccgtgtatcttcaaatgaacagcctgagagctgaggacactgctgtgtatttctgtgctaga |

Figure 3E

## Antibody Heavy chain DNA features

| Sequence | CDR3                               | FR4                                  |
|----------|------------------------------------|--------------------------------------|
| Name     |                                    |                                      |
| Ab10     | gactcttgacttg                      | tggggccaggggacccctggtcacccgtctcgagc  |
| Ab20     | gactcttgacttg                      | tggggccggggacccctggtcacccgtctcgagc   |
| Ab21     | gactcttgacttg                      | tggggccggggacccctggtcacccgtctcgagc   |
| Ab22     | gactcttgacttg                      | tggggccaggggacccctggtcacccgtctcgagc  |
| Ab23     | gagatccgtgatggtgatgttctgtataaagtgg | tggggccggggacccctggtcacccgtctcgagc   |
| Ab10.H   | gactcttgacttg                      | tggggccaaagggacccctggtcacccgtctcgagc |
| Ab21.H   | gactcttgacttg                      | tggggccaaagggacccctggtcacccgtctcgagc |
| Ab10.H2  | gactcttgacttg                      | tggggccaaagggacccctggtcacccgtctcgagc |
| Ab10.H3  | gactcttgacttg                      | tggggccaaagggacccctggtcacccgtctcgagc |
| Ab10.H4  | gactcttgacttg                      | tggggccaaagggacccctggtcacccgtctcgagc |
| Ab10.H5  | gactcttgacttg                      | tggggccaaagggacccctggtcacccgtctcgagc |
| Ab10.H6  | gactcttgacttg                      | tggggccaaagggacccctggtcacccgtctcgagc |
| Ab21.H2  | gactcttgacttg                      | tggggccaaagggacccctggtcacccgtctcgagc |
| Ab21.H3  | gactcttgacttg                      | tggggccaaagggacccctggtcacccgtctcgagc |
| Ab21.H4  | gactcttgacttg                      | tggggccaaagggacccctggtcacccgtctcgagc |

Figure 3F

## Antibody Heavy chain DNA features

## Sequence

| Name    | Constant region                                                          |
|---------|--------------------------------------------------------------------------|
| Ab10    | gcctccaccaaggcccatcggtcttccccctggcaccctctccaagagcacctctggggcacagcgccctgg |
| Ab20    | gcctccaccaaggcccatcggtcttccccctggcaccctctccaagagcacctctggggcacagcgccctgg |
| Ab21    | gcctccaccaaggcccatcggtcttccccctggcaccctctccaagagcacctctggggcacagcgccctgg |
| Ab22    | gcctccaccaaggcccatcggtcttccccctggcaccctctccaagagcacctctggggcacagcgccctgg |
| Ab23    | gcctccaccaaggcccatcggtcttccccctggcaccctctccaagagcacctctggggcacagcgccctgg |
| Ab10.H  | gcctccaccaaggcccatcggtcttccccctggcaccctctccaagagcacctctggggcacagcgccctgg |
| Ab21.H  | gcctccaccaaggcccatcggtcttccccctggcaccctctccaagagcacctctggggcacagcgccctgg |
| Ab10.H2 | gcctccaccaaggcccatcggtcttccccctggcaccctctccaagagcacctctggggcacagcgccctgg |
| Ab10.H3 | gcctccaccaaggcccatcggtcttccccctggcaccctctccaagagcacctctggggcacagcgccctgg |
| Ab10.H4 | gcctccaccaaggcccatcggtcttccccctggcaccctctccaagagcacctctggggcacagcgccctgg |
| Ab10.H5 | gcctccaccaaggcccatcggtcttccccctggcaccctctccaagagcacctctggggcacagcgccctgg |
| Ab10.H6 | gcctccaccaaggcccatcggtcttccccctggcaccctctccaagagcacctctggggcacagcgccctgg |
| Ab21.H2 | gcctccaccaaggcccatcggtcttccccctggcaccctctccaagagcacctctggggcacagcgccctgg |
| Ab21.H3 | gcctccaccaaggcccatcggtcttccccctggcaccctctccaagagcacctctggggcacagcgccctgg |
| Ab21.H4 | gcctccaccaaggcccatcggtcttccccctggcaccctctccaagagcacctctggggcacagcgccctgg |

Figure 3G

## Antibody Heavy chain DNA features

## Sequence

| Name    | Constant region                                                              |
|---------|------------------------------------------------------------------------------|
| Ab10    | gctgcctggtcaaggactacttccccgaaccggtgacgggtgctgtggaactcaggcgccctgaccagcgcggtgc |
| Ab20    | gctgcctggtcaaggactacttccccgaaccggtgacgggtgctgtggaactcaggcgccctgaccagcgcggtgc |
| Ab21    | gctgcctggtcaaggactacttccccgaaccggtgacgggtgctgtggaactcaggcgccctgaccagcgcggtgc |
| Ab22    | gctgcctggtcaaggactacttccccgaaccggtgacgggtgctgtggaactcaggcgccctgaccagcgcggtgc |
| Ab23    | gctgcctggtcaaggactacttccccgaaccggtgacgggtgctgtggaactcaggcgccctgaccagcgcggtgc |
| Ab10.H  | gctgcctggtcaaggactacttccccgaaccggtgacgggtgctgtggaactcaggcgccctgaccagcgcggtgc |
| Ab21.H  | gctgcctggtcaaggactacttccccgaaccggtgacgggtgctgtggaactcaggcgccctgaccagcgcggtgc |
| Ab10.H2 | gctgcctggtcaaggactacttccccgaaccggtgacgggtgctgtggaactcaggcgccctgaccagcgcggtgc |
| Ab10.H3 | gctgcctggtcaaggactacttccccgaaccggtgacgggtgctgtggaactcaggcgccctgaccagcgcggtgc |
| Ab10.H4 | gctgcctggtcaaggactacttccccgaaccggtgacgggtgctgtggaactcaggcgccctgaccagcgcggtgc |
| Ab10.H5 | gctgcctggtcaaggactacttccccgaaccggtgacgggtgctgtggaactcaggcgccctgaccagcgcggtgc |
| Ab10.H6 | gctgcctggtcaaggactacttccccgaaccggtgacgggtgctgtggaactcaggcgccctgaccagcgcggtgc |
| Ab21.H2 | gctgcctggtcaaggactacttccccgaaccggtgacgggtgctgtggaactcaggcgccctgaccagcgcggtgc |
| Ab21.H3 | gctgcctggtcaaggactacttccccgaaccggtgacgggtgctgtggaactcaggcgccctgaccagcgcggtgc |
| Ab21.H4 | gctgcctggtcaaggactacttccccgaaccggtgacgggtgctgtggaactcaggcgccctgaccagcgcggtgc |

Figure 3H

## Antibody Heavy chain DNA features

## Sequence

| Name    | Constant region                                                              |
|---------|------------------------------------------------------------------------------|
| Ab10    | acaccttcccggctgtcctacagtcctcagagctctactccctcagcagcgtggtgacccgtgccctccagcagct |
| Ab20    | acaccttcccggctgtcctacagtcctcagagctctactccctcagcagcgtggtgacccgtgccctccagcagct |
| Ab21    | acaccttcccggctgtcctacagtcctcagagctctactccctcagcagcgtggtgacccgtgccctccagcagct |
| Ab22    | acaccttcccggctgtcctacagtcctcagagctctactccctcagcagcgtggtgacccgtgccctccagcagct |
| Ab23    | acaccttcccggctgtcctacagtcctcagagctctactccctcagcagcgtggtgacccgtgccctccagcagct |
| Ab10.H  | acaccttcccggctgtcctacagtcctcagagctctactccctcagcagcgtggtgacccgtgccctccagcagct |
| Ab21.H  | acaccttcccggctgtcctacagtcctcagagctctactccctcagcagcgtggtgacccgtgccctccagcagct |
| Ab10.H2 | acaccttcccggctgtcctacagtcctcagagctctactccctcagcagcgtggtgacccgtgccctccagcagct |
| Ab10.H3 | acaccttcccggctgtcctacagtcctcagagctctactccctcagcagcgtggtgacccgtgccctccagcagct |
| Ab10.H4 | acaccttcccggctgtcctacagtcctcagagctctactccctcagcagcgtggtgacccgtgccctccagcagct |
| Ab10.H5 | acaccttcccggctgtcctacagtcctcagagctctactccctcagcagcgtggtgacccgtgccctccagcagct |
| Ab10.H6 | acaccttcccggctgtcctacagtcctcagagctctactccctcagcagcgtggtgacccgtgccctccagcagct |
| Ab21.H2 | acaccttcccggctgtcctacagtcctcagagctctactccctcagcagcgtggtgacccgtgccctccagcagct |
| Ab21.H3 | acaccttcccggctgtcctacagtcctcagagctctactccctcagcagcgtggtgacccgtgccctccagcagct |
| Ab21.H4 | acaccttcccggctgtcctacagtcctcagagctctactccctcagcagcgtggtgacccgtgccctccagcagct |

Figure 3I

## Antibody Heavy chain DNA features

## Sequence

| Name    | Constant region                                                             |
|---------|-----------------------------------------------------------------------------|
| Ab10    | tgggcacccagacctacatctgcaacgtgaatcacaaagccagcaacaccaaggtggacgcgagagttgagccca |
| Ab20    | tgggcacccagacctacatctgcaacgtgaatcacaaagccagcaacaccaaggtggacaaagttgagccca    |
| Ab21    | tgggcacccagacctacatctgcaacgtgaatcacaaagccagcaacaccaaggtggacaaagttgagccca    |
| Ab22    | tgggcacccagacctacatctgcaacgtgaatcacaaagccagcaacaccaaggtggacgcgagagttgagccca |
| Ab23    | tgggcacccagacctacatctgcaacgtgaatcacaaagccagcaacaccaaggtggacgcgagagttgagccca |
| Ab10.H  | tgggcacccagacctacatctgcaacgtgaatcacaaagccagcaacaccaaggtggacgcgagagttgagccca |
| Ab21.H  | tgggcacccagacctacatctgcaacgtgaatcacaaagccagcaacaccaaggtggacaaagttgagccca    |
| Ab10.H2 | tgggcacccagacctacatctgcaacgtgaatcacaaagccagcaacaccaaggtggacaaagttgagccca    |
| Ab10.H3 | tgggcacccagacctacatctgcaacgtgaatcacaaagccagcaacaccaaggtggacaaagttgagccca    |
| Ab10.H4 | tgggcacccagacctacatctgcaacgtgaatcacaaagccagcaacaccaaggtggacaaagttgagccca    |
| Ab10.H5 | tgggcacccagacctacatctgcaacgtgaatcacaaagccagcaacaccaaggtggacaaagttgagccca    |
| Ab10.H6 | tgggcacccagacctacatctgcaacgtgaatcacaaagccagcaacaccaaggtggacaaagttgagccca    |
| Ab21.H2 | tgggcacccagacctacatctgcaacgtgaatcacaaagccagcaacaccaaggtggacaaagttgagccca    |
| Ab21.H3 | tgggcacccagacctacatctgcaacgtgaatcacaaagccagcaacaccaaggtggacaaagttgagccca    |
| Ab21.H4 | tgggcacccagacctacatctgcaacgtgaatcacaaagccagcaacaccaaggtggacaaagttgagccca    |

Figure 3J

## Antibody Heavy chain DNA features

## Sequence

| Name    | Constant region                                                        |
|---------|------------------------------------------------------------------------|
| Ab10    | aatcttgacaaaactcacacatgccaccgtgccagcacctgaactcctgggggaccgtcagtccttctct |
| Ab20    | aatcttgacaaaactcacacatgccaccgtgccagcacctgaactcctgggggaccgtcagtccttctct |
| Ab21    | aatcttgacaaaactcacacatgccaccgtgccagcacctgaactcctgggggaccgtcagtccttctct |
| Ab22    | aatcttgacaaaactcacacatgccaccgtgccagcacctgaactcctgggggaccgtcagtccttctct |
| Ab23    | aatcttgacaaaactcacacatgccaccgtgccagcacctgaactcctgggggaccgtcagtccttctct |
| Ab10.H  | aatcttgacaaaactcacacatgccaccgtgccagcacctgaactcctgggggaccgtcagtccttctct |
| Ab21.H  | aatcttgacaaaactcacacatgccaccgtgccagcacctgaactcctgggggaccgtcagtccttctct |
| Ab10.H2 | aatcttgacaaaactcacacatgccaccgtgccagcacctgaactcctgggggaccgtcagtccttctct |
| Ab10.H3 | aatcttgacaaaactcacacatgccaccgtgccagcacctgaactcctgggggaccgtcagtccttctct |
| Ab10.H4 | aatcttgacaaaactcacacatgccaccgtgccagcacctgaactcctgggggaccgtcagtccttctct |
| Ab10.H5 | aatcttgacaaaactcacacatgccaccgtgccagcacctgaactcctgggggaccgtcagtccttctct |
| Ab10.H6 | aatcttgacaaaactcacacatgccaccgtgccagcacctgaactcctgggggaccgtcagtccttctct |
| Ab21.H2 | aatcttgacaaaactcacacatgccaccgtgccagcacctgaactcctgggggaccgtcagtccttctct |
| Ab21.H3 | aatcttgacaaaactcacacatgccaccgtgccagcacctgaactcctgggggaccgtcagtccttctct |
| Ab21.H4 | aatcttgacaaaactcacacatgccaccgtgccagcacctgaactcctgggggaccgtcagtccttctct |

Figure 3K

## Antibody Heavy chain DNA features

## Sequence

| Name    | Constant region                                                         |
|---------|-------------------------------------------------------------------------|
| Ab10    | tcccccaaaacccaaggacaccctcatgatctcccgaccctgaggtcacatgcgtggtggtgacgtgagcc |
| Ab20    | tcccccaaaacccaaggacaccctcatgatctcccgaccctgaggtcacatgcgtggtggtgacgtgagcc |
| Ab21    | tcccccaaaacccaaggacaccctcatgatctcccgaccctgaggtcacatgcgtggtggtgacgtgagcc |
| Ab22    | tcccccaaaacccaaggacaccctcatgatctcccgaccctgaggtcacatgcgtggtggtgacgtgagcc |
| Ab23    | tcccccaaaacccaaggacaccctcatgatctcccgaccctgaggtcacatgcgtggtggtgacgtgagcc |
| Ab10.H  | tcccccaaaacccaaggacaccctcatgatctcccgaccctgaggtcacatgcgtggtggtgacgtgagcc |
| Ab21.H  | tcccccaaaacccaaggacaccctcatgatctcccgaccctgaggtcacatgcgtggtggtgacgtgagcc |
| Ab10.H2 | tcccccaaaacccaaggacaccctcatgatctcccgaccctgaggtcacatgcgtggtggtgacgtgagcc |
| Ab10.H3 | tcccccaaaacccaaggacaccctcatgatctcccgaccctgaggtcacatgcgtggtggtgacgtgagcc |
| Ab10.H4 | tcccccaaaacccaaggacaccctcatgatctcccgaccctgaggtcacatgcgtggtggtgacgtgagcc |
| Ab10.H5 | tcccccaaaacccaaggacaccctcatgatctcccgaccctgaggtcacatgcgtggtggtgacgtgagcc |
| Ab10.H6 | tcccccaaaacccaaggacaccctcatgatctcccgaccctgaggtcacatgcgtggtggtgacgtgagcc |
| Ab21.H2 | tcccccaaaacccaaggacaccctcatgatctcccgaccctgaggtcacatgcgtggtggtgacgtgagcc |
| Ab21.H3 | tcccccaaaacccaaggacaccctcatgatctcccgaccctgaggtcacatgcgtggtggtgacgtgagcc |
| Ab21.H4 | tcccccaaaacccaaggacaccctcatgatctcccgaccctgaggtcacatgcgtggtggtgacgtgagcc |

Figure 3L

## Antibody Heavy chain DNA features

## Sequence

| Name    | Constant region                                                               |
|---------|-------------------------------------------------------------------------------|
| Ab10    | acgaagaccctgaggtcaagttcaactggtagcgtggacgcgctggaggtgcataatgccaaagacacaaagccgcg |
| Ab20    | acgaagaccctgaggtcaagttcaactggtagcgtggacgcgctggaggtgcataatgccaaagacacaaagccgcg |
| Ab21    | acgaagaccctgaggtcaagttcaactggtagcgtggacgcgctggaggtgcataatgccaaagacacaaagccgcg |
| Ab22    | acgaagaccctgaggtcaagttcaactggtagcgtggacgcgctggaggtgcataatgccaaagacacaaagccgcg |
| Ab23    | acgaagaccctgaggtcaagttcaactggtagcgtggacgcgctggaggtgcataatgccaaagacacaaagccgcg |
| Ab10.H  | acgaagaccctgaggtcaagttcaactggtagcgtggacgcgctggaggtgcataatgccaaagacacaaagccgcg |
| Ab21.H  | acgaagaccctgaggtcaagttcaactggtagcgtggacgcgctggaggtgcataatgccaaagacacaaagccgcg |
| Ab10.H2 | acgaagaccctgaggtcaagttcaactggtagcgtggacgcgctggaggtgcataatgccaaagacacaaagccgcg |
| Ab10.H3 | acgaagaccctgaggtcaagttcaactggtagcgtggacgcgctggaggtgcataatgccaaagacacaaagccgcg |
| Ab10.H4 | acgaagaccctgaggtcaagttcaactggtagcgtggacgcgctggaggtgcataatgccaaagacacaaagccgcg |
| Ab10.H5 | acgaagaccctgaggtcaagttcaactggtagcgtggacgcgctggaggtgcataatgccaaagacacaaagccgcg |
| Ab10.H6 | acgaagaccctgaggtcaagttcaactggtagcgtggacgcgctggaggtgcataatgccaaagacacaaagccgcg |
| Ab21.H2 | acgaagaccctgaggtcaagttcaactggtagcgtggacgcgctggaggtgcataatgccaaagacacaaagccgcg |
| Ab21.H3 | acgaagaccctgaggtcaagttcaactggtagcgtggacgcgctggaggtgcataatgccaaagacacaaagccgcg |
| Ab21.H4 | acgaagaccctgaggtcaagttcaactggtagcgtggacgcgctggaggtgcataatgccaaagacacaaagccgcg |

Figure 3M

## Antibody Heavy chain DNA features

## Sequence

| Name    | Constant region                                                            |
|---------|----------------------------------------------------------------------------|
| Ab10    | aggagcagtagccagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaagg |
| Ab20    | aggagcagtagccagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaagg |
| Ab21    | aggagcagtagccagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaagg |
| Ab22    | aggagcagtagccagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaagg |
| Ab23    | aggagcagtagccagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaagg |
| Ab10.H  | aggagcagtagccagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaagg |
| Ab21.H  | aggagcagtagccagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaagg |
| Ab10.H2 | aggagcagtagccagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaagg |
| Ab10.H3 | aggagcagtagccagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaagg |
| Ab10.H4 | aggagcagtagccagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaagg |
| Ab10.H5 | aggagcagtagccagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaagg |
| Ab10.H6 | aggagcagtagccagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaagg |
| Ab21.H2 | aggagcagtagccagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaagg |
| Ab21.H3 | aggagcagtagccagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaagg |
| Ab21.H4 | aggagcagtagccagcacgtaccgtgtggtcagcgtcctcaccgtcctgcaccaggactggctgaatggcaagg |

Figure 3N

## Antibody Heavy chain DNA features

## Sequence

| Name    | Constant region                                                            |
|---------|----------------------------------------------------------------------------|
| Ab10    | agtacaagtgcagggtctccaacaaagccctccagccccccatcgagaaaaccatctccaaagccaaaggcagc |
| Ab20    | agtacaagtgcagggtctccaacaaagccctccagccccccatcgagaaaaccatctccaaagccaaaggcagc |
| Ab21    | agtacaagtgcagggtctccaacaaagccctccagccccccatcgagaaaaccatctccaaagccaaaggcagc |
| Ab22    | agtacaagtgcagggtctccaacaaagccctccagccccccatcgagaaaaccatctccaaagccaaaggcagc |
| Ab23    | agtacaagtgcagggtctccaacaaagccctccagccccccatcgagaaaaccatctccaaagccaaaggcagc |
| Ab10.H  | agtacaagtgcagggtctccaacaaagccctccagccccccatcgagaaaaccatctccaaagccaaaggcagc |
| Ab21.H  | agtacaagtgcagggtctccaacaaagccctccagccccccatcgagaaaaccatctccaaagccaaaggcagc |
| Ab10.H2 | agtacaagtgcagggtctccaacaaagccctccagccccccatcgagaaaaccatctccaaagccaaaggcagc |
| Ab10.H3 | agtacaagtgcagggtctccaacaaagccctccagccccccatcgagaaaaccatctccaaagccaaaggcagc |
| Ab10.H4 | agtacaagtgcagggtctccaacaaagccctccagccccccatcgagaaaaccatctccaaagccaaaggcagc |
| Ab10.H5 | agtacaagtgcagggtctccaacaaagccctccagccccccatcgagaaaaccatctccaaagccaaaggcagc |
| Ab10.H6 | agtacaagtgcagggtctccaacaaagccctccagccccccatcgagaaaaccatctccaaagccaaaggcagc |
| Ab21.H2 | agtacaagtgcagggtctccaacaaagccctccagccccccatcgagaaaaccatctccaaagccaaaggcagc |
| Ab21.H3 | agtacaagtgcagggtctccaacaaagccctccagccccccatcgagaaaaccatctccaaagccaaaggcagc |
| Ab21.H4 | agtacaagtgcagggtctccaacaaagccctccagccccccatcgagaaaaccatctccaaagccaaaggcagc |

Figure 3O

## Antibody Heavy chain DNA features

## Sequence

| Name    | Constant region                                                              |
|---------|------------------------------------------------------------------------------|
| Ab10    | cccagagaaccacaggtgtacacccctgcccccatcccggaggagatgaccaagaaccaggtcagcctgacctgcc |
| Ab20    | cccagagaaccacaggtgtacacccctgcccccatcccggaggagatgaccaagaaccaggtcagcctgacctgcc |
| Ab21    | cccagagaaccacaggtgtacacccctgcccccatcccggaggagatgaccaagaaccaggtcagcctgacctgcc |
| Ab22    | cccagagaaccacaggtgtacacccctgcccccatcccggaggagatgaccaagaaccaggtcagcctgacctgcc |
| Ab23    | cccagagaaccacaggtgtacacccctgcccccatcccggaggagatgaccaagaaccaggtcagcctgacctgcc |
| Ab10.H  | cccagagaaccacaggtgtacacccctgcccccatcccggaggagatgaccaagaaccaggtcagcctgacctgcc |
| Ab21.H  | cccagagaaccacaggtgtacacccctgcccccatcccggaggagatgaccaagaaccaggtcagcctgacctgcc |
| Ab10.H2 | cccagagaaccacaggtgtacacccctgcccccatcccggaggagatgaccaagaaccaggtcagcctgacctgcc |
| Ab10.H3 | cccagagaaccacaggtgtacacccctgcccccatcccggaggagatgaccaagaaccaggtcagcctgacctgcc |
| Ab10.H4 | cccagagaaccacaggtgtacacccctgcccccatcccggaggagatgaccaagaaccaggtcagcctgacctgcc |
| Ab10.H5 | cccagagaaccacaggtgtacacccctgcccccatcccggaggagatgaccaagaaccaggtcagcctgacctgcc |
| Ab10.H6 | cccagagaaccacaggtgtacacccctgcccccatcccggaggagatgaccaagaaccaggtcagcctgacctgcc |
| Ab21.H2 | cccagagaaccacaggtgtacacccctgcccccatcccggaggagatgaccaagaaccaggtcagcctgacctgcc |
| Ab21.H3 | cccagagaaccacaggtgtacacccctgcccccatcccggaggagatgaccaagaaccaggtcagcctgacctgcc |
| Ab21.H4 | cccagagaaccacaggtgtacacccctgcccccatcccggaggagatgaccaagaaccaggtcagcctgacctgcc |

Figure 3P

## Antibody Heavy chain DNA features

## Sequence

| Name    | Constant region                                                               |
|---------|-------------------------------------------------------------------------------|
| Ab10    | tggtcaaaaggcttctatcccagcgacatcgccgtggagtggagagcaatgggcagccggagagaacaactacaaga |
| Ab20    | tggtcaaaaggcttctatcccagcgacatcgccgtggagtggagagcaatgggcagccggagagaacaactacaaga |
| Ab21    | tggtcaaaaggcttctatcccagcgacatcgccgtggagtggagagcaatgggcagccggagagaacaactacaaga |
| Ab22    | tggtcaaaaggcttctatcccagcgacatcgccgtggagtggagagcaatgggcagccggagagaacaactacaaga |
| Ab23    | tggtcaaaaggcttctatcccagcgacatcgccgtggagtggagagcaatgggcagccggagagaacaactacaaga |
| Ab10.H  | tggtcaaaaggcttctatcccagcgacatcgccgtggagtggagagcaatgggcagccggagagaacaactacaaga |
| Ab21.H  | tggtcaaaaggcttctatcccagcgacatcgccgtggagtggagagcaatgggcagccggagagaacaactacaaga |
| Ab10.H2 | tggtcaaaaggcttctatcccagcgacatcgccgtggagtggagagcaatgggcagccggagagaacaactacaaga |
| Ab10.H3 | tggtcaaaaggcttctatcccagcgacatcgccgtggagtggagagcaatgggcagccggagagaacaactacaaga |
| Ab10.H4 | tggtcaaaaggcttctatcccagcgacatcgccgtggagtggagagcaatgggcagccggagagaacaactacaaga |
| Ab10.H5 | tggtcaaaaggcttctatcccagcgacatcgccgtggagtggagagcaatgggcagccggagagaacaactacaaga |
| Ab10.H6 | tggtcaaaaggcttctatcccagcgacatcgccgtggagtggagagcaatgggcagccggagagaacaactacaaga |
| Ab21.H2 | tggtcaaaaggcttctatcccagcgacatcgccgtggagtggagagcaatgggcagccggagagaacaactacaaga |
| Ab21.H3 | tggtcaaaaggcttctatcccagcgacatcgccgtggagtggagagcaatgggcagccggagagaacaactacaaga |
| Ab21.H4 | tggtcaaaaggcttctatcccagcgacatcgccgtggagtggagagcaatgggcagccggagagaacaactacaaga |

Figure 3Q

## Antibody Heavy chain DNA features

## Sequence

| Name    | Constant region                                                               |
|---------|-------------------------------------------------------------------------------|
| Ab10    | ccacgcctcccgctgctggactccgacggctccttcttcttctctacagcaagctcacctggacaagagcaggtggc |
| Ab20    | ccacgcctcccgctgctggactccgacggctccttcttcttctctacagcaagctcacctggacaagagcaggtggc |
| Ab21    | ccacgcctcccgctgctggactccgacggctccttcttcttctctacagcaagctcacctggacaagagcaggtggc |
| Ab22    | ccacgcctcccgctgctggactccgacggctccttcttcttctctacagcaagctcacctggacaagagcaggtggc |
| Ab23    | ccacgcctcccgctgctggactccgacggctccttcttcttctctacagcaagctcacctggacaagagcaggtggc |
| Ab10.H  | ccacgcctcccgctgctggactccgacggctccttcttcttctctacagcaagctcacctggacaagagcaggtggc |
| Ab21.H  | ccacgcctcccgctgctggactccgacggctccttcttcttctctacagcaagctcacctggacaagagcaggtggc |
| Ab10.H2 | ccacgcctcccgctgctggactccgacggctccttcttcttctctacagcaagctcacctggacaagagcaggtggc |
| Ab10.H3 | ccacgcctcccgctgctggactccgacggctccttcttcttctctacagcaagctcacctggacaagagcaggtggc |
| Ab10.H4 | ccacgcctcccgctgctggactccgacggctccttcttcttctctacagcaagctcacctggacaagagcaggtggc |
| Ab10.H5 | ccacgcctcccgctgctggactccgacggctccttcttcttctctacagcaagctcacctggacaagagcaggtggc |
| Ab10.H6 | ccacgcctcccgctgctggactccgacggctccttcttcttctctacagcaagctcacctggacaagagcaggtggc |
| Ab21.H2 | ccacgcctcccgctgctggactccgacggctccttcttcttctctacagcaagctcacctggacaagagcaggtggc |
| Ab21.H3 | ccacgcctcccgctgctggactccgacggctccttcttcttctctacagcaagctcacctggacaagagcaggtggc |
| Ab21.H4 | ccacgcctcccgctgctggactccgacggctccttcttcttctctacagcaagctcacctggacaagagcaggtggc |

Figure 3R

## Antibody Heavy chain DNA features

## Sequence

| Name    | Constant region                                                                 |
|---------|---------------------------------------------------------------------------------|
| Ab10    | agcaggggaacgtcttctctcatgctccgtgatgcatgaggtctgtgcacaaaccactacacgcagaagagcctctccc |
| Ab20    | agcaggggaacgtcttctctcatgctccgtgatgcatgaggtctgtgcacaaaccactacacgcagaagagcctctccc |
| Ab21    | agcaggggaacgtcttctctcatgctccgtgatgcatgaggtctgtgcacaaaccactacacgcagaagagcctctccc |
| Ab22    | agcaggggaacgtcttctctcatgctccgtgatgcatgaggtctgtgcacaaaccactacacgcagaagagcctctccc |
| Ab23    | agcaggggaacgtcttctctcatgctccgtgatgcatgaggtctgtgcacaaaccactacacgcagaagagcctctccc |
| Ab10.H  | agcaggggaacgtcttctctcatgctccgtgatgcatgaggtctgtgcacaaaccactacacgcagaagagcctctccc |
| Ab21.H  | agcaggggaacgtcttctctcatgctccgtgatgcatgaggtctgtgcacaaaccactacacgcagaagagcctctccc |
| Ab10.H2 | agcaggggaacgtcttctctcatgctccgtgatgcatgaggtctgtgcacaaaccactacacgcagaagagcctctccc |
| Ab10.H3 | agcaggggaacgtcttctctcatgctccgtgatgcatgaggtctgtgcacaaaccactacacgcagaagagcctctccc |
| Ab10.H4 | agcaggggaacgtcttctctcatgctccgtgatgcatgaggtctgtgcacaaaccactacacgcagaagagcctctccc |
| Ab10.H5 | agcaggggaacgtcttctctcatgctccgtgatgcatgaggtctgtgcacaaaccactacacgcagaagagcctctccc |
| Ab10.H6 | agcaggggaacgtcttctctcatgctccgtgatgcatgaggtctgtgcacaaaccactacacgcagaagagcctctccc |
| Ab21.H2 | agcaggggaacgtcttctctcatgctccgtgatgcatgaggtctgtgcacaaaccactacacgcagaagagcctctccc |
| Ab21.H3 | agcaggggaacgtcttctctcatgctccgtgatgcatgaggtctgtgcacaaaccactacacgcagaagagcctctccc |
| Ab21.H4 | agcaggggaacgtcttctctcatgctccgtgatgcatgaggtctgtgcacaaaccactacacgcagaagagcctctccc |

Figure 3S

## Antibody Heavy chain DNA features

## Sequence

| Name    | Constant region | SEQ ID NO: |
|---------|-----------------|------------|
| Ab10    | tgtctccgggtaaa  | 411)       |
| Ab20    | tgtctccgggtaaa  | 451)       |
| Ab21    | tgtctccgggtaaa  | 851)       |
| Ab22    | tgtctccgggtaaa  | 891)       |
| Ab23    | tgtctccgggtaaa  | 931)       |
| Ab10.H  | tgtctccgggtaaa  | 971)       |
| Ab21.H  | tgtctccgggtaaa  | 1211)      |
| Ab10.H2 | tgtctccgggtaaa  | 1291)      |
| Ab10.H3 | tgtctccgggtaaa  | 1331)      |
| Ab10.H4 | tgtctccgggtaaa  | 1371)      |
| Ab10.H5 | tgtctccgggtaaa  | 1411)      |
| Ab10.H6 | tgtctccgggtaaa  | 1451)      |
| Ab21.H2 | tgtctccgggtaaa  | 1491)      |
| Ab21.H3 | tgtctccgggtaaa  | 1531)      |
| Ab21.H4 | tgtctccgggtaaa  | 1571)      |

Figure 4A

## Antibody Light chain DNA features

| Sequence | FR1                                                                     |
|----------|-------------------------------------------------------------------------|
| Name     |                                                                         |
| Ab10     | gccgccgtgctgacccagactccatctcccgtgtctgcagctgtgggaggcacagtcaccatcaattgc   |
| Ab20     | gccgccgtgctgacccagactccatctcccgtgtctgcagctgtgggaggcacagtcagcatcagttgc   |
| Ab21     | gccgccgtgctgacccagactccatctcccgtgtctgcagctgtgggaggcacagtcagcatcagttgc   |
| Ab22     | gcagccgtgctgacccagacacacatcgcccggtgtctgcagctgtgggaggcacagtcaccatcaattgc |
| Ab23     | gccatcaaaatgacccagactccatctcccgtgtctgcagctgtgggaggcacagtcaccatcaattgc   |
| Ab10.H   | gacgccagctgacccagctctcctccacccgtgtctgcagctgtgggaggcacagtcaccatcacttgc   |
| Ab21.H   | gacgccagctgacccagctctcctccacccgtgtctgcagctgtgggaggcacagtcaccatcacttgc   |
| Ab10.H2  | gccgtgctgacccagctctcctccacccgtgtctgcagctgtgggaggcacagtcaccatcacttgc     |
| Ab10.H3  | gacatccagctgacccagctctcctccacccgtgtctgcagctgtgggaggcacagtcaccatcacttgc  |
| Ab10.H4  | gacatccagctgacccagctctcctccacccgtgtctgcagctgtgggaggcacagtcaccatcacttgc  |
| Ab10.H5  | cagctgacccagctctcctccacccgtgtctgcagctgtgggaggcacagtcaccatcacttgc        |
| Ab10.H6  | caggtgctgacccagctctcctccacccgtgtctgcagctgtgggaggcacagtcaccatcacttgc     |
| Ab21.H2  | gccgtgctgacccagctctcctccacccgtgtctgcagctgtgggaggcacagtcaccatcacttgc     |
| Ab21.H3  | gacatccagctgacccagctctcctccacccgtgtctgcagctgtgggaggcacagtcaccatcacttgc  |
| Ab21.H4  | gacatccgtgctgacccagctctcctccacccgtgtctgcagctgtgggaggcacagtcaccatcacttgc |

Figure 4B

## Antibody Light chain DNA features

| Sequence | CDR1                                    | FR2                                       |
|----------|-----------------------------------------|-------------------------------------------|
| Name     |                                         |                                           |
| Ab10     | cagtcagtgagagtggtttacggtaactacttagcc    | tggtttcagcagaacacccagggcagcctcccaagctcc   |
| Ab20     | cagtcagtgagagtggtttatagtaactacttagcc    | tggtttcagcagaacacccagggcagcctcccaagctcc   |
| Ab21     | aagtcagtgagagcgttttatggtgactacttagcc    | tggtttcagcagaacacccagggcagcctcccaagcaac   |
| Ab22     | cagtcagtcagagtggtttatgataacgactggttagcc | tggtttcagcagaacacccagggcagcctcccaagctcc   |
| Ab23     | caggccagtgaggacatttacaccaatttagcc       | tggtatcagcagaacacccagggcagcctcccaacctcc   |
| Ab10.H   | cagtcagtgagagtggtttacggtaactacttagcc    | tggtttcagcagaacacccagggcaaaagccctcaagttcc |
| Ab21.H   | aagtcagtgagagcgtttatggtgactacttagcc     | tggtttcagcagaacacccagggcaaaagccctcaagcaac |
| Ab10.H2  | cagtcagtgagagtggtttacggtaactacttagcc    | tggtttcagcagaacacccagggcaaaagccctcaagttcc |
| Ab10.H3  | cagtcagtgagagtggtttacggtaactacttagcc    | tggtttcagcagaacacccagggcaaaagccctcaagttcc |
| Ab10.H4  | cagtcagtgagagtggtttacggtaactacttagcc    | tggtttcagcagaacacccagggcaaaagccctcaagttcc |
| Ab10.H5  | cagtcagtgagagtggtttacggtaactacttagcc    | tggtttcagcagaacacccagggcaaaagccctcaagttcc |
| Ab10.H6  | cagtcagtgagagtggtttacggtaactacttagcc    | tggtttcagcagaacacccagggcaaaagccctcaagttcc |
| Ab21.H2  | aagtcagtgagagcgtttatggtgactacttagcc     | tggtttcagcagaacacccagggcaaaagccctcaagcaac |
| Ab21.H3  | aagtcagtgagagcgtttatggtgactacttagcc     | tggtttcagcagaacacccagggcaaaagccctcaagcaac |
| Ab21.H4  | aagtcagtgagagcgtttatggtgactacttagcc     | tggtttcagcagaacacccagggcaaaagccctcaagcaac |

Figure 4C

## Antibody Light chain DNA features

| Sequence | FR2      | CDR2                   | FR3                                             |
|----------|----------|------------------------|-------------------------------------------------|
| Name     | tgatctac | gaagcatccaaactggaatct  | gggtcccatcgcggttcagcggcagtggaatctgggacacagttca  |
| Ab10     | tgatctac | gaagcatccaaactggcatct  | gggtcccatcgcggttcaaaggcagtggaatctgggacacagttca  |
| Ab20     | tgatctat | gatgcatccactctggcatct  | gggtcccatcgcggttcaaaggcagtggaatctgggacacagttca  |
| Ab21     | tgatctat | ctgacatccactctggcatct  | ggagtcccatcgcggttcagcggcagtggaatctgggacacagttca |
| Ab22     | tgatctat | gatgcatccgactctggcatct | gggtcccatcgcggttcagcggcagtggaatctgggacacagttca  |
| Ab23     | tgatctat | gaagcatccaaactggaatct  | ggagtcccatcaaggttcagcggcagtggaatctgggacacagttca |
| Ab10.H   | tgatctat | gatgcatccactctggcatct  | ggagtcccatcaaggttcagcggcagtggaatctgggacacagttca |
| Ab21.H   | tgatctat | gaagcatccaaactggaatct  | ggagtcccatcaaggttcagcggcagtggaatctgggacacagttca |
| Ab10.H2  | tgatctat | gaagcatccaaactggaatct  | ggagtcccatcaaggttcagcggcagtggaatctgggacacagttca |
| Ab10.H3  | tgatctat | gaagcatccaaactggaatct  | ggagtcccatcaaggttcagcggcagtggaatctgggacacagttca |
| Ab10.H4  | tgatctat | gaagcatccaaactggaatct  | ggagtcccatcaaggttcagcggcagtggaatctgggacacagttca |
| Ab10.H5  | tgatctat | gaagcatccaaactggaatct  | ggagtcccatcaaggttcagcggcagtggaatctgggacacagttca |
| Ab10.H6  | tgatctat | gaagcatccaaactggaatct  | ggagtcccatcaaggttcagcggcagtggaatctgggacacagttca |
| Ab21.H2  | tgatctat | gatgcatccactctggcatct  | ggagtcccatcaaggttcagcggcagtggaatctgggacacagttca |
| Ab21.H3  | tgatctat | gatgcatccactctggcatct  | ggagtcccatcaaggttcagcggcagtggaatctgggacacagttca |
| Ab21.H4  | tgatctat | gatgcatccactctggcatct  | ggagtcccatcaaggttcagcggcagtggaatctgggacacagttca |

Figure 4D

## Antibody Light chain DNA features

| Sequence | FR3                                                | CDR3                          |
|----------|----------------------------------------------------|-------------------------------|
| Name     | ctctcaccatcagcgacttgacgtgtgacgatgctgccacttactactgt | gcaggcgggtgatatattagtggaaggtg |
| Ab10     | ctctcaccatcagcgacttgacgtgtgacgatgctgccacttactactgt | gcaggcgggtatagtagtggaaggtg    |
| Ab20     | ctctcaccatcagcggtgacgtgtgacgatgctgccacttactactgt   | gcaggcgggttatgttagtgcaaggtg   |
| Ab21     | ctctcaccatcagtggtgtgacgtgtgacgatgctgccacttactactgt | ctaggcgggtatgatgaagatgggtg    |
| Ab22     | ctctcaccatcagcgccgtgacgtgtgacgatgctgccacttactactgt | caaggtgtgtgcttgagtagtaata     |
| Ab23     | ctctcaccatcagcgccgtgacgtgtgacgatgctgccacttactactgt | gcaggcgggtgatatattagtggaaggtg |
| Ab10.H   | ctctcaccatcagcgccgtgacgtgtgacgatgctgccacttactactgt | gcaggcgggttatgttagtgcaaggtg   |
| Ab21.H   | ctctcaccatcagcgccgtgacgtgtgacgatgctgccacttactactgt | gcaggcgggtgatatattagtggaaggtg |
| Ab10.H2  | ctctcaccatcagcgccgtgacgtgtgacgatgctgccacttactactgt | gcaggcgggtgatatattagtggaaggtg |
| Ab10.H3  | ctctcaccatcagcgccgtgacgtgtgacgatgctgccacttactactgt | gcaggcgggtgatatattagtggaaggtg |
| Ab10.H4  | ctctcaccatcagcgccgtgacgtgtgacgatgctgccacttactactgt | gcaggcgggtgatatattagtggaaggtg |
| Ab10.H5  | ctctcaccatcagcgccgtgacgtgtgacgatgctgccacttactactgt | gcaggcgggtgatatattagtggaaggtg |
| Ab10.H6  | ctctcaccatcagcgccgtgacgtgtgacgatgctgccacttactactgt | gcaggcgggtgatatattagtggaaggtg |
| Ab21.H2  | ctctcaccatcagcgccgtgacgtgtgacgatgctgccacttactactgt | gcaggcgggttatgttagtgcaaggtg   |
| Ab21.H3  | ctctcaccatcagcgccgtgacgtgtgacgatgctgccacttactactgt | gcaggcgggttatgttagtgcaaggtg   |
| Ab21.H4  | ctctcaccatcagcgccgtgacgtgtgacgatgctgccacttactactgt | gcaggcgggttatgttagtgcaaggtg   |

Figure 4E

## Antibody Light chain DNA features

| Antibody Sequence | CDR3              | FR4                               | Constant region             |
|-------------------|-------------------|-----------------------------------|-----------------------------|
| Ab10              | ttgct             | ttcggcgaggagaccgaggtggtggtcaaacgt | acggtagcgggcccccatctgtcttca |
| Ab20              | ttgct             | ttcggcgaggagaccgaggtggtggtcaaacgt | acggtagcgggcccccatctgtcttca |
| Ab21              | ttgct             | ttcggcgaggagaccgaggtggtggtcaaacgt | acggtagcgggcccccatctgtcttca |
| Ab22              | atacgcatgtt       | ttcggcgaggagaccgaggtggtggtcaaacgt | acggtagcgggcccccatctgtcttca |
| Ab23              | ctggttatggttccgct | ttcggcgaggagaccgaggtggtggtcaaacgt | acggtagcgggcccccatctgtcttca |
| Ab10.H            | ttgct             | ttcggcgaggagaccgaggtggtggtcaaacgt | acggtagcgggcccccatctgtcttca |
| Ab21.H            | ttgct             | ttcggcgaggagaccgaggtggtggtcaaacgt | acggtagcgggcccccatctgtcttca |
| Ab10.H2           | ttgct             | ttcggcgaggagaccgaggtggtggtcaaacgt | acggtagcgggcccccatctgtcttca |
| Ab10.H3           | ttgct             | ttcggcgaggagaccgaggtggtggtcaaacgt | acggtagcgggcccccatctgtcttca |
| Ab10.H4           | ttgct             | ttcggcgaggagaccgaggtggtggtcaaacgt | acggtagcgggcccccatctgtcttca |
| Ab10.H5           | ttgct             | ttcggcgaggagaccgaggtggtggtcaaacgt | acggtagcgggcccccatctgtcttca |
| Ab10.H6           | ttgct             | ttcggcgaggagaccgaggtggtggtcaaacgt | acggtagcgggcccccatctgtcttca |
| Ab21.H2           | ttgct             | ttcggcgaggagaccgaggtggtggtcaaacgt | acggtagcgggcccccatctgtcttca |
| Ab21.H3           | ttgct             | ttcggcgaggagaccgaggtggtggtcaaacgt | acggtagcgggcccccatctgtcttca |
| Ab21.H4           | ttgct             | ttcggcgaggagaccgaggtggtggtcaaacgt | acggtagcgggcccccatctgtcttca |

Figure 4F

## Antibody Light chain DNA features

| Antibody Sequence | Constant region                                                          |
|-------------------|--------------------------------------------------------------------------|
| Ab10              | tcttcccgccatctgatgagcagttgaaatctggaactgcctctgtgtgctgctgaataaacttctatccca |
| Ab20              | tcttcccgccatctgatgagcagttgaaatctggaactgcctctgtgtgctgctgaataaacttctatccca |
| Ab21              | tcttcccgccatctgatgagcagttgaaatctggaactgcctctgtgtgctgctgaataaacttctatccca |
| Ab22              | tcttcccgccatctgatgagcagttgaaatctggaactgcctctgtgtgctgctgaataaacttctatccca |
| Ab23              | tcttcccgccatctgatgagcagttgaaatctggaactgcctctgtgtgctgctgaataaacttctatccca |
| Ab10.H            | tcttcccgccatctgatgagcagttgaaatctggaactgcctctgtgtgctgctgaataaacttctatccca |
| Ab21.H            | tcttcccgccatctgatgagcagttgaaatctggaactgcctctgtgtgctgctgaataaacttctatccca |
| Ab10.H2           | tcttcccgccatctgatgagcagttgaaatctggaactgcctctgtgtgctgctgaataaacttctatccca |
| Ab10.H3           | tcttcccgccatctgatgagcagttgaaatctggaactgcctctgtgtgctgctgaataaacttctatccca |
| Ab10.H4           | tcttcccgccatctgatgagcagttgaaatctggaactgcctctgtgtgctgctgaataaacttctatccca |
| Ab10.H5           | tcttcccgccatctgatgagcagttgaaatctggaactgcctctgtgtgctgctgaataaacttctatccca |
| Ab10.H6           | tcttcccgccatctgatgagcagttgaaatctggaactgcctctgtgtgctgctgaataaacttctatccca |
| Ab21.H2           | tcttcccgccatctgatgagcagttgaaatctggaactgcctctgtgtgctgctgaataaacttctatccca |
| Ab21.H3           | tcttcccgccatctgatgagcagttgaaatctggaactgcctctgtgtgctgctgaataaacttctatccca |
| Ab21.H4           | tcttcccgccatctgatgagcagttgaaatctggaactgcctctgtgtgctgctgaataaacttctatccca |

Figure 4G

## Antibody Light chain DNA features

## Sequence

| Name    | Constant region                                                                 |
|---------|---------------------------------------------------------------------------------|
| Ab10    | gagaggccaaagtacagtggaaggtggataaacgcccctccaatcgggttaactcccaggagagtggtcacagagcagg |
| Ab20    | gagaggccaaagtacagtggaaggtggataaacgcccctccaatcgggttaactcccaggagagtggtcacagagcagg |
| Ab21    | gagaggccaaagtacagtggaaggtggataaacgcccctccaatcgggttaactcccaggagagtggtcacagagcagg |
| Ab22    | gagaggccaaagtacagtggaaggtggataaacgcccctccaatcgggttaactcccaggagagtggtcacagagcagg |
| Ab23    | gagaggccaaagtacagtggaaggtggataaacgcccctccaatcgggttaactcccaggagagtggtcacagagcagg |
| Ab10.H  | gagaggccaaagtacagtggaaggtggataaacgcccctccaatcgggttaactcccaggagagtggtcacagagcagg |
| Ab21.H  | gagaggccaaagtacagtggaaggtggataaacgcccctccaatcgggttaactcccaggagagtggtcacagagcagg |
| Ab10.H2 | gagaggccaaagtacagtggaaggtggataaacgcccctccaatcgggttaactcccaggagagtggtcacagagcagg |
| Ab10.H3 | gagaggccaaagtacagtggaaggtggataaacgcccctccaatcgggttaactcccaggagagtggtcacagagcagg |
| Ab10.H4 | gagaggccaaagtacagtggaaggtggataaacgcccctccaatcgggttaactcccaggagagtggtcacagagcagg |
| Ab10.H5 | gagaggccaaagtacagtggaaggtggataaacgcccctccaatcgggttaactcccaggagagtggtcacagagcagg |
| Ab10.H6 | gagaggccaaagtacagtggaaggtggataaacgcccctccaatcgggttaactcccaggagagtggtcacagagcagg |
| Ab21.H2 | gagaggccaaagtacagtggaaggtggataaacgcccctccaatcgggttaactcccaggagagtggtcacagagcagg |
| Ab21.H3 | gagaggccaaagtacagtggaaggtggataaacgcccctccaatcgggttaactcccaggagagtggtcacagagcagg |
| Ab21.H4 | gagaggccaaagtacagtggaaggtggataaacgcccctccaatcgggttaactcccaggagagtggtcacagagcagg |

Figure 4H

## Antibody Light chain DNA features

## Sequence

| Name    | Constant region                                                                |
|---------|--------------------------------------------------------------------------------|
| Ab10    | acagcaaggacagcacctacagcctcagcagcacccctgacgtgagcaaaagcagactacgagaaaacacaaaagtct |
| Ab20    | acagcaaggacagcacctacagcctcagcagcacccctgacgtgagcaaaagcagactacgagaaaacacaaaagtct |
| Ab21    | acagcaaggacagcacctacagcctcagcagcacccctgacgtgagcaaaagcagactacgagaaaacacaaaagtct |
| Ab22    | acagcaaggacagcacctacagcctcagcagcacccctgacgtgagcaaaagcagactacgagaaaacacaaaagtct |
| Ab23    | acagcaaggacagcacctacagcctcagcagcacccctgacgtgagcaaaagcagactacgagaaaacacaaaagtct |
| Ab10.H  | acagcaaggacagcacctacagcctcagcagcacccctgacgtgagcaaaagcagactacgagaaaacacaaaagtct |
| Ab21.H  | acagcaaggacagcacctacagcctcagcagcacccctgacgtgagcaaaagcagactacgagaaaacacaaaagtct |
| Ab10.H2 | acagcaaggacagcacctacagcctcagcagcacccctgacgtgagcaaaagcagactacgagaaaacacaaaagtct |
| Ab10.H3 | acagcaaggacagcacctacagcctcagcagcacccctgacgtgagcaaaagcagactacgagaaaacacaaaagtct |
| Ab10.H4 | acagcaaggacagcacctacagcctcagcagcacccctgacgtgagcaaaagcagactacgagaaaacacaaaagtct |
| Ab10.H5 | acagcaaggacagcacctacagcctcagcagcacccctgacgtgagcaaaagcagactacgagaaaacacaaaagtct |
| Ab10.H6 | acagcaaggacagcacctacagcctcagcagcacccctgacgtgagcaaaagcagactacgagaaaacacaaaagtct |
| Ab21.H2 | acagcaaggacagcacctacagcctcagcagcacccctgacgtgagcaaaagcagactacgagaaaacacaaaagtct |
| Ab21.H3 | acagcaaggacagcacctacagcctcagcagcacccctgacgtgagcaaaagcagactacgagaaaacacaaaagtct |
| Ab21.H4 | acagcaaggacagcacctacagcctcagcagcacccctgacgtgagcaaaagcagactacgagaaaacacaaaagtct |

Figure 4I  
Antibody Light chain DNA features

| Sequence | Constant region                                                       |
|----------|-----------------------------------------------------------------------|
| Name     |                                                                       |
| Ab10     | acgcctgcgaagtcaccccatcagggcctgagctcgccctcacaaaagagcttcaacaggggagagtgt |
| Ab20     | acgcctgcgaagtcaccccatcagggcctgagctcgccctcacaaaagagcttcaacaggggagagtgt |
| Ab21     | acgcctgcgaagtcaccccatcagggcctgagctcgccctcacaaaagagcttcaacaggggagagtgt |
| Ab22     | acgcctgcgaagtcaccccatcagggcctgagctcgccctcacaaaagagcttcaacaggggagagtgt |
| Ab23     | acgcctgcgaagtcaccccatcagggcctgagctcgccctcacaaaagagcttcaacaggggagagtgt |
| Ab10.H   | acgcctgcgaagtcaccccatcagggcctgagctcgccctcacaaaagagcttcaacaggggagagtgt |
| Ab21.H   | acgcctgcgaagtcaccccatcagggcctgagctcgccctcacaaaagagcttcaacaggggagagtgt |
| Ab10.H2  | acgcctgcgaagtcaccccatcagggcctgagctcgccctcacaaaagagcttcaacaggggagagtgt |
| Ab10.H3  | acgcctgcgaagtcaccccatcagggcctgagctcgccctcacaaaagagcttcaacaggggagagtgt |
| Ab10.H4  | acgcctgcgaagtcaccccatcagggcctgagctcgccctcacaaaagagcttcaacaggggagagtgt |
| Ab10.H5  | acgcctgcgaagtcaccccatcagggcctgagctcgccctcacaaaagagcttcaacaggggagagtgt |
| Ab10.H6  | acgcctgcgaagtcaccccatcagggcctgagctcgccctcacaaaagagcttcaacaggggagagtgt |
| Ab21.H2  | acgcctgcgaagtcaccccatcagggcctgagctcgccctcacaaaagagcttcaacaggggagagtgt |
| Ab21.H3  | acgcctgcgaagtcaccccatcagggcctgagctcgccctcacaaaagagcttcaacaggggagagtgt |
| Ab21.H4  | acgcctgcgaagtcaccccatcagggcctgagctcgccctcacaaaagagcttcaacaggggagagtgt |

Figure 4J  
Antibody Light chain DNA features

| Sequence | Constant region   |
|----------|-------------------|
| Name     |                   |
| Ab10     | (SEQ ID NO: 431)  |
| Ab20     | (SEQ ID NO: 471)  |
| Ab21     | (SEQ ID NO: 871)  |
| Ab22     | (SEQ ID NO: 911)  |
| Ab23     | (SEQ ID NO: 951)  |
| Ab10.H   | (SEQ ID NO: 991)  |
| Ab21.H   | (SEQ ID NO: 1231) |
| Ab10.H2  | (SEQ ID NO: 1311) |
| Ab10.H3  | (SEQ ID NO: 1351) |
| Ab10.H4  | (SEQ ID NO: 1391) |
| Ab10.H5  | (SEQ ID NO: 1431) |
| Ab10.H6  | (SEQ ID NO: 1471) |
| Ab21.H2  | (SEQ ID NO: 1511) |
| Ab21.H3  | (SEQ ID NO: 1551) |
| Ab21.H4  | (SEQ ID NO: 1591) |

Figure 5  
Antibody Heavy chain Protein features

| Sequence Name | Variable region coordinates | SEQ ID NO: | CDR1 coordinates | SEQ ID NO: | CDR2 coordinates | SEQ ID NO: | CDR3 coordinates | SEQ ID NO: |
|---------------|-----------------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Ab10          | 1-109                       | 402        | 30-34            | 404        | 49-64            | 406        | 95-98            | 408        |
| Ab20          | 1-109                       | 442        | 30-34            | 444        | 49-64            | 446        | 95-98            | 448        |
| Ab21          | 1-109                       | 842        | 30-34            | 844        | 49-64            | 846        | 95-98            | 848        |
| Ab22          | 1-112                       | 882        | 31-35            | 884        | 50-66            | 886        | 98-101           | 888        |
| Ab23          | 1-117                       | 922        | 30-34            | 924        | 49-64            | 926        | 95-106           | 928        |
| Ab10.H        | 1-112                       | 962        | 31-35            | 964        | 50-65            | 966        | 98-101           | 968        |
| Ab21.H        | 1-112                       | 1202       | 31-35            | 1204       | 50-65            | 1206       | 98-101           | 1208       |
| Ab10.H2       | 1-112                       | 1282       | 31-35            | 1284       | 50-65            | 1286       | 98-101           | 1288       |
| Ab10.H3       | 1-112                       | 1322       | 31-35            | 1324       | 50-65            | 1326       | 98-101           | 1328       |
| Ab10.H4       | 1-112                       | 1362       | 31-35            | 1364       | 50-65            | 1366       | 98-101           | 1368       |
| Ab10.H5       | 1-112                       | 1402       | 31-35            | 1404       | 50-65            | 1406       | 98-101           | 1408       |
| Ab10.H6       | 1-112                       | 1442       | 31-35            | 1444       | 50-65            | 1446       | 98-101           | 1448       |
| Ab21.H2       | 1-112                       | 1482       | 31-35            | 1484       | 50-65            | 1486       | 98-101           | 1488       |
| Ab21.H3       | 1-112                       | 1522       | 31-35            | 1524       | 50-65            | 1526       | 98-101           | 1528       |
| Ab21.H4       | 1-112                       | 1562       | 31-35            | 1564       | 50-65            | 1566       | 98-101           | 1568       |

Figure 6  
Antibody Heavy chain Protein features

| Sequence Name | FR1 coordinates | SEQ ID NO: | FR2 coordinates | SEQ ID NO: | FR3 coordinates | SEQ ID NO: | FR4 coordinates | SEQ ID NO: | Constant region coordinates | SEQ ID NO: |
|---------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------------------|------------|
| Ab10          | 1-29            | 403        | 35-48           | 405        | 65-94           | 407        | 99-109          | 409        | 110-439                     | 410        |
| Ab20          | 1-29            | 443        | 35-48           | 445        | 65-94           | 447        | 99-109          | 449        | 110-439                     | 450        |
| Ab21          | 1-29            | 843        | 35-48           | 845        | 65-94           | 847        | 99-109          | 849        | 110-439                     | 850        |
| Ab22          | 1-30            | 883        | 36-49           | 885        | 67-97           | 887        | 102-112         | 889        | 113-442                     | 890        |
| Ab23          | 1-29            | 923        | 35-48           | 925        | 65-94           | 927        | 107-117         | 929        | 118-447                     | 930        |
| Ab10.H        | 1-30            | 963        | 36-49           | 965        | 66-97           | 967        | 102-112         | 969        | 113-442                     | 970        |
| Ab21.H        | 1-30            | 1203       | 36-49           | 1205       | 66-97           | 1207       | 102-112         | 1209       | 113-442                     | 1210       |
| Ab10.H2       | 1-30            | 1283       | 36-49           | 1285       | 66-97           | 1287       | 102-112         | 1289       | 113-442                     | 1290       |
| Ab10.H3       | 1-30            | 1323       | 36-49           | 1325       | 66-97           | 1327       | 102-112         | 1329       | 113-442                     | 1330       |
| Ab10.H4       | 1-30            | 1363       | 36-49           | 1365       | 66-97           | 1367       | 102-112         | 1369       | 113-442                     | 1370       |
| Ab10.H5       | 1-30            | 1403       | 36-49           | 1405       | 66-97           | 1407       | 102-112         | 1409       | 113-442                     | 1410       |
| Ab10.H6       | 1-30            | 1443       | 36-49           | 1445       | 66-97           | 1447       | 102-112         | 1449       | 113-442                     | 1450       |
| Ab21.H2       | 1-30            | 1483       | 36-49           | 1485       | 66-97           | 1487       | 102-112         | 1489       | 113-442                     | 1490       |
| Ab21.H3       | 1-30            | 1523       | 36-49           | 1525       | 66-97           | 1527       | 102-112         | 1529       | 113-442                     | 1530       |
| Ab21.H4       | 1-30            | 1563       | 36-49           | 1565       | 66-97           | 1567       | 102-112         | 1569       | 113-442                     | 1570       |

Figure 7  
Antibody Light chain Protein features

| Sequence Name | Variable region coordinates | SEQ ID NO: | CDR1 coordinates | SEQ ID NO: | CDR2 coordinates | SEQ ID NO: | CDR3 coordinates | SEQ ID NO: |
|---------------|-----------------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Ab10          | 1-110                       | 422        | 24-35            | 424        | 51-57            | 426        | 90-99            | 428        |
| Ab20          | 1-110                       | 462        | 24-35            | 464        | 51-57            | 466        | 90-99            | 468        |
| Ab21          | 1-110                       | 862        | 24-35            | 864        | 51-57            | 866        | 90-99            | 868        |
| Ab22          | 1-113                       | 902        | 24-36            | 904        | 52-58            | 906        | 91-102           | 908        |
| Ab23          | 1-113                       | 942        | 24-34            | 944        | 50-56            | 946        | 89-102           | 948        |
| Ab10.H        | 1-110                       | 982        | 24-35            | 984        | 51-57            | 986        | 90-99            | 988        |
| Ab21.H        | 1-110                       | 1222       | 24-35            | 1224       | 51-57            | 1226       | 90-99            | 1228       |
| Ab10.H2       | 1-109                       | 1302       | 23-34            | 1304       | 50-56            | 1306       | 89-98            | 1308       |
| Ab10.H3       | 1-110                       | 1342       | 24-35            | 1344       | 51-57            | 1346       | 90-99            | 1348       |
| Ab10.H4       | 1-110                       | 1382       | 24-35            | 1384       | 51-57            | 1386       | 90-99            | 1388       |
| Ab10.H5       | 1-108                       | 1422       | 22-33            | 1424       | 49-55            | 1426       | 88-97            | 1428       |
| Ab10.H6       | 1-109                       | 1462       | 23-34            | 1464       | 50-56            | 1466       | 89-98            | 1468       |
| Ab21.H2       | 1-109                       | 1502       | 23-34            | 1504       | 50-56            | 1506       | 89-98            | 1508       |
| Ab21.H3       | 1-110                       | 1542       | 24-35            | 1544       | 51-57            | 1546       | 90-99            | 1548       |
| Ab21.H4       | 1-110                       | 1582       | 24-35            | 1584       | 51-57            | 1586       | 90-99            | 1588       |

Figure 8  
Antibody Light chain Protein features

| Sequencer Name | FR1 coordinates | SEQ ID NO: | FR2 coordinates | SEQ ID NO: | FR3 coordinates | SEQ ID NO: | FR4 coordinates | SEQ ID NO: | Constant region coordinates | SEQ ID NO: |
|----------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------------------|------------|
| Ab10           | 1-23            | 423        | 36-50           | 425        | 58-89           | 427        | 100-110         | 429        | 111-216                     | 430        |
| Ab20           | 1-23            | 463        | 36-50           | 465        | 58-89           | 467        | 100-110         | 469        | 111-216                     | 470        |
| Ab21           | 1-23            | 863        | 36-50           | 865        | 58-89           | 867        | 100-110         | 869        | 111-216                     | 870        |
| Ab22           | 1-23            | 903        | 37-51           | 905        | 59-90           | 907        | 103-113         | 909        | 114-219                     | 910        |
| Ab23           | 1-23            | 943        | 35-49           | 945        | 57-88           | 947        | 103-113         | 949        | 114-219                     | 950        |
| Ab10.H         | 1-23            | 983        | 36-50           | 985        | 58-89           | 987        | 100-110         | 989        | 111-216                     | 990        |
| Ab21.H         | 1-23            | 1223       | 36-50           | 1225       | 58-89           | 1227       | 100-110         | 1229       | 111-216                     | 1230       |
| Ab10.H2        | 1-22            | 1303       | 35-49           | 1305       | 57-88           | 1307       | 99-109          | 1309       | 110-215                     | 1310       |
| Ab10.H3        | 1-23            | 1343       | 36-50           | 1345       | 58-89           | 1347       | 100-110         | 1349       | 111-216                     | 1350       |
| Ab10.H4        | 1-23            | 1383       | 36-50           | 1385       | 58-89           | 1387       | 100-110         | 1389       | 111-216                     | 1390       |
| Ab10.H5        | 1-21            | 1423       | 34-48           | 1425       | 56-87           | 1427       | 98-108          | 1429       | 109-214                     | 1430       |
| Ab10.H6        | 1-22            | 1463       | 35-49           | 1465       | 57-88           | 1467       | 99-109          | 1469       | 110-215                     | 1470       |
| Ab21.H2        | 1-22            | 1503       | 35-49           | 1505       | 57-88           | 1507       | 99-109          | 1509       | 110-215                     | 1510       |
| Ab21.H3        | 1-23            | 1543       | 36-50           | 1545       | 58-89           | 1547       | 100-110         | 1549       | 111-216                     | 1550       |
| Ab21.H4        | 1-23            | 1583       | 36-50           | 1585       | 58-89           | 1587       | 100-110         | 1589       | 111-216                     | 1590       |

Figure 9  
Antibody Heavy chain DNA features

| Sequence Name | Variable region coordinates | SEQ ID NO: | CDR1 coordinates | SEQ ID NO: | CDR2 coordinates | SEQ ID NO: | CDR3 coordinates | SEQ ID NO: |
|---------------|-----------------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Ab10          | 1-327                       | 412        | 88-102           | 414        | 145-192          | 416        | 283-294          | 418        |
| Ab20          | 1-327                       | 452        | 88-102           | 454        | 145-192          | 456        | 283-294          | 458        |
| Ab21          | 1-327                       | 852        | 88-102           | 854        | 145-192          | 856        | 283-294          | 858        |
| Ab22          | 1-336                       | 892        | 91-105           | 894        | 148-198          | 896        | 292-303          | 898        |
| Ab23          | 1-351                       | 932        | 88-102           | 934        | 145-192          | 936        | 283-318          | 938        |
| Ab10.H        | 1-336                       | 972        | 91-105           | 974        | 148-195          | 976        | 292-303          | 978        |
| Ab21.H        | 1-336                       | 1212       | 91-105           | 1214       | 148-195          | 1216       | 292-303          | 1218       |
| Ab10.H2       | 1-336                       | 1292       | 91-105           | 1294       | 148-195          | 1296       | 292-303          | 1298       |
| Ab10.H3       | 1-336                       | 1332       | 91-105           | 1334       | 148-195          | 1336       | 292-303          | 1338       |
| Ab10.H4       | 1-336                       | 1372       | 91-105           | 1374       | 148-195          | 1376       | 292-303          | 1378       |
| Ab10.H5       | 1-336                       | 1412       | 91-105           | 1414       | 148-195          | 1416       | 292-303          | 1418       |
| Ab10.H6       | 1-336                       | 1452       | 91-105           | 1454       | 148-195          | 1456       | 292-303          | 1458       |
| Ab21.H2       | 1-336                       | 1492       | 91-105           | 1494       | 148-195          | 1496       | 292-303          | 1498       |
| Ab21.H3       | 1-336                       | 1532       | 91-105           | 1534       | 148-195          | 1536       | 292-303          | 1538       |
| Ab21.H4       | 1-336                       | 1572       | 91-105           | 1574       | 148-195          | 1576       | 292-303          | 1578       |

Figure 10  
Antibody Heavy chain DNA features

| Sequence Name | FR1 coordinates | SEQ ID NO: | FR2 coordinates | SEQ ID NO: | FR3 coordinates | SEQ ID NO: | FR4 coordinates | SEQ ID NO: | Constant region coordinates | SEQ ID NO: |
|---------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------------------|------------|
| Ab10          | 1-87            | 413        | 103-144         | 415        | 193-282         | 417        | 295-327         | 419        | 328-1317                    | 420        |
| Ab20          | 1-87            | 453        | 103-144         | 455        | 193-282         | 457        | 295-327         | 459        | 328-1317                    | 460        |
| Ab21          | 1-87            | 853        | 103-144         | 855        | 193-282         | 857        | 295-327         | 859        | 328-1317                    | 860        |
| Ab22          | 1-90            | 893        | 106-147         | 895        | 199-291         | 897        | 304-336         | 899        | 337-1326                    | 900        |
| Ab23          | 1-87            | 933        | 103-144         | 935        | 193-282         | 937        | 319-351         | 939        | 352-1341                    | 940        |
| Ab10.H        | 1-90            | 973        | 106-147         | 975        | 196-291         | 977        | 304-336         | 979        | 337-1326                    | 980        |
| Ab21.H        | 1-90            | 1213       | 106-147         | 1215       | 196-291         | 1217       | 304-336         | 1219       | 337-1326                    | 1220       |
| Ab10.H2       | 1-90            | 1293       | 106-147         | 1295       | 196-291         | 1297       | 304-336         | 1299       | 337-1326                    | 1300       |
| Ab10.H3       | 1-90            | 1333       | 106-147         | 1335       | 196-291         | 1337       | 304-336         | 1339       | 337-1326                    | 1340       |
| Ab10.H4       | 1-90            | 1373       | 106-147         | 1375       | 196-291         | 1377       | 304-336         | 1379       | 337-1326                    | 1380       |
| Ab10.H5       | 1-90            | 1413       | 106-147         | 1415       | 196-291         | 1417       | 304-336         | 1419       | 337-1326                    | 1420       |
| Ab10.H6       | 1-90            | 1453       | 106-147         | 1455       | 196-291         | 1457       | 304-336         | 1459       | 337-1326                    | 1460       |
| Ab21.H2       | 1-90            | 1493       | 106-147         | 1495       | 196-291         | 1497       | 304-336         | 1499       | 337-1326                    | 1500       |
| Ab21.H3       | 1-90            | 1533       | 106-147         | 1535       | 196-291         | 1537       | 304-336         | 1539       | 337-1326                    | 1540       |
| Ab21.H4       | 1-90            | 1573       | 106-147         | 1575       | 196-291         | 1577       | 304-336         | 1579       | 337-1326                    | 1580       |

Figure 11  
Antibody Light chain DNA features

| Sequence Name | Variable region coordinates | SEQ ID NO: | CDR1 coordinates | SEQ ID NO: | CDR2 coordinates | SEQ ID NO: | CDR3 coordinates | SEQ ID NO: |
|---------------|-----------------------------|------------|------------------|------------|------------------|------------|------------------|------------|
| Ab10          | 1-330                       | 432        | 70-105           | 434        | 151-171          | 436        | 268-297          | 438        |
| Ab20          | 1-330                       | 472        | 70-105           | 474        | 151-171          | 476        | 268-297          | 478        |
| Ab21          | 1-330                       | 872        | 70-105           | 874        | 151-171          | 876        | 268-297          | 878        |
| Ab22          | 1-339                       | 912        | 70-108           | 914        | 154-174          | 916        | 271-306          | 918        |
| Ab23          | 1-339                       | 952        | 70-102           | 954        | 148-168          | 956        | 265-306          | 958        |
| Ab10.H        | 1-330                       | 992        | 70-105           | 994        | 151-171          | 996        | 268-297          | 998        |
| Ab21.H        | 1-330                       | 1232       | 70-105           | 1234       | 151-171          | 1236       | 268-297          | 1238       |
| Ab10.H2       | 1-327                       | 1312       | 67-102           | 1314       | 148-168          | 1316       | 265-294          | 1318       |
| Ab10.H3       | 1-330                       | 1352       | 70-105           | 1354       | 151-171          | 1356       | 268-297          | 1358       |
| Ab10.H4       | 1-330                       | 1392       | 70-105           | 1394       | 151-171          | 1396       | 268-297          | 1398       |
| Ab10.H5       | 1-324                       | 1432       | 64-99            | 1434       | 145-165          | 1436       | 262-291          | 1438       |
| Ab10.H6       | 1-327                       | 1472       | 67-102           | 1474       | 148-168          | 1476       | 265-294          | 1478       |
| Ab21.H2       | 1-327                       | 1512       | 67-102           | 1514       | 148-168          | 1516       | 265-294          | 1518       |
| Ab21.H3       | 1-330                       | 1552       | 70-105           | 1554       | 151-171          | 1556       | 268-297          | 1558       |
| Ab21.H4       | 1-330                       | 1592       | 70-105           | 1594       | 151-171          | 1596       | 268-297          | 1598       |

Figure 12

## Antibody Light chain DNA features

| Sequence Name | FR1 coordinates | SEQ ID NO: | FR2 coordinates | SEQ ID NO: | FR3 coordinates | SEQ ID NO: | FR4 coordinates | SEQ ID NO: | Constant region coordinates | SEQ ID NO: |
|---------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------|------------|-----------------------------|------------|
| Ab10          | 1-69            | 433        | 106-150         | 435        | 172-267         | 437        | 298-330         | 439        | 331-648                     | 440        |
| Ab20          | 1-69            | 473        | 106-150         | 475        | 172-267         | 477        | 298-330         | 479        | 331-648                     | 480        |
| Ab21          | 1-69            | 873        | 106-150         | 875        | 172-267         | 877        | 298-330         | 879        | 331-648                     | 880        |
| Ab22          | 1-69            | 913        | 109-153         | 915        | 175-270         | 917        | 307-339         | 919        | 340-657                     | 920        |
| Ab23          | 1-69            | 953        | 103-147         | 955        | 169-264         | 957        | 307-339         | 959        | 340-657                     | 960        |
| Ab10.H        | 1-69            | 993        | 106-150         | 995        | 172-267         | 997        | 298-330         | 999        | 331-648                     | 1000       |
| Ab21.H        | 1-69            | 1233       | 106-150         | 1235       | 172-267         | 1237       | 298-330         | 1239       | 331-648                     | 1240       |
| Ab10.H2       | 1-66            | 1313       | 103-147         | 1315       | 169-264         | 1317       | 295-327         | 1319       | 328-645                     | 1320       |
| Ab10.H3       | 1-69            | 1353       | 106-150         | 1355       | 172-267         | 1357       | 298-330         | 1359       | 331-648                     | 1360       |
| Ab10.H4       | 1-69            | 1393       | 106-150         | 1395       | 172-267         | 1397       | 298-330         | 1399       | 331-648                     | 1400       |
| Ab10.H5       | 1-63            | 1433       | 100-144         | 1435       | 166-261         | 1437       | 292-324         | 1439       | 325-642                     | 1440       |
| Ab10.H6       | 1-66            | 1473       | 103-147         | 1475       | 169-264         | 1477       | 295-327         | 1479       | 328-645                     | 1480       |
| Ab21.H2       | 1-66            | 1513       | 103-147         | 1515       | 169-264         | 1517       | 295-327         | 1519       | 328-645                     | 1520       |
| Ab21.H3       | 1-69            | 1553       | 106-150         | 1555       | 172-267         | 1557       | 298-330         | 1559       | 331-648                     | 1560       |
| Ab21.H4       | 1-69            | 1593       | 106-150         | 1595       | 172-267         | 1597       | 298-330         | 1599       | 331-648                     | 1600       |

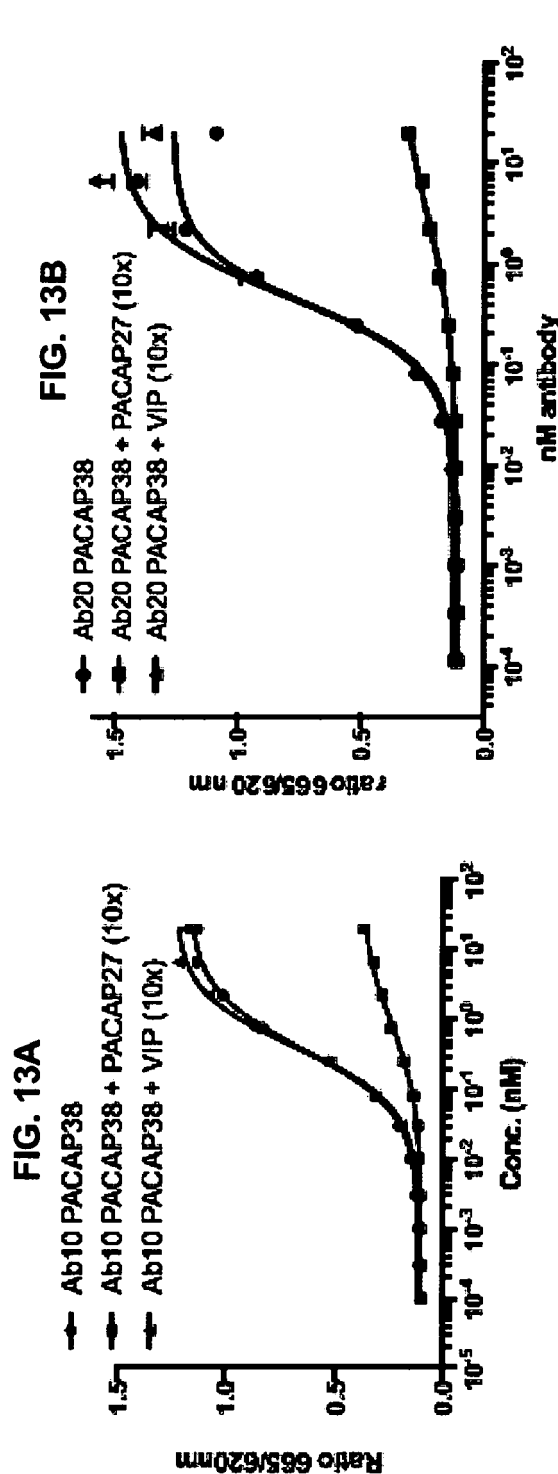
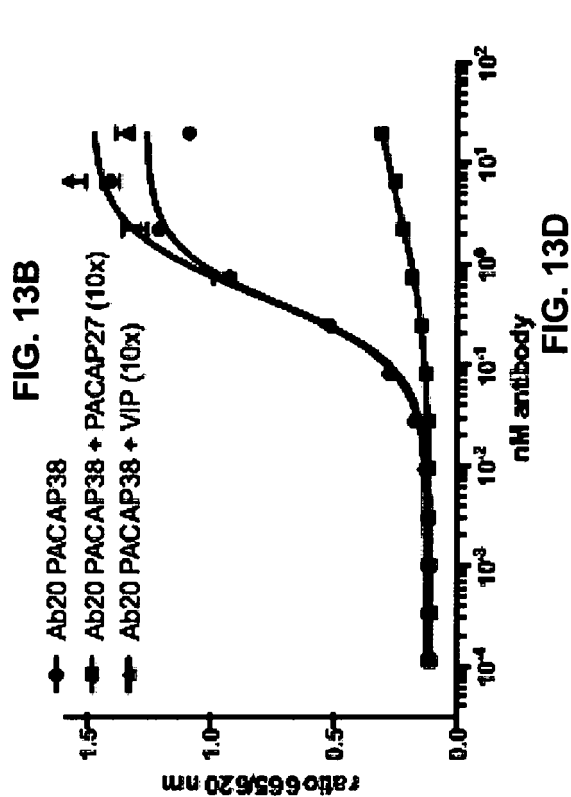
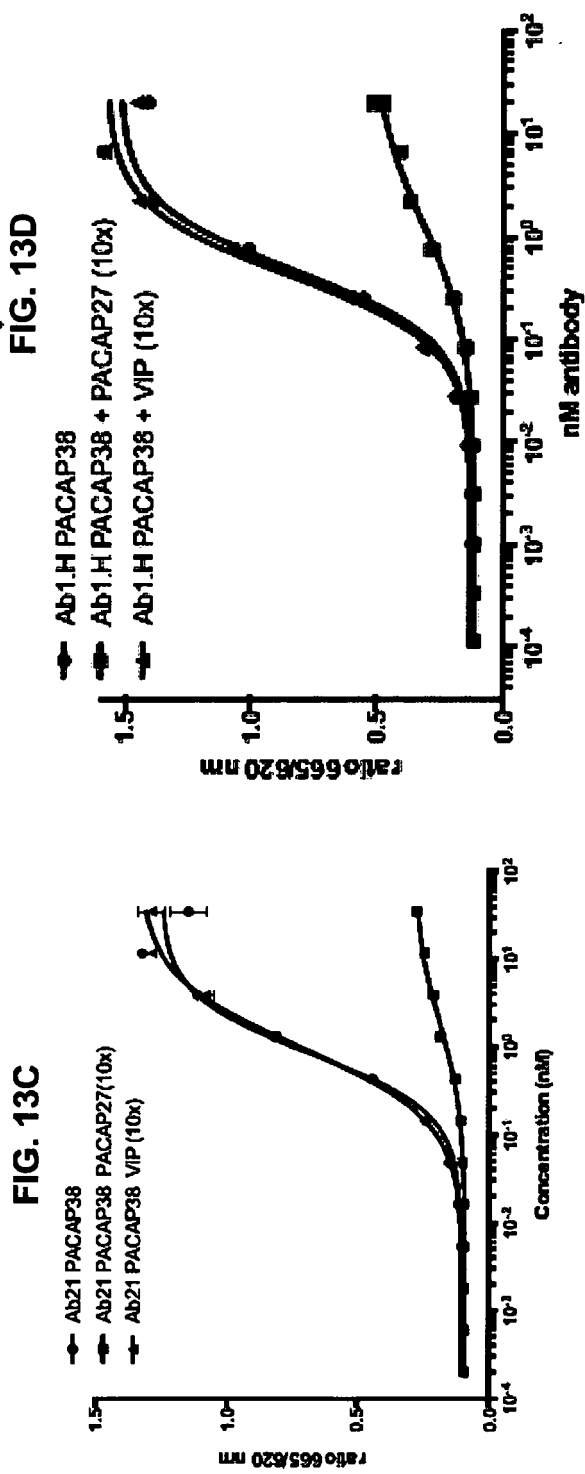
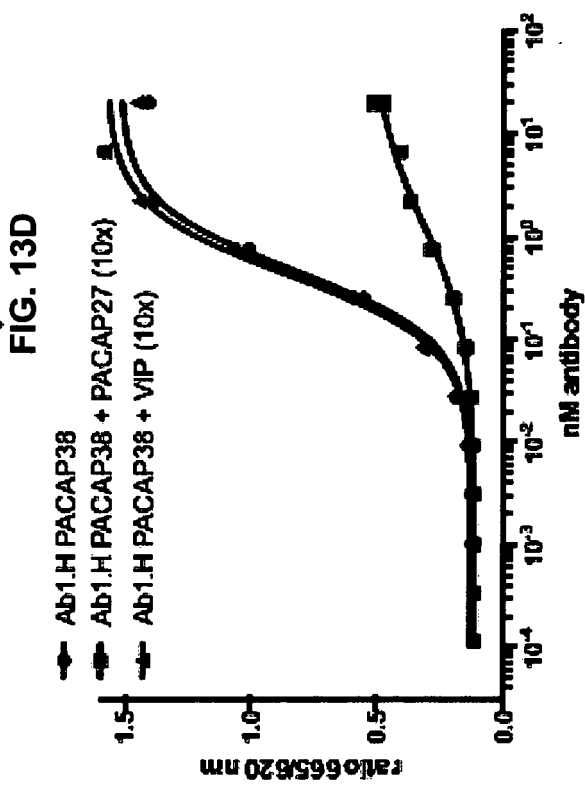


**FIG. 13F**

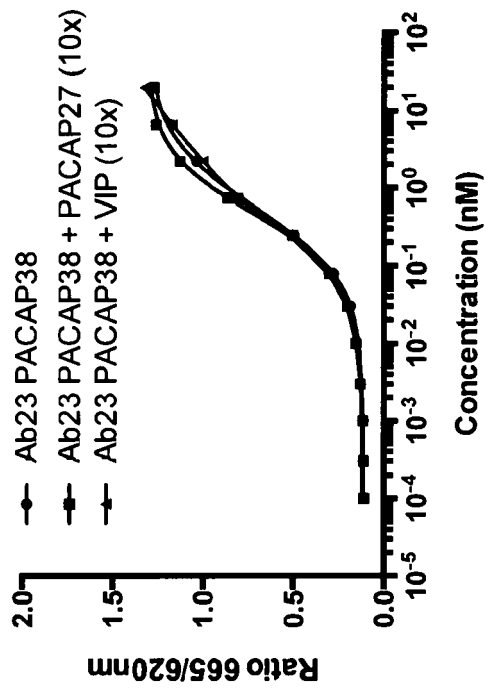


**FIG. 13E**

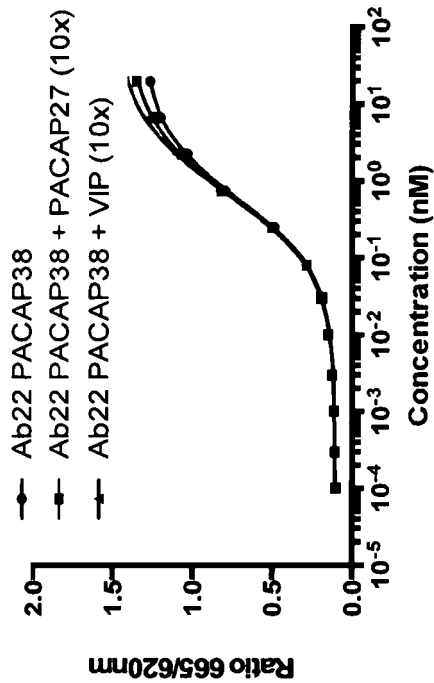


**FIG. 14B**

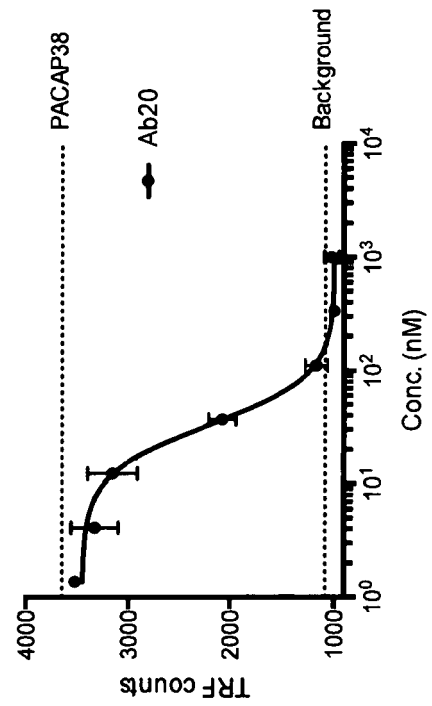
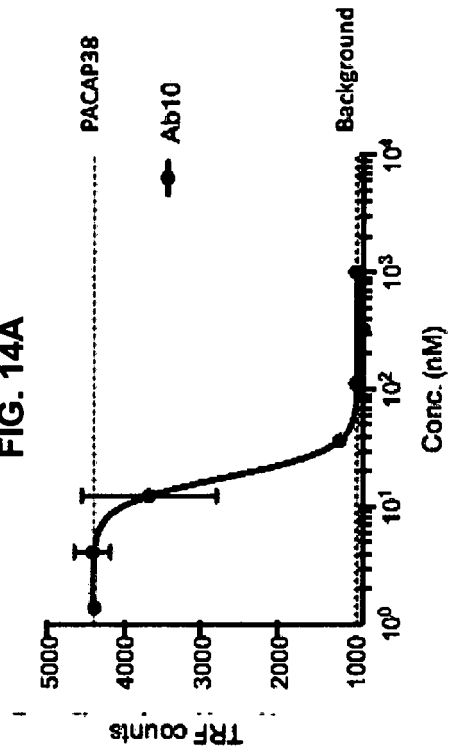
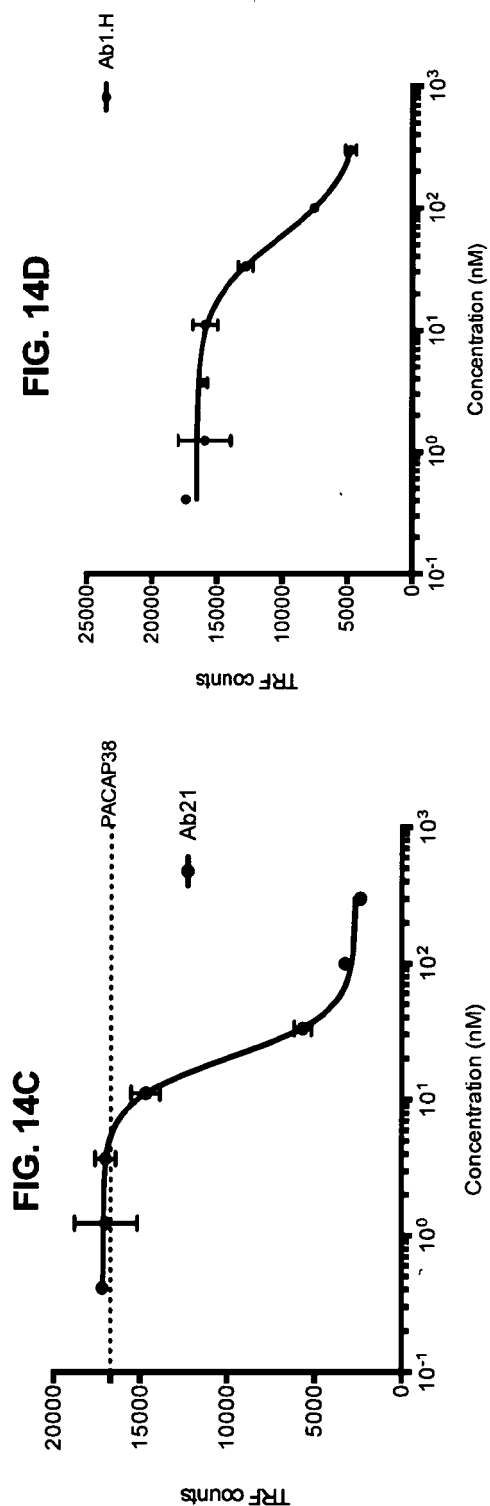
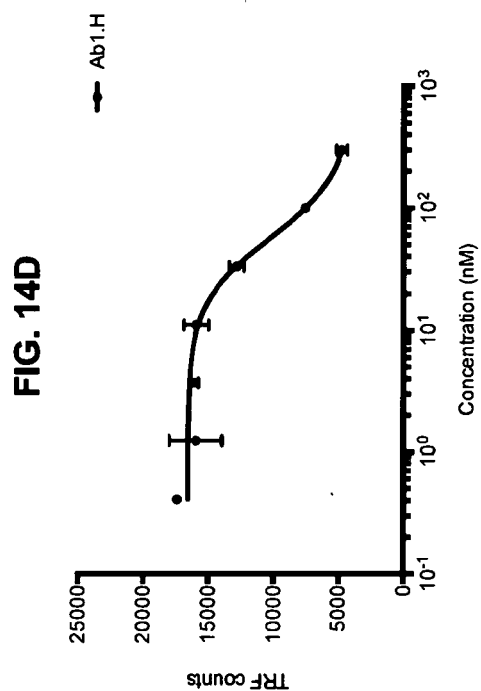
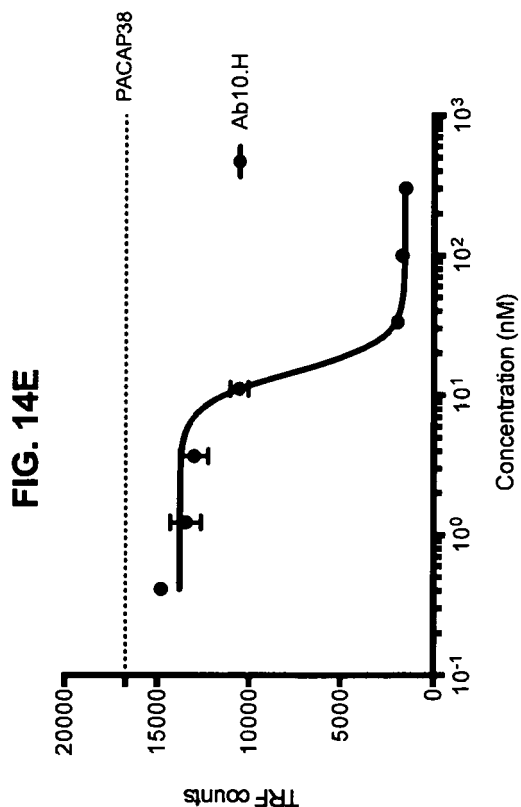
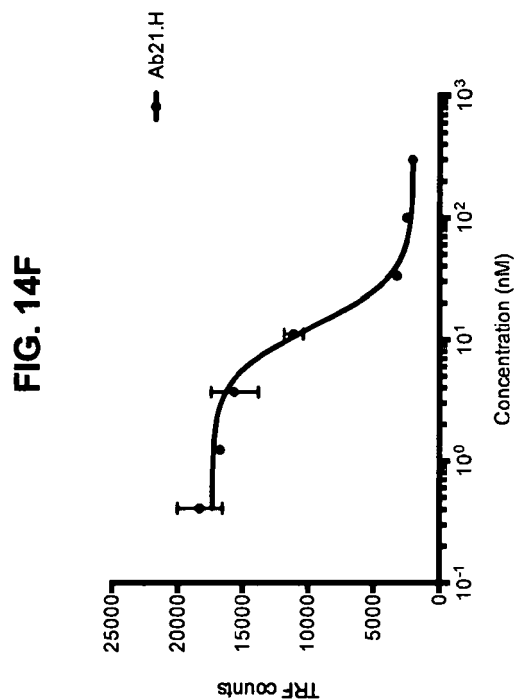
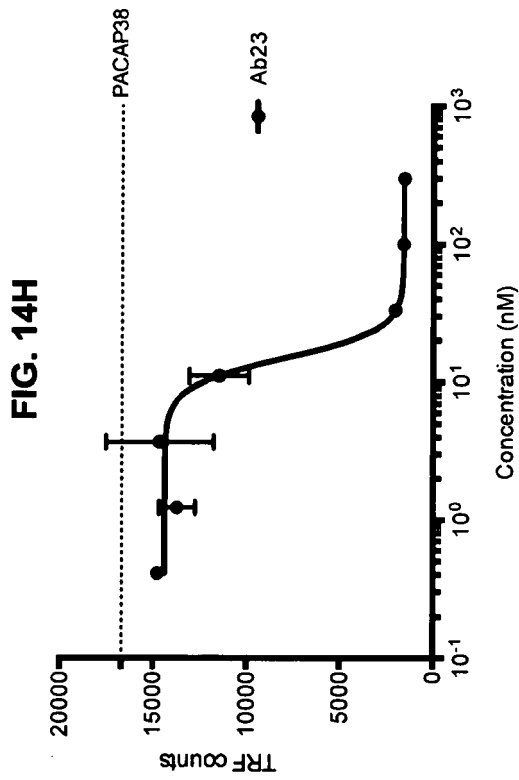
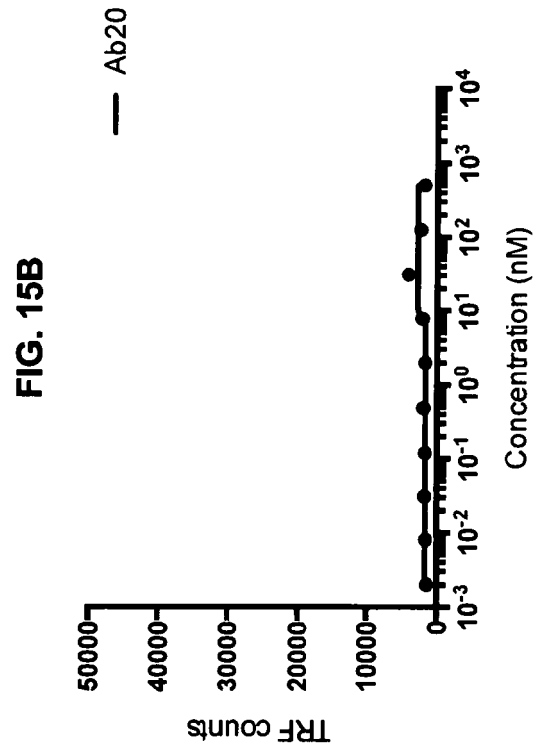
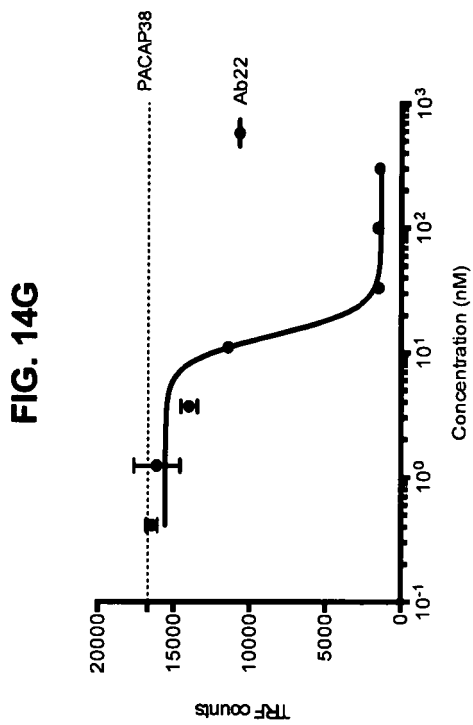


**FIG. 14A**







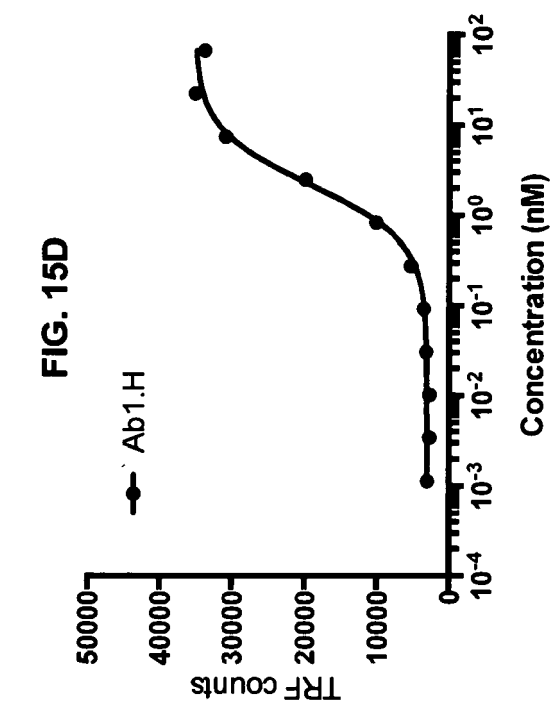
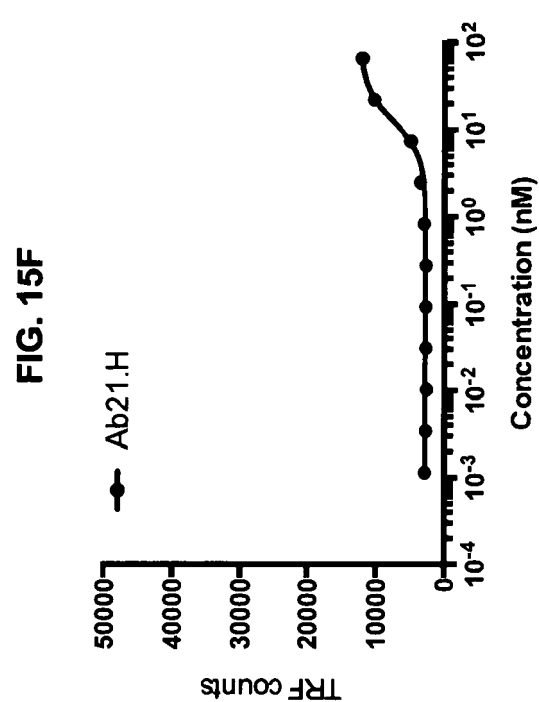
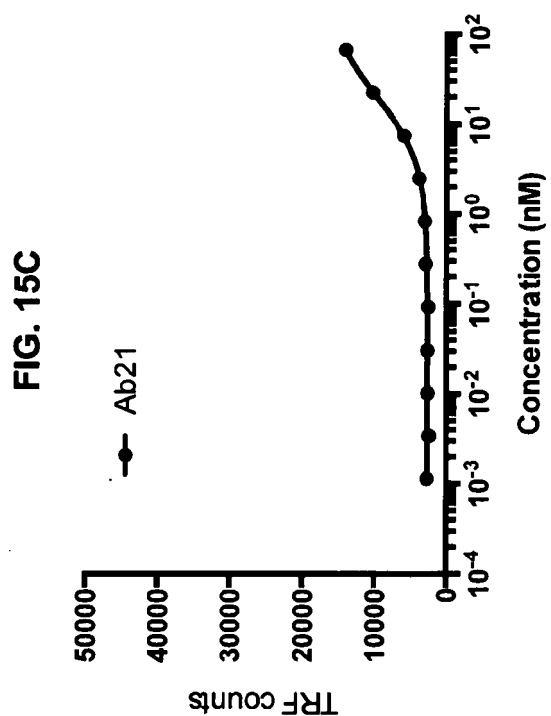
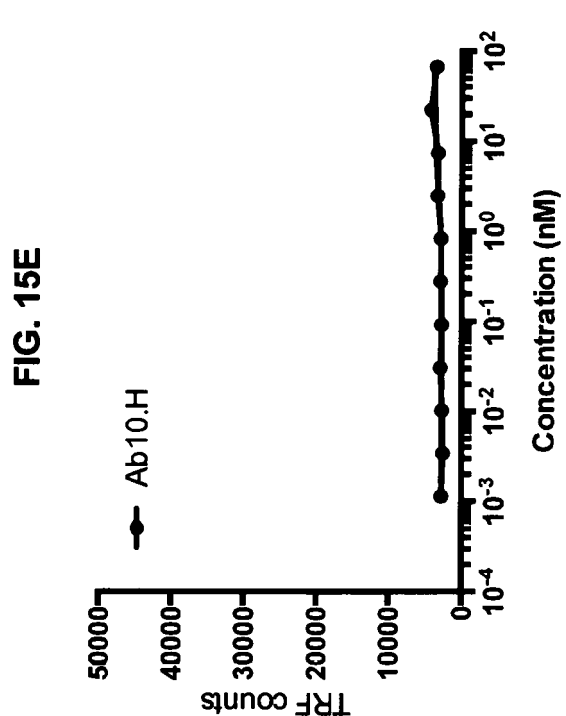


FIG. 15H

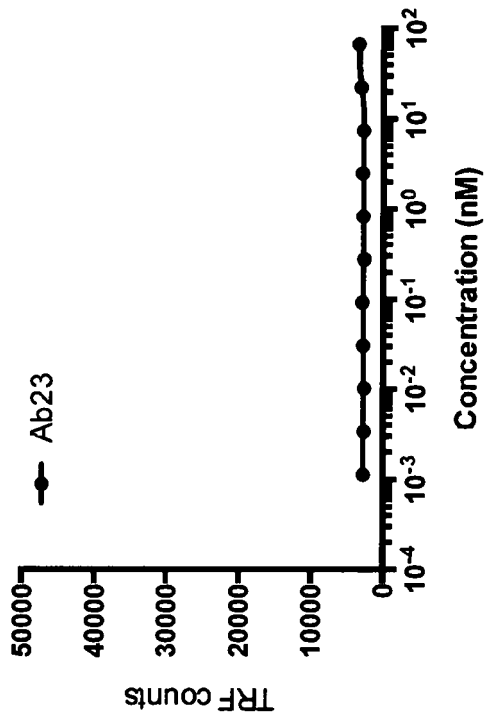


FIG. 15J

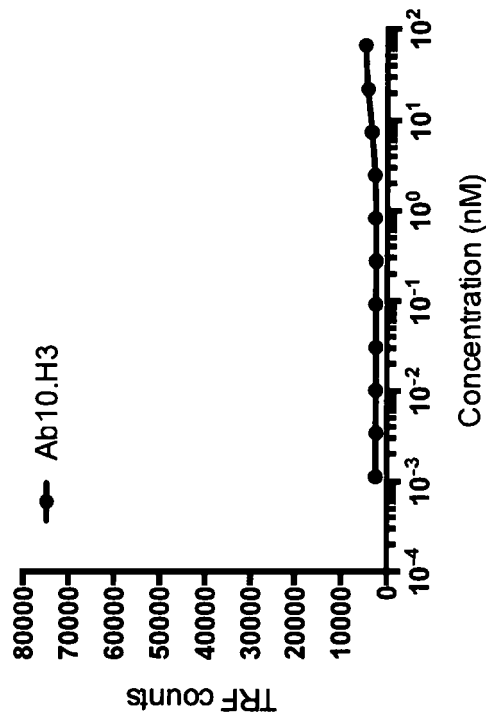


FIG. 15G

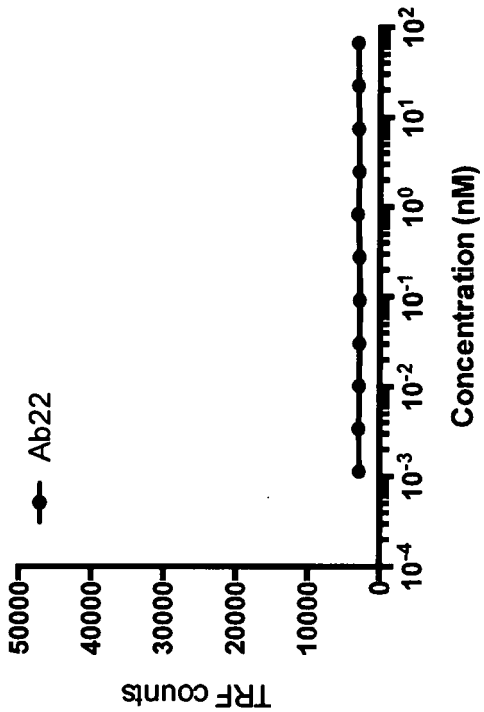


FIG. 15I

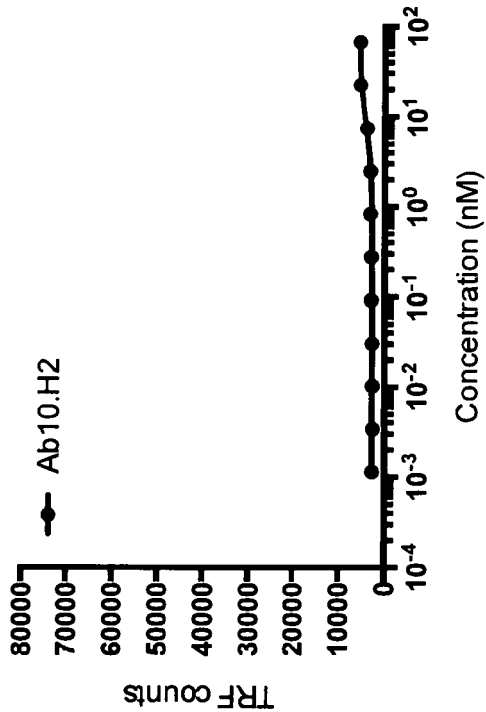


FIG. 15K

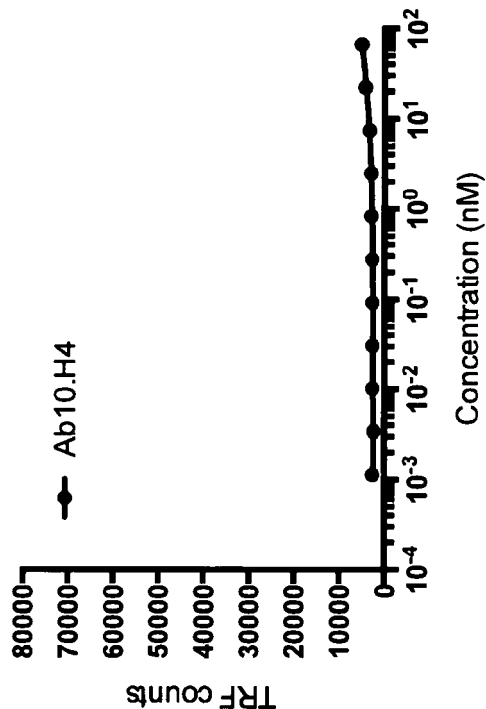


FIG. 15L

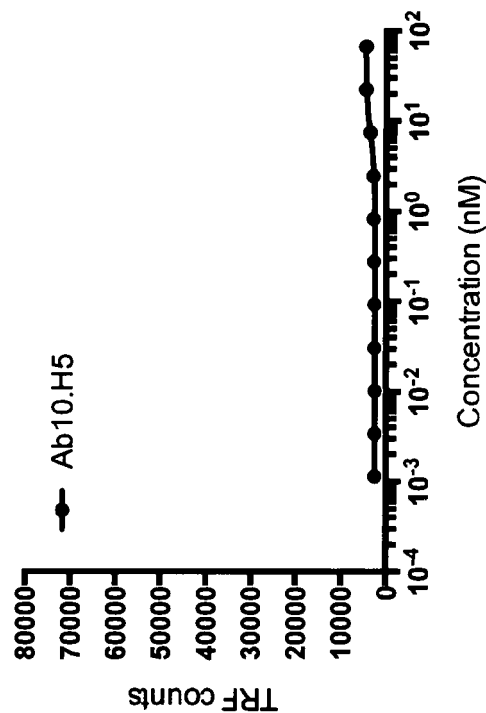


FIG. 15M

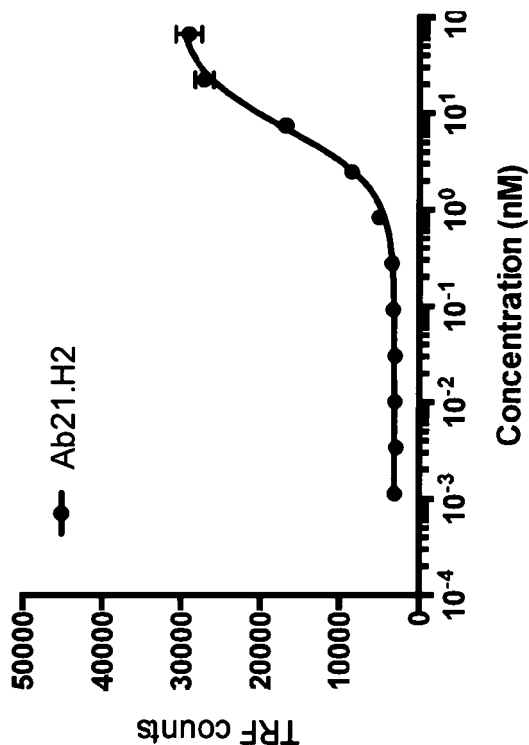


FIG. 15N

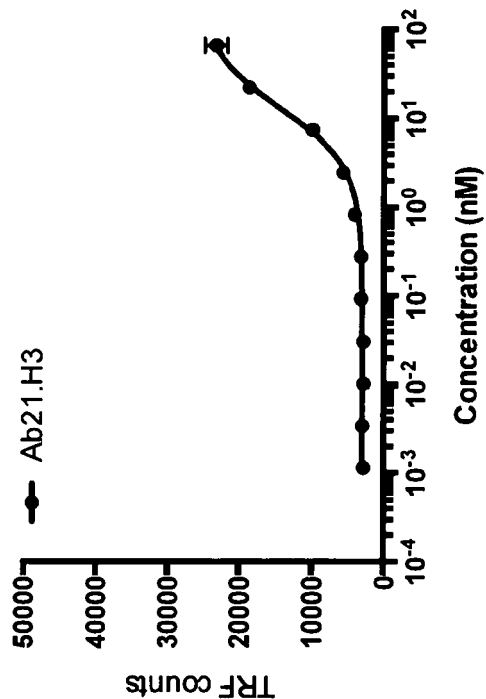


**FIG. 150**

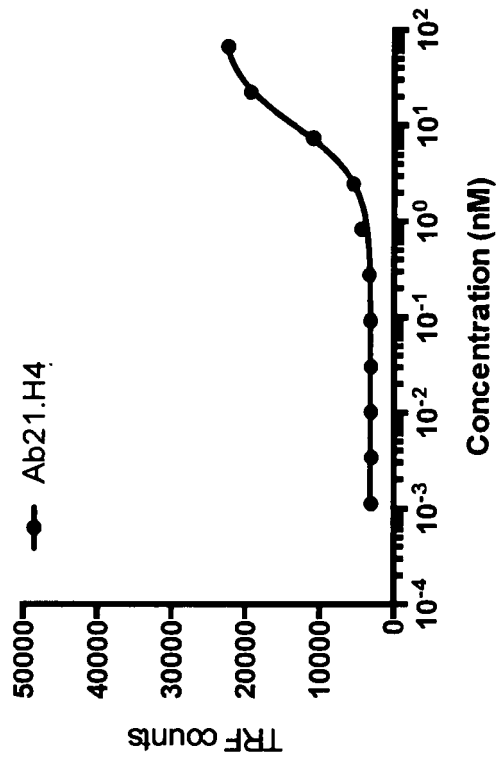


**FIG. 16A**

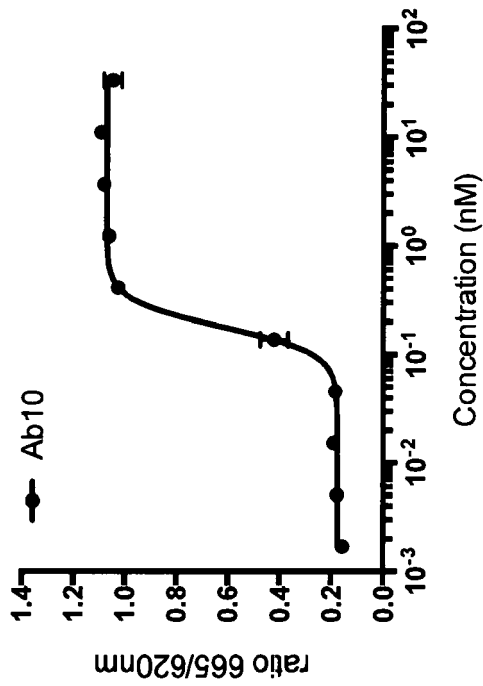


**FIG. 16B**

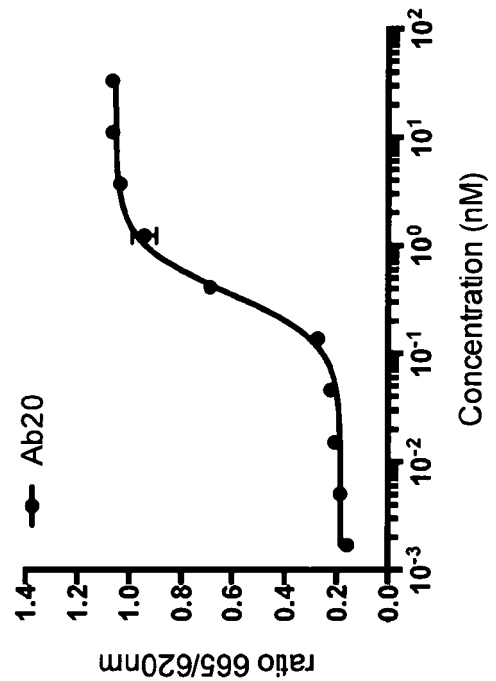


**FIG. 16C**

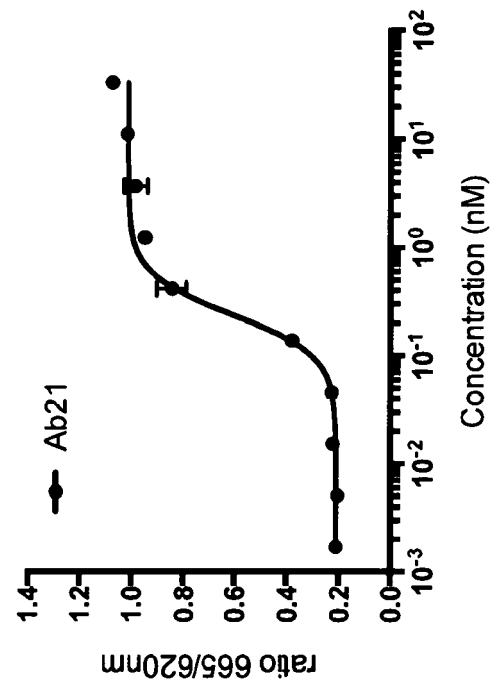


FIG. 16D

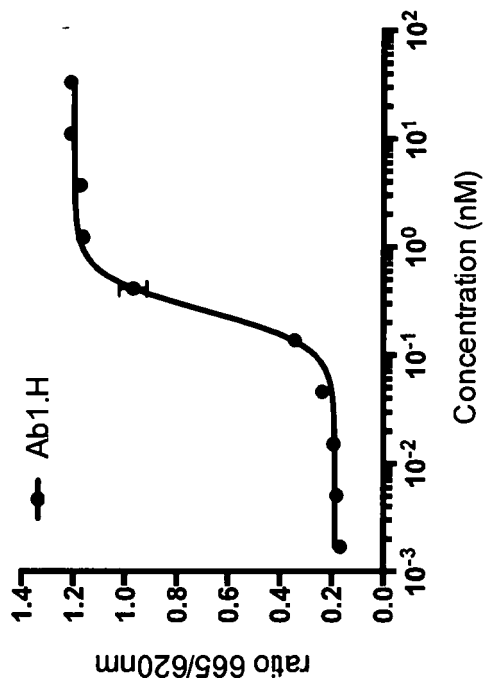


FIG. 16E

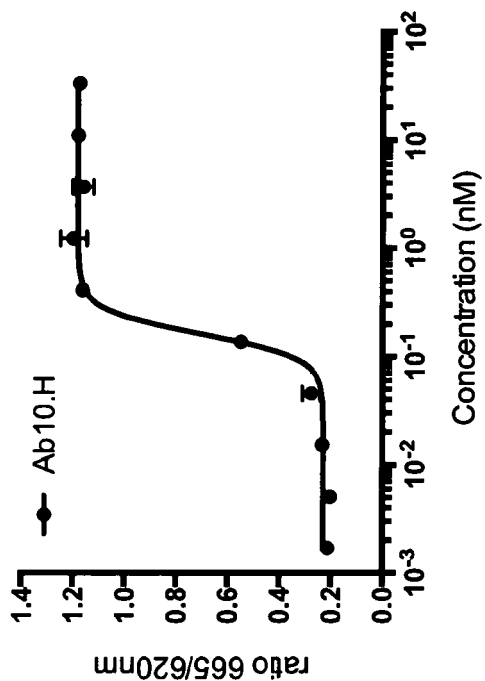


FIG. 16F

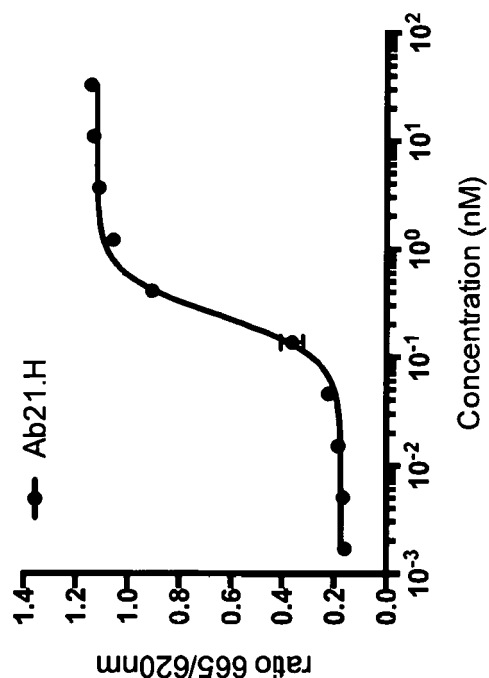
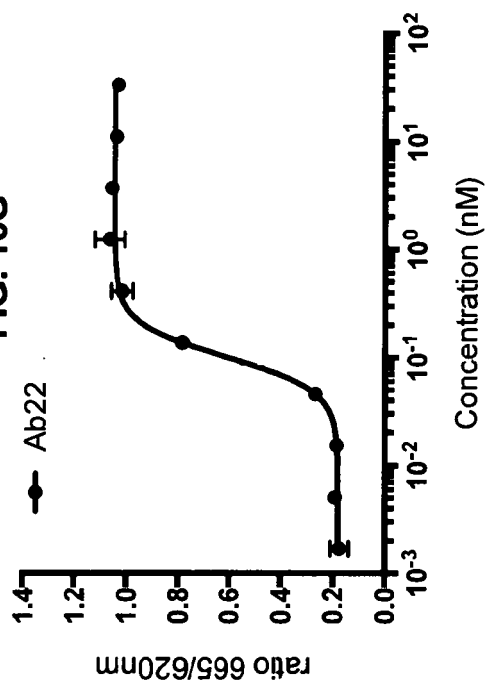
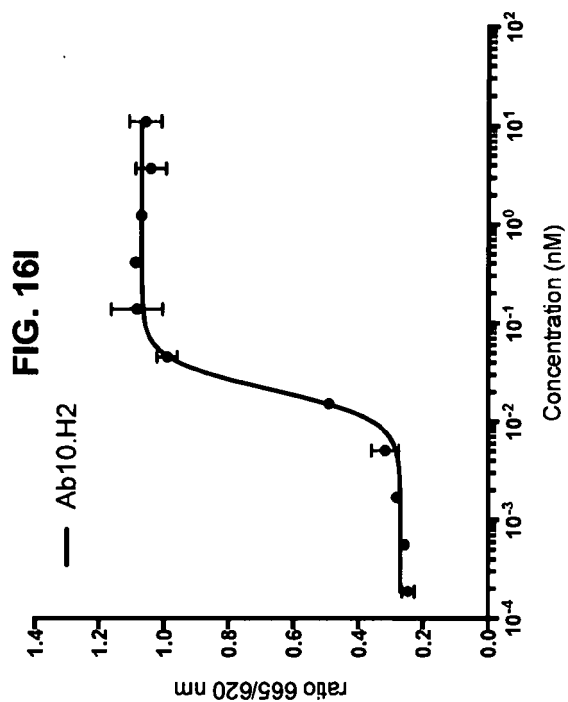
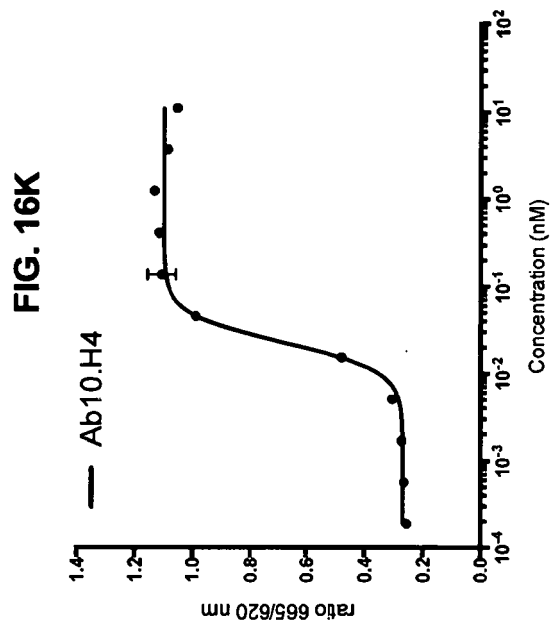
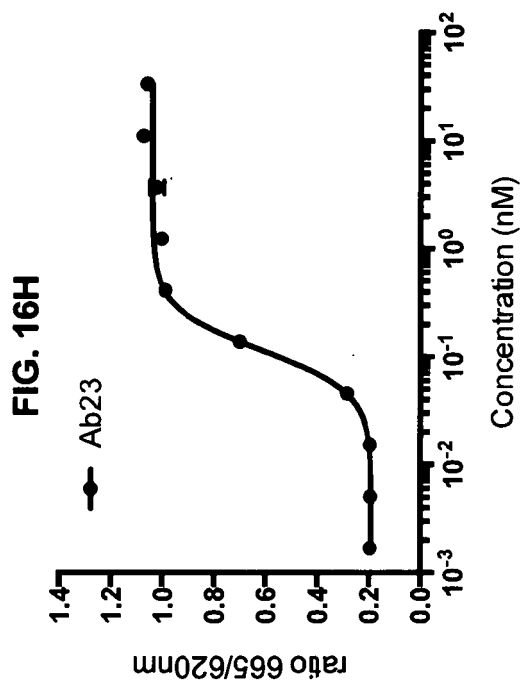
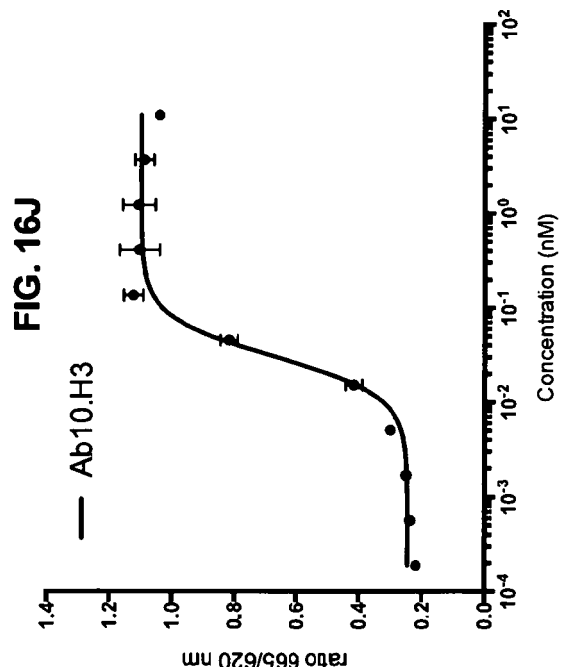


FIG. 16G





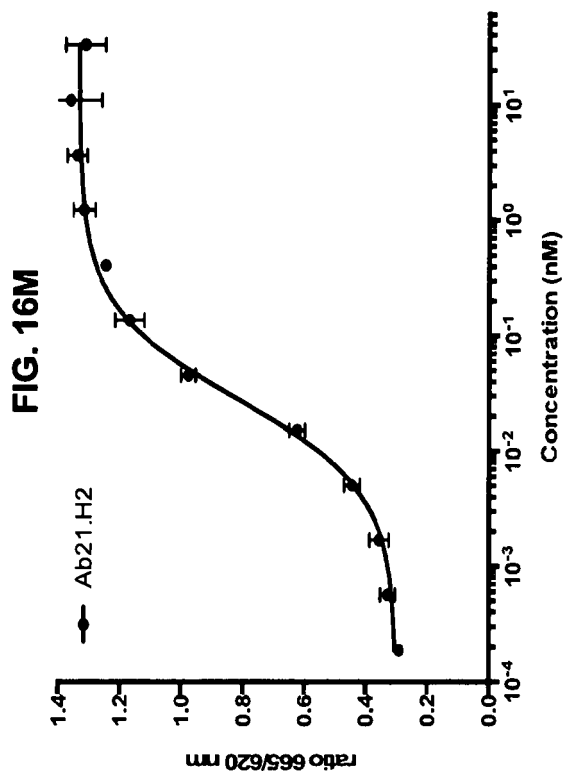
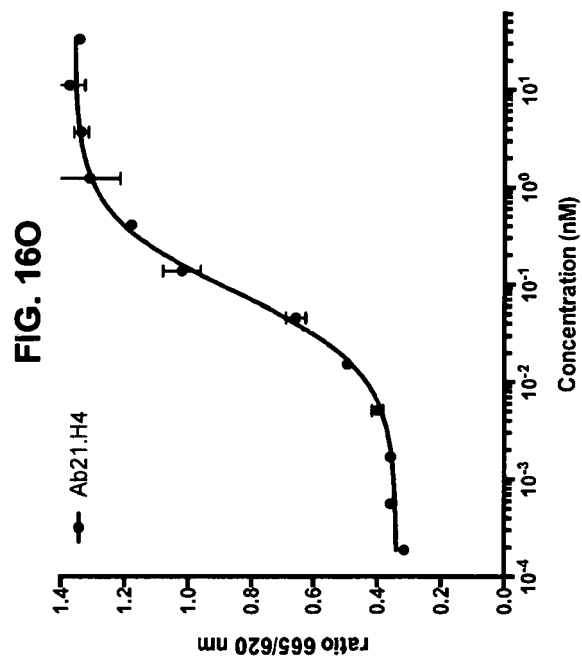
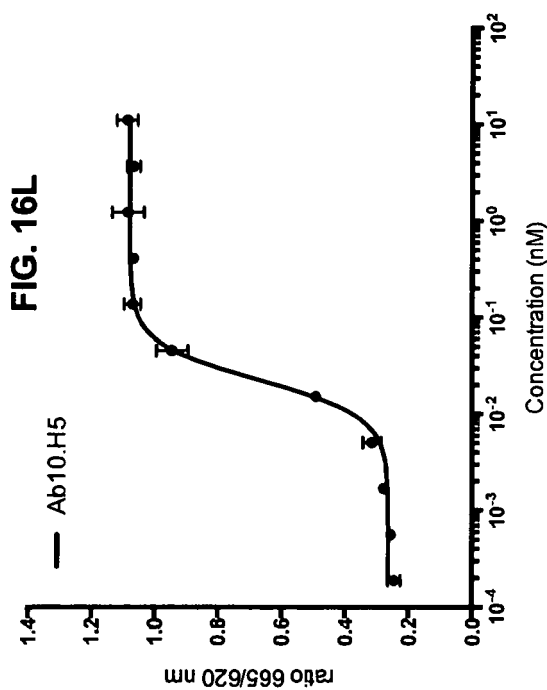
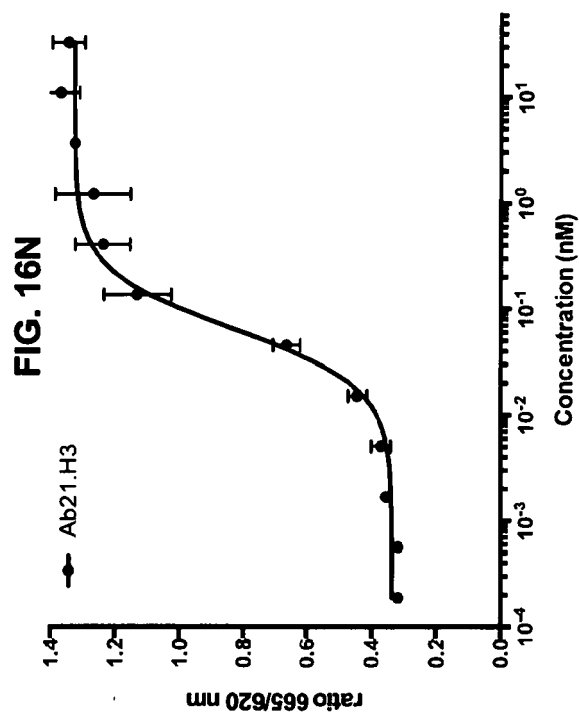


FIG. 17B

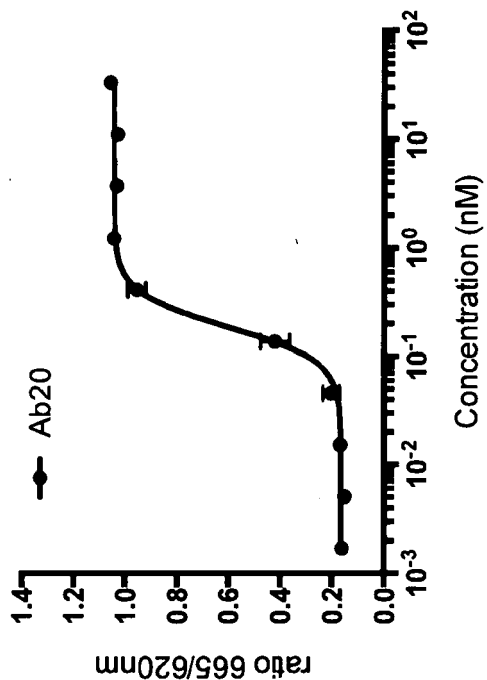


FIG. 17D

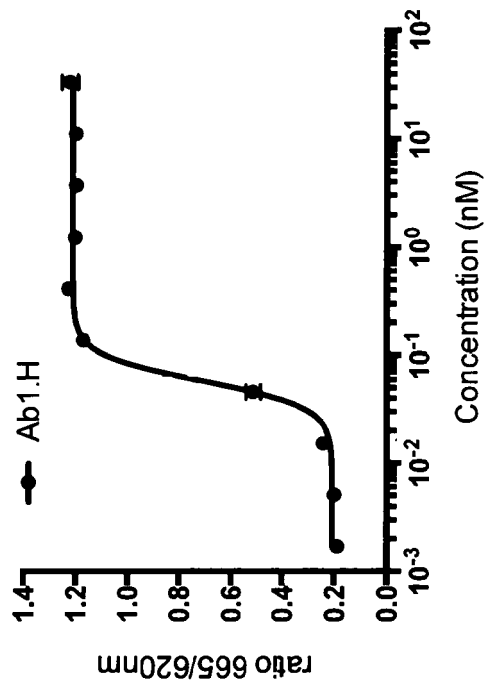


FIG. 17A

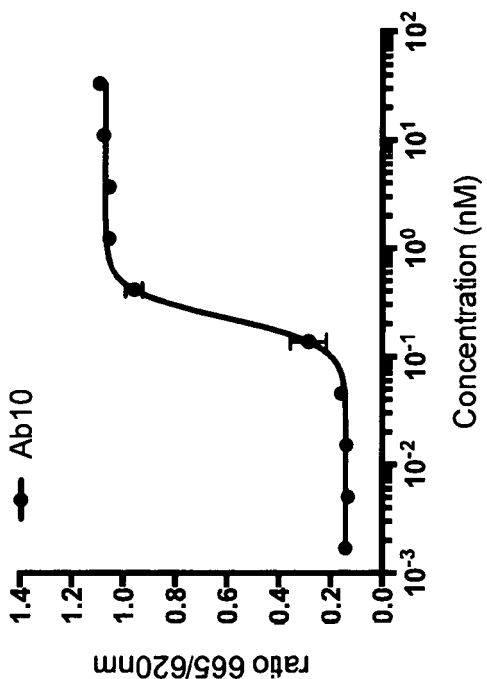


FIG. 17C

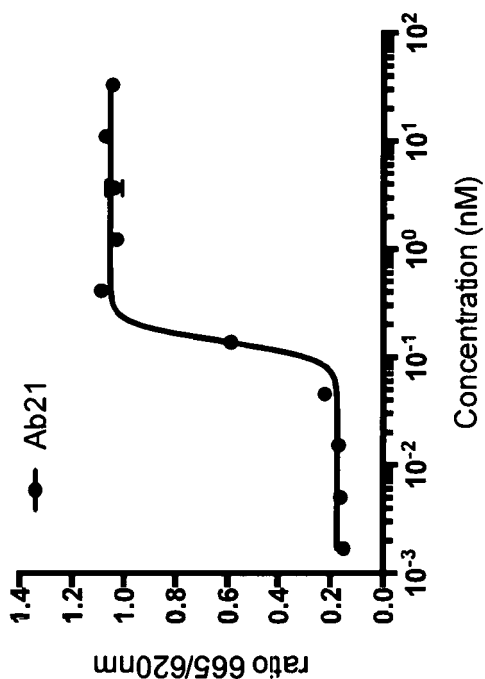


FIG. 17F

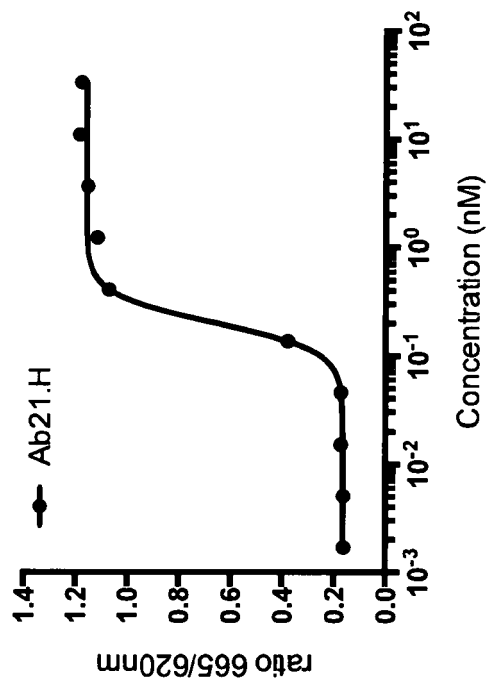


FIG. 17H

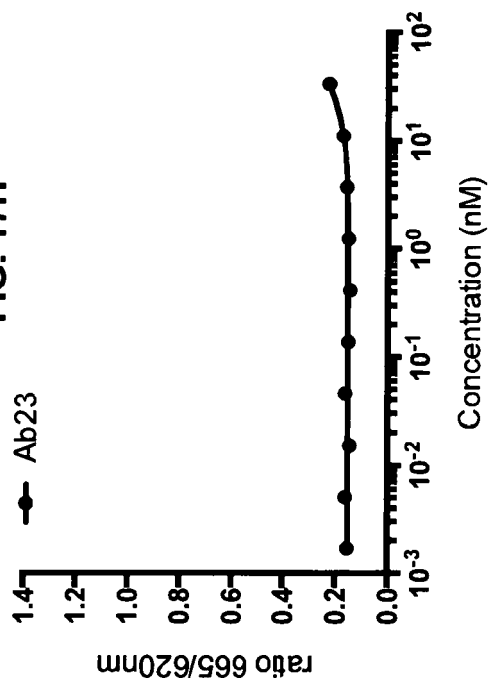


FIG. 17E

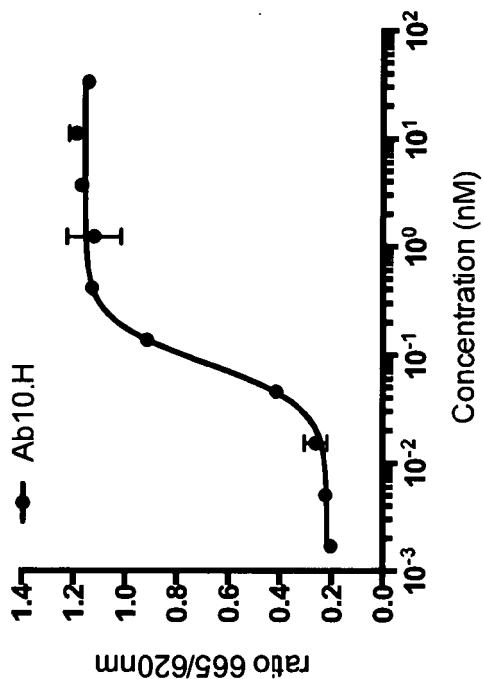
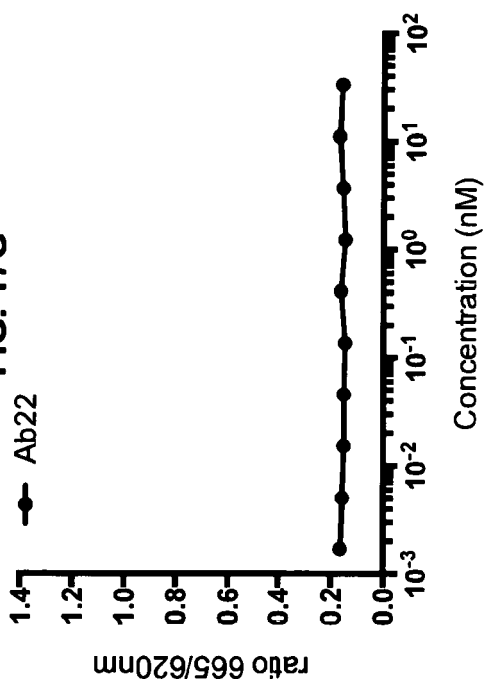
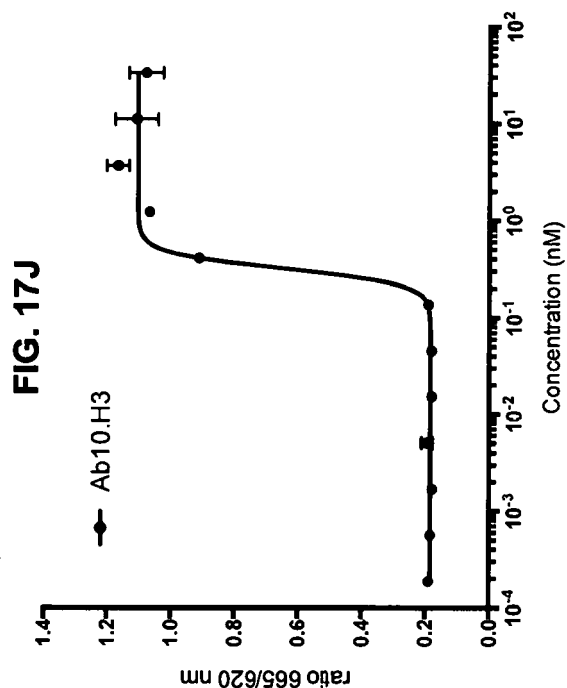
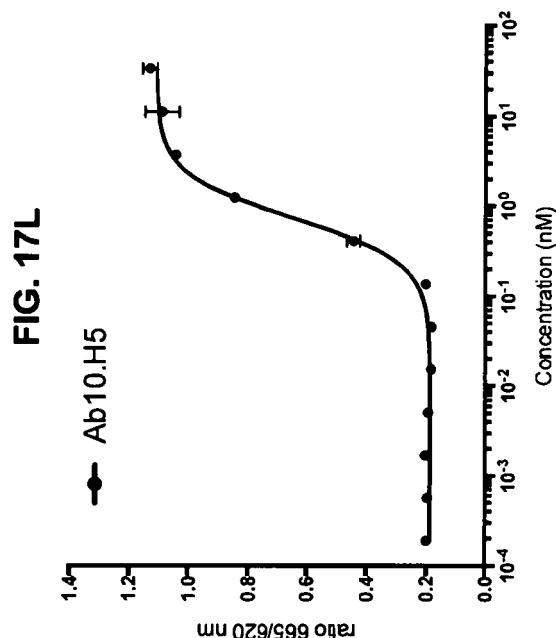
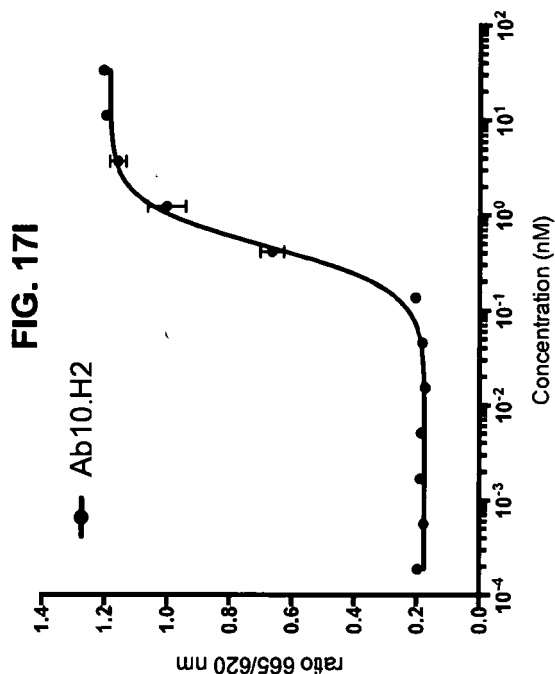
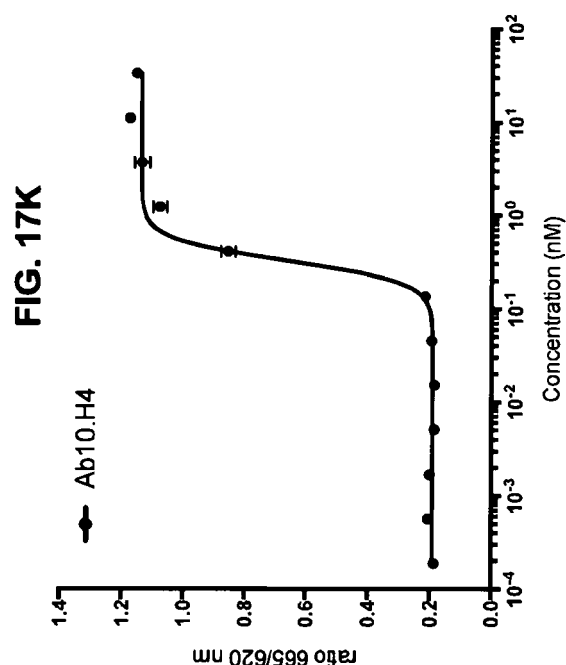


FIG. 17G





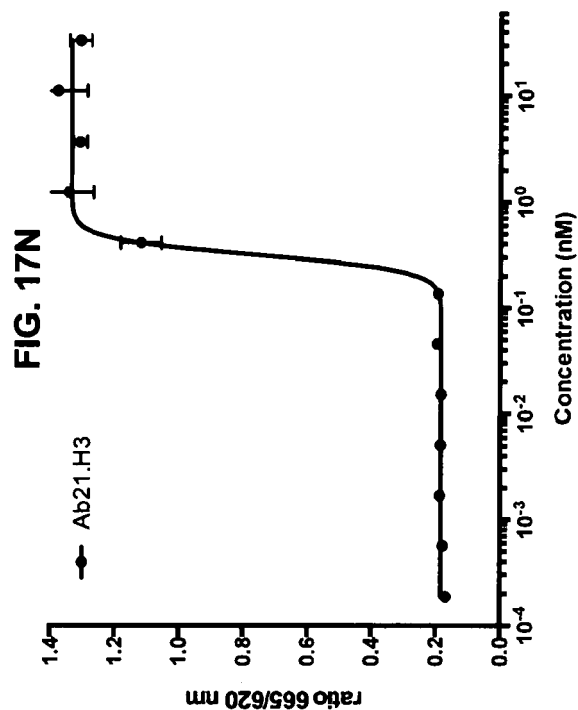
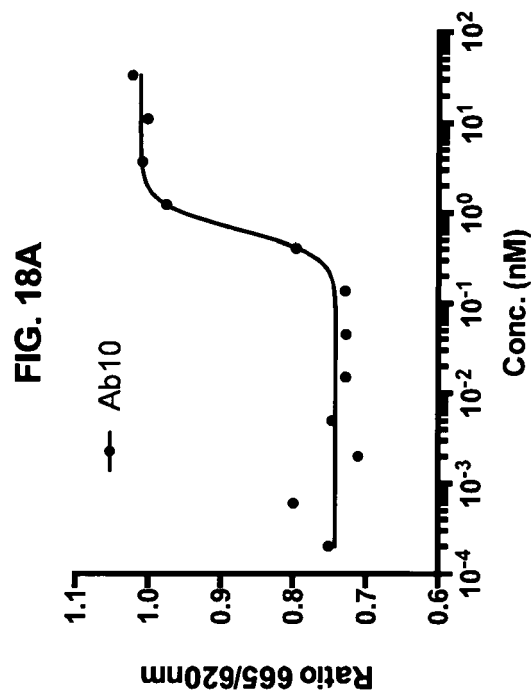
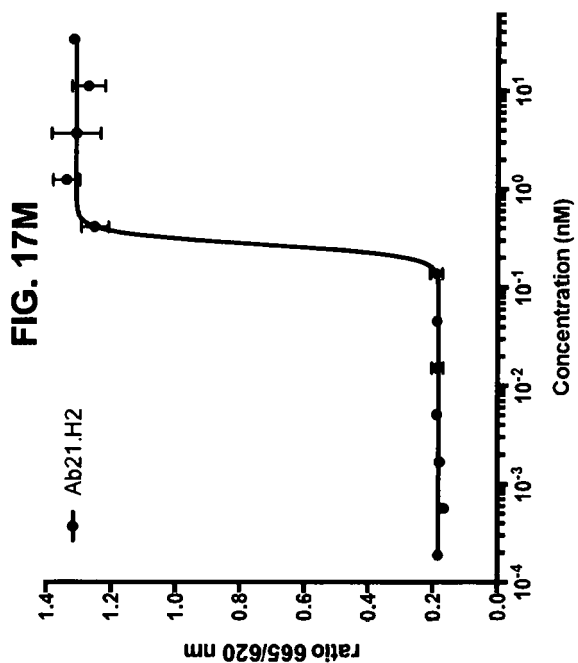
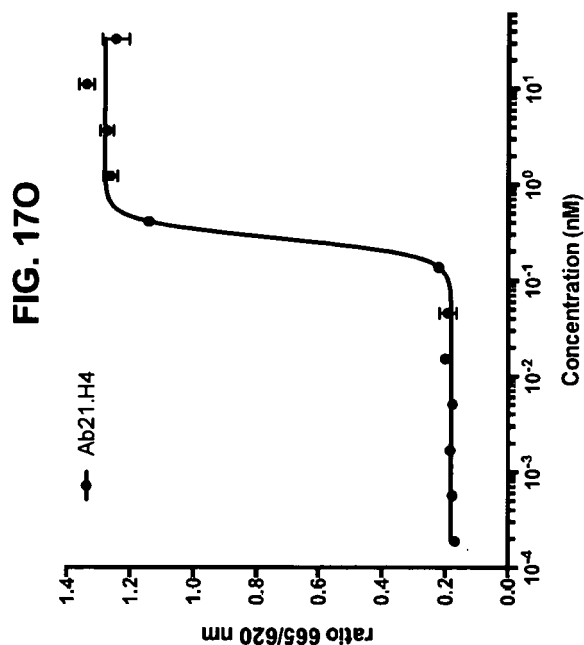


FIG. 18B

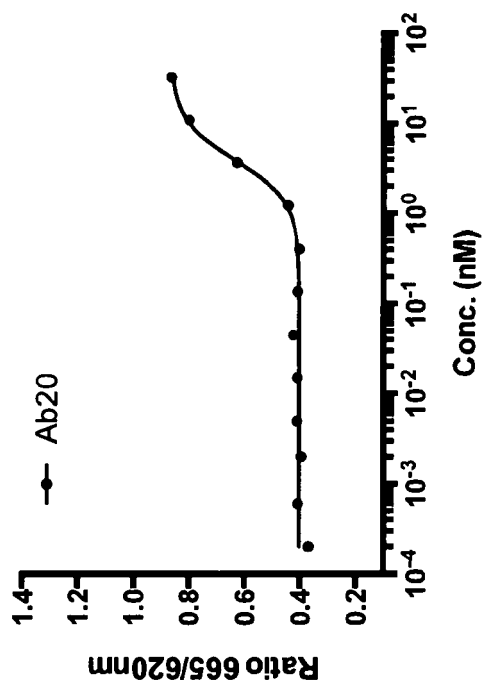


FIG. 18C

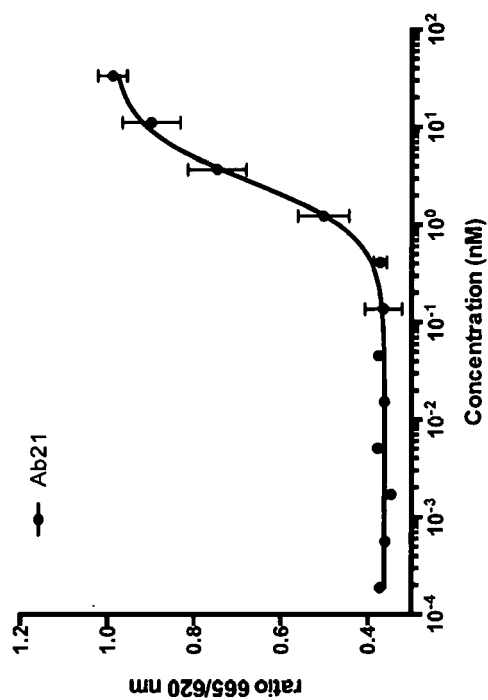


FIG. 18D

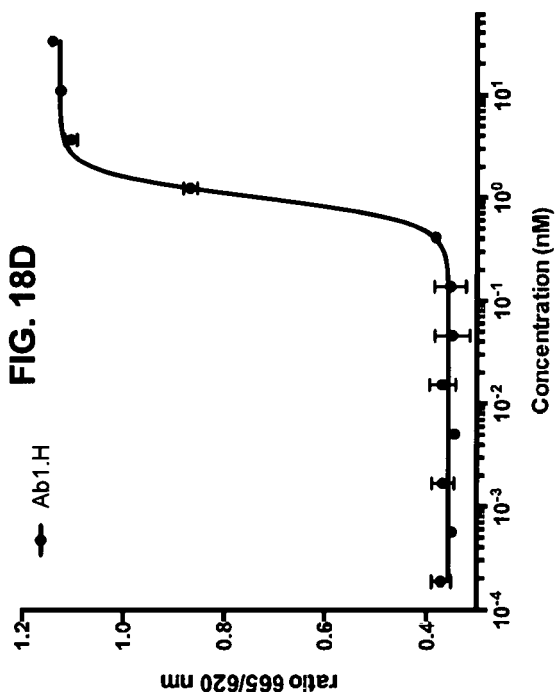
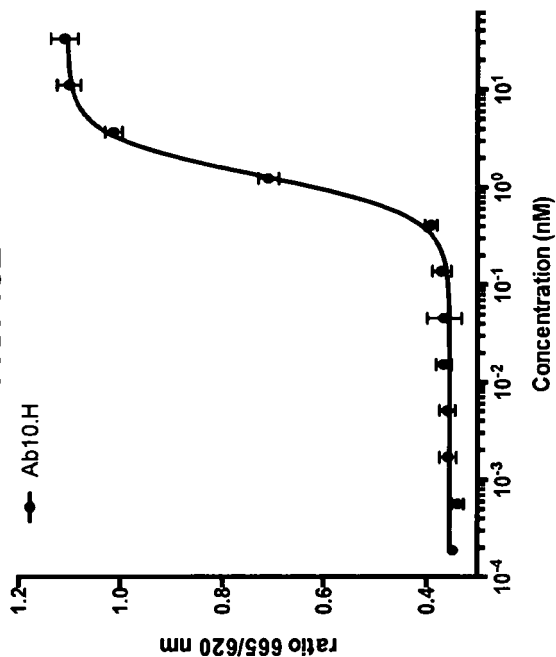
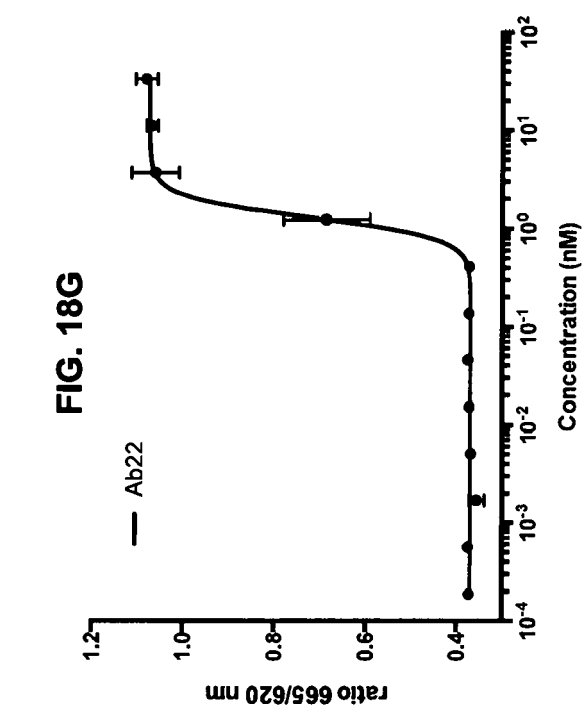
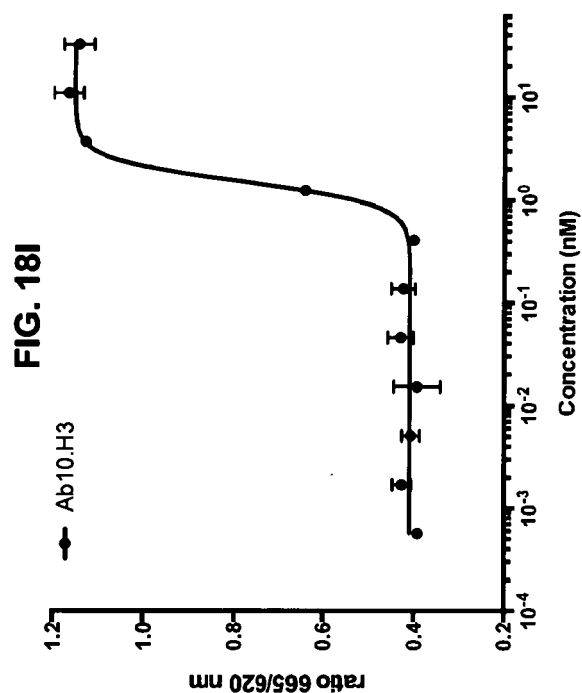
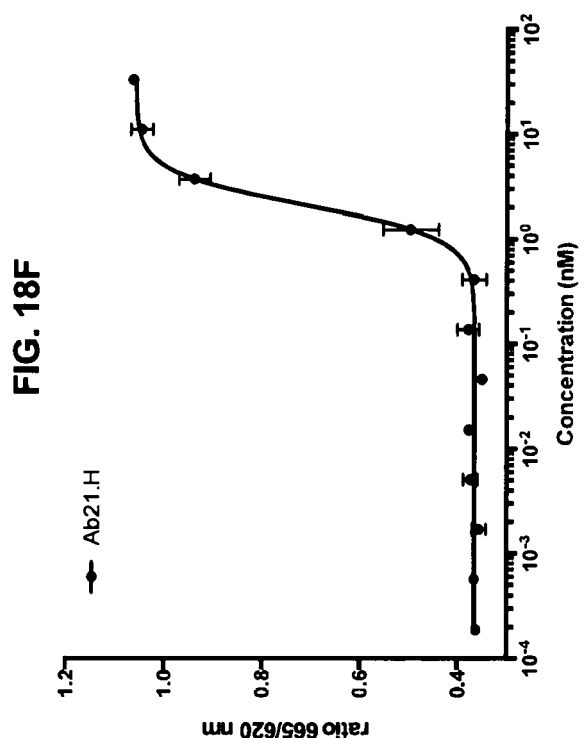
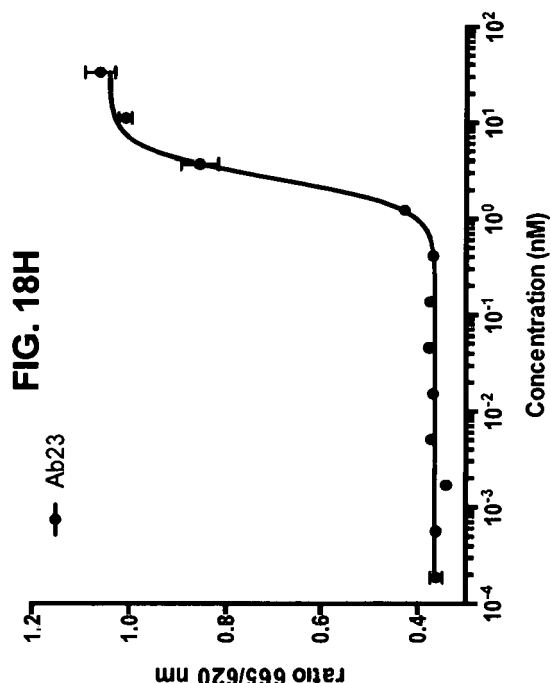


FIG. 18E





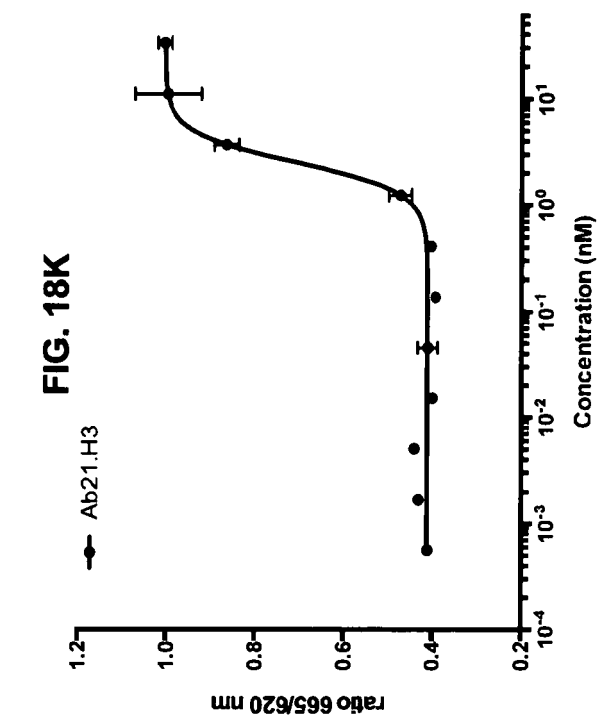
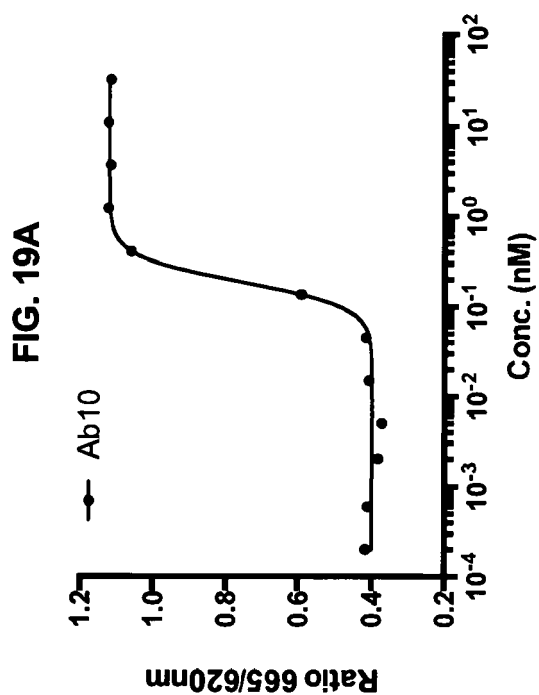
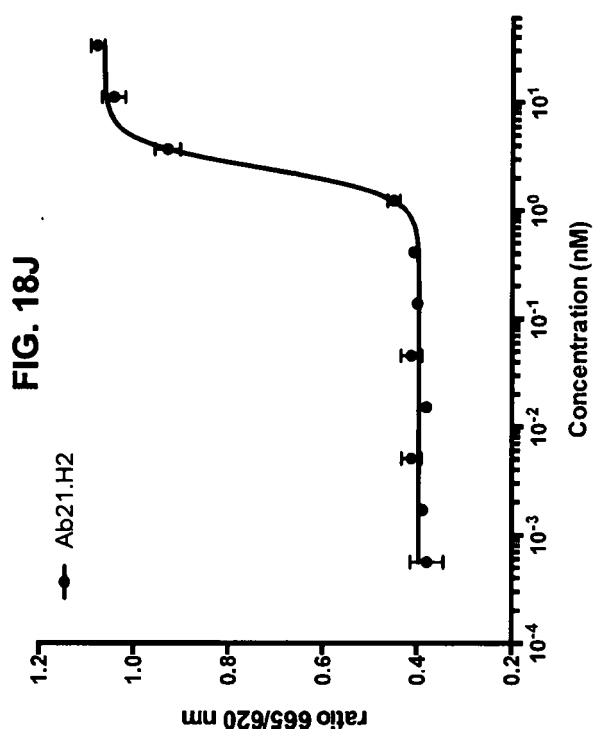
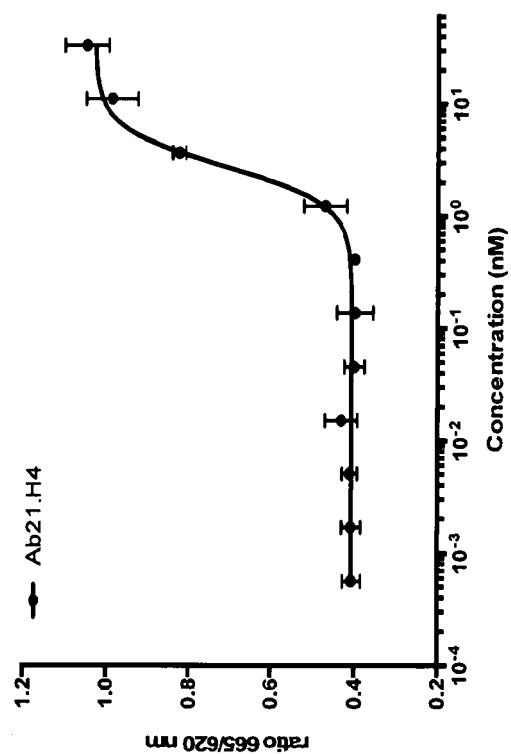


FIG. 19B

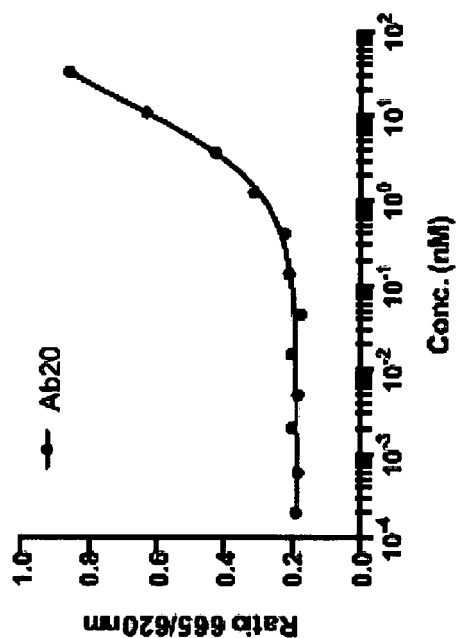


FIG. 19C

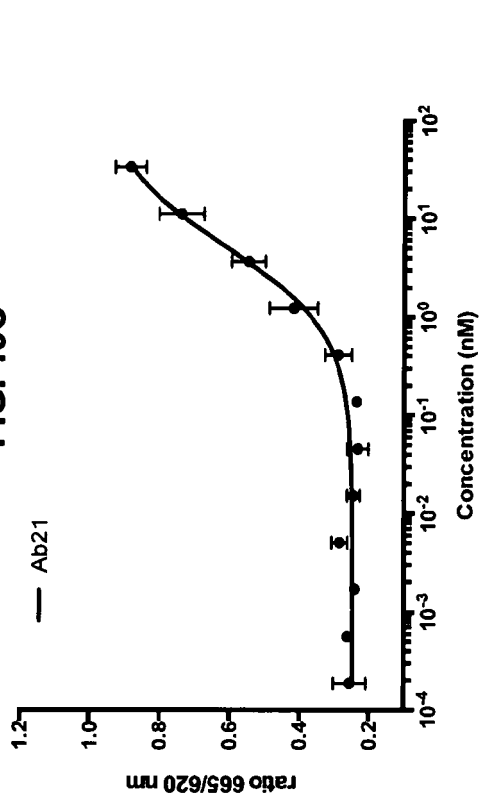


FIG. 19D

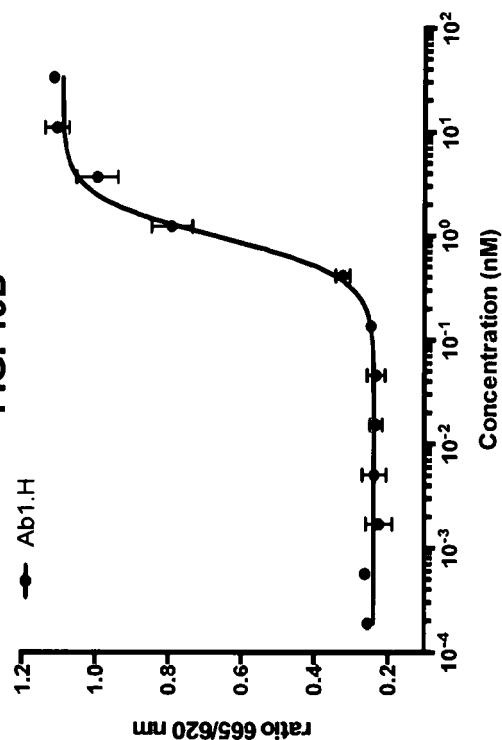


FIG. 19E

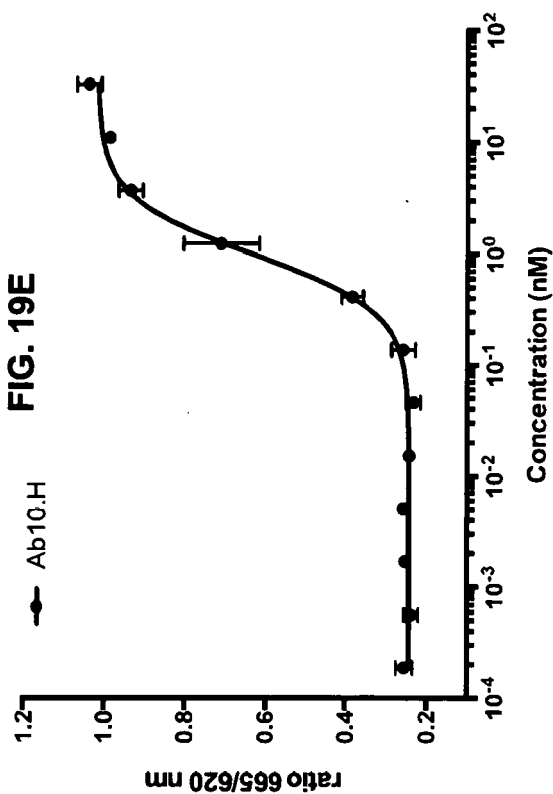


FIG. 19G

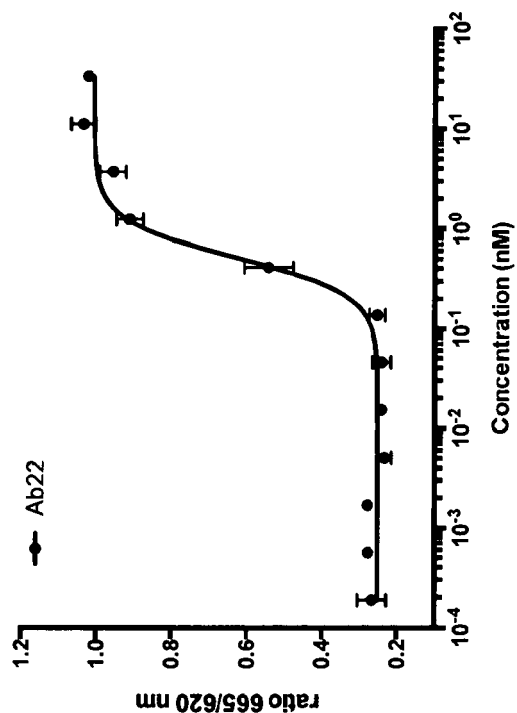


FIG. 19I

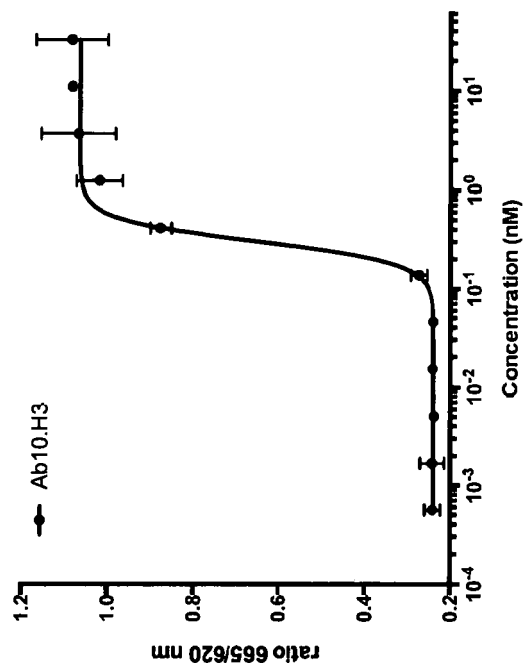


FIG. 19F

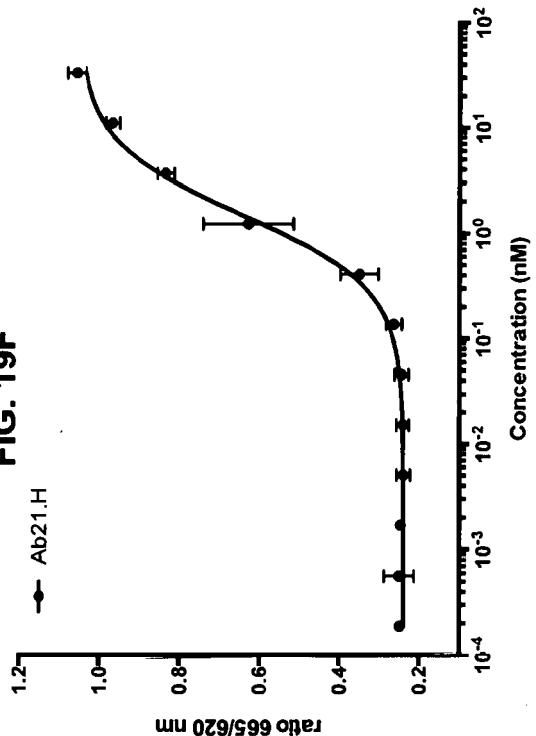
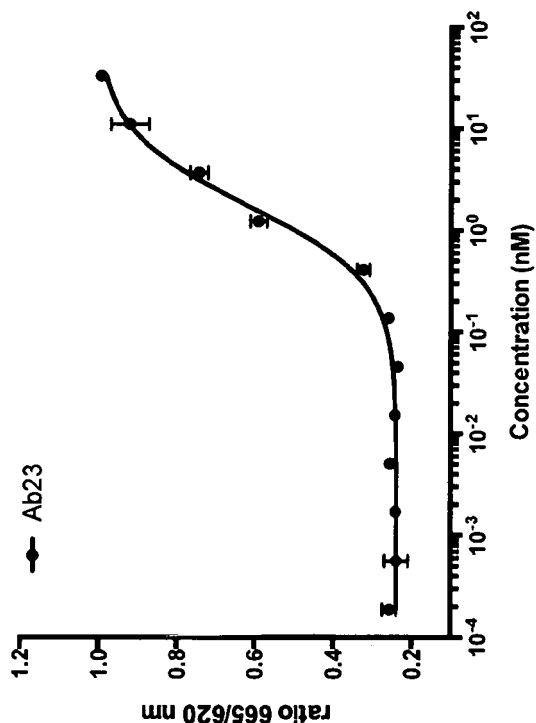
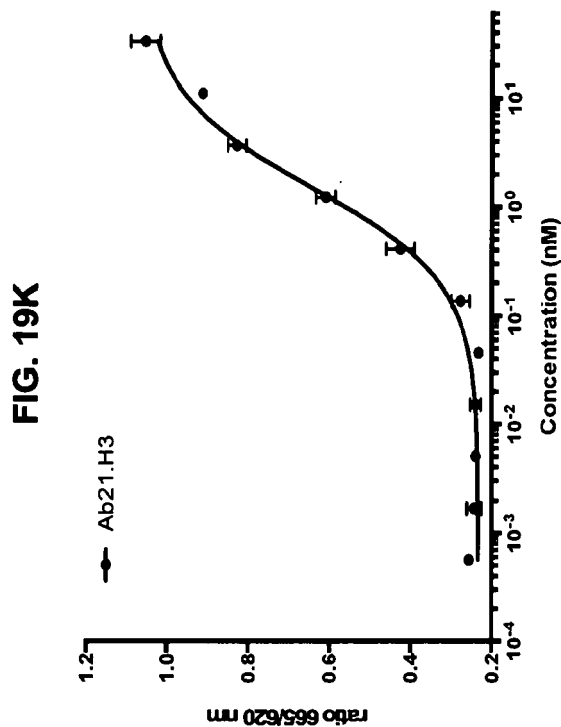
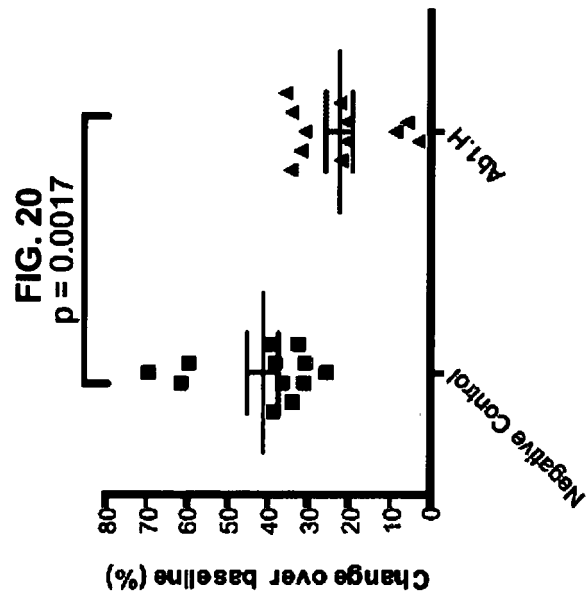
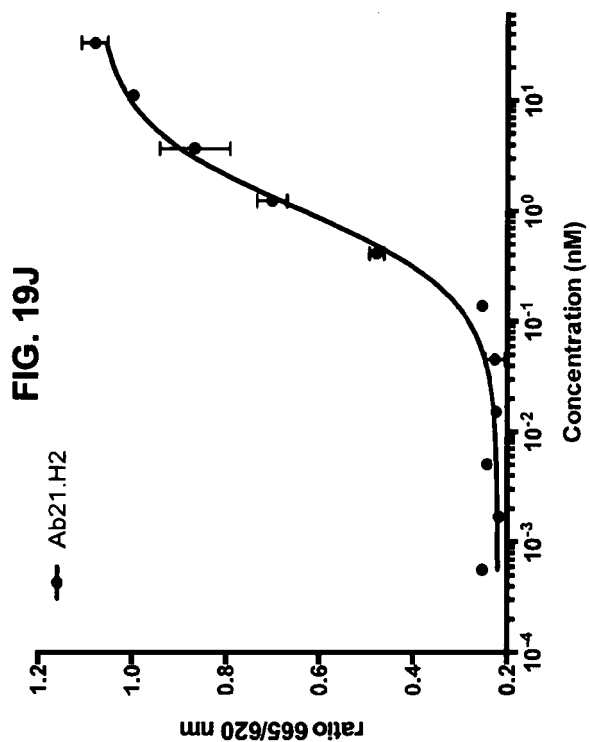
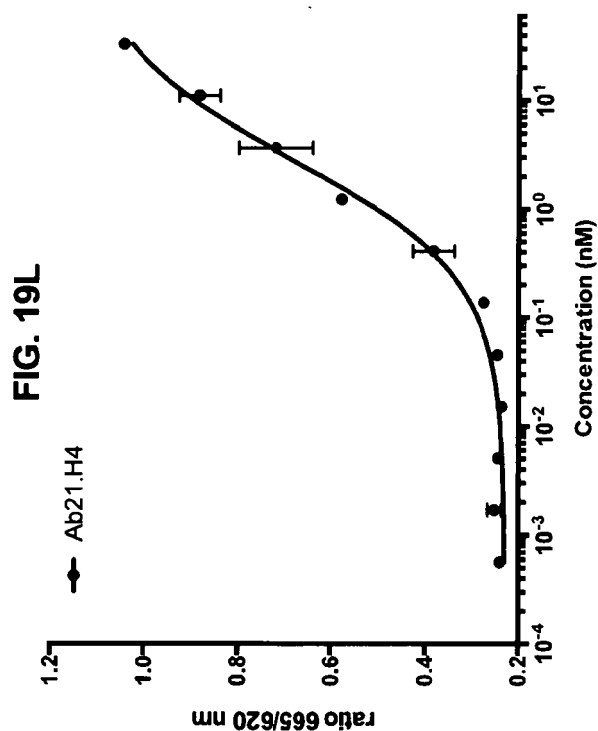
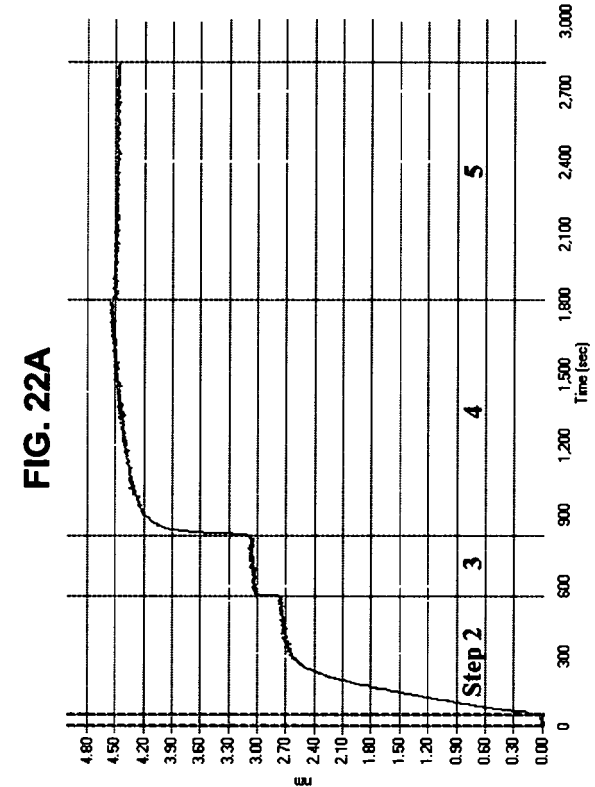
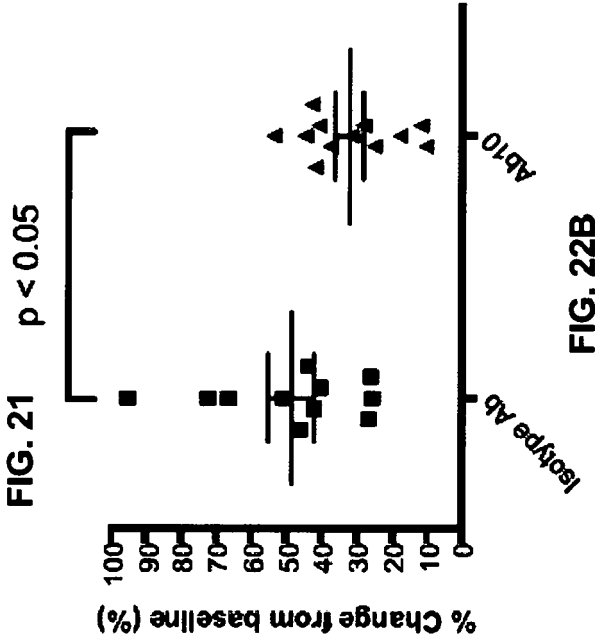
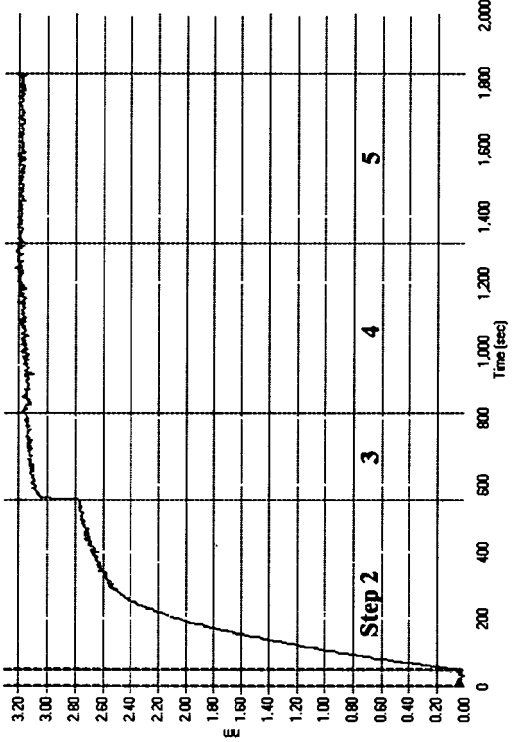
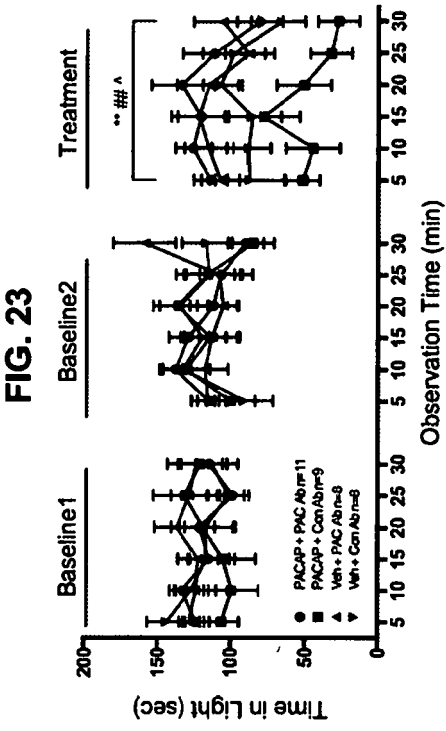


FIG. 19H







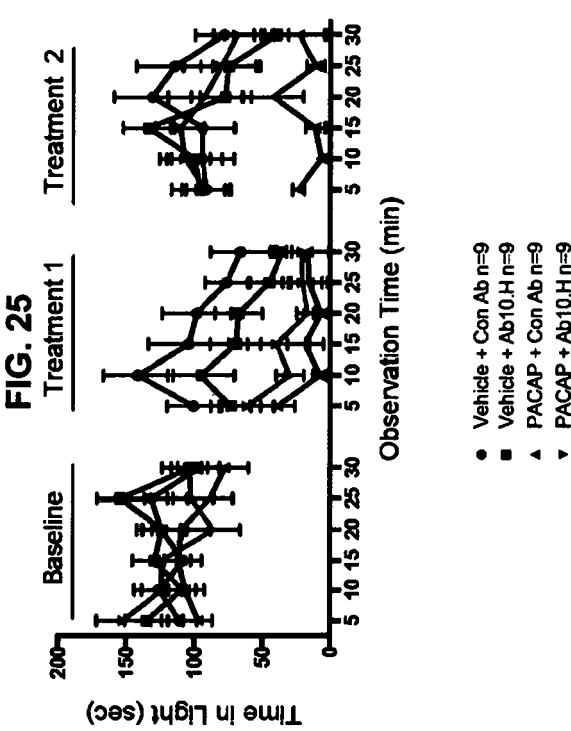
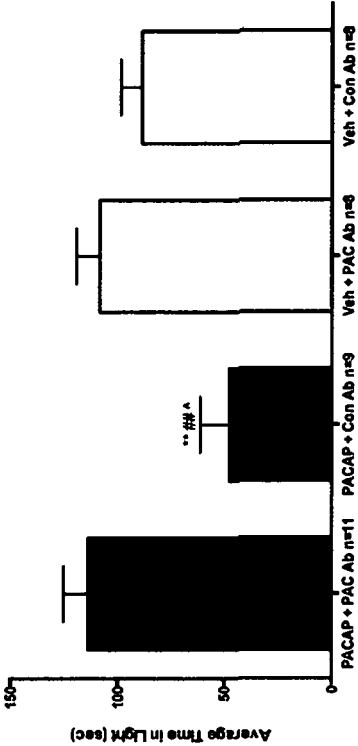
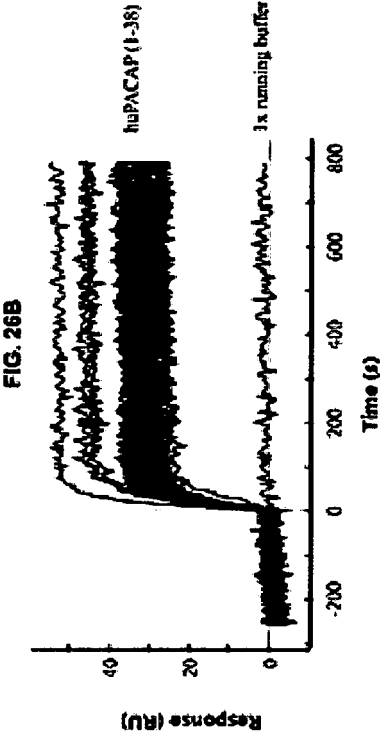
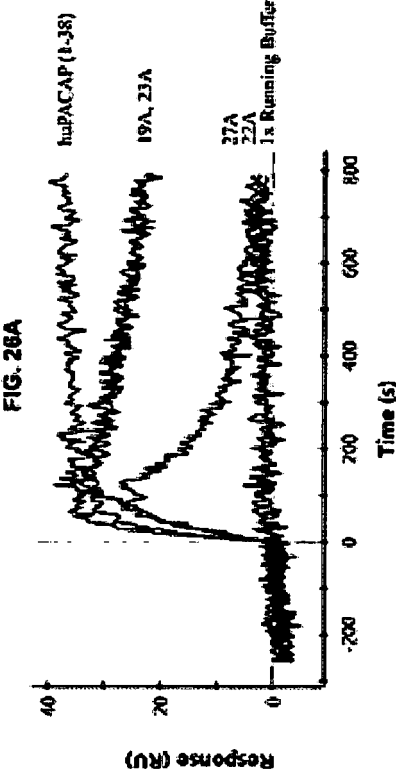
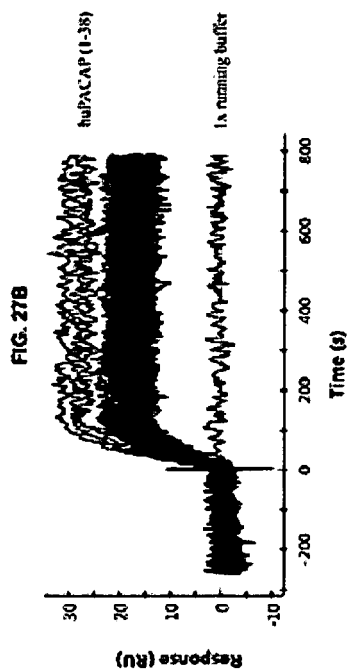
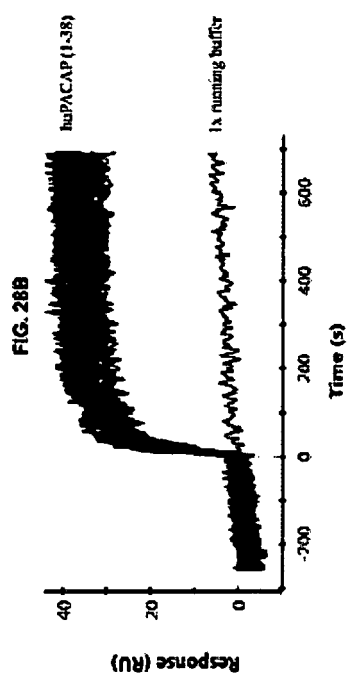
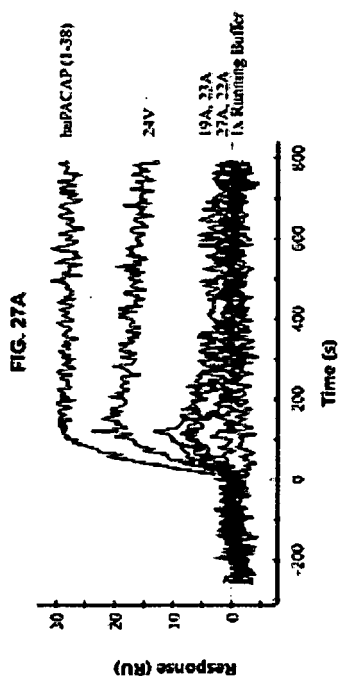
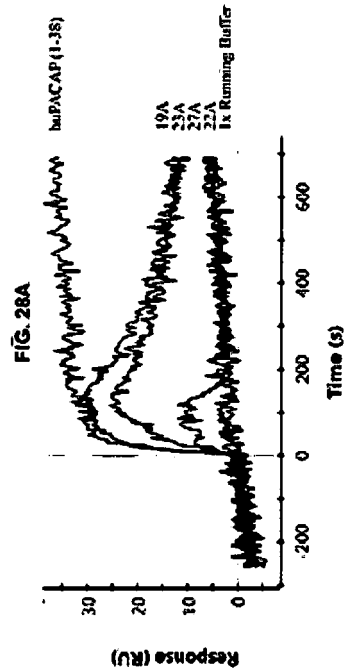


**FIG. 24**





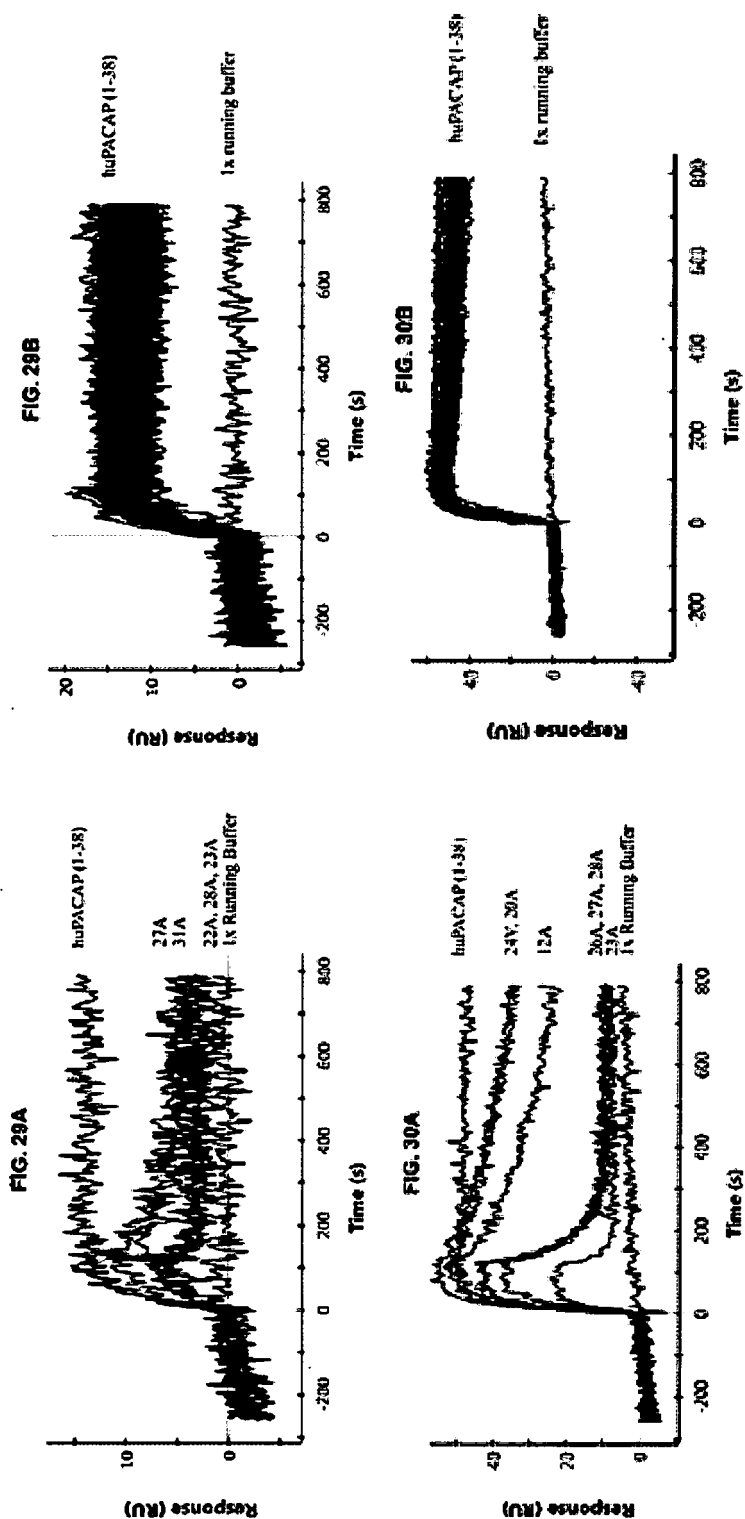


**FIG. 31A. Summary of effects of PACAP alanine scanning mutants on antibody binding**

| VIP | PACAP |    | Ab10 | Ab20 | Ab21 | Ab22 | Ab23 |
|-----|-------|----|------|------|------|------|------|
| H   | H     | 1  |      |      |      |      |      |
| S   | S     | 2  |      |      |      |      |      |
| D   | D     | 3  |      |      |      |      |      |
| A   | G     | 4  |      |      |      |      |      |
| V   | I     | 5  |      |      |      |      |      |
| F   | F     | 6  |      |      |      |      |      |
| T   | T     | 7  |      |      |      |      |      |
| D   | D     | 8  |      |      |      |      |      |
| N   | S     | 9  |      |      |      |      |      |
| Y   | Y     | 10 |      |      |      |      |      |
| T   | S     | 11 |      |      |      |      |      |
| R   | R     | 12 |      |      |      |      | 12A  |
| L   | Y     | 13 |      |      |      |      |      |
| R   | R     | 14 |      |      |      |      |      |
| K   | K     | 15 |      |      |      |      |      |
| Q   | Q     | 16 |      |      |      |      |      |
| M   | M     | 17 |      |      |      |      |      |
| A   | A     | 18 |      |      |      |      |      |
| V   | V     | 19 | 19A  | 19A  | 19A  |      |      |
| K   | K     | 20 |      |      |      |      | 20A  |
| K   | K     | 21 |      |      |      |      |      |
| Y   | Y     | 22 | 22A  | 22A  | 22A  | 22A  |      |
| L   | L     | 23 | 23A  | 23A  | 23A  | 23A  | 23A  |
| N   | A     | 24 |      | 24V  |      |      | 24V  |
| S   | A     | 25 |      |      |      |      |      |
| I   | V     | 26 |      |      |      |      | 26A  |
| L   | L     | 27 | 27A  | 27A  | 27A  | 27A  | 27A  |

**FIG. 31B. Summary of effects of PACAP alanine scanning mutants on antibody binding**

| VIP | PACAP |    | Ab10 | Ab20 | Ab21 | Ab22 | Ab23 |
|-----|-------|----|------|------|------|------|------|
| N   | G     | 28 |      |      |      | 28A  | 28A  |
|     | K     | 29 |      |      |      |      |      |
|     | R     | 30 |      |      |      |      |      |
|     | Y     | 31 |      |      |      | 31A  |      |
|     | K     | 32 |      |      |      |      |      |
|     | Q     | 33 |      |      |      |      |      |
|     | R     | 34 |      |      |      |      |      |
|     | V     | 35 |      |      |      |      |      |
|     | K     | 36 |      |      |      |      |      |
|     | N     | 37 |      |      |      |      |      |
|     | K     | 38 |      |      |      |      |      |

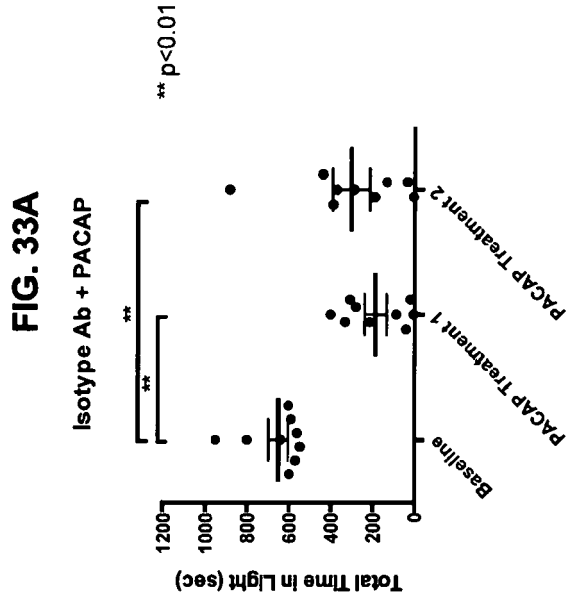
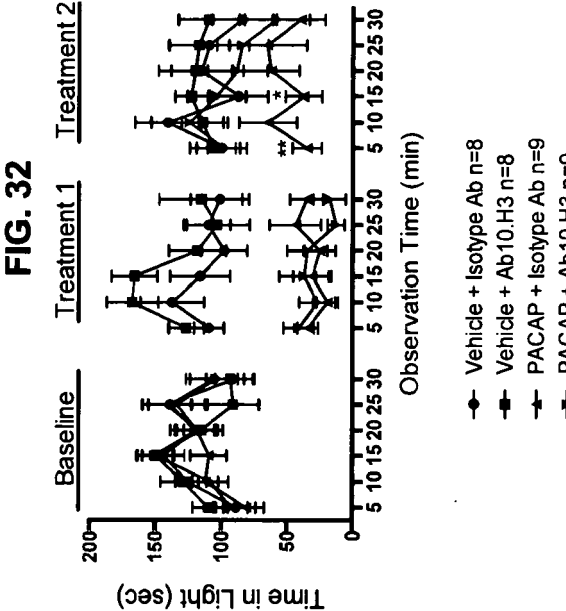
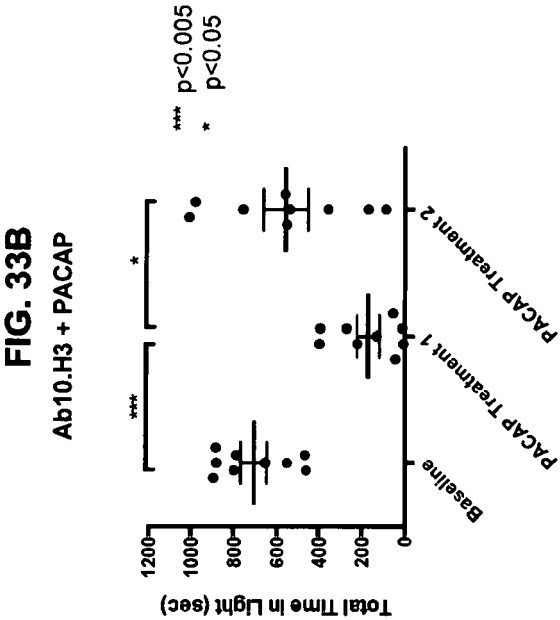


FIG. 34A

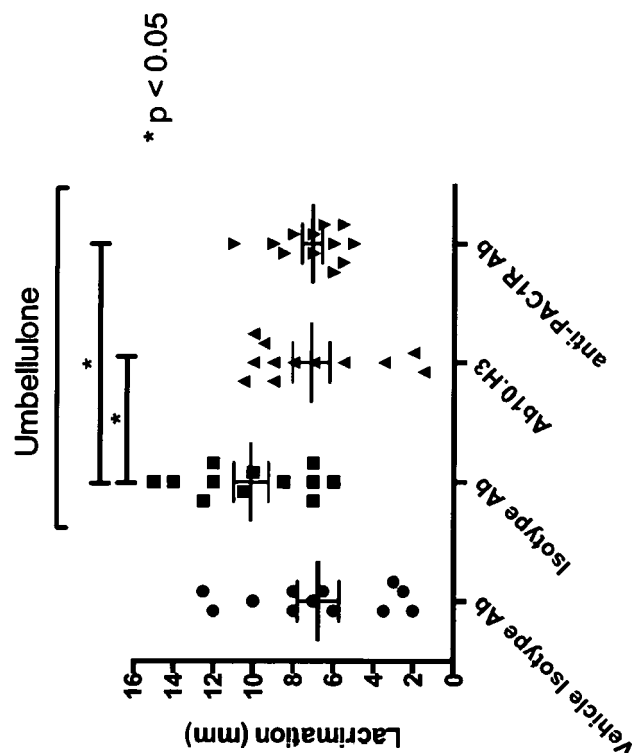


FIG. 34B

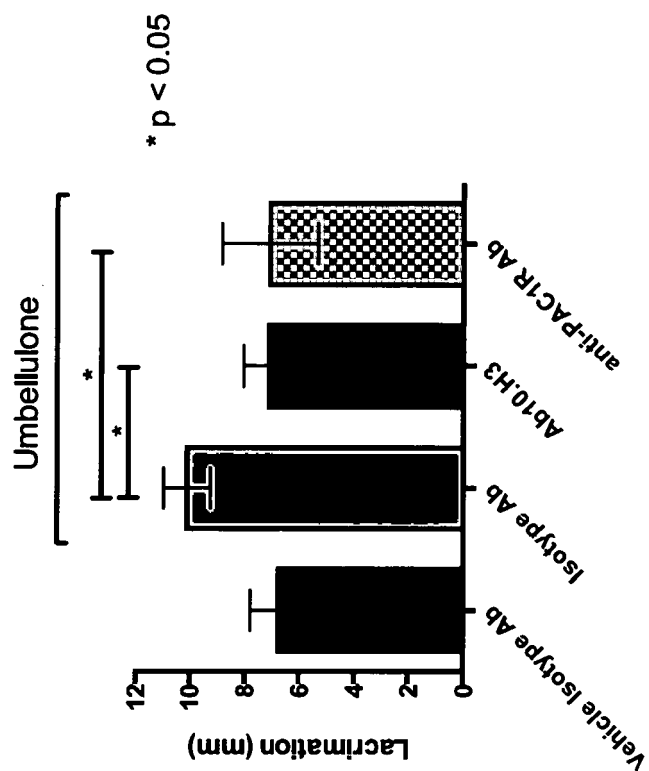


FIG. 35A

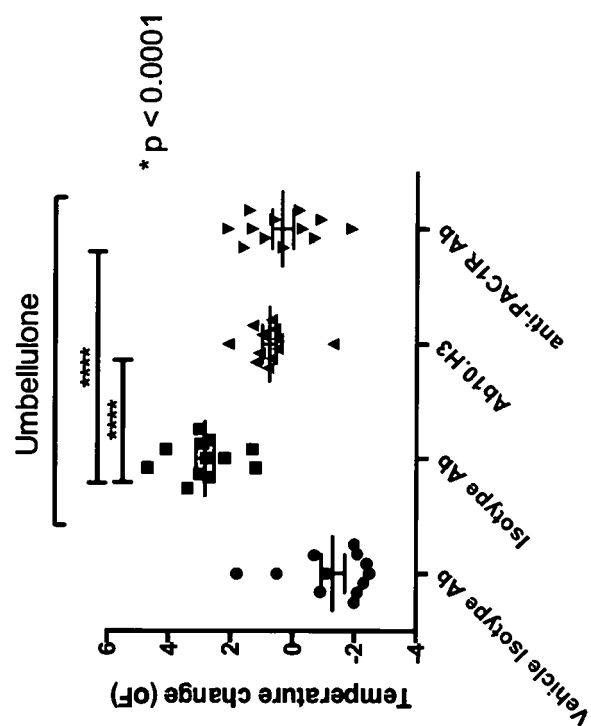


FIG. 35B

