

FIG. 1A

```
MSLISKEELIKLAYSIRPRENEYKTILTNLDEYNKLTNNNNENKYLQLKK 50
MSLISKEELIKLAYSIRPRENEYKTILTNLDEYNKLTNNNNENKYLQLKK 50
MSLISKEELIKLAYSIRPRENEYKTILTNLDEYNKLTNNNNENKYLQLKK 50
MSLISKEELIKLAYSIRPRENEYKTILTNLDEYNKLTNNNNENKYLQLKK 50
MSLISKEELIKLAYSIRPRENEYKTILTNLDEYNKLTNNNNENKYLQLKK 50
*****

LNESIDVFMNKYKTSSRNRA LSNLKKDILKEVILIKNSNTSPVEKNLHFV 100
LNESIDVFMNKYKTSSRNRA LSNLKKDILKEVILIKNSNTSPVEKNLHFV 100
LNESIDVFMNKYKTSSRNRA LSNLKKDILKEVILIKNSNTSPVEKNLHFV 100
LNESIDVFMNKYKSSRNRA LSNLKKDILKEVILIKNSNTSPVEKNLHFV 100
LNESIDVFMNKYKSSRNRA LSNLKKDILKEVILIKNSNTSPVEKNLHFV 100
*****

WIGGEVSDIALEYIKQWADINAEYNIKLWYDSEAFVNTLKKAI VESSTT 150
WIGGEVSDIALEYIKQWADINAEYNIKLWYDSEAFVNTLKKAI VESSTT 150
WIGGEVSDIALEYIKQWADINAEYNIKLWYDSEAFVNTLKKAI VESSTT 150
WIGGEVSDIALEYIKQWADINAEYNIKLWYDSEAFVNTLKKAI VESSTT 150
WIGGEVSDIALEYIKQWADINAEYNIKLWYDSEAFVNTLKKAI VESSTT 150
*****

EALQLLEEEIQNPQFDNMKFYKKRMEFIYDRQKRFINYYSQINKPTVPT 200
EALQLLEEEIQNPQFDNMKFYKKRMEFIYDRQKRFINYYSQINKPTVPT 200
EALQLLEEEIQNPQFDNMKFYKKRMEFIYDRQKRFINYYSQINKPTVPT 200
EALQLLEEEIQNPQFDNMKFYKKRMEFIYDRQKRFINYYSQINKPTVPT 200
EALQLLEEEIQNPQFDNMKFYKKRMEFIYDRQKRFINYYSQINKPTVPT 200
*****

IDDIKSHLVSEYNRDETVLESYRTNSLRKINSNHGIDIRANSLFTEQEL 250
IDDIKSHLVSEYNRDETVLESYRTNSLRKINSNHGIDIRANSLFTEQEL 250
IDDIKSHLVSEYNRDETVLESYRTNSLRKINSNHGIDIRANSLFTEQEL 250
IDDIKSHLVSEYNRDETVLESYRTNSLRKINSNHGIDIRANSLFTEQEL 250
IDDIKSHLVSEYNRDETVLESYRTNSLRKINSNHGIDIRANSLFTEQEL 250
*****

LNIYSQELLNRGNLAAASDIVRLLALKNF GG VYLDVDM L PGIHSDLFKTI 300
LNIYSQELLNRGNLAAASDIVRLLALKNF GG VYLDVDM L PGIHSDLFKTI 300
LNIYSQELLNRGNLAAASDIVRLLALKNF GG VYLDVDM L PGIHSDLFKTI 300
LNIYSQELLNRGNLAAASDIVRLLALKNF GG VYLDVDM L PGIHSDLFKTI 300
LNIYSQELLNRGNLAAASDIVRLLALKNF GG VYLDVDM L PGIHSDLFKTI 300
*****

SRPSSIGLDRWEMIKLEAIMKYKKYINNYTSENFDKLDQQLKDNFKLIIE 350
SRPSSIGLDRWEMIKLEAIMKYKKYINNYTSENFDKLDQQLKDNFKLIIE 350
SRPSSIGLDRWEMIKLEAIMKYKKYINNYTSENFDKLDQQLKDNFKLIIE 350
PRPSSIGLDRWEMIKLEAIMKYKKYINNYTSENFDKLDQQLKDNFKLIIE 350
PRPSSIGLDRWEMIKLEAIMKYKKYINNYTSENFDKLDQQLKDNFKLIIE 350
*****
```

FIG. 1B

SKSEKSEIFSKLENLNVSDLEIKIAFALGSVINQALISKQGSYLTNLVIE 400
SKSEKSEIFSKLENLNVSDLEIKIAFALGSVINQALISKQGSYLTNLVIE 400
SKSEKSEIFSKLENLNVSDLEIKIAFALGSVINQALISKQGSYLTNLVIE 400
SKSEKSEIFSKLENLNVSDLEIKIAFALGSVINQALISKQGSYLTNLVIE 400
SKSEKSEIFSKLENLNVSDLEIKIAFALGSVINQALISKQGSYLTNLVIE 400

QVKNRYQFLNQHLNPAIESDNNFTDTTKIFHDSLFSATAENSMFLTKIA 450
QVKNRYQFLNQHLNPAIESDNNFTDTTKIFHDSLFSATAENSMFLTKIA 450
QVKNRYQFLNQHLNPAIESDNNFTDTTKIFHDSLFSATAENSMFLTKIA 450
QVKNRYQFLNQHLNPAIESDNNFTDTTKIFHDSLFSATAENSMFLTKIA 450
QVKNRYQFLNQHLNPAIESDNNFTDTTKIFHDSLFSATAENSMFLTKIA 450

PYLQVGFMPEARSTISLSGPGAYASAYYDFINLQENTIEKTLKASDLIEF 500
PYLQVGFMPEARSTISLSGPGAYASAYYDFINLQENTIEKTLKASDLIEF 500
PYLQVGFMPEARSTISLSGPGAYASAYYDFINLQENTIEKTLKASDLIEF 500
PYLQVGFMPEARSTISLSGPGAYASAYYDFINLQENTIEKTLKASDLIEF 500
PYLQVGFMPEARSTISLSGPGAYASAYYDFINLQENTIEKTLKASDLIEF 500

KFPENNLSQLTEQEINSLWSFDQASAKYQFEKYVRDYGGSLSSEDNGVDF 550
KFPENNLSQLTEQEINSLWSFDQASAKYQFEKYVRDYGGSLSSEDNGVDF 550
KFPENNLSQLTEQEINSLWSFDQASAKYQFEKYVRDYGGSLSSEDNGVDF 550
KFPENNLSQLTEQEINSLWSFDQASAKYQFEKYVRDYGGSLSSEDNGVDF 550
KFPENNLSQLTEQEINSLWSFDQASAKYQFEKYVRDYGGSLSSEDNGVDF 550

NKNTALDKNYLLNNKIPSNNVEEAGSKNYVHYIIQLQGDDISYEATCNLF 600
NKNTALDKNYLLNNKIPSNNVEEAGSKNYVHYIIQLQGDDISYEATCNLF 600
NKNTALDKNYLLNNKIPSNNVEEAGSKNYVHYIIQLQGDDISYEATCNLF 600
NKNTALDKNYLLNNKIPSNNVEEAGSKNYVHYIIQLQGDDISYEATCNLF 600
NKNTALDKNYLLNNKIPSNNVEEAGSKNYVHYIIQLQGDDISYEATCNLF 600

SKNPKNSIIIQRNMNESAKSYFLSDDGESILELNKYRIPERLKNKEKVKV 650
SKNPKNSIIIQRNMNESAKSYFLSDDGESILELNKYRIPERLKNKEKVKV 650
SKNPKNSIIIQRNMNESAKSYFLSDDGESILELNKYRIPERLKNKEKVKV 650
SKNPKNSIIIQRNMNESAKSYFLSDDGESILELNKYRIPERLKNKEKVKV 650
SKNPKNSIIIQRNMNESAKSYFLSDDGESILELNKYRIPERLKNKEKVKV 650

TFIGHGKDEFNTSEFARLSVDLSNEISSFLDTIKLDISPKNVEVNLLGC 700
TFIGHGKDEFNTSEFARLSVDLSNEISSFLDTIKLDISPKNVEVNLLGA 700
TFIGHGKDEFNTSEFARLSVDLSNEISSFLDTIKLDISPKNVEVNLLGC 700
TFIGHGKDEFNTSEFARLSVDLSNEISSFLDTIKLDISPKNVEVNLLGC 700
TFIGHGKDEFNTSEFARLSVDLSNEISSFLDTIKLDISPKNVEVNLLGC 700
*****.

FIG. 1C

```
NMFSYDFNVEETYPGKLLLSIMDKITSTLPDVNKN SITIGANQYEV RINS 750
NMFSYDFNVEETYPGKLLLSIMDKITSTLPDVNKN SITIGANQYEV RINS 750
NMFSYDFNVEETYPGKLLLSIMDKITSTLPDVNKN SITIGANQYEV RINS 750
NMFSYDFNVEETYPGKLLLSIMDKITSTLPDVNKN SITIGANQYEV RINS 750
NMFSYDFNVEETYPGKLLLSIMDKITSTLPDVNKN SITIGANQYEV RINS 750
*****

EGRKELLAHSGKWINKEEA IMSDLSSKEYIFFDSIDNKLKAKSKNIPGLA 800
EGRKELLAHSGKWINKEEA IMSDLSSKEYIFFDSIDNKLKAKSKNIPGLA 800
EGRKELLAHSGKWINKEEA IMSDLSSKEYIFFDSIDNKLKAKSKNIPGLA 800
EGRKELLAHSGKWINKEEA IMSDLSSKEYIFFDSIDNKLKAKSKNIPGLA 800
EGRKELLAHSGKWINKEEA IMSDLSSKEYIFFDSIDNKLKAKSKNIPGLA 800
*****

SISEDIKTLLLDASVSPDTKFILNNLKLNI ESSIGDYIYYEKLEPVKNII 850
SISEDIKTLLLDASVSPDTKFILNNLKLNI ESSIGDYIYYEKLEPVKNII 850
SISEDIKTLLLDASVSPDTKFILNNLKLNI ESSIGDYIYYEKLEPVKNII 850
SISEDIKTLLLDASVSPDTKFILNNLKLNI ESSIGDYIYYEKLEPVKNII 850
SISEDIKTLLLDASVSPDTKFILNNLKLNI ESSIGDYIYYEKLEPVKNII 850
*****

HNSIDDLIDEFNLL ENVSDELYELKKLNNLDEKYLISFEDISKNNSTYSV 900
HNSIDDLIDEFNLL ENVSDELYELKKLNNLDEKYLISFEDISKNNSTYSV 900
HNSIDDLIDEFNLL ENVSDELYELKKLNNLDEKYLISFEDISKNNSTYSV 900
HNSIDDLIDEFNLL ENVSDELYELKKLNNLDEKYLISFEDISKNNSTYSV 900
HNSIDDLIDEFNLL ENVSDELYELKKLNNLDEKYLISFEDISKNNSTYSV 900
*****

RFINKSNGESVYVETEKEIFSKYSEHITKEISTIKNSIITDVNGNLLDNI 950
RFINKSNGESVYVETEKEIFSKYSEHITKEISTIKNSIITDVNGNLLDNI 950
RFINKSNGESVYVETEKEIFSKYSEHITKEISTIKNSIITDVNGNLLDNI 950
RFINKSNGESVYVETEKEIFSKYSEHITKEISTIKNSIITDVNGNLLDNI 950
RFINKSNGESVYVETEKEIFSKYSEHITKEISTIKNSIITDVNGNLLDNI 950
*****

QLDHTSQVNTLNAAFFIQSLIDYSSNKDVLNDLSTSVKVQLYAQLFSTGL 1000
QLDHTSQVNTLNAAFFIQSLIDYSSNKDVLNDLSTSVKVQLYAQLFSTGL 1000
QLDHTSQVNTLNAAFFIQSLIDYSSNKDVLNDLSTSVKVQLYAQLFSTGL 1000
QLDHTSQVNTLNAAFFIQSLIDYSSNKDVLNDLSTSVKVQLYAQLFSTGL 1000
QLDHTSQVNTLNAAFFIQSLIDYSSNKDVLNDLSTSVKVQLYAQLFSTGL 1000
*****

NTIYDSIQLVNLISNAVNDTINVLP TITEGPIVSTILDGINLGAAIKEL 1050
NTIYDSIQLVNLISNAVNDTINVLP TITEGPIVSTILDGINLGAAIKEL 1050
NTIYDSIQLVNLISNAVNDTINVLP TITEGPIVSTILDGINLGAAIKEL 1050
NTIYDSIQLVNLISNAVNDTINVLP TITEGPIVSTILDGINLGAAIKEL 1050
NTIYDSIQLVNLISNAVNDTINVLP TITEGPIVSTILDGINLGAAIKEL 1050
*****
```

FIG. 1D

LDEHDPLLKKELEAKVGVLA INMSLSIAATVASIVGIGA EVTIFLLPIAG 1100
LDEHDPLLKKELEAKVGVLA INMSLSIAATVASIVGIGA EVTIFLLPIAG 1100
LDEHDPLLKKELEAKVGVLA INMSLSIAATVASIVGIGA EVTIFLLPIAG 1100
LDEHDPLLKKELEAKVGVLA INMSLSIAATVASIVGIGA EVTIFLLPIAG 1100
LDEHDPLLKKELEAKVGVLA INMSLSIAATVASIVGIGA EVTIFLLPIAG 1100

ISAGIPSLVNNELILHDKATSVVNYFNHLS ES SKYGPLKTEDDKILVPID 1150
ISAGIPSLVNNELILHDKATSVVNYFNHLS ES SKYGPLKTEDDKILVPID 1150
ISAGIPSLVNNELILHDKATSVVNYFNHLS ES SKYGPLKTEDDKILVPID 1150
ISAGIPSLVNNELILHDKATSVVNYFNHLS ES KEYGPLKTEDDKILVPID 1150
ISAGIPSLVNNELILHDKATSVVNYFNHLS ES KEYGPLKTEDDKILVPID 1150
*****:*****

DLVISEIDFNNSIKLGTCN ILAMEGGSGHTVTGNIDHFFSSPSISSHIP 1200
DLVISEIDFNNSIKLGTCN ILAMEGGSGHTVTGNIDHFFSSPSISSHIP 1200
DLVISEIDFNNSIKLGTCN ILAMEGGSGHTVTGNIDHFFSSPSISSHIP 1200
DLVISEIDFNNSIKLGTCN ILAMEGGSGHTVTGNIDHFFSSPYISSHIP 1200
DLVISEIDFNNSIKLGTCN ILAMEGGSGHTVTGNIDHFFSSPYISSHIP 1200
***** *****

SLSIYSAIGIETENLDFS KIMMLPNAPSRVFWWETGAVPGLRSLENDGT 1250
SLSIYSAIGIETENLDFS KIMMLPNAPSRVFWWETGAVPGLRSLENDGT 1250
SLSIYSAIGIETENLDFS KIMMLPNAPSRVFWWETGAVPGLRSLENDGT 1250
SLSVYSAIGIKTENLDFS KIMMLPNAPSRVFWWETGAVPGLRSLENN GT 1250
SLSVYSAIGIKTENLDFS KIMMLPNAPSRVFWWETGAVPGLRSLENN GT 1250
:**:*****:*****:***

RLLDSIRDLYPGKFYWRFYAFFDYAITTLKPVYEDTNIKIKL DKDTRNFI 1300
RLLDSIRDLYPGKFYWRFYAFFDYAITTLKPVYEDTNIKIKL DKDTRNFI 1300
RLLDSIRDLYPGKFYWRFYAFFDYAITTLKPVYEDTNIKIKL DKDTRNFI 1300
KLLDSIRDLYPGKFYWRFYAFFDYAITTLKPVYEDTNTKIKL DKDTRNFI 1300
KLLDSIRDLYPGKFYWRFYAFFDYAITTLKPVYEDTNTKIKL DKDTRNFI 1300
:***** *****

MPTITTNEIRNKLSYSFDGAGGTYSLLLSSYP ISTNINLSKDDLWIFNID 1350
MPTITTNEIRNKLSYSFDGAGGTYSLLLSSYP ISTNINLSKDDLWIFNID 1350
MPTITTNEIRNKLSYSFDGAGGTYSLLLSSYP ISTNINLSKDDLWIFNID 1350
MPTITTDEIRNKLSYSFDGAGGTYSLLLSSYP ISMNINLSKDDLWIFNID 1350
MPTITTDEIRNKLSYSFDGAGGTYSLLLSSYP ISMNINLSKDDLWIFNID 1350
*****:***** *****

NEVREISIENGTIKKGKLIKDVLSKIDINKNKLIIGNQTIDFSGDIDN KD 1400
NEVREISIENGTIKKGKLIKDVLSKIDINKNKLIIGNQTIDFSGDIDN KD 1400
NEVREISIENGTIKKGKLIKDVLSKIDINKNKLIIGNQTIDFSGDIDN KD 1400
NEVREISIENGTIKKGKLI EDVLSKIDINKNKLIIGNQTIDFSGDIDN KD 1400
NEVREISIENGTIKKGKLI EDVLSKIDINKNKLIIGNQTIDFSGDIDN KD 1400
*****:***:*****

FIG. 1E

RYIFLTCELDDKISLIIEINLVAKSYSLLLSGDKNYLISNLSNIEKINT 1450
RYIFLTCELDDKISLIIEINLVAKSYSLLLSGDKNYLISNLSNIEKINT 1450
RYIFLTCELDDKISLIIEINLVAKSYSLLLSGDKNYLISNLSNIEKINT 1450
RYIFLTCELDDKISLIIEINLVAKSYSLLLSGDKNYLISNLSNIEKINT 1450
RYIFLTCELDDKISLIIEINLVAKSYSLLLSGDKNYLISNLSNIEKINT 1450

LGLDSKNIAYNYTDESNNKYFGAISKTSQKSIHYKKDSKNILEFYNDST 1500
LGLDSKNIAYNYTDESNNKYFGAISKTSQKSIHYKKDSKNILEFYNDST 1500
LGLDSKNIAYNYTDESNNKYFGAISKTSQKSIHYKKDSKNILEFYNDST 1500
LGLDSKNIAYNYTDESNNKYFGAISKTSQKSIHYKKDSKNILEFYNGST 1500
LGLDSKNIAYNYTDESNNKYFGAISKTSQKSIHYKKDSKNILEFYNGST 1500
*****.

LEFNSKDFIAEDINVMKDDINTITGKYVVDNNTDKSIDFSISLVSKNQV 1550
LEFNSKDFIAEDINVMKDDINTITGKYVVDNNTDKSIDFSISLVSKNQV 1550
LEFNSKDFIAEDINVMKDDINTITGKYVVDNNTDKSIDFSISLVSKNQV 1550
LEFNSKDFIAEDINVMKDDINTITGKYVVDNNTDKSIDFSISLVSKNQV 1550
LEFNSKDFIAEDINVMKDDINTITGKYVVDNNTDKSIDFSISLVSKNQV 1550

KVNGLYLINESVYSSYLDFVKNSDGHNTSNFMNLFNDNISFWKLFQFENI 1600
KVNGLYLINESVYSSYLDFVKNSDGHNTSNFMNLFNDNISFWKLFQFENI 1600
KVNGLYLINESVYSSYLDFVKNSDGHNTSNFMNLFNDNISFWKLFQFENI 1600
KVNGLYLINESVYSSYLDFVKNSDGHNTSNFMNLFNDNISFWKLFQFENI 1600
KVNGLYLINESVYSSYLDFVKNSDGHNTSNFMNLFNDNISFWKLFQFENI 1600
*****.

NFVIDKYFTLVGKTNLGYVEFICDNNKNIDIFYGEWKTSSSKSTIFSGNG 1650
NFVIDKYFTLVGKTNLGYVEFICDNNKNIDIFYGEWKTSSSKSTIFSGNG 1650
NFVIDKYFTLVGKTNLGYVEFICDNNKNIDIFYGEWKTSSSKSTIFSGNG 1650
NFVIDKYFTLVGKTNLGYVEFICDNNKNIDIFYGEWKTSSSKSTIFSGNG 1650
NFVIDKYFTLVGKTNLGYVEFICDNNKNIDIFYGEWKTSSSKSTIFSGNG 1650

RNVVVEPIYNPDTGEDISTSLDFSIEPLYGIDRYINKVLIAPDLYTSLIN 1700
RNVVVEPIYNPDTGEDISTSLDFSIEPLYGIDRYINKVLIAPDLYTSLIN 1700
RNVVVEPIYNPDTGEDISTSLDFSIEPLYGIDRYINKVLIAPDLYTSLIN 1700
RNVVVEPIYNPDTGEDISTSLDFSIEPLYGIDRYINKVLIAPDLYTSLIN 1700
RNVVVEPIYNPDTGEDISTSLDFSIEPLYGIDRYINKVLIAPDLYTSLIN 1700

INTNYYSNEYYPEIIVLNPNTFHKKNINLDSSSFYKRWSTEGSDFILVR 1750
INTNYYSNEYYPEIIVLNPNTFHKKNINLDSSSFYKRWSTEGSDFILVR 1750
INTNYYSNEYYPEIIVLNPNTFHKKNINLDSSSFYKRWSTEGSDFILVR 1750
INTNYYSNEYYPEIIVLNPNTFHKKNINLDSSSFYKRWSTEGSDFILVR 1750
INTNYYSNEYYPEIIVLNPNTFHKKNINLDSSSFYKRWSTEGSDFILVR 1750

FIG. 1F

YLEESNKKILQKIRIKGILSNTQSFNKMSIDFKDIKKLSLGYIMSNFKSF 1800
YLEESNKKILQKIRIKGILSNTQSFNKMSIDFKDIKKLSLGYIMSNFKSF 1800
YLEESNKKILQKIRIKGILSNTQSFNKMSIDFKDIKKLSLGYIMSNFKSF 1800
YLEESNKKILQKIRIKGILSNTQSFNKMSIDFKDIKKLSLGYIMSNFKSF 1800
YLEESNKKILQKIRIKGILSNTQSFNKMSIDFKDIKKLSLGYIMSNFKSF 1800

NSENELDRDHLGFKIIDNKTYYYDEDSKLVKGLININNSLFYFDPIEFNL 1850
NSENELDRDHLGFKIIDNKTYYYDEDSKLVKGLININNSLFYFDPIEFNL 1850
NSENELDRDHLGFKIIDNKTYYYDEDSKLVKGLININNSLFYFDPIEFNL 1850
NSENELDRDHLGFKIIDNKTYYYDEDSKLVKGLININNSLFYFDPIESNL 1850
NSENELDRDHLGFKIIDNKTYYYDEDSKLVKGLININNSLFYFDPIESNL 1850
***** **

VTGWQTINGKKYYFDINTGAALISYKIINGKHFYFNNDGVMQLGVFKGPD 1900
VTGWQTINGKKYYFDINTGAALISYKIINGKHFYFNNDGVMQLGVFKGPD 1900
VTGWQTINGKKYYFDINTGAALTSYKIINGKHFYFNNDGVMQLGVFKGPD 1900
VTGWQTINGKKYYFDINTGAASTSYKIINGKHFYFNNGVMQLGVFKGPD 1900
VTGWQTINGKKYYFDINTGAASTSYKIINGKHFYFNNGVMQLGVFKGPD 1900
***** :*****

GFEYFAPANTQNNNIEGQAIVYQSKFLTNGKKYYFDNDSKAVTGWRIIN 1950
GFEYFAPANTQNNNIEGQAIVYQSKFLTNGKKYYFDNDSKAVTGWRIIN 1950
GFEYFAPANTQNNNIEGQAIVYQSKFLTNGKKYYFDNNSKAVTGWRIIN 1950
GFEYFAPANTQNNNIEGQAIVYQSKFLTNGKKYYFDNDSKAVTGWRIIN 1950
GFEYFAPANTQNNNIEGQAIVYQSKFLTNGKKYYFDNDSKAVTGWRIIN 1950
***** :*****

NEKYYFNPNNIAAAGLQVIDNNKYYFNPDTAIISKGWQTVNGSRYYFDT 2000
NEKYYFNPNNIAAAGLQVIDNNKYYFNPDTAIISKGWQTVNGSRYYFDT 2000
NEKYYFNPNNIAAAGLQVIDNNKYYFNPDTAIISKGWQTVNGSRYYFDT 2000
NEKYYFNPNNIAAAGLQVIDNNKYYFNPDTAIISKGWQTVNGSRYYFDT 2000
NEKYYFNPNNIAAAGLQVIDNNKYYFNPDTAIISKGWQTVNGSRYYFDT 2000

DTAIAFNGYKTIDGKHFFYFSDCVVKIGVFSTSNNGFEYFAPANTYNNNIE 2050
DTAIAFNGYKTIDGKHFFYFSDCVVKIGVFSTSNNGFEYFAPANTYNNNIE 2050
DTAIAFNGYKTIDGKHFFYFSDCVVKIGVFSTSNNGFEYFAPANTYNNNIE 2050
DTAIAFNGYKTIDGKHFFYFSDCVVKIGVFSGSNGFEYFAPANTYNNNIE 2050
DTAIAFNGYKTIDGKHFFYFSDCVVKIGVFSGSNGFEYFAPANTYNNNIE 2050

GQAIVYQSKFLTNGKKYYFDNNSKAVTGWQTIDSKKYYFNTNTAEAAATG 2100
GQAIVYQSKFLTNGKKYYFDNNSKAVTGWQTIDSKKYYFNTNTAEAAATG 2100
GQAIVYQSKFLTNGKKYYFDNNSKAVTGLQTIDSKKYYFNTNTAEAAATG 2100
GQAIVYQSKFLTNGKKYYFDNNSKAVTGWQTIDSKKYYFNTNTAEAAATG 2100
GQAIVYQSKFLTNGKKYYFDNNSKAVTGWQTIDSKKYYFNTNTAEAAATG 2100

FIG. 1G

WQTIDGKKYYFNTNTAEAAATGWQTIDGKKYYFNTNTAIASTGYTIINGKH 2150
WQTIDGKKYYFNTNTAEAAATGWQTIDGKKYYFNTNTAIASTGYTIINGKH 2150
WQTIDGKKYYFNTNTAEAAATGWQTIDGKKYYFNTNTAIASTGYTIINGKH 2150
WQTIDGKKYYFNTNTAEAAATGWQTIDGKKYYFNTNTSIASTGYTIINGKY 2150
WQTIDGKKYYFNTNTAEAAATGWQTIDGKKYYFNTNTSIASTGYTIINGKY 2150
*****:*****:

FYFNTDGIMQIGVFKGPNGFEYFAPANTDANNIEGQAILYQNEFLTLNGK 2200
FYFNTDGIMQIGVFKGPNGFEYFAPANTDANNIEGQAILYQNEFLTLNGK 2200
FYFNTDGIMQIGVFKGPNGFEYFAPANTDANNIEGQAILYQNEFLTLNGK 2200
FYFNTDGIMQIGVFKVPNGFEYFAPANTHNNNIEGQAILYQNKFLTLNGK 2200
FYFNTDGIMQIGVFKVPNGFEYFAPANTHNNNIEGQAILYQNKFLTLNGK 2200
***** *****. *****:*****

KYYFGSDSKAVTGWRIINNKKYYFNPNNIAIAIHLCTINNDKYYFSYDGI 2250
KYYFGSDSKAVTGWRIINNKKYYFNPNNIAIAIHLCTINNDKYYFSYDGI 2250
KYYFGSDSKAVTGWRIINNKKYYFNPNNIAIAIHLCTINNDKYYFSYDGI 2250
KYYFGSDSKAITGWQTIDGKKYYFNPNNIAIAATHLCTINNDKYYFSYDGI 2250
KYYFGSDSKAITGWQTIDGKKYYFNPNNIAIAATHLCTINNDKYYFSYDGI 2250
*****:***: *:.***** *****

LQNGYITIERNNFYFDANNESKMVTGVFKGPNGFEYFAPANTHNNNIEGQ 2300
LQNGYITIERNNFYFDANNESKMVTGVFKGPNGFEYFAPANTHNNNIEGQ 2300
LQNGYITIERNNFYFDANNESKMVTGVFKGPNGFEYFAPANTHNNNIEGQ 2300
LQNGYITIERNNFYFDANNESKMVTGVFKGPNGFEYFAPANTHNNNIEGQ 2300
LQNGYITIERNNFYFDANNESKMVTGVFKGPNGFEYFAPANTHNNNIEGQ 2300

AIVYQNKFLTLNGKKYYFDNDSKAVTGWQTIDGKKYYFNLNTAEAAATGWQ 2350
AIVYQNKFLTLNGKKYYFDNDSKAVTGWQTIDGKKYYFNLNTAEAAATGWQ 2350
AIVYQNKFLTLNGKKYYFDNDSKAVTGWQTIDGKKYYFNLNTAEAAATGWQ 2350
AIVYQNKFLTLNGKKYYFDNDSKAVTGWQTIDSKYYFNLNTAVAVTGWQ 2350
AIVYQNKFLTLNGKKYYFDNDSKAVTGWQTIDSKYYFNLNTAVAVTGWQ 2350
*****.***** *.****

TIDGKKYYFNLNTAEAAATGWQTIDGKKYYFNTNTFIASTGYTSINGKHFY 2400
TIDGKKYYFNLNTAEAAATGWQTIDGKKYYFNTNTFIASTGYTSINGKHFY 2400
TIDGKKYYFNLNTAEAAATGWQTIDGKKYYFNTNTFIASTGYTSINGKHFY 2400
TIDGKYYFNLNTAEAAATGWQTIDGKRYFNTNTYIASTGYTIINGKHFY 2400
TIDGKYYFNLNTAEAAATGWQTIDGKRYFNTNTYIASTGYTIINGKHFY 2400
****:*****:*****:***** *****

FNTDGIMQIGVFKGPNGFEYFAPANTHNNNIEGQAILYQNKFLTLNGKKY 2450
FNTDGIMQIGVFKGPNGFEYFAPANTHNNNIEGQAILYQNKFLTLNGKKY 2450
FNTDGIMQIGVFKGPNGFEYFAPANTDANNIEGQAILYQNKFLTLNGKKY 2450
FNTDGIMQIGVFKGPDGFEYFAPANTHNNNIEGQAILYQNKFLTLNGKKY 2450
FNTDGIMQIGVFKGPDGFEYFAPANTHNNNIEGQAILYQNKFLTLNGKKY 2450
*****:*****.*****

FIG. 1H

YFGSDSKAVTGLRTIDGKKYYFNTNTAVAVTGWQTINGKKYYFNTNTSIA 2500
YFGSDSKAVTGLRTIDGKKYYFNTNTAVAVTGWQTINGKKYYFNTNTSIA 2500
YFGSDSKAVTGLRTIDGKKYYFNTNTAVAVTGWQTINGKKYYFNTNTSIA 2500
YFGSDSKAVTGLRTIDGKKYYFNTNTAVAVTGWQTINGKKYYFNTNTYIA 2500
YFGSDSKAVTGLRTIDGKKYYFNTNTAVAVTGWQTINGKKYYFNTNTYIA 2500
***** **

STGYTIISGKHFFYFNTDGIMQIGVFKGPDGFEYFAPANTDANNIEGQAIR 2550
STGYTIISGKHFFYFNTDGIMQIGVFKGPDGFEYFAPANTDANNIEGQAIR 2550
STGYTIISGKHFFYFNTDGIMQIGVFKGPDGFEYFAPANTDANNIEGQAIR 2550
STGYTIISGKHFFYFNTDGIMQIGVFKGPDGFEYFAPANTDANNIEGQAIR 2550
STGYTIISGKHFFYFNTDGIMQIGVFKGPDGFEYFAPANTDANNIEGQAIR 2550

YQNRFLYLHDNIYYFGNNSKAATGWVTIDGNRYFFEPNTAMGANGYKTID 2600
YQNRFLYLHDNIYYFGNNSKAATGWVTIDGNRYFFEPNTAMGANGYKTID 2600
YQNRFLYLHDNIYYFGNNSKAATGWVTIDGNRYFFEPNTAMGANGYKTID 2600
YQNRFLYLHDNIYYFGNNSKAATGWATIDGNRYFFEPNTAMGANGYKTID 2600
YQNRFLYLHDNIYYFGNNSKAATGWATIDGNRYFFEPNTAMGANGYKTID 2600
*****;*****.*****

NKNFYFRNGLPQIGVFKGSNGFEYFAPANTDANNIEGQAIRYQNRFLHLL 2650
NKNFYFRNGLPQIGVFKGSNGFEYFAPANTDANNIEGQAIRYQNRFLHLL 2650
NKNFYFRNGLPQIGVFKGSNGFEYFAPANTDANNIEGQAIRYQNRFLHLL 2650
NKNFYFRNGLPQIGVFKGPNNGFEYFAPANTDANNIDGQAIRYQNRFLHLL 2650
NKNFYFRNGLPQIGVFKGPNNGFEYFAPANTDANNIDGQAIRYQNRFLHLL 2650
*****.*****;*****

GKIYYFGNNSKAVTGWQTINGKVYYFMPDTAMAAAGGLFEIDGVIYFFGV 2700
GKIYYFGNNSKAVTGWQTINGKVYYFMPDTAMAAAGGLFEIDGVIYFFGV 2700
GKIYYFGNNSKAVTGWQTINGKVYYFMPDTAMAAAGGLFEIDGVIYFFGV 2700
GKIYYFGNNSKAVTGWQTINSKVYYFMPDTAMAAAGGLFEIDGVIYFFGV 2700
GKIYYFGNNSKAVTGWQTINSKVYYFMPDTAMAAAGGLFEIDGVIYFFGV 2700
*****.*****

DGVKAPGIYG 2710 (SEQ ID NO: 1, 630)
DGVKAPGIYG 2710 (SEQ ID NO: 4)
DGVKAPGIYG 2710 (SEQ ID NO: 19, VPI10463)
DGVKAPGIYG 2710 (SEQ ID NO: 15, R20291)
DGVKAPGIYG 2710 (SEQ ID NO: 17, CD196)

Fig. 2A

MSLVNRKQLEKMANVRFRTQEDEYVAILDALEEEYHNMSSENTVVEKYLKDKDINSLTDIYI 60
MSLVNRKQLEKMANVRFRTQEDEYVAILDALEEEYHNMSSENTVVEKYLKDKDINSLTDIYI 60
MSLVNRKQLEKMANVRFRTQEDEYVAILDALEEEYHNMSSENTVVEKYLKDKDINSLTDIYI 60
MSLVNRKQLEKMANVRFRTQEDEYVAILDALEEEYHNMSSENTVVEKYLKDKDINSLTDIYI 60
MSLVNRKQLEKMANVRFRTQEDEYVAILDALEEEYHNMSSENTVVEKYLKDKDINSLTDIYI 60
*****.*****

DTYKKSGRNKALKKFKEYLVTEVLELKNNNLTPVEKNLHFVWIGGQINDTAINYINQWKD 120
DTYKKSGRNKALKKFKEYLVTEVLELKNNNLTPVEKNLHFVWIGGQINDTAINYINQWKD 120
DTYKKSGRNKALKKFKEYLVTEVLELKNNNLTPVEKNLHFVWIGGQINDTAINYINQWKD 120
DTYKKSGRNKALKKFKEYLVTEVLELKNNNLTPVEKNLHFVWIGGQINDTAINYINQWKD 120
DTYKKSGRNKALKKFKEYLVTEVLELKNNNLTPVEKNLHFVWIGGQINDTAINYINQWKD 120

VNSDYNVNVFYDSNAFLINTLKTIVVESAINDTLESFRENLDNPRFDYNKFFRKRMEIY 180
VNSDYNVNVFYDSNAFLINTLKTIVVESAINDTLESFRENLDNPRFDYNKFFRKRMEIY 180
VNSDYNVNVFYDSNAFLINTLKTIVVESAINDTLESFRENLDNPRFDYNKFFRKRMEIY 180
VNSDYNVNVFYDSNAFLINTLKTIVVESAINDTLESFRENLDNPRFDYNKFFRKRMEIY 180
VNSDYNVNVFYDSNAFLINTLKTIVVESAINDTLESFRENLDNPRFDYNKFFRKRMEIY 180
*****:*****:*****:*****:*****

DKQKNFINYYKAQREENPELIIDDIVKTYLSNEYSKEIDELNTYIEESLNKITQNSGNDV 240
DKQKNFINYYKAQREENPELIIDDIVKTYLSNEYSKEIDELNTYIEESLNKITQNSGNDV 240
DKQKNFINYYKAQREENPELIIDDIVKTYLSNEYSKEIDELNTYIEESLNKITQNSGNDV 240
DKQKNFINYYKTQREENPDLIIDDIVKIYLSNEYSKDIDELNSYIEESLNKVTENSGNDV 240
DKQKNFINYYKTQREENPDLIIDDIVKIYLSNEYSKDIDELNSYIEESLNKVTENSGNDV 240
*****:*****:*****:*****:*****:*****:*****

RNFEFEKNGESFNLYEQELVERWNLAASDILRISALKEIGMYLDVDMPLPGIQPDLFES 300
RNFEFEKNGESFNLYEQELVERWNLAASDILRISALKEIGMYLDVDMPLPGIQPDLFES 300
RNFEFEKNGESFNLYEQELVERWNLAASDILRISALKEIGMYLAVAMPLPGIQPDLFES 300
RNFEFEKNGESFNLYEQELVERWNLAASDILRISALKEIGMYLAVAMPLPGIQPDLFES 300
RNFEFEKNGESFNLYEQELVERWNLAASDILRISALKEIGMYLAVAMPLPGIQPDLFES 300
*****.*****:*****:*****:*****:*****:*****

IEKPSSVTVDWFEMTKLEAIMKYKEYIPEYTSEHFDMLDEEVQSSFESVLASKSDKSEIF 360
IEKPSSVTVDWFEMTKLEAIMKYKEYIPEYTSEHFDMLDEEVQSSFESVLASKSDKSEIF 360
IEKPSSVTVDWFEMTKLEAIMKYKEYIPEYTSEHFDMLDEEVQSSFESVLASKSDKSEIF 360
IEKPSSVTVDWFEMTKLEAIMKYKEYIPEYTSEHFDMLDEEVQSSFESVLASKSDKSEIF 360
IEKPSSVTVDWFEMTKLEAIMKYKEYIPEYTSEHFDMLDEEVQSSFESVLASKSDKSEIF 360
*****.*****:*****:*****:*****:*****:*****

SSLGDMEASPLEVKIAFNSKGIINQGLISVKDSYCSNLIVKQIENRYKILNNSLNPAISE 420
SSLGDMEASPLEVKIAFNSKGIINQGLISVKDSYCSNLIVKQIENRYKILNNSLNPAISE 420
SSLGDMEASPLEVKIAFNSKGIINQGLISVKDSYCSNLIVKQIENRYKILNNSLNPAISE 420
SSLGDMEASPLEVKIAFNSKGIINQGLISVKDSYCSNLIVKQIENRYKILNNSLNPAISE 420
SSLGDMEASPLEVKIAFNSKGIINQGLISVKDSYCSNLIVKQIENRYKILNNSLNPAISE 420

DNDFNTTTNTFIDSIMAEANADNGRFMMELGKYLRVGFFPDVKTTINLSGPEAYAAAYQD 480
DNDFNTTTNTFIDSIMAEANADNGRFMMELGKYLRVGFFPDVKTTINLSGPEAYAAAYQD 480
DNDFNTTTNTFIDSIMAEANADNGRFMMELGKYLRVGFFPDVKTTINLSGPEAYAAAYQD 480

FIG. 2B

DNDFNTTTNAFIDSIMAEANADNGRFMMELGKYLRVGFFPDVKTTINLSGPEAYAAAYQD 480
DNDFNTTTNAFIDSIMAEANADNGRFMMELGKYLRVGFFPDVKTTINLSGPEAYAAAYQD 480
*****:*****

LLMFKEGSMNIHLIEADLRNFEISKTNISQSTEQEMASLWSFDDARAKAQFEEYKRNYFE 540
LLMFKEGSMNIHLIEADLRNFEISKTNISQSTEQEMASLWSFDDARAKAQFEEYKRNYFE 540
LLMFKEGSMNIHLIEADLRNFEISKTNISQSTEQEMASLWSFDDARAKAQFEEYKRNYFE 540
LLMFKEGSMNIHLIEADLRNFEISKTNISQSTEQEMASLWSFDDARAKAQFEEYKKNYFE 540
LLMFKEGSMNIHLIEADLRNFEISKTNISQSTEQEMASLWSFDDARAKAQFEEYKKNYFE 540
*****:****

GSLGEDDNLDFSQNIVVDKEYLLEKISSLARSSSERGYIHYIVQLQGDKISYEACNLFAK 600
GSLGEDDNLDFSQNIVVDKEYLLEKISSLARSSSERGYIHYIVQLQGDKISYEACNLFAK 600
GSLGEDDNLDFSQNIVVDKEYLLEKISSLARSSSERGYIHYIVQLQGDKISYEACNLFAK 600
GSLGEDDNLDFSQNTVVDKEYLLEKISSLARSSSERGYIHYIVQLQGDKISYEACNLFAK 600
GSLGEDDNLDFSQNTVVDKEYLLEKISSLARSSSERGYIHYIVQLQGDKISYEACNLFAK 600

TPYDSVLFQKNIEDSEIAYYYNPGDGEIQEIDKYKIPSIISDRPKIKLTFIGHGKDEFNT 660
TPYDSVLFQKNIEDSEIAYYYNPGDGEIQEIDKYKIPSIISDRPKIKLTFIGHGKDEFNT 660
TPYDSVLFQKNIEDSEIAYYYNPGDGEIQEIDKYKIPSIISDRPKIKLTFIGHGKDEFNT 660
TPYDSVLFQKNIEDSEIAYYYNPGDGEIQEIDKYKIPSIISDRPKIKLTFIGHGKDEFNT 660
TPYDSVLFQKNIEDSEIAYYYNPGDGEIQEIDKYKIPSIISDRPKIKLTFIGHGKDEFNT 660

DIFAGFDVDSLSTEIEAAIDLAKEDISPXSIEINLLGCNMFSYSINVEETYPGKLLLKVK 720
DIFAGFDVDSLSTEIEAAIDLAKEDISPXSIEINLLGCNMFSYSINVEETYPGKLLLKVK 720
DIFAGFDVDSLSTEIEAAIDLAKEDISPXSIEINLLGANMFSYSINVEETYPGKLLLKVK 720
DIFAGLDVDSLSTEIETAIDLAKEDISPXSIEINLLGCNMFSYSVNVEETYPGKLLLRVK 720
DIFAGLDVDSLSTEIETAIDLAKEDISPXSIEINLLGCNMFSYSVNVEETYPGKLLLRVK 720
*****:*****:*****:*****:*****:*****:****

DKISELMPSISQDSIIIVSANQYEVRLINSEGRRELLDHSGEWINKEESI IKDISKEYISF 780
DKISELMPSISQDSIIIVSANQYEVRLINSEGRRELLDHSGEWINKEESI IKDISKEYISF 780
DKISELMPSISQDSIIIVSANQYEVRLINSEGRRELLDHSGEWINKEESI IKDISKEYISF 780
DKVSELMPSISQDSIIIVSANQYEVRLINSEGRRELLDHSGEWINKEESI IKDISKEYISF 780
DKVSELMPSISQDSIIIVSANQYEVRLINSEGRRELLDHSGEWINKEESI IKDISKEYISF 780
** :*****

NPKENKITVKSKNLPELSTLLQEIRNNSNSSDIELEEKVMLTECEINVISNIDTQIVEER 840
NPKENKITVKSKNLPELSTLLQEIRNNSNSSDIELEEKVMLTECEINVISNIDTQIVEER 840
NPKENKITVKSKNLPELSTLLQEIRNNSNSSDIELEEKVMLTECEINVISNIDTQIVEER 840
NPKENKIIVKSKNLPELSTLLQEIRNNSNSSDIELEEKVMLAECEINVISNIDTQVVEGR 840
NPKENKIIVKSKNLPELSTLLQEIRNNSNSSDIELEEKVMLAECEINVISNIDTQVVEGR 840
***** *****:*****:****

IEEAKNLTSDSINYIKDEFKLI ESISDALCDLKQQNELEDSHFISFEDISSETDEGFSIRF 900
IEEAKNLTSDSINYIKDEFKLI ESISDALCDLKQQNELEDSHFISFEDISSETDEGFSIRF 900
IEEAKNLTSDSINYIKDEFKLI ESISDALCDLKQQNELEDSHFISFEDISSETDEGFSIRF 900
IEEAKSLTSDSINYIKNEFKLIESISDALYDLKQQNELEESHFISFEDILETDEGFSIRF 900
IEEAKSLTSDSINYIKNEFKLIESISDALYDLKQQNELEESHFISFEDILETDEGFSIRF 900
*****:*****:***** *****:***** *****

FIG. 2C

INKETGESIFVETEKTIIFSEYANHITTEEISKIKGTIFDVTNGKLVKKVNLDTTHEVNTLN 960
INKETGESIFVETEKTIIFSEYANHITTEEISKIKGTIFDVTNGKLVKKVNLDTTHEVNTLN 960
INKETGESIFVETEKTIIFSEYANHITTEEISKIKGTIFDVTNGKLVKKVNLDTTHEVNTLN 960
IDKETGESIFVETEKAIIFSEYANHITTEEISKIKGTIFDVTNGKLVKKVNLDTTHEVNTLN 960
IDKETGESIFVETEKAIIFSEYANHITTEEISKIKGTIFDVTNGKLVKKVNLDTTHEVNTLN 960
*:*****:*****:*****

AAFFIQSLIEYNSSKESLSNLSVAMKVQVYAQLFSTGLNTITDAAKVVELVSTALDETID 1020
AAFFIQSLIEYNSSKESLSNLSVAMKVQVYAQLFSTGLNTITDAAKVVELVSTALDETID 1020
AAFFIQSLIEYNSSKESLSNLSVAMKVQVYAQLFSTGLNTITDAAKVVELVSTALDETID 1020
AAFFIQSLIEYNSSKESLSNLSVAMKVQVYAQLFSTGLNTITDAAKVVELVSTALDETID 1020
AAFFIQSLIEYNSSKESLSNLSVAMKVQVYAQLFSTGLNTITDAAKVVELVSTALDETID 1020

LLPTLSEGLPIIATIIDGVSLGAAIKELSETSDPLLQEIEAKIGIMAVNLTATTAIIT 1080
LLPTLSEGLPIIATIIDGVSLGAAIKELSETSDPLLQEIEAKIGIMAVNLTATTAIIT 1080
LLPTLSEGLPIIATIIDGVSLGAAIKELSETSDPLLQEIEAKIGIMAVNLTATTAIIT 1080
LLPTLSEGLPVIATIIDGVSLGAAIKELSETSDPLLQEIEAKIGIMAVNLTAATTAIIT 1080
LLPTLSEGLPVIATIIDGVSLGAAIKELSETSDPLLQEIEAKIGIMAVNLTAATTAIIT 1080
*****:*****:*****

SSLGIASGFSILLVPLAGISAGIPSLVNNELVLRDKATKVVDYFKHVSLVETEGVFTLLD 1140
SSLGIASGFSILLVPLAGISAGIPSLVNNELVLRDKATKVVDYFKHVSLVETEGVFTLLD 1140
SSLGIASGFSILLVPLAGISAGIPSLVNNELVLRDKATKVVDYFKHVSLVETEGVFTLLD 1140
SSLGIASGFSILLVPLAGISAGIPSLVNNELILRDKATKVVDYFSHISLAESEGAFTSLD 1140
SSLGIASGFSILLVPLAGISAGIPSLVNNELILRDKATKVVDYFSHISLAESEGAFTSLD 1140
*****:*****.*:*.*:*.** **

DKIMMPQDDLVISEIDFNNSIVLGKCEIWRMEGGSGHTVTDDIDHFFSAPSITYREPHL 1200
DKIMMPQDDLVISEIDFNNSIVLGKCEIWRMEGGSGHTVTDDIDHFFSAPSITYREPHL 1200
DKIMMPQDDLVISEIDFNNSIVLGKCEIWRMEGGSGHTVTDDIDHFFSAPSITYREPHL 1200
DKIMMPQDDLVISEIDFNNSITLGKCEIWRMEGGSGHTVTDDIDHFFSAPSITYREPHL 1200
DKIMMPQDDLVISEIDFNNSITLGKCEIWRMEGGSGHTVTDDIDHFFSAPSITYREPHL 1200
*****.*****

SIYDVLEVQKEELDLSKDLMLPNAPNRVFAWETGWTPGLRSLNDGTCLLDRIIRDNYEG 1260
SIYDVLEVQKEELDLSKDLMLPNAPNRVFAWETGWTPGLRSLNDGTCLLDRIIRDNYEG 1260
SIYDVLEVQKEELDLSKDLMLPNAPNRVFAWETGWTPGLRSLNDGTCLLDRIIRDNYEG 1260
SIYDVLEVQKEELDLSKDLMLPNAPNRVFAWETGWTPGLRSLNDGTCLLDRIIRDNYEG 1260
SIYDVLEVQKEELDLSKDLMLPNAPNRVFAWETGWTPGLRSLNDGTCLLDRIIRDNYEG 1260

EFYWRYFAFIADALITTLKPRYEDTNIRINLDSNTRSFIVPIITTEYIREKLSYSFYGSG 1320
EFYWRYFAFIADALITTLKPRYEDTNIRINLDSNTRSFIVPIITTEYIREKLSYSFYGSG 1320
EFYWRYFAFIADALITTLKPRYEDTNIRINLDSNTRSFIVPIITTEYIREKLSYSFYGSG 1320
EFYWRYFAFIADALITTLKPRYEDTNIRINLDSNTRSFIVPVITTEYIREKLSYSFYGSG 1320
EFYWRYFAFIADALITTLKPRYEDTNIRINLDSNTRSFIVPVITTEYIREKLSYSFYGSG 1320
*****:*****

GTYALSLSQYNMGINIELSESDVWIIDVDNVVRDVTIESDKIKKGDIEGILSTLSIEEN 1380
GTYALSLSQYNMGINIELSESDVWIIDVDNVVRDVTIESDKIKKGDIEGILSTLSIEEN 1380
GTYALSLSQYNMGINIELSESDVWIIDVDNVVRDVTIESDKIKKGDIEGILSTLSIEEN 1380

[illegible]

```
VFDTS DGYKYFAPANTVNDNIYGQAVEYSGLVRVGEDVYYFGETYTTIETGWIYDMENESD 2220
VFDTS DGYKYFAPANTVNDNIYGQAVEYSGLVRVGEDVYYFGETYTTIETGWIYDMENESD 2220
VFDTS DGYKYFAPANTVNDNIYGQAVEYSGLVRVGEDVYYFGETYTTIETGWIYDMENESD 2220
VFDTS DGYKYFAPANTVNDNIYGQAVEYSGLVRVGEDVYYFGETYTTIETGWIYDMENESD 2220
VFDTS DGYKYFAPANTVNDNIYGQAVEYSGLVRVGEDVYYFGETYTTIETGWIYDMENESD 2220
*****
```

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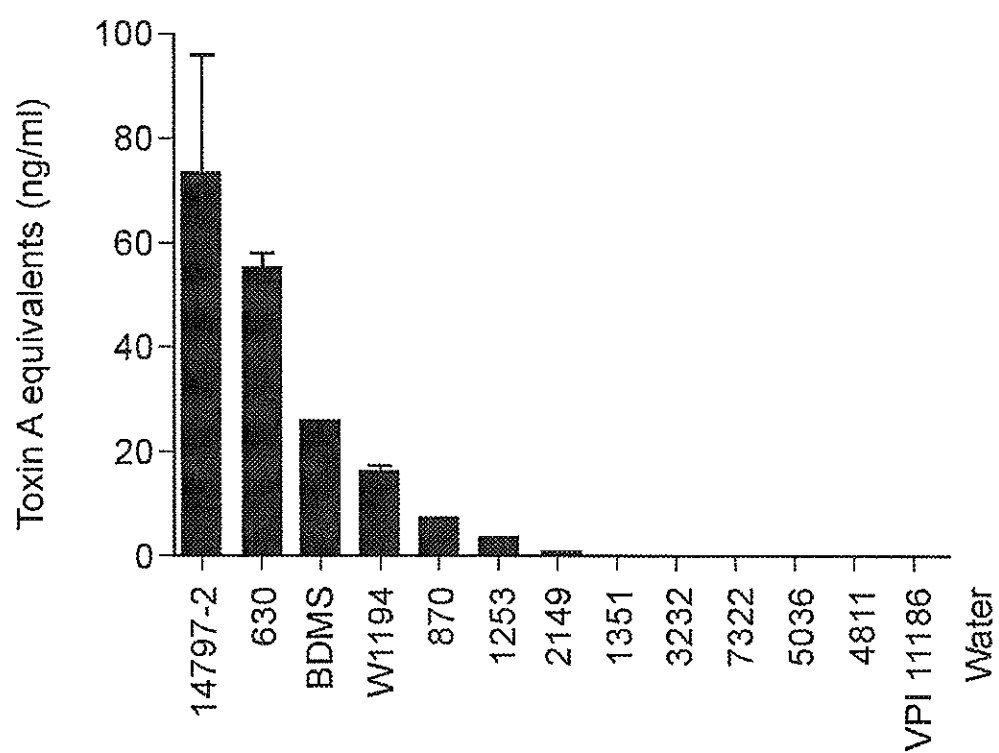
Fig 2F

KYYFNPETKKACKGINLIDDIKYYFDEKGIMRTGLISFENNNYYFNENGEMQFGYINIED 2280
KYYFNPETKKACKGINLIDDIKYYFDEKGIMRTGLISFENNNYYFNENGEMQFGYINIED 2280
KYYFNPETKKACKGINLIDDIKYYFDEKGIMRTGLISFENNNYYFNENGEMQFGYINIED 2280
KYYFDPETKKAYKGINVIDDIKYYFDENGIMRTGLITFEDNHYYFNEDGIMQYGYLNIED 2280
KYYFDPETKKAYKGINVIDDIKYYFDENGIMRTGLITFEDNHYYFNEDGIMQYGYLNIED 2280
****:***** ****:*****:*****:***:***:*****:* **:**:****

KMFYFGEDGVMQIGVFNTPDGFKYFAHQNTLDENFEGESINYTGWLDLDEKRYFFTDEYI 2340
KMFYFGEDGVMQIGVFNTPDGFKYFAHQNTLDENFEGESINYTGWLDLDEKRYFFTDEYI 2340
KMFYFGEDGVMQIGVFNTPDGFKYFAHQNTLDENFEGESINYTGWLDLDEKRYFFTDEYI 2340
KTFYFSEDGIMQIGVFNTPDGFKYFAHQNTLDENFEGESINYTGWLDLDEKRYFFTDEYI 2340
KTFYFSEDGIMQIGVFNTPDGFKYFAHQNTLDENFEGESINYTGWLDLDEKRYFFTDEYI 2340
* ***.***:*****:*****:*****:*****:*****:*****:*****:*****

AATGSVIIDGEEYYFDPDTAQLVISE 2366 (SEQ ID NO: 2, 630)
AATGSVIIDGEEYYFDPDTAQLVISE 2366 (SEQ ID NO: 25, VPI10463)
AATGSVIIDGEEYYFDPDTAQLVISE 2366 (SEQ ID NO: 6)
AATGSVIIDGEEYYFDPDTAQLVISE 2366 (SEQ ID NO: 21, R20291)
AATGSVIIDGEEYYFDPDTAQLVISE 2366 (SEQ ID NO: 23, CD196)

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FIG. 3

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FIG. 4A

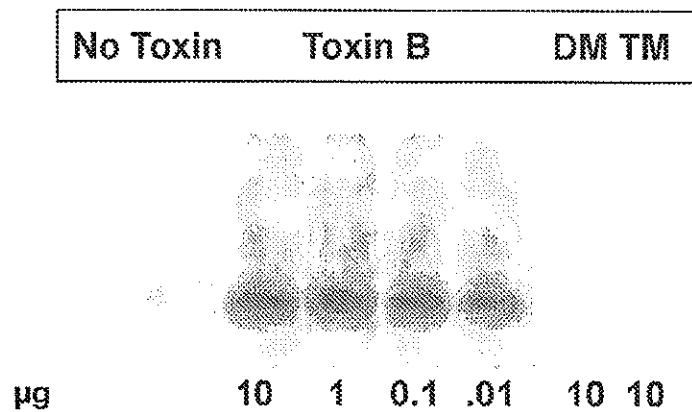


FIG. 4B

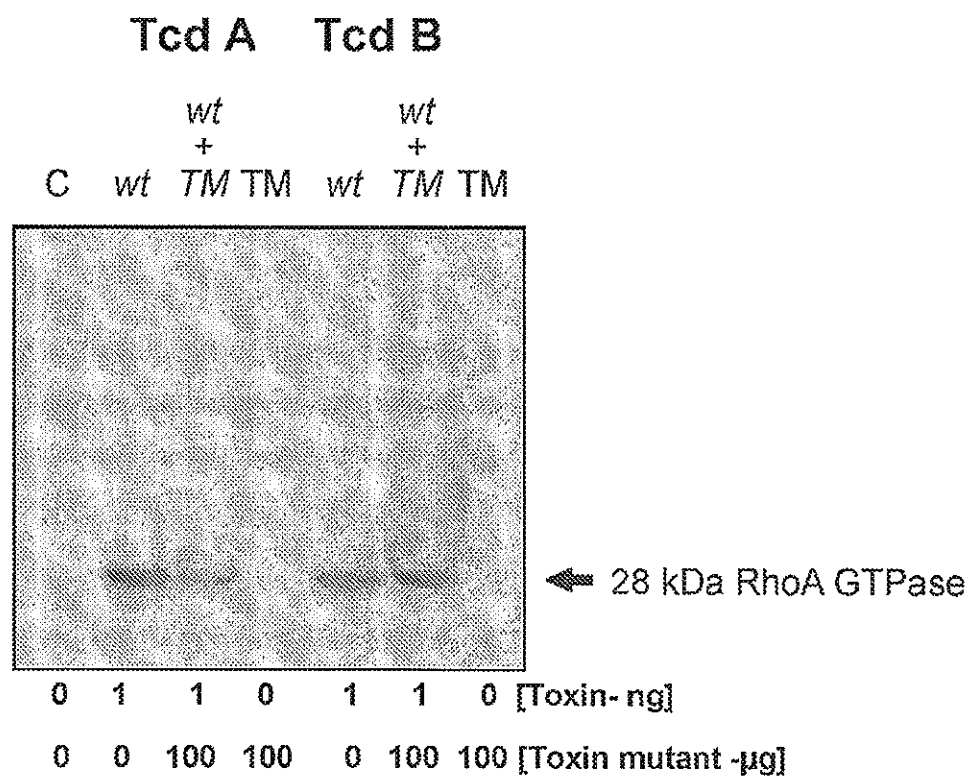


FIG. 5

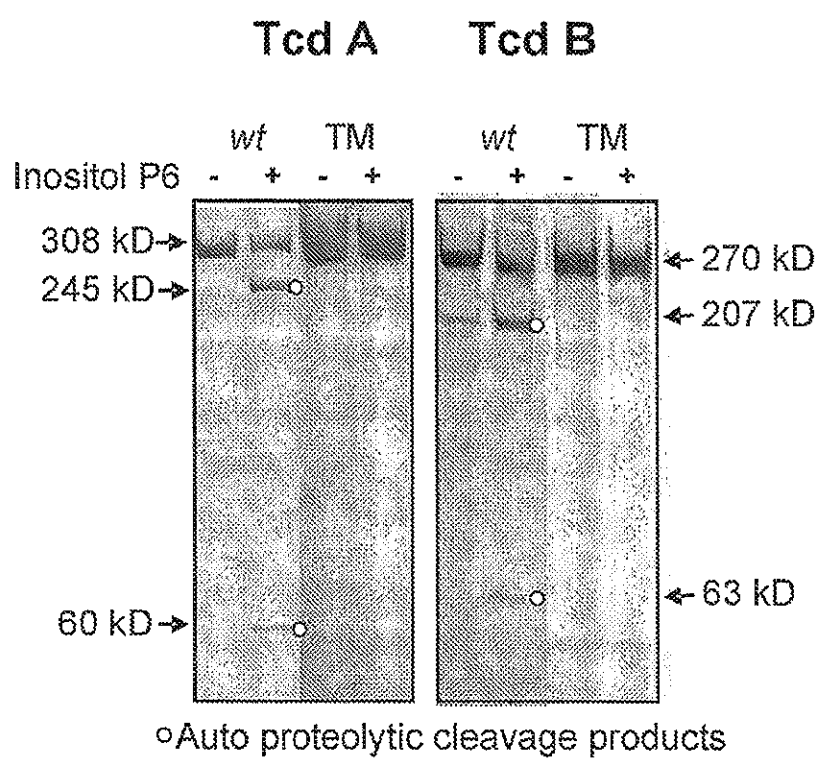


FIG. 6

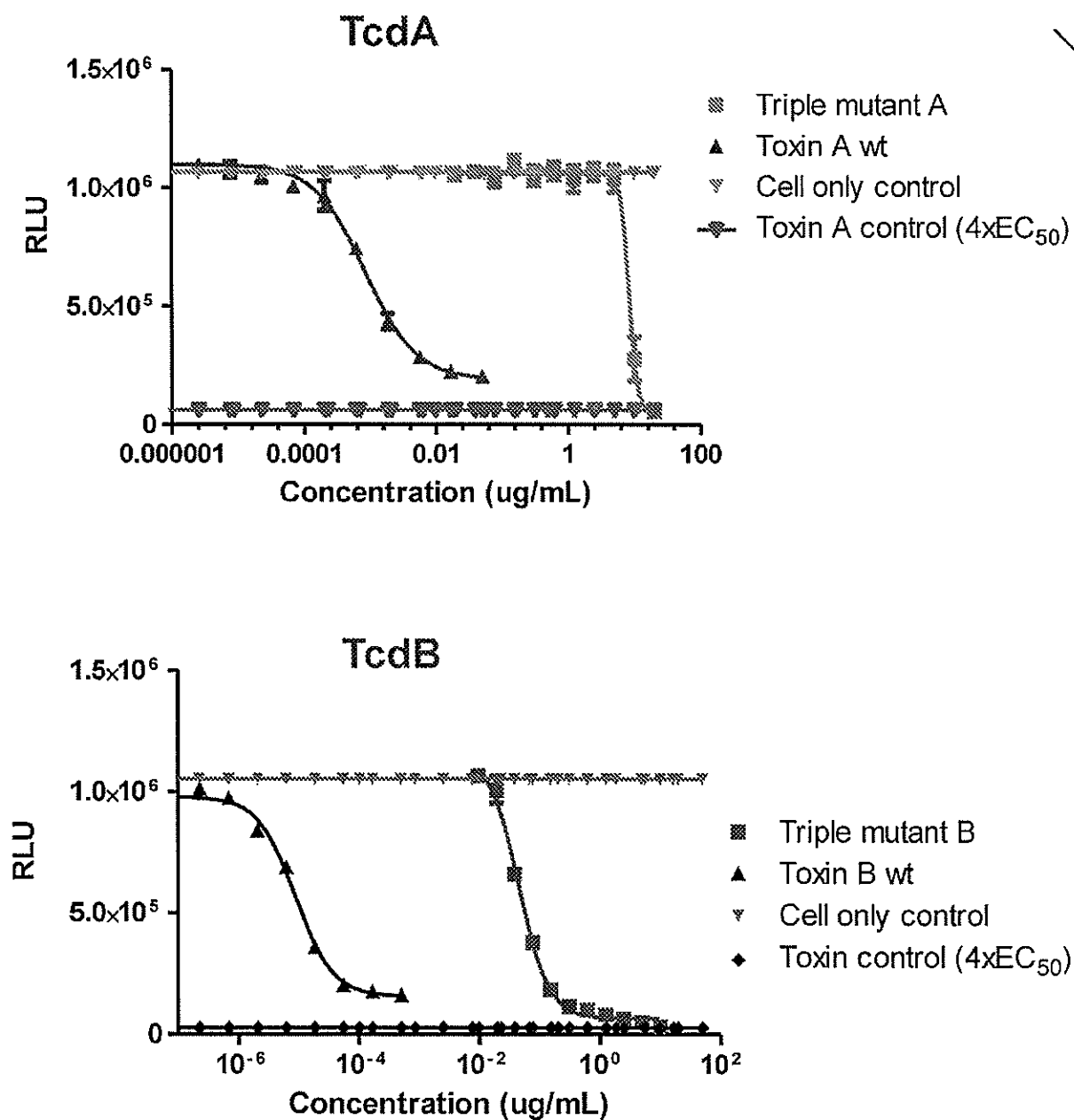
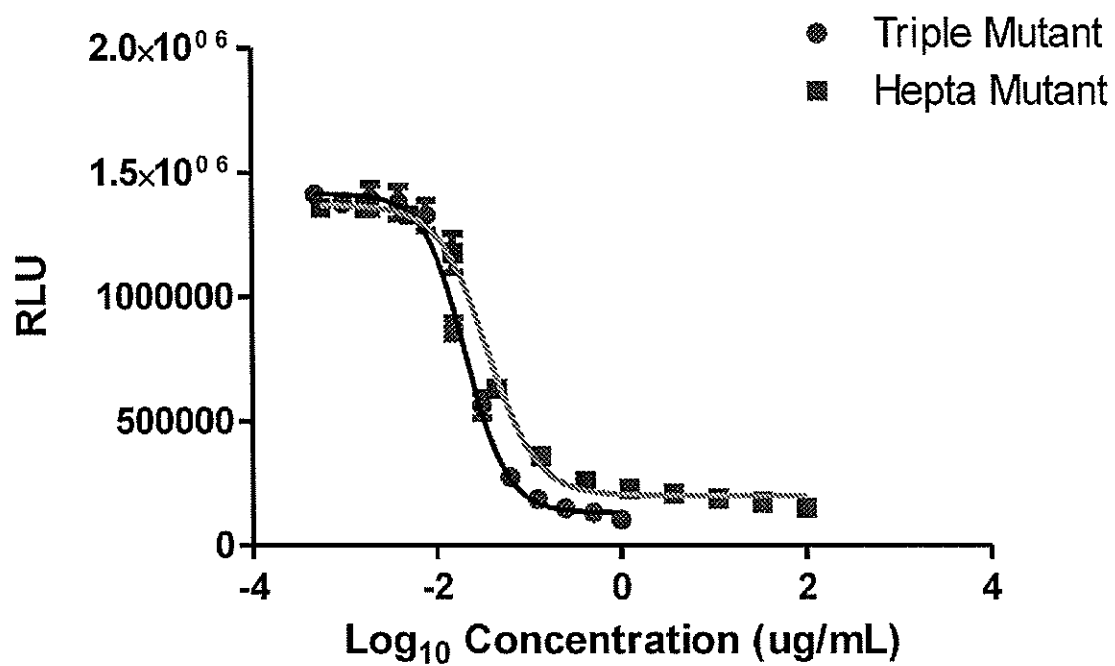


FIG. 7

	Triple Mutant	Hepta Mutant
EC ₅₀	0.02078	0.03590

FIG. 8

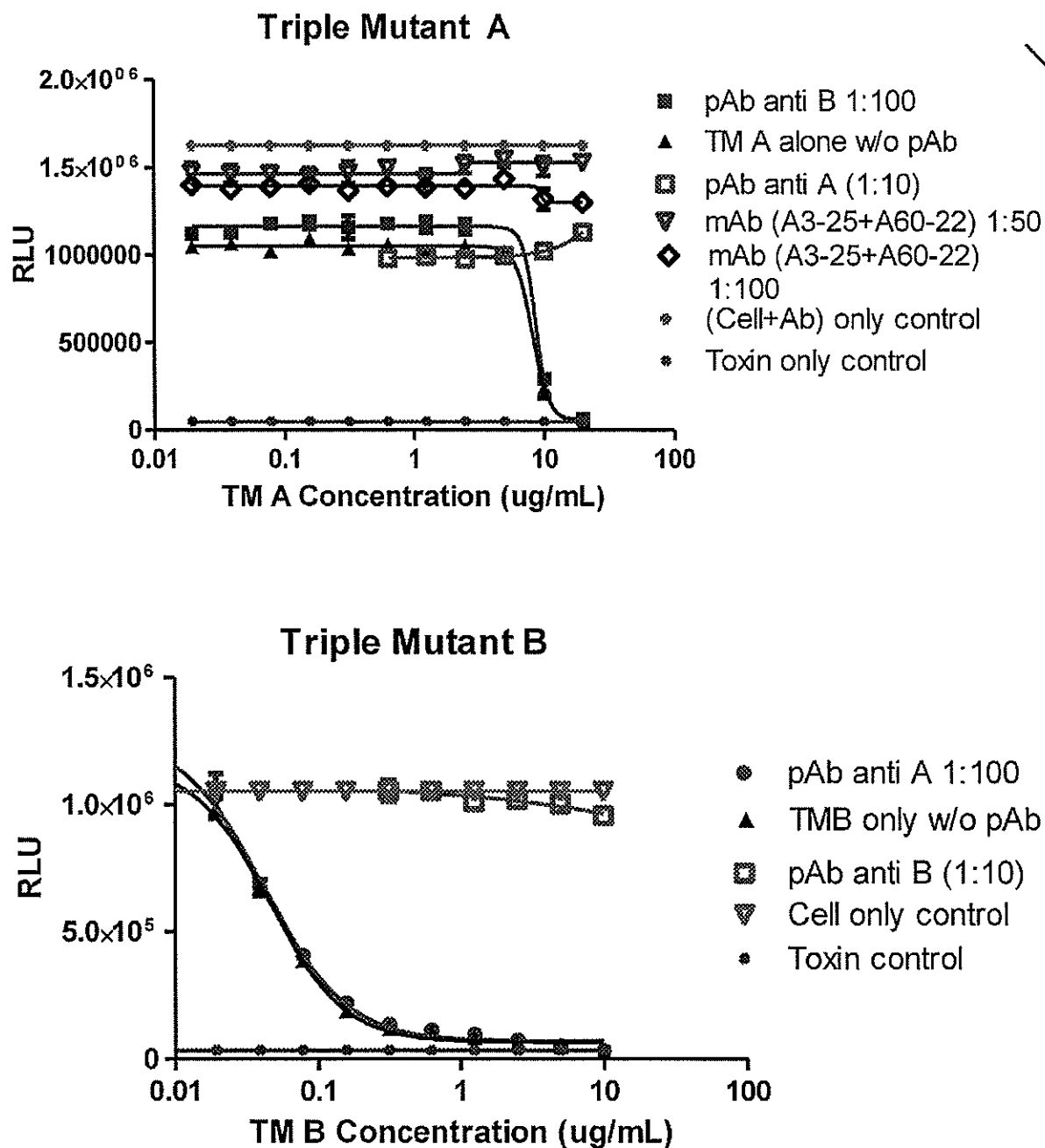
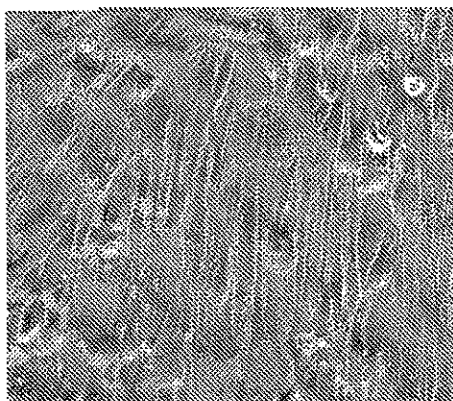
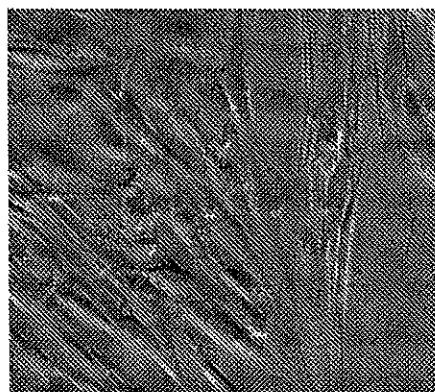


FIG. 9

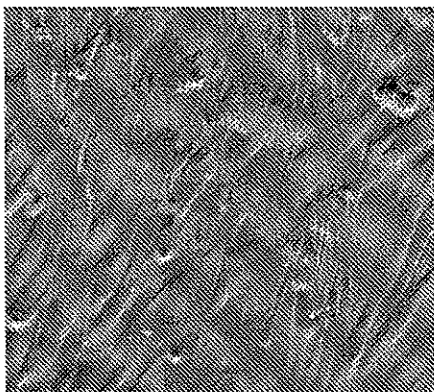
A



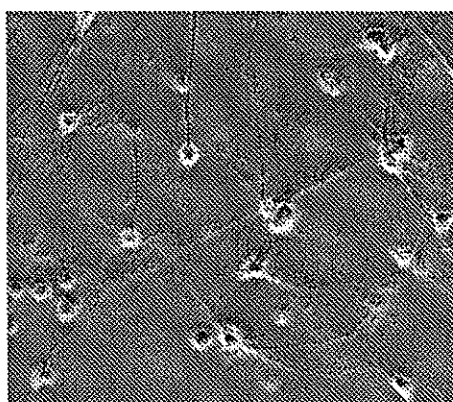
B



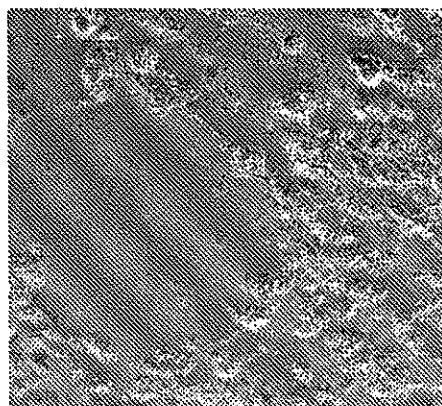
C



D



E



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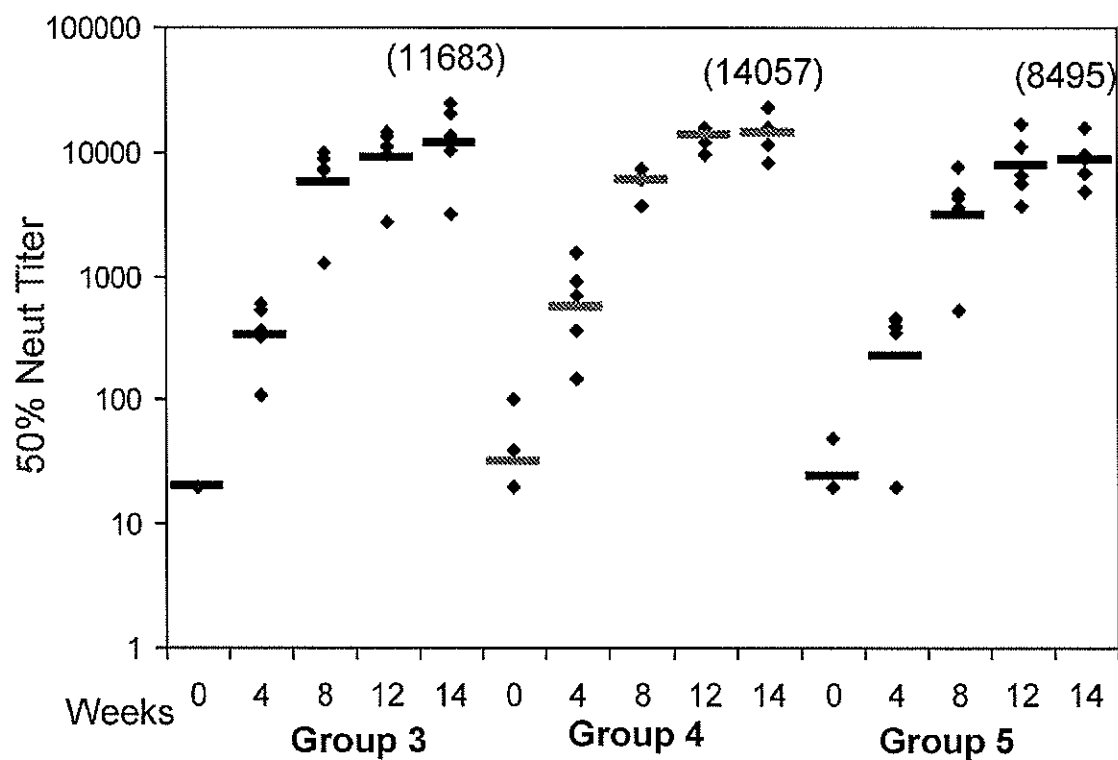
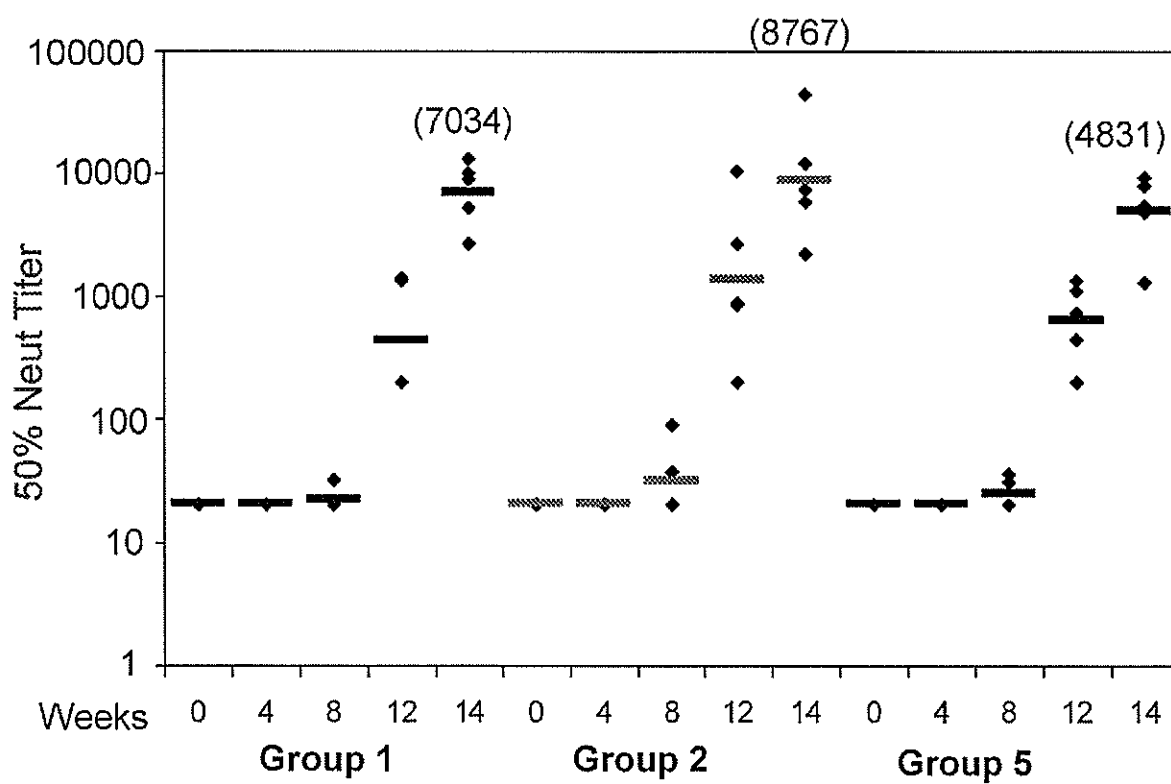
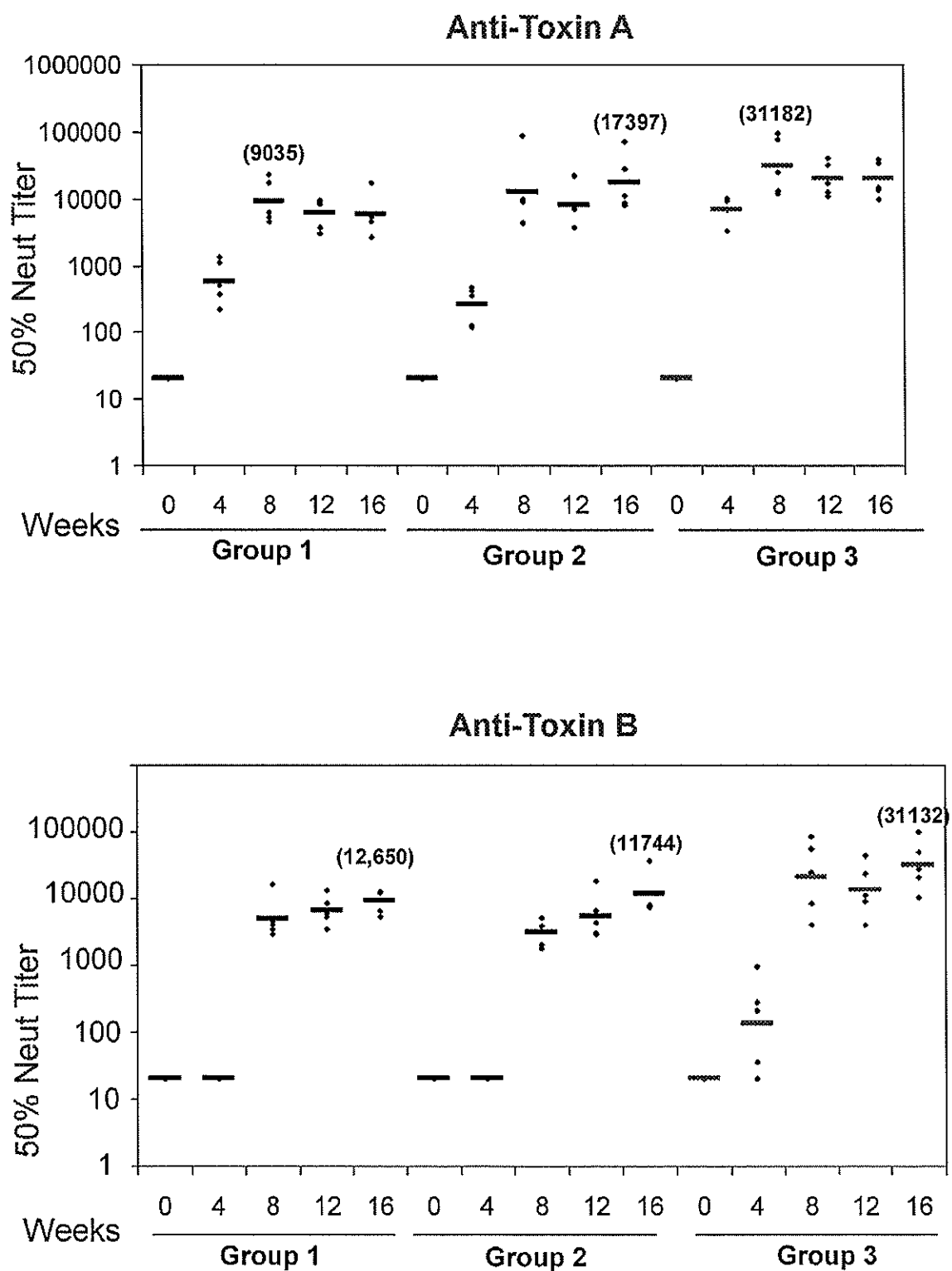
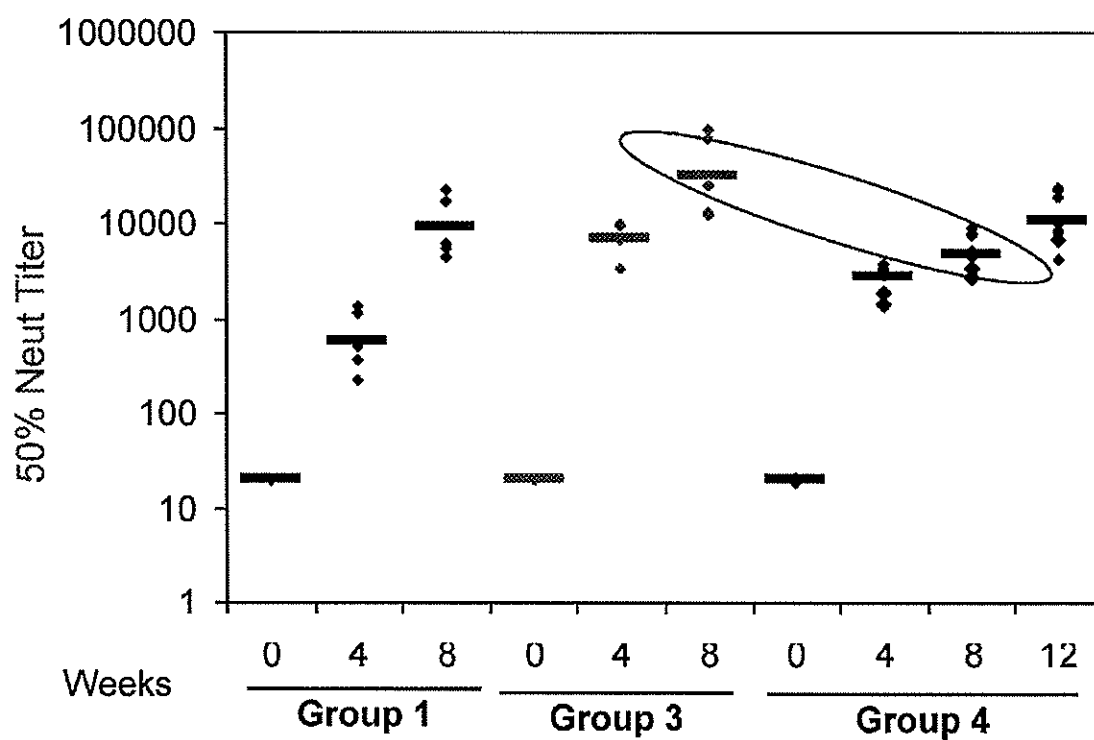
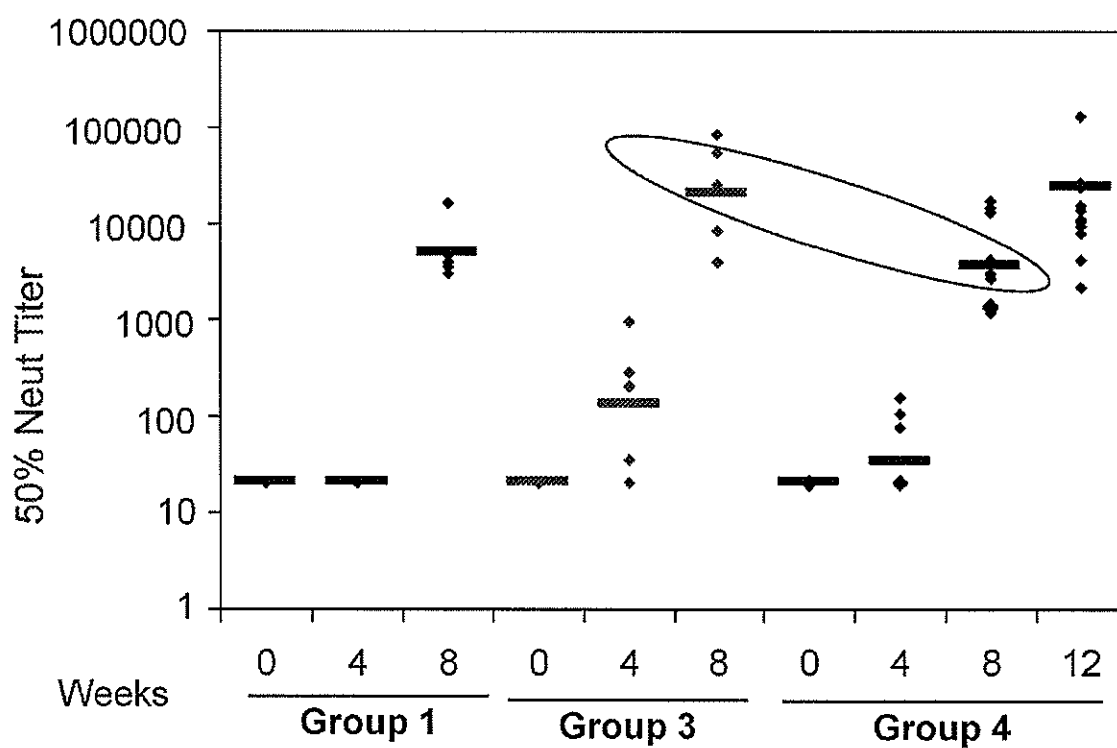
FIG. 11A**FIG. 11B**

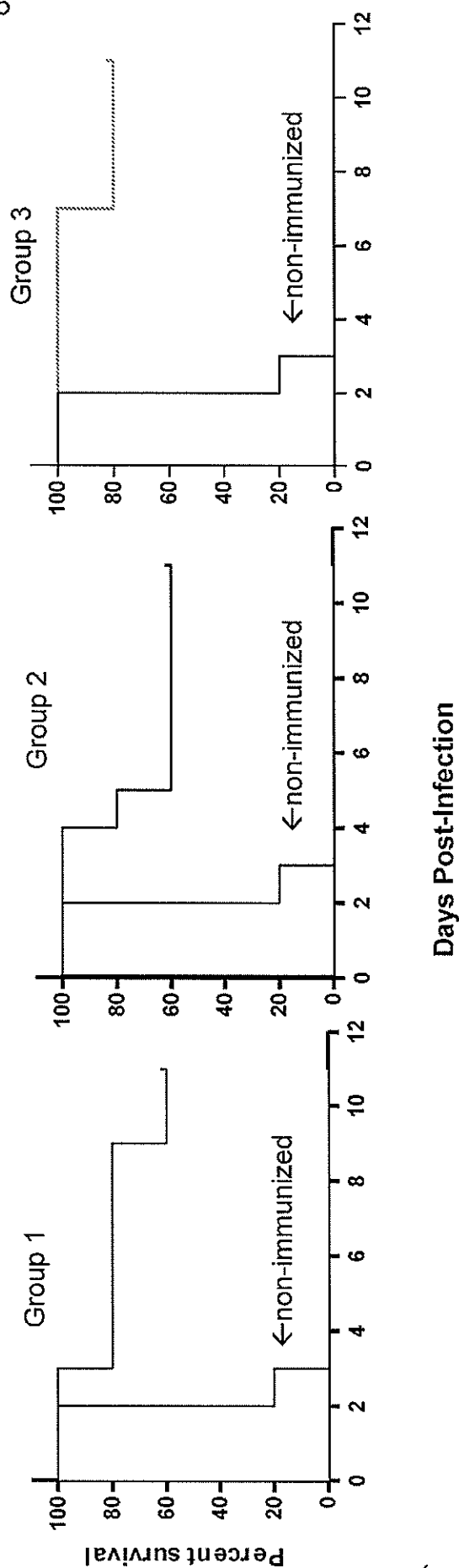
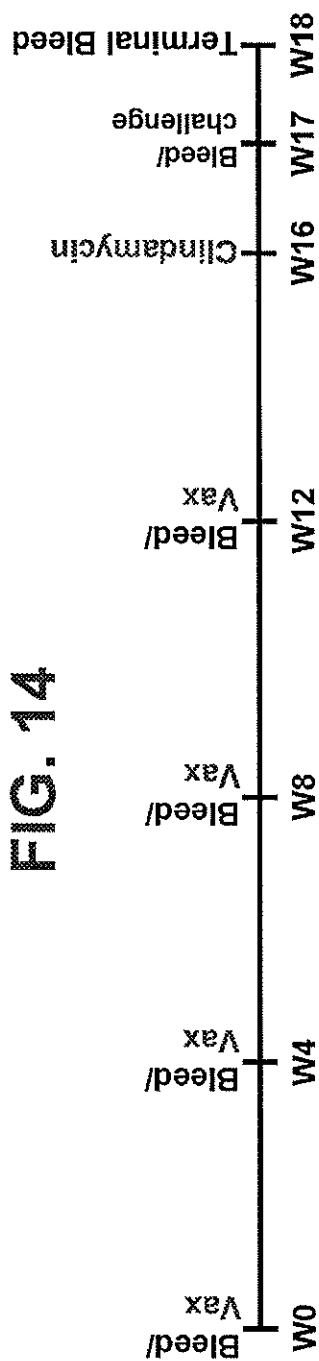
FIG. 12

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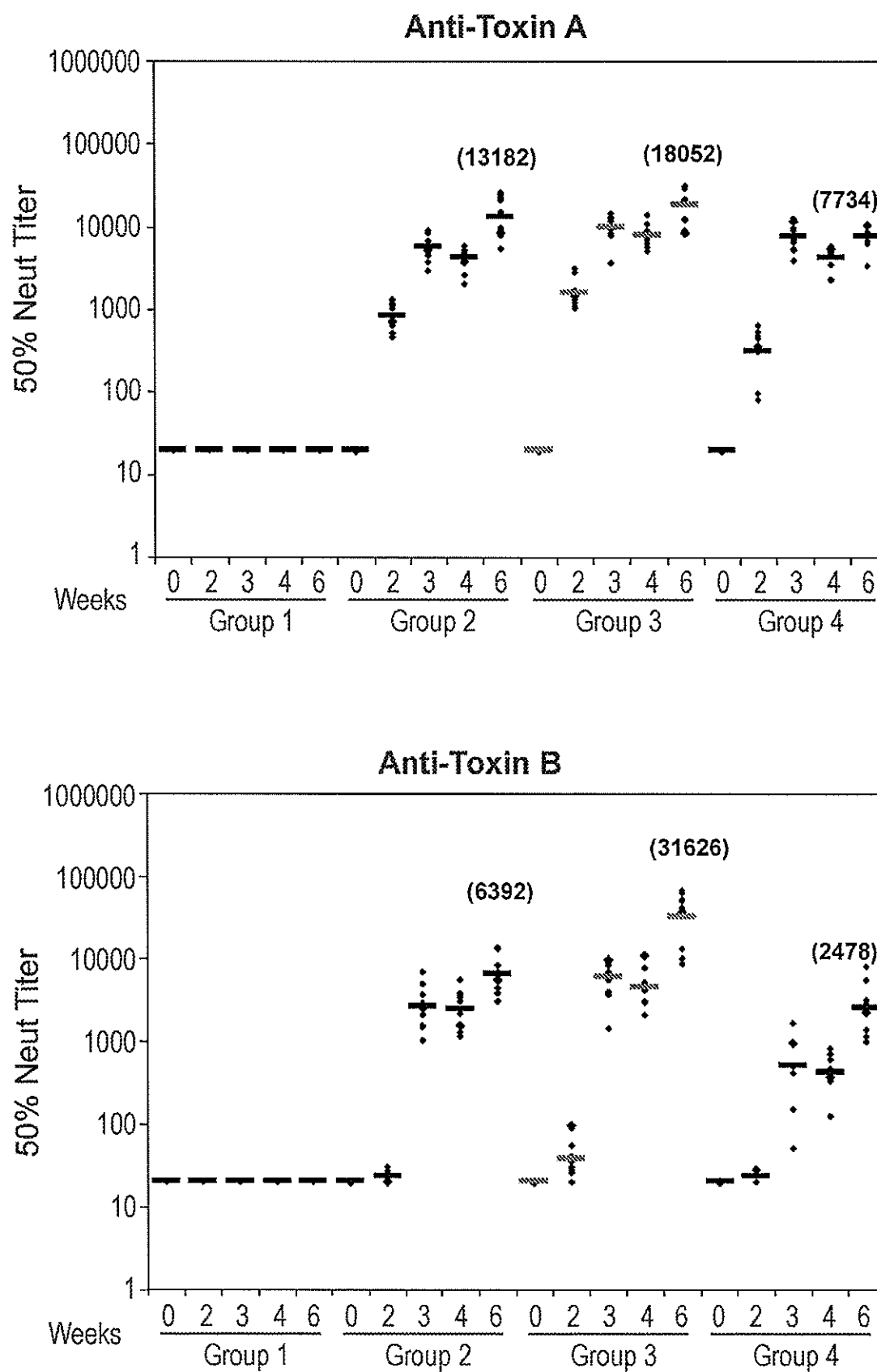
FIG. 13A**FIG. 13B**

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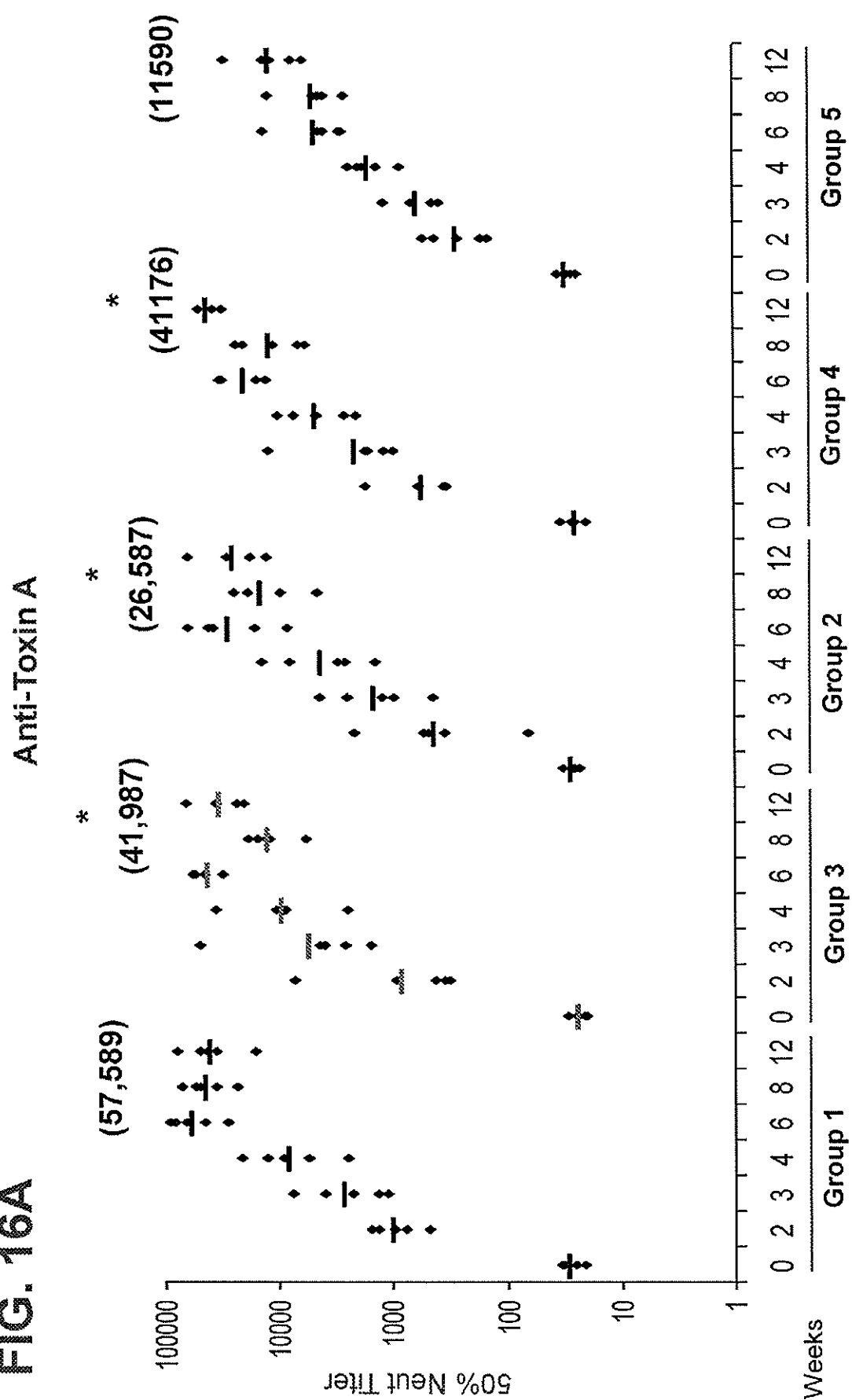
FIG. 14



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FIG. 15

FILE 16A



Anti-Toxin B

FIG. 16B

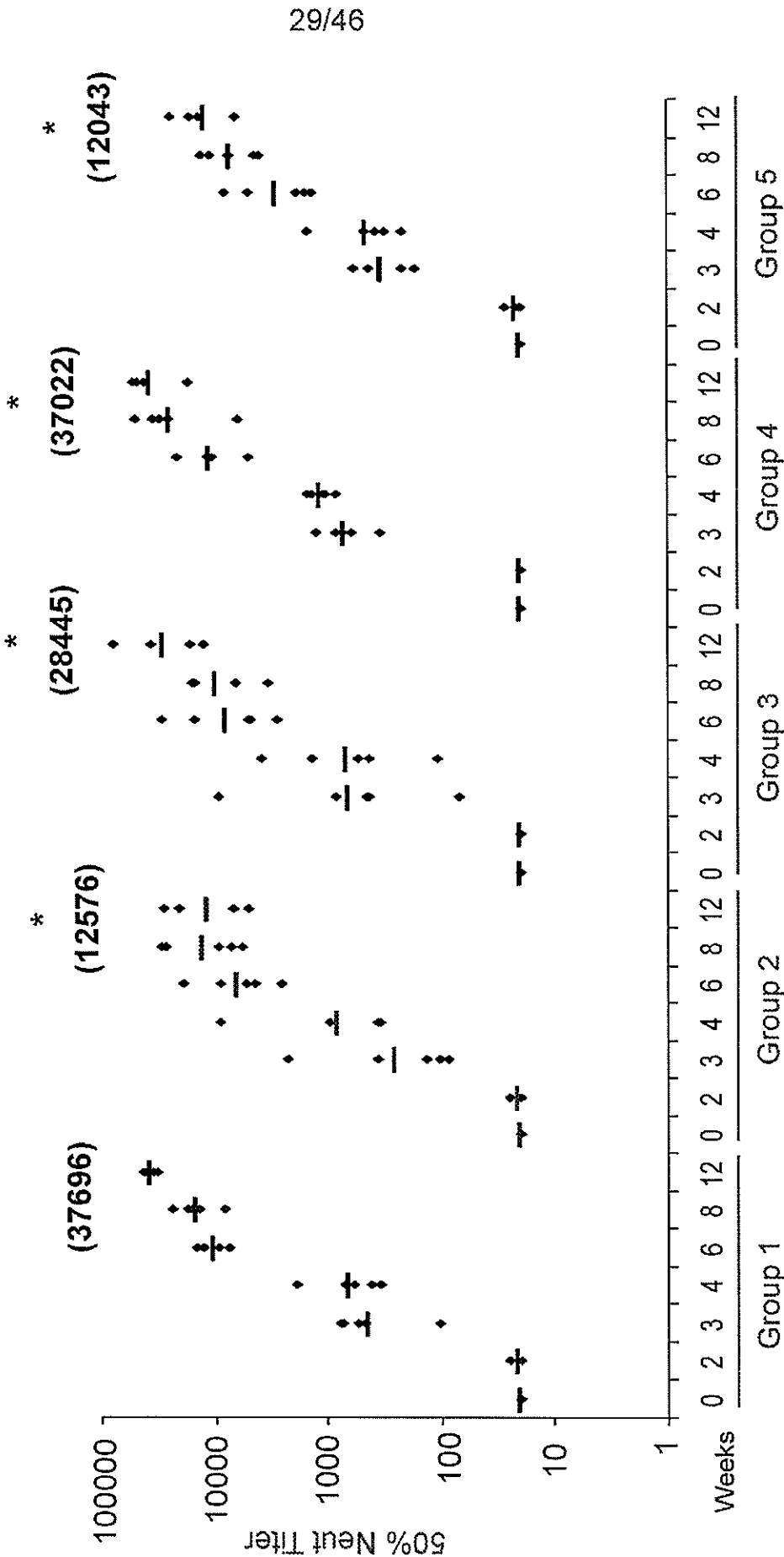


FIG. 17

Variable Light Chain (muK)

MKLPVRLLVLMFWIPGSSS DVVMTHHTPLSLPVSLGDQASMSCRS
SQSLIHSNGNTYLHWYLQKPGQSPKLLISKVSNRFSGVPDRFSG
SGSGTDFTLKISRVEAEDLG VYFC SQTTYFPYTFGGGTREIKRAD
AAPTVSIFPPSS (SEQ ID NO: 36)

Variable Heavy Chain (mIgE)

MYLGLNCVFIVFLLKGVQSE EVNLEESGGGLVQPGGSMKLSCVAS
GFTFTNYWMNWVRQSPEKGLEWIAEIRLKSHNYATHFAESVKG
RFTISRDDSKSAVSLQMTNLTPEDTGIFYCTWD YYGNPAFVYWG
QGT LVTVSAASIRNPQLYPLKPKGTASMTLGCLVKDYFPGPVT
VTWYSDSLNMSTVN (SEQ ID NO: 37)

FIG. 18

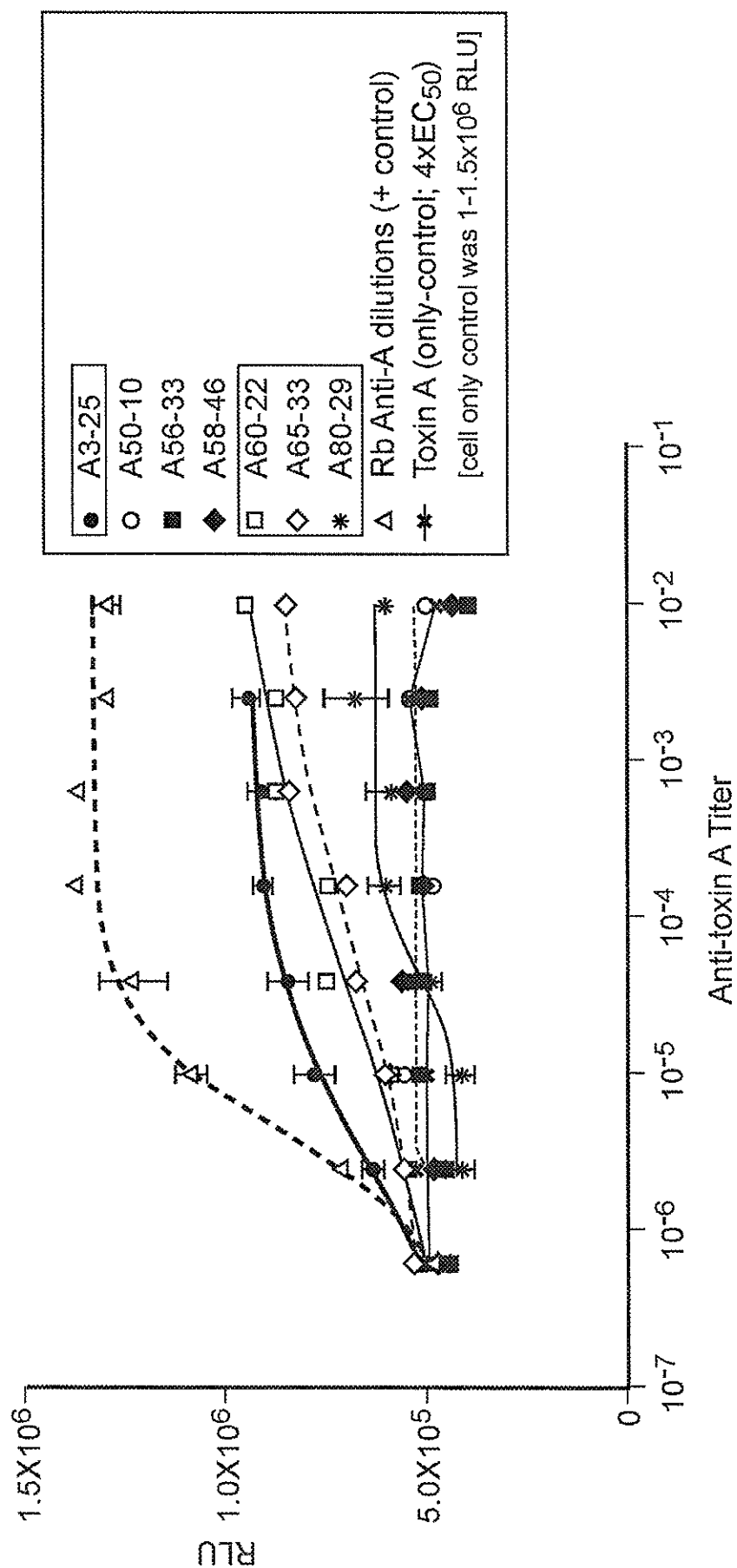


FIG. 19

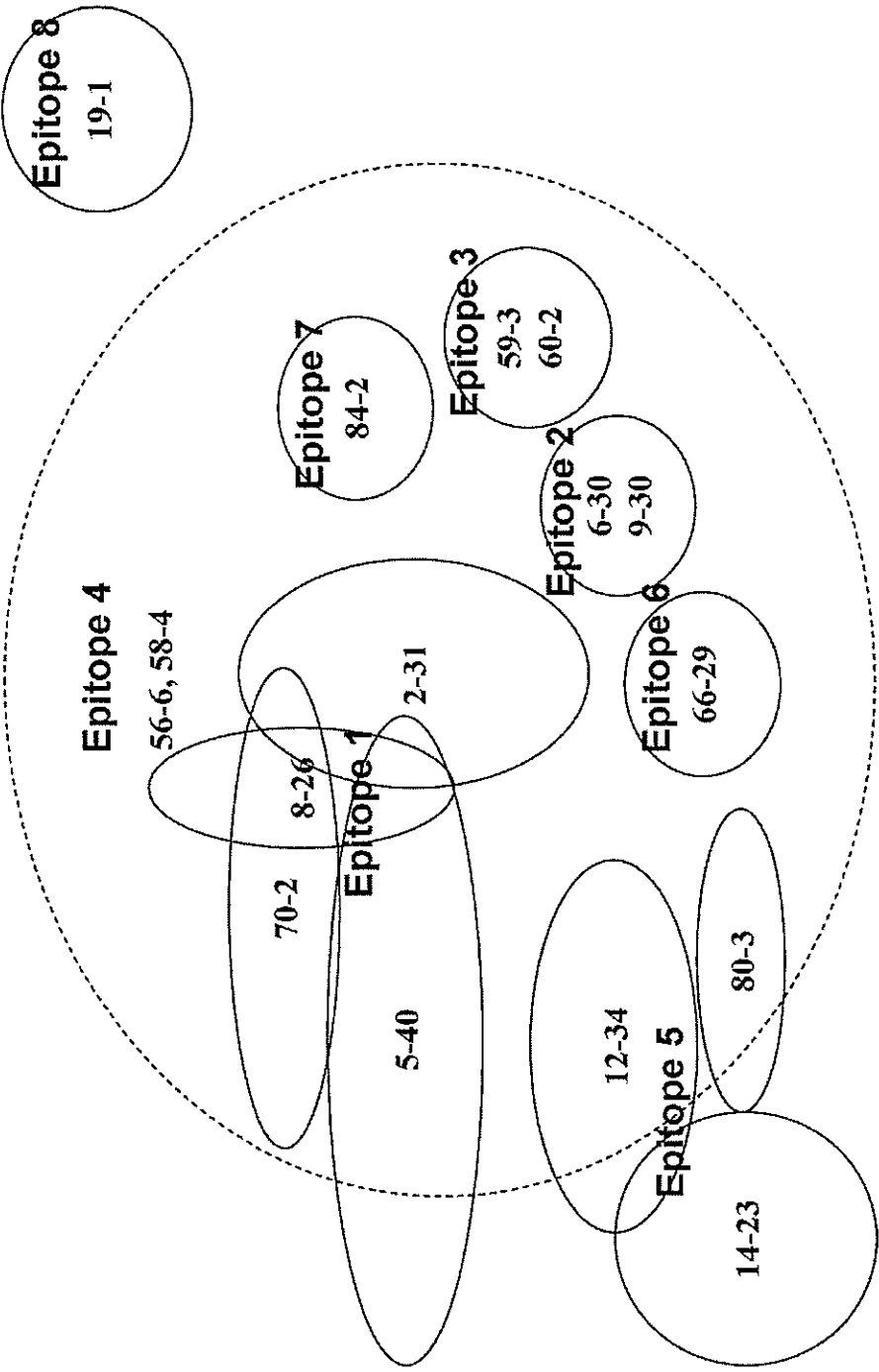


FIG. 20C

Toxin A Neutralization by mAb A3-25 plus A80-29 Dilutions

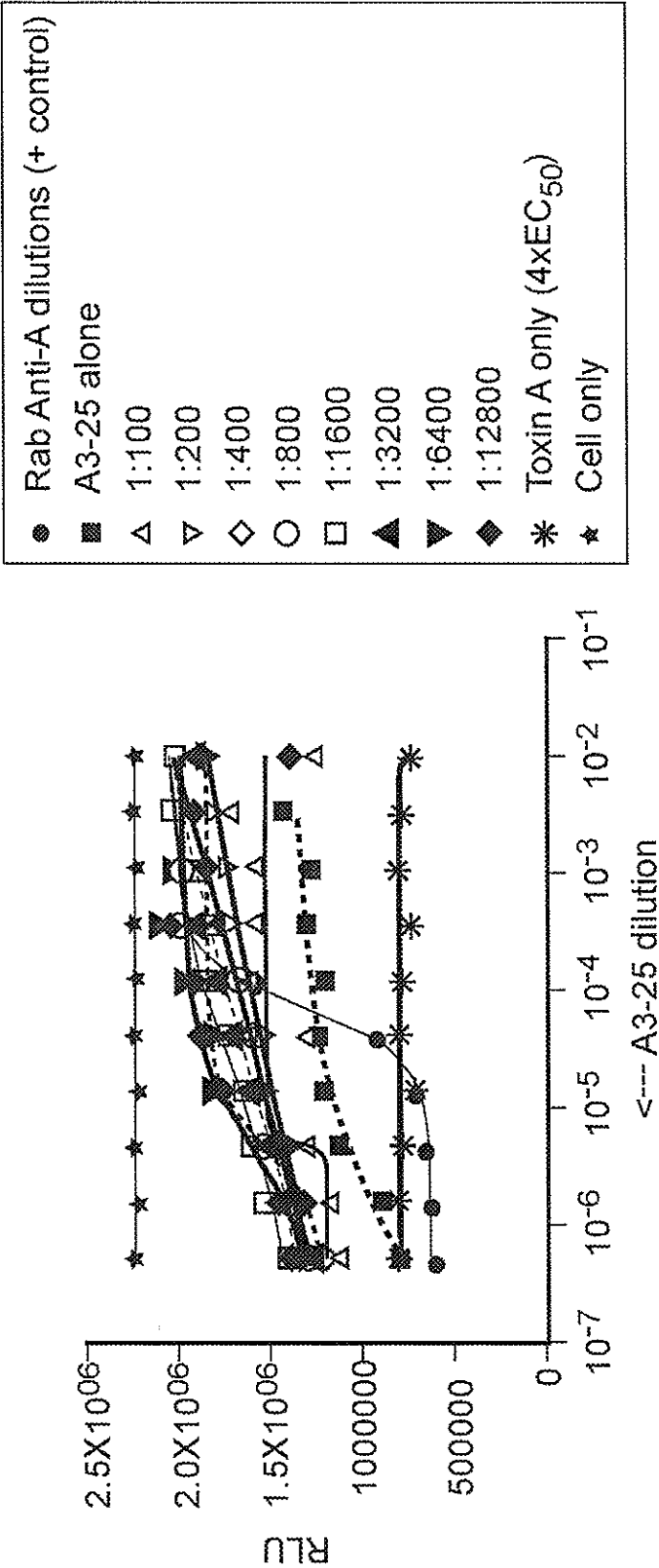


FIG. 21A

Toxin B Neutralization by Reference Sera and Different mAbs

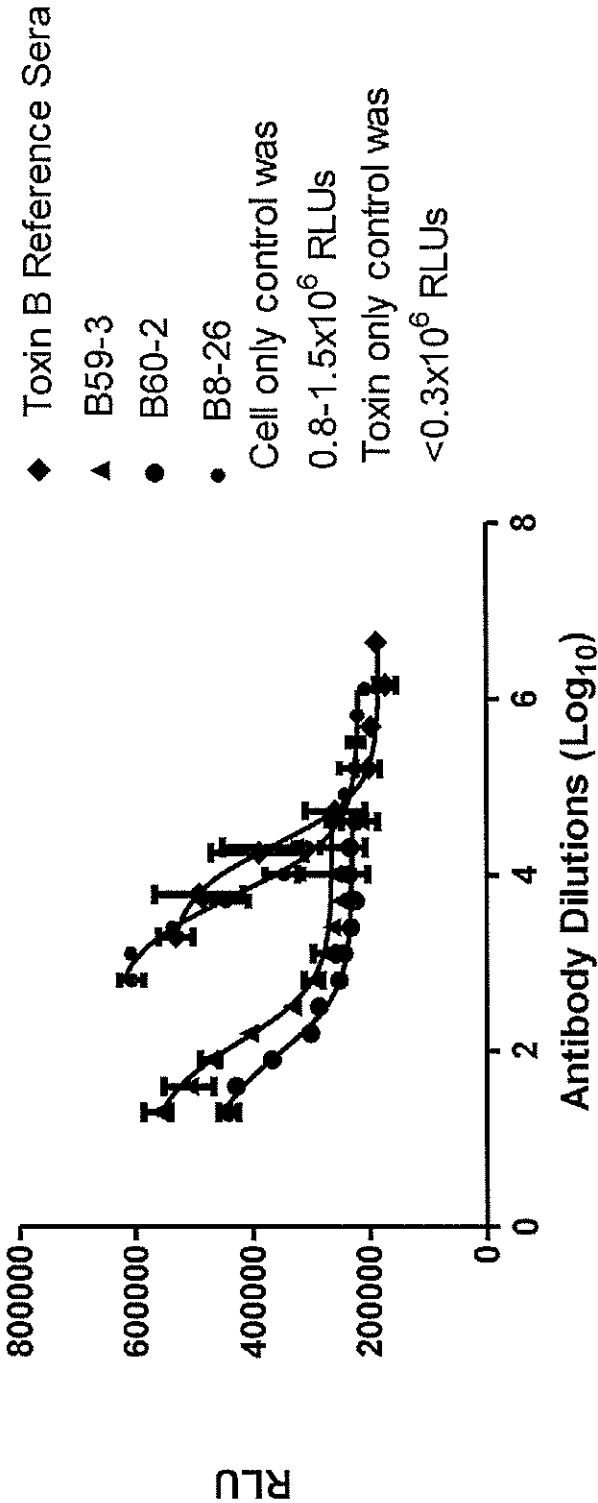


FIG. 21B

Toxin B Neutralization by B8-26 mAb plus B59-3 Dilutions

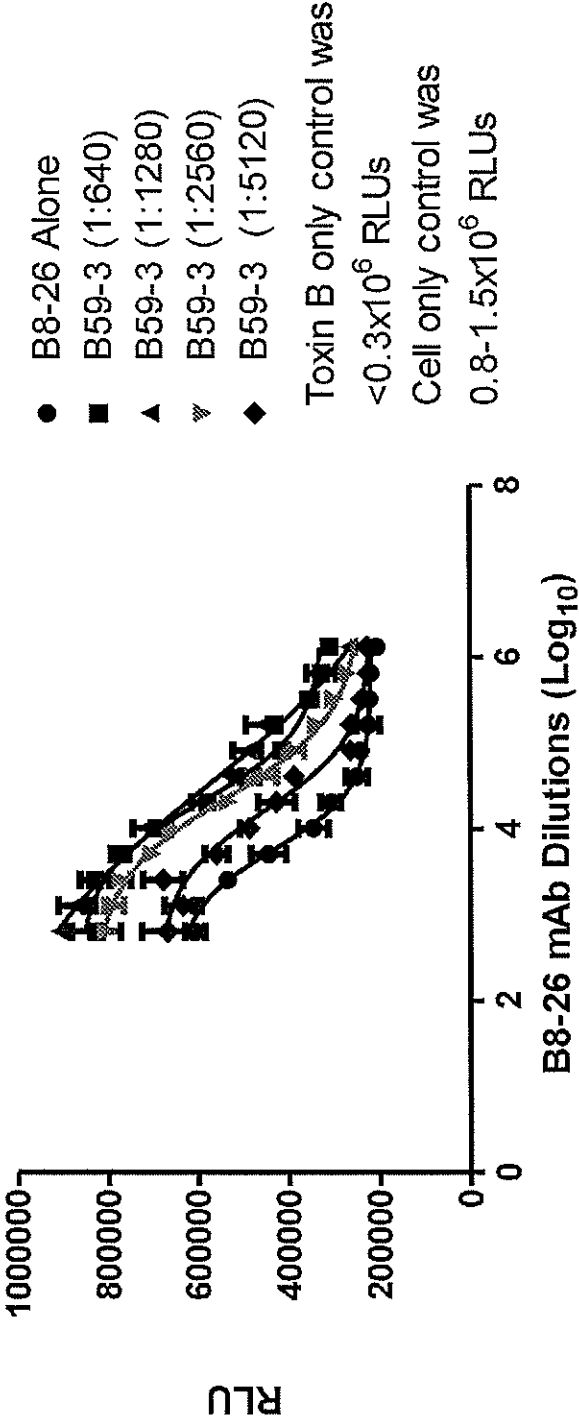


FIG. 22

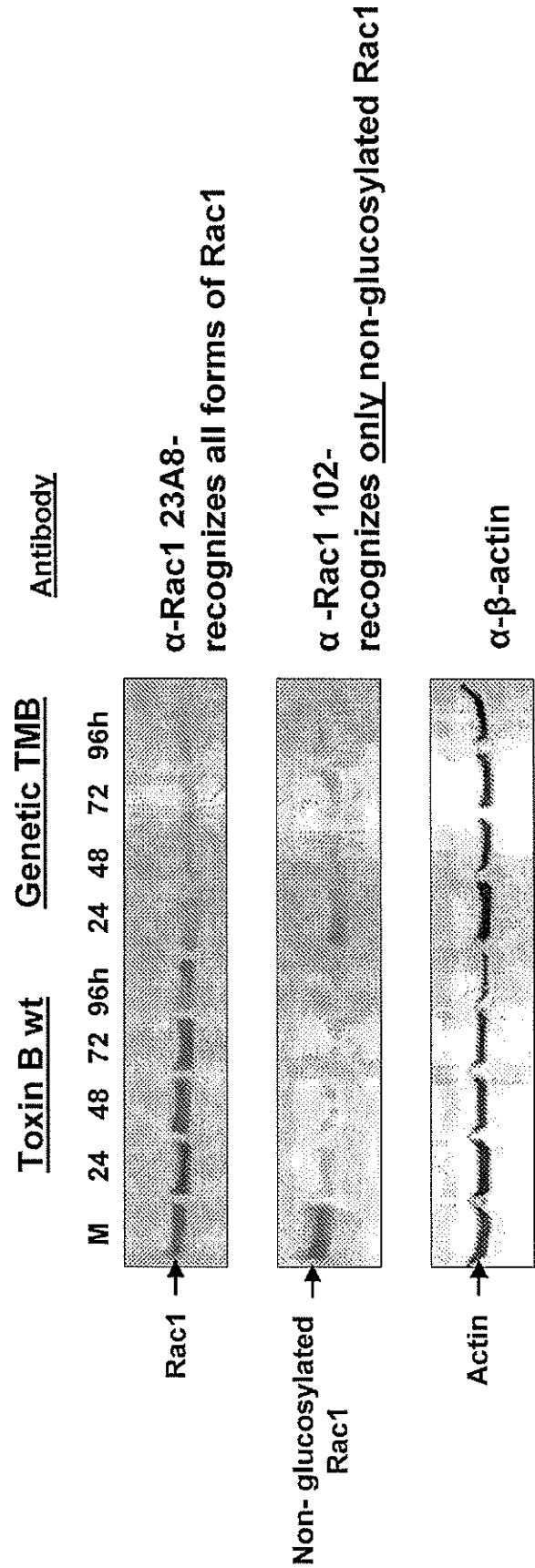


FIG. 23A

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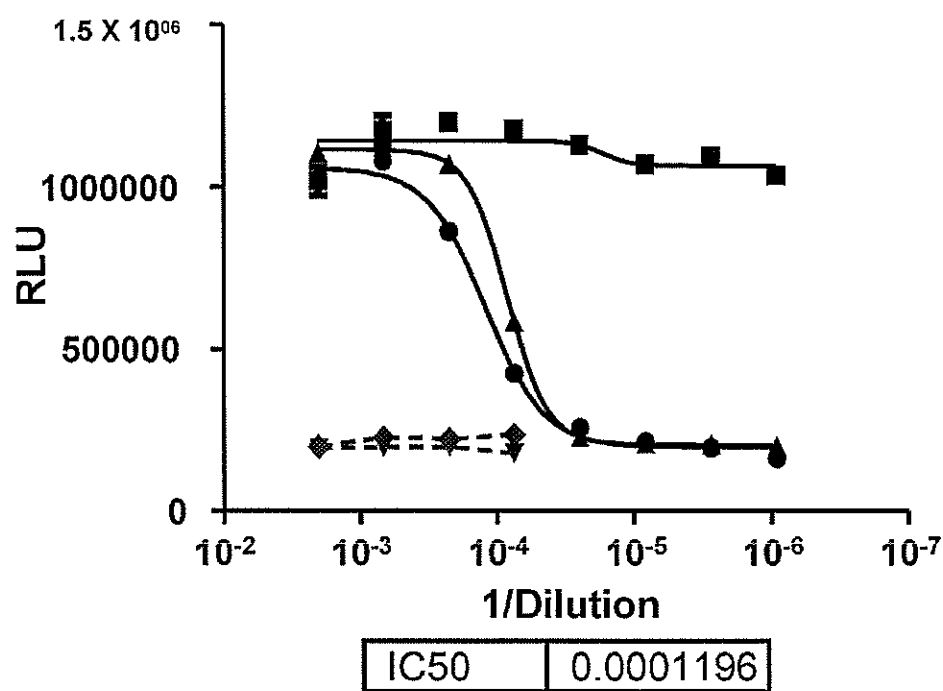
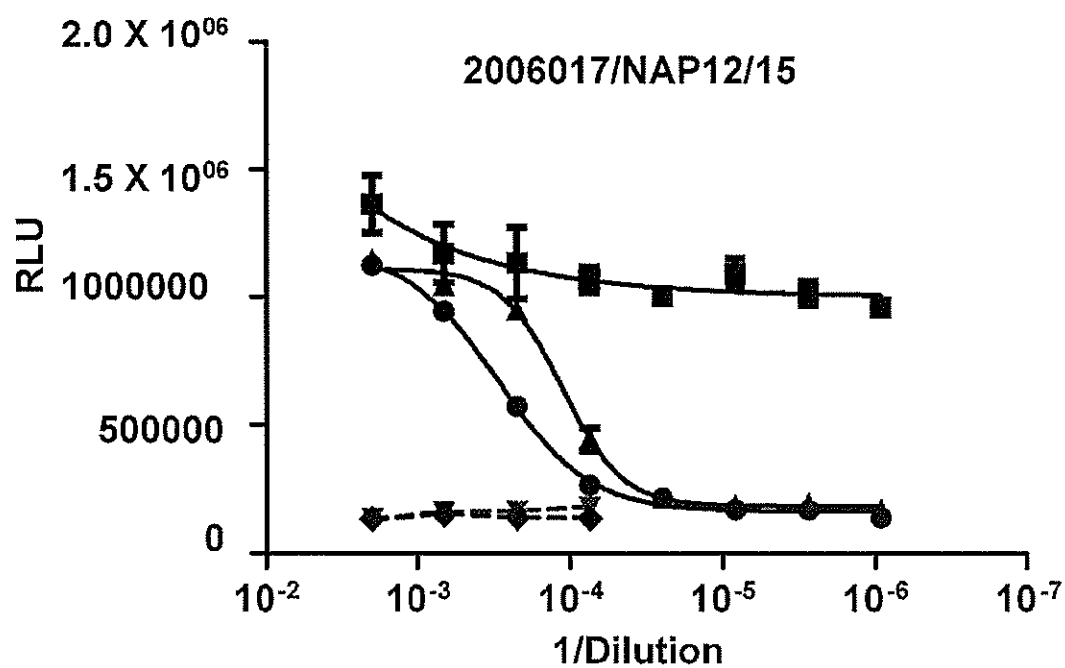


FIG. 23B

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FIG. 23C

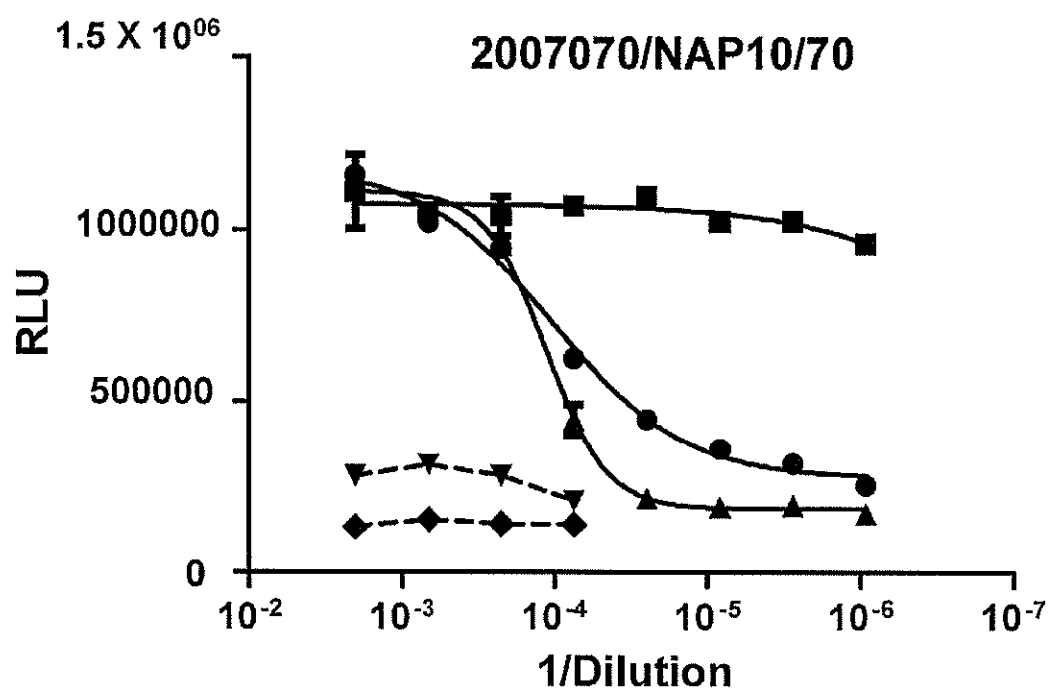
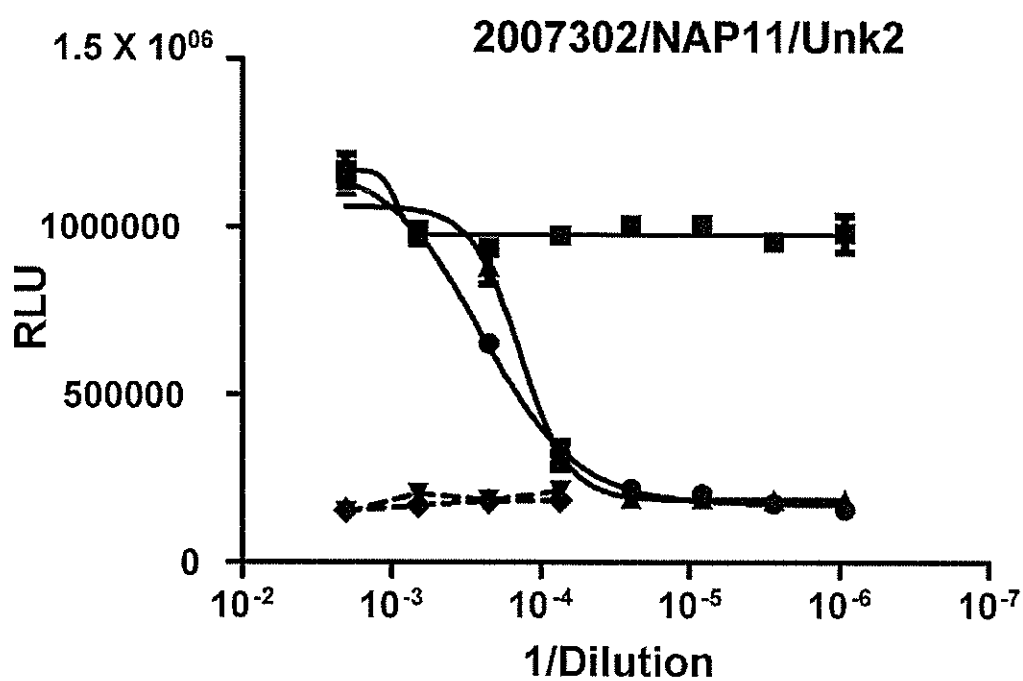
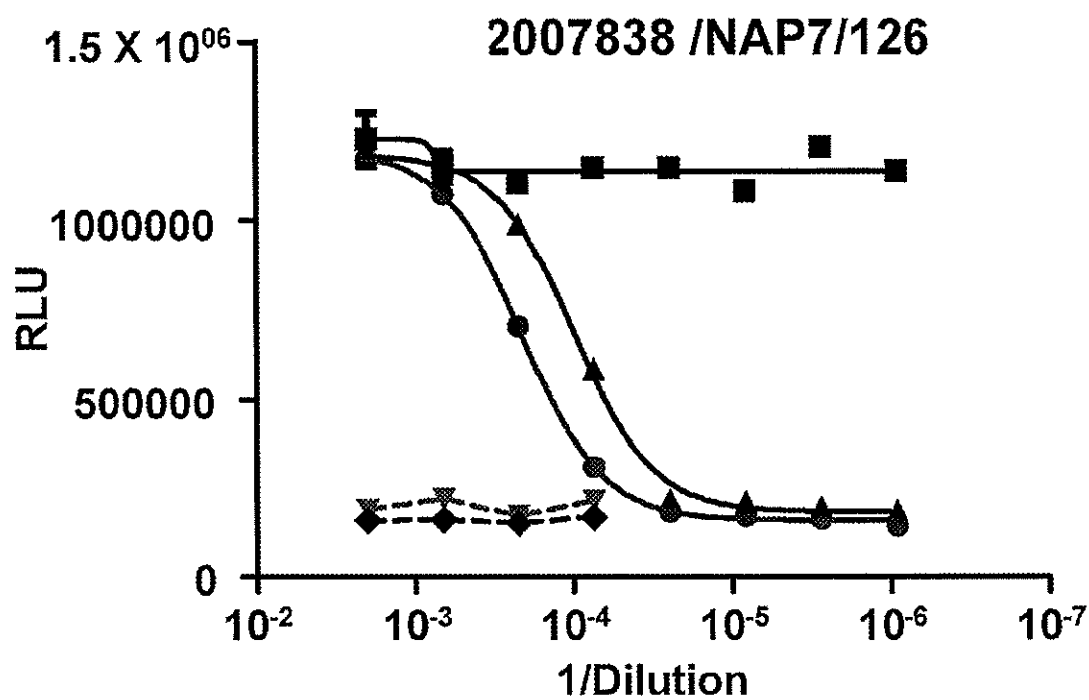
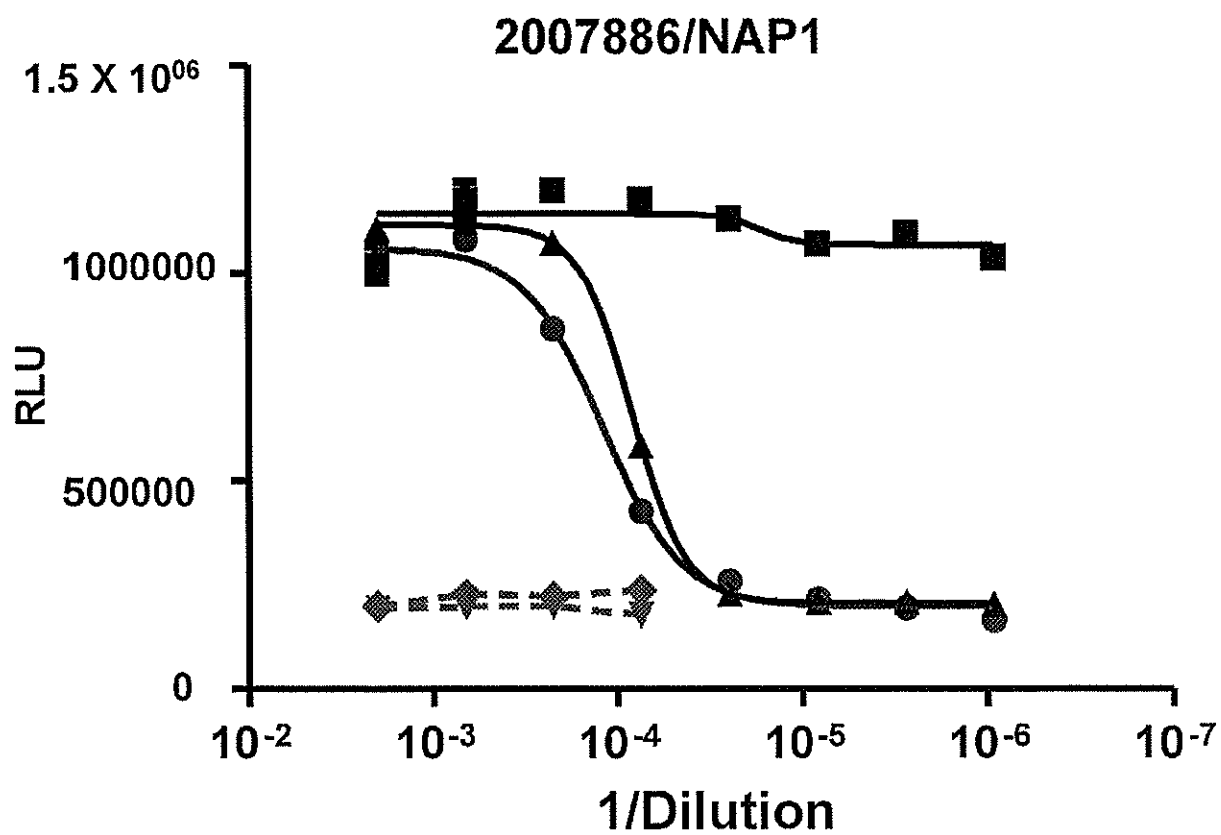


FIG. 23D



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FIG. 23E**FIG. 23F**

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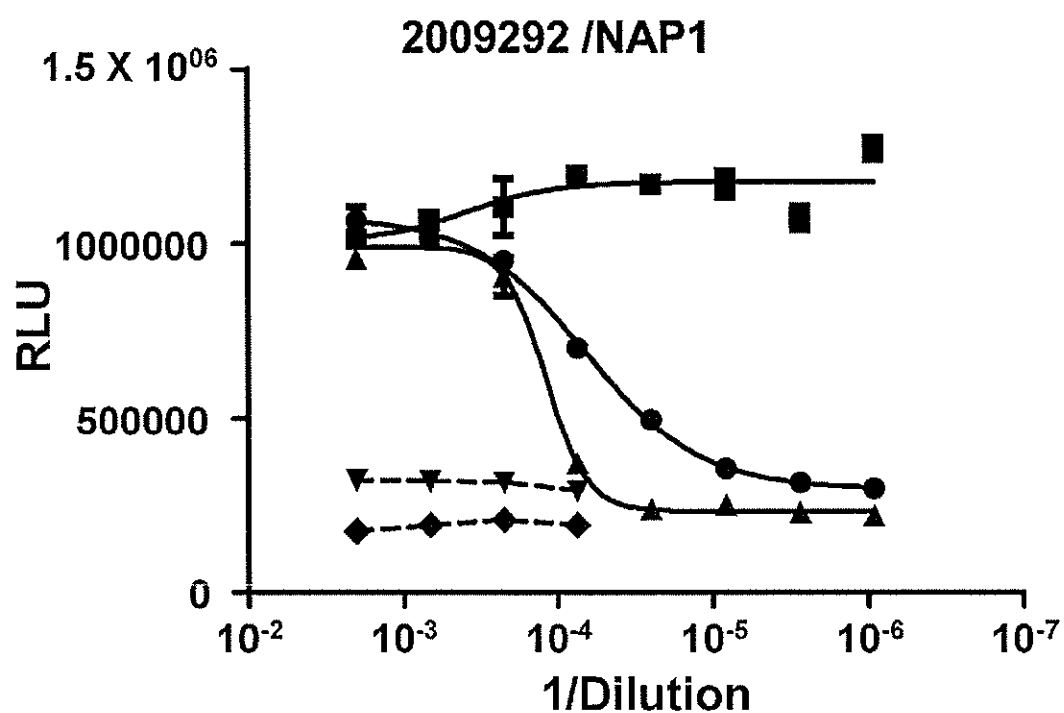
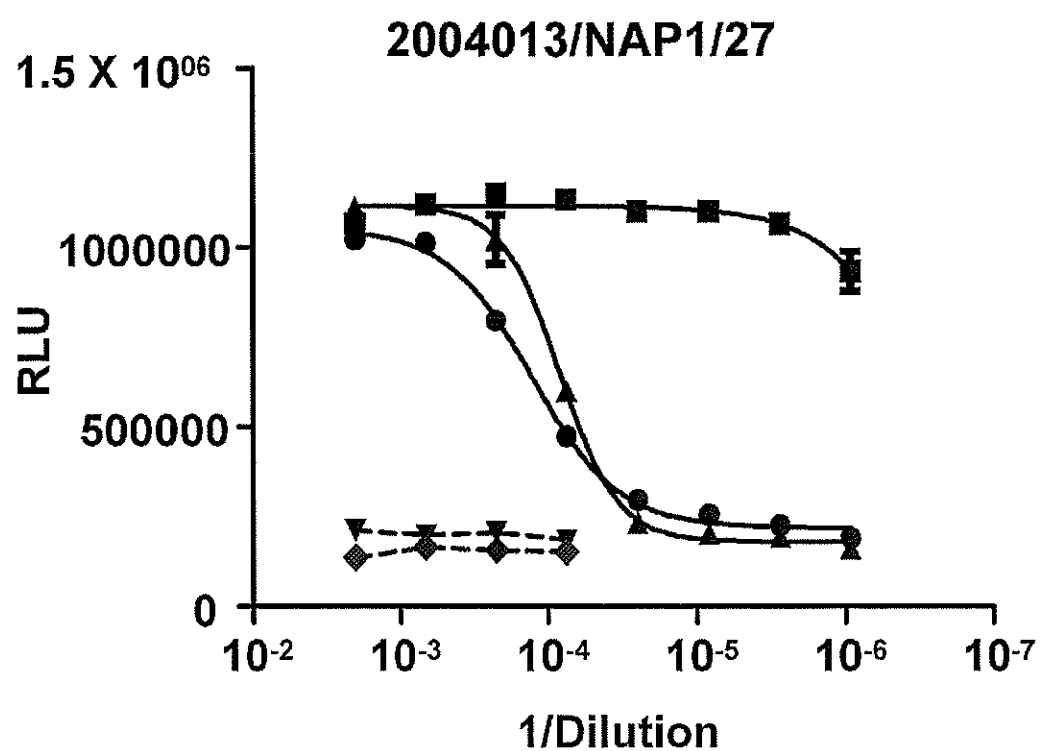
FIG. 23G**FIG. 23H**

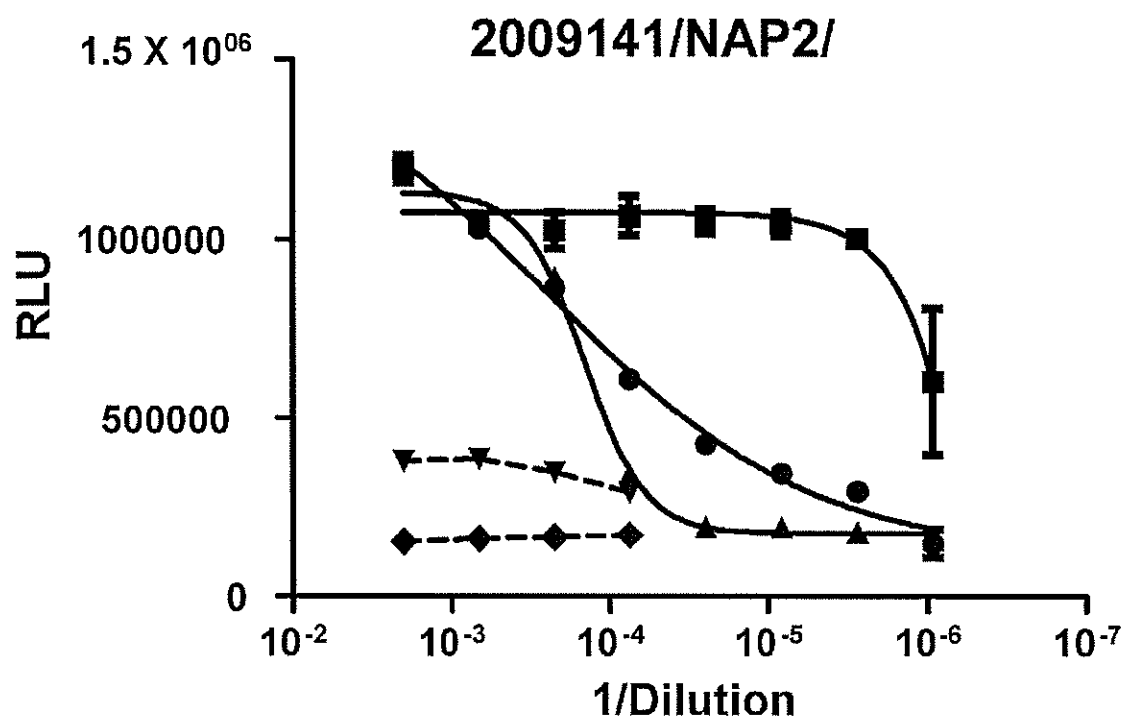
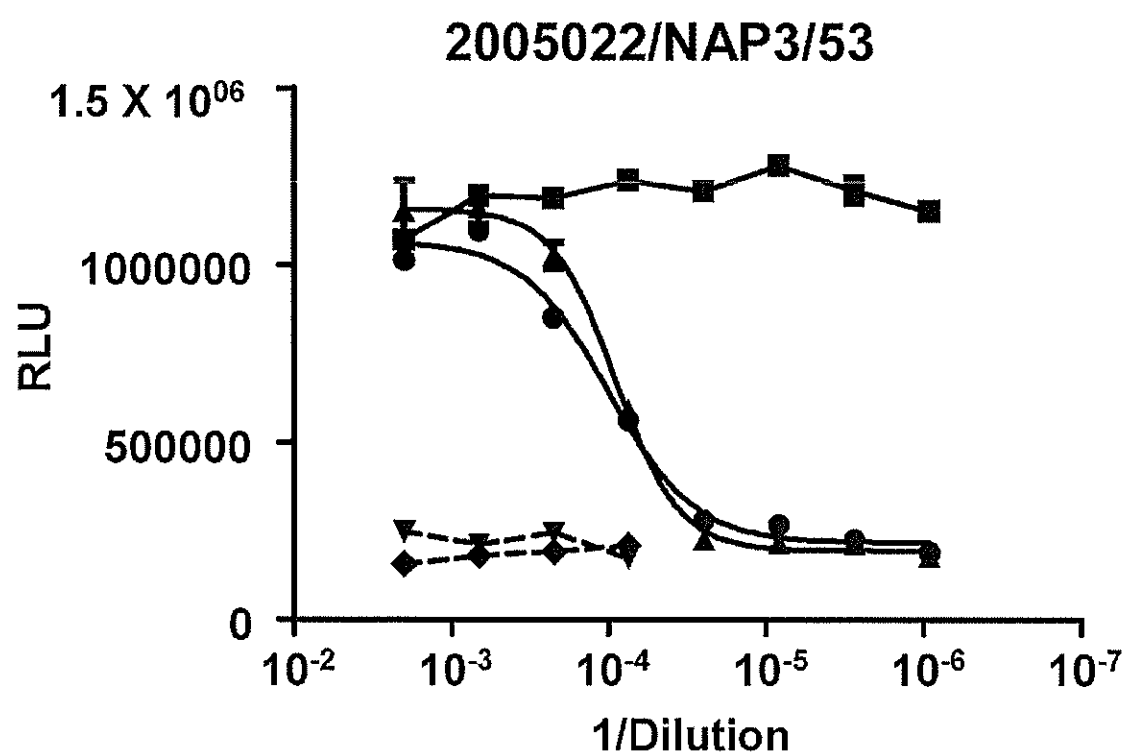
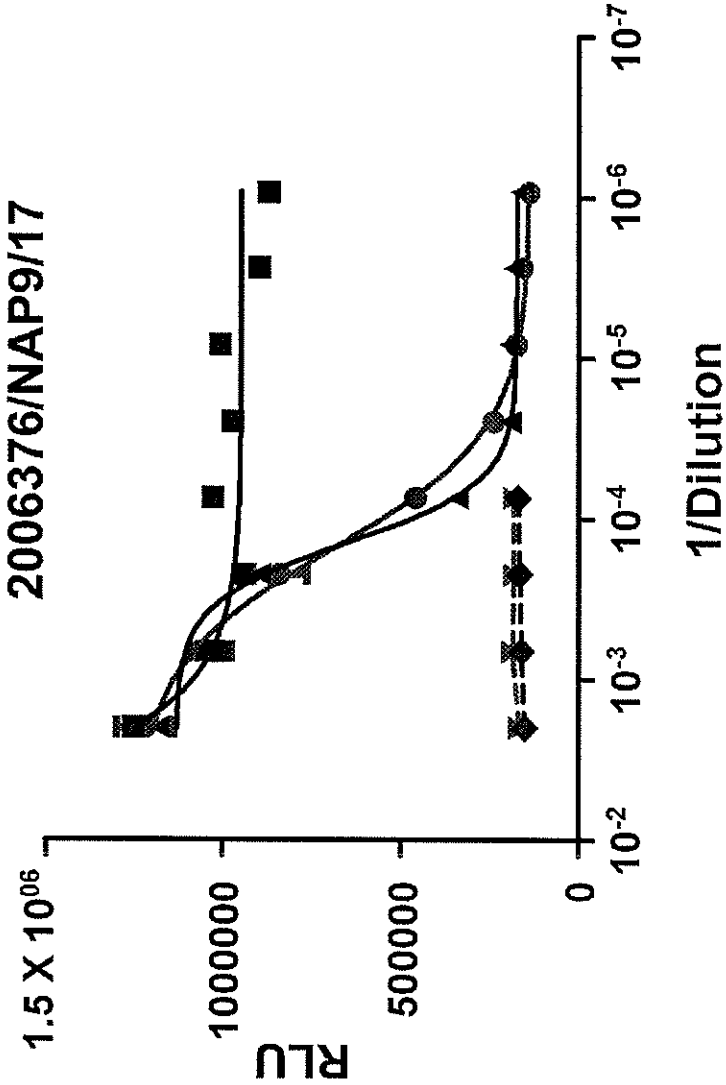
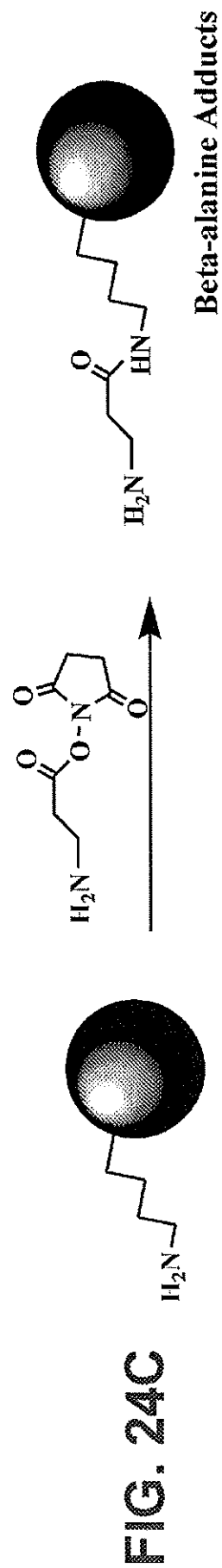
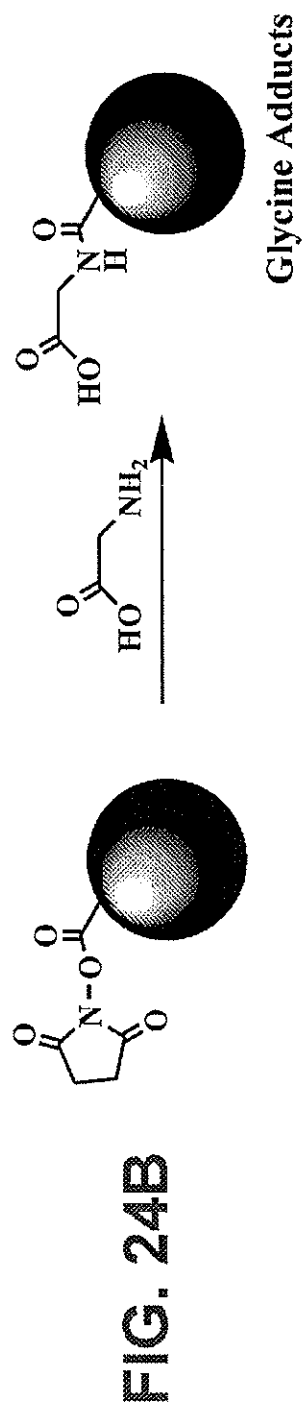
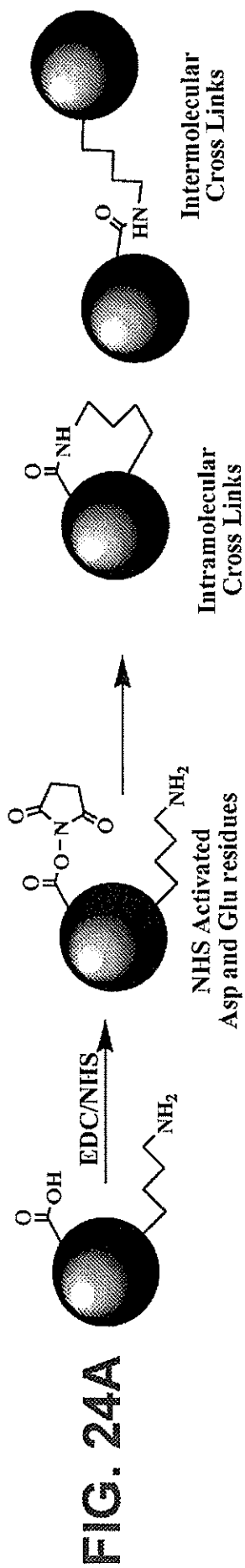
FIG. 23 I**FIG. 23J**

FIG. 23K





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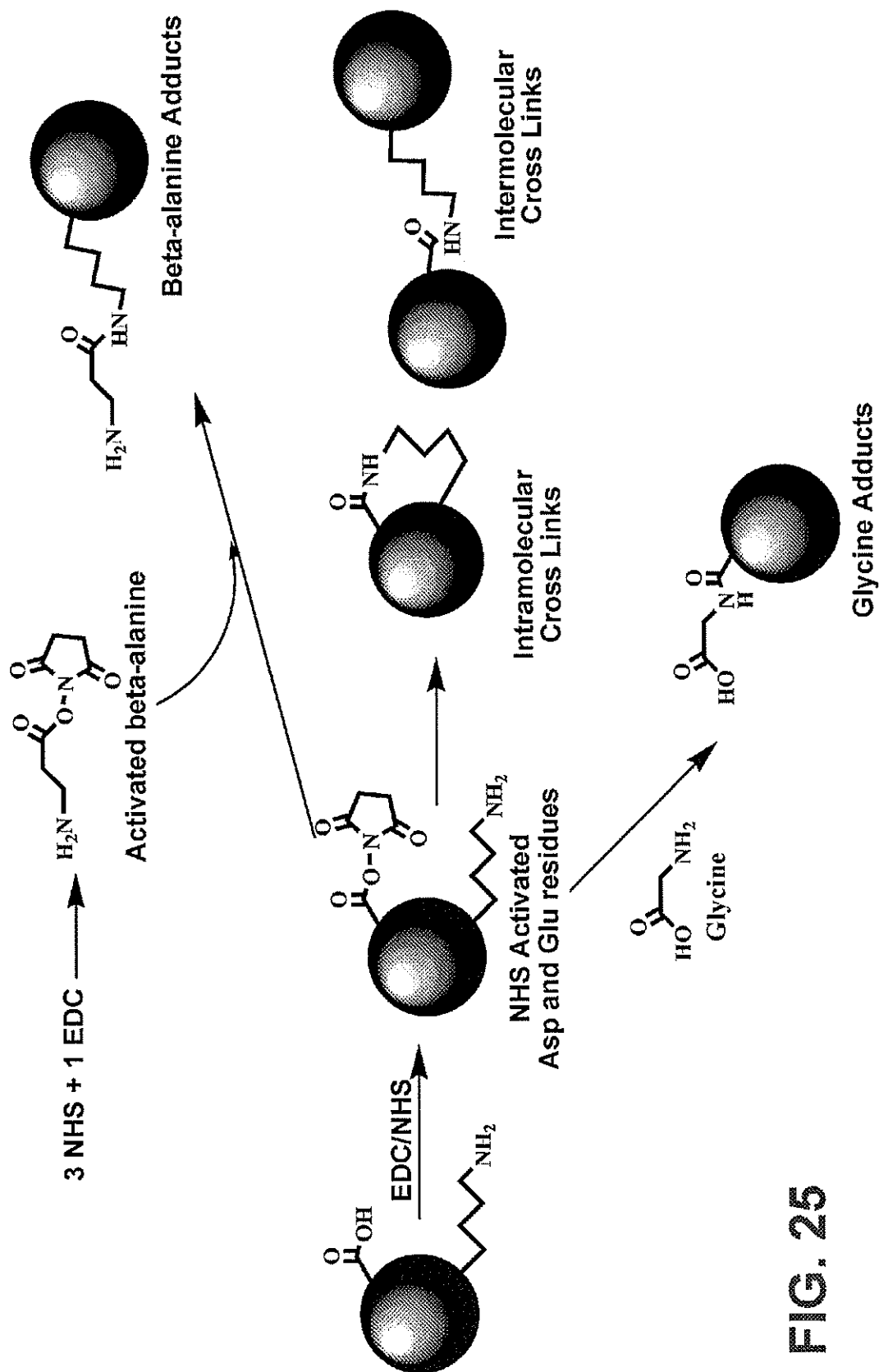


FIG. 25