

FIG. 1A

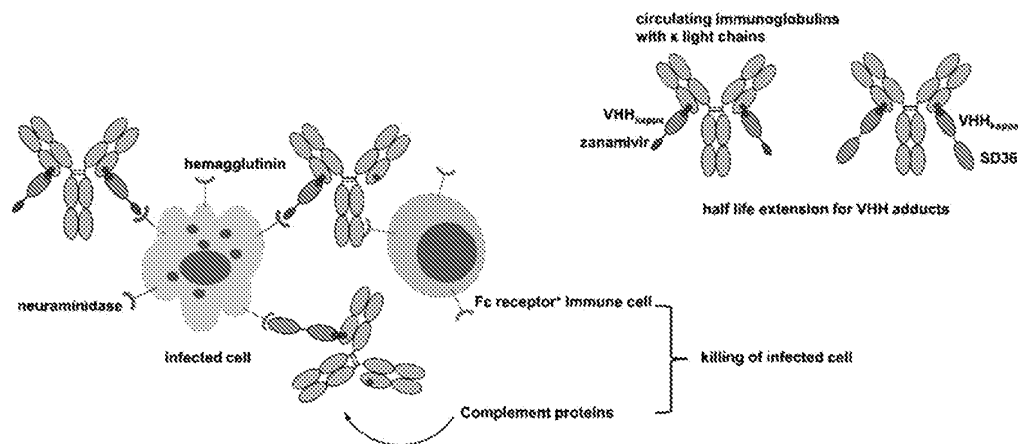


FIG. 1B

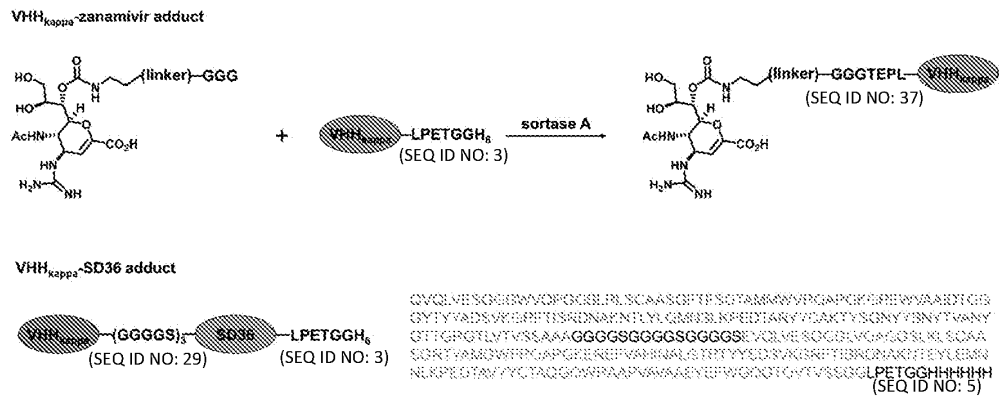


FIG. 1C

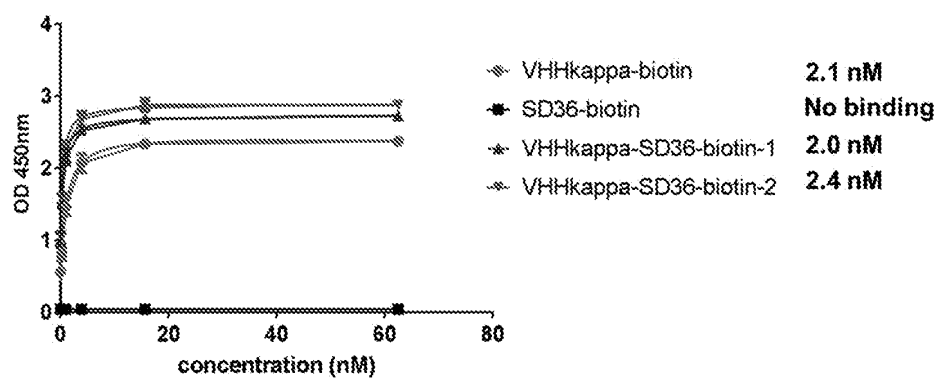


FIG. 2

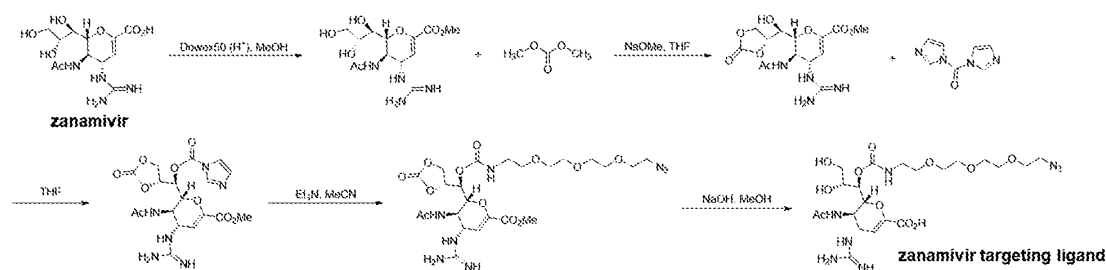


FIG. 3A

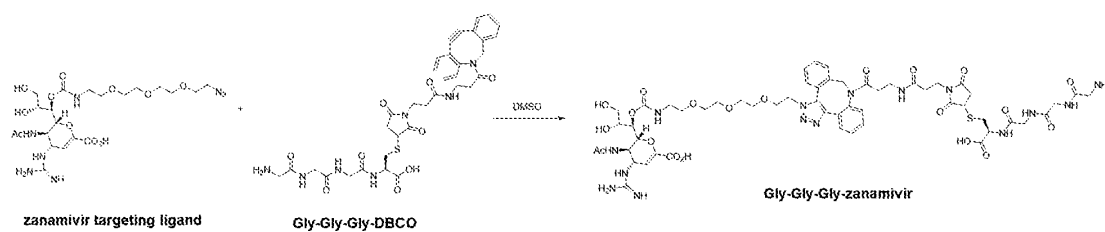


FIG. 3B

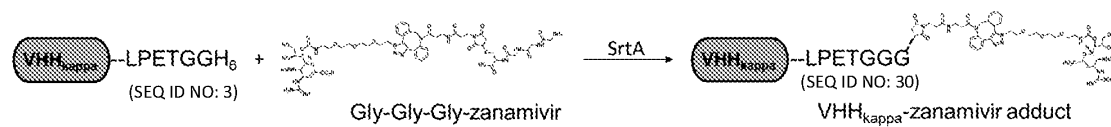


FIG. 3C

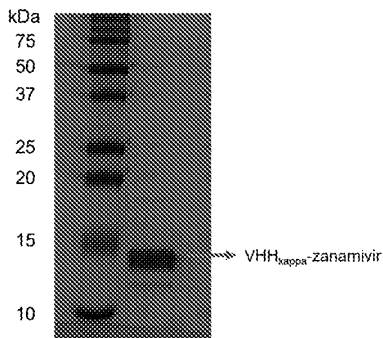


FIG. 4A

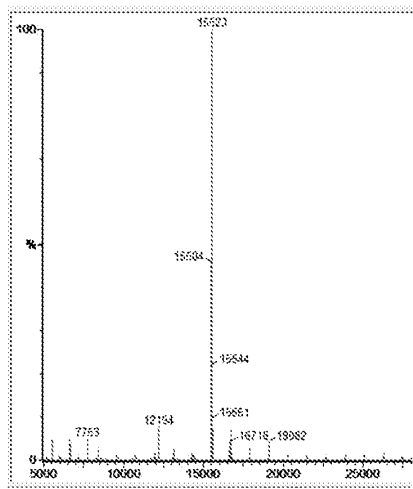


FIG. 4B

Influenza A virus -- A/Wisconsin/629-D00015/2009 (H1N1)pdm09

K_d : 6.0 nM

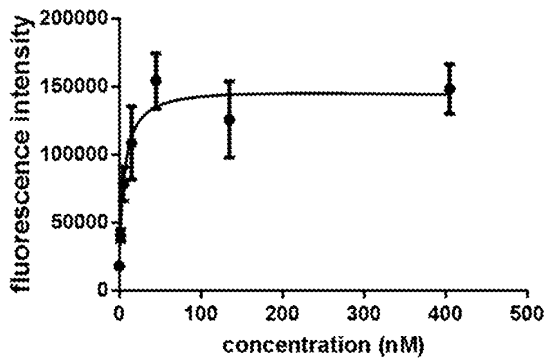


FIG. 5A

Influenza A virus -- A/Hong Kong/8/1968 (H3N2)

K_d : 10.5 nM

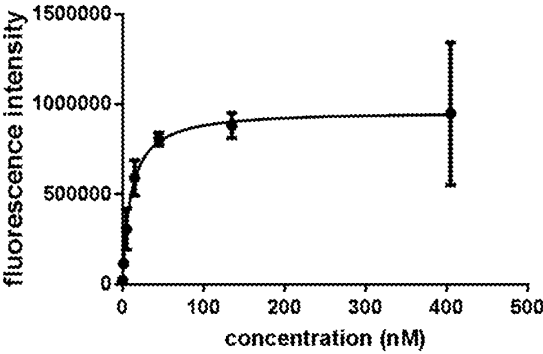


FIG. 5B

influenza B virus -- B/Florida/4/2006

K_d : 7.2 nM

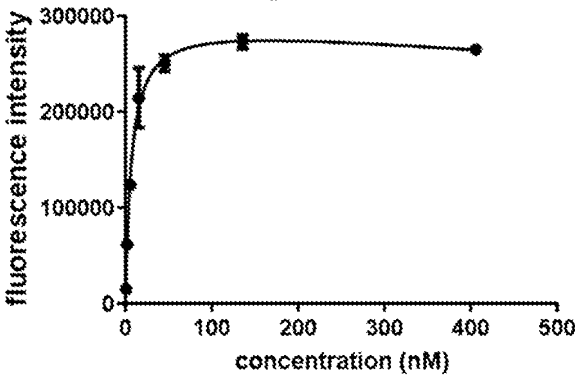


FIG. 5C

influenza B virus -- B/Brisbane/60/2008

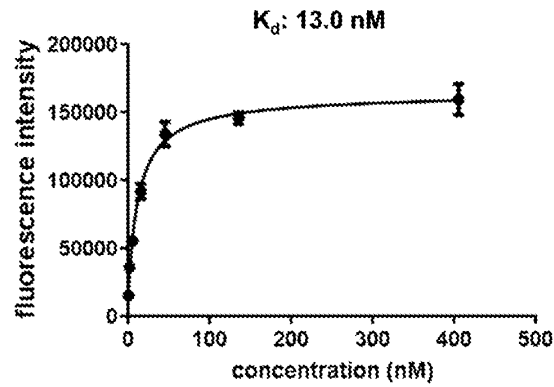


FIG. 5D

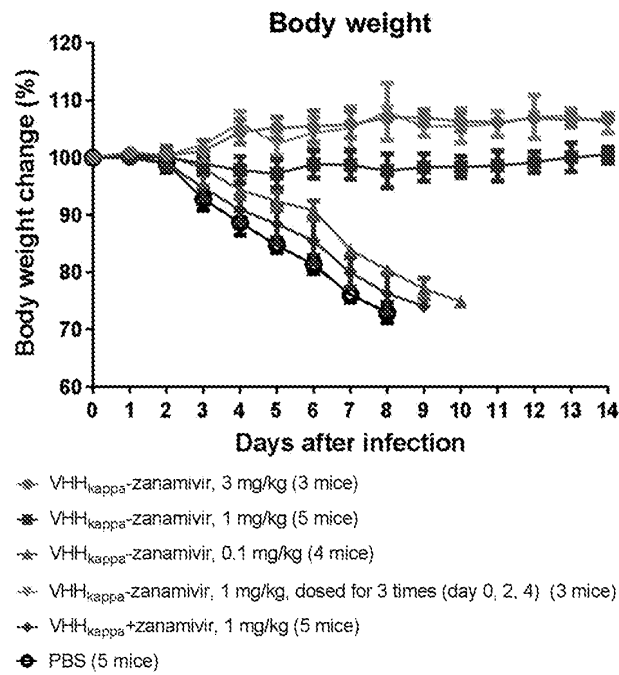


FIG. 6A

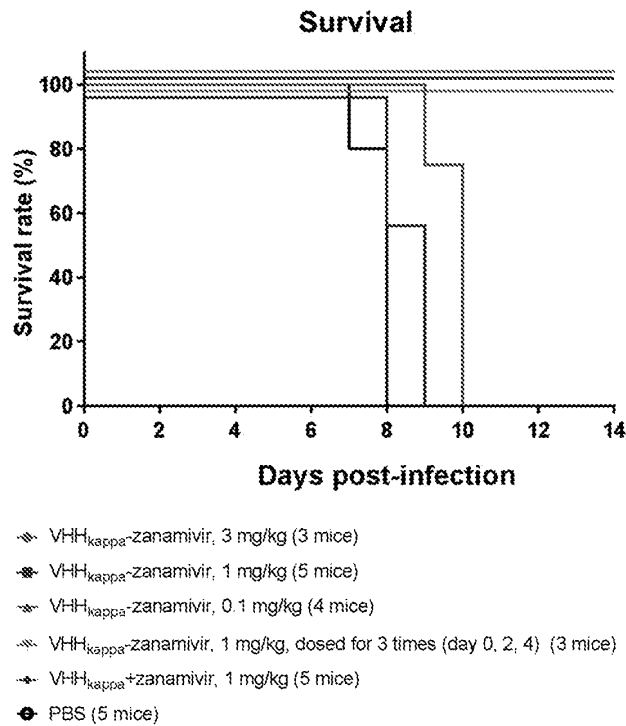


FIG. 6B

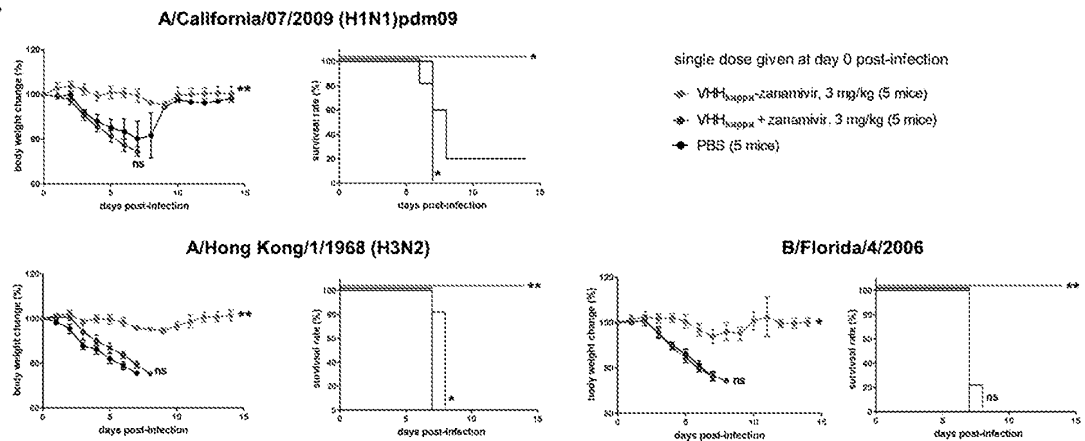


FIG. 6C

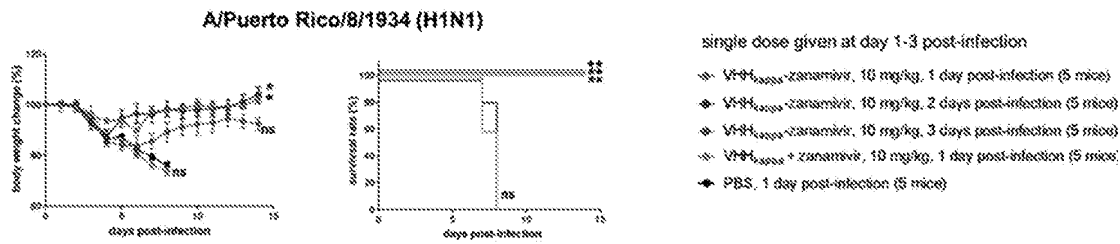


FIG. 6D

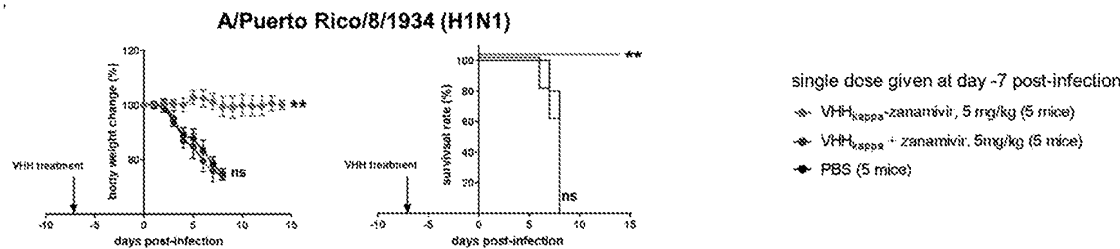


FIG. 6E

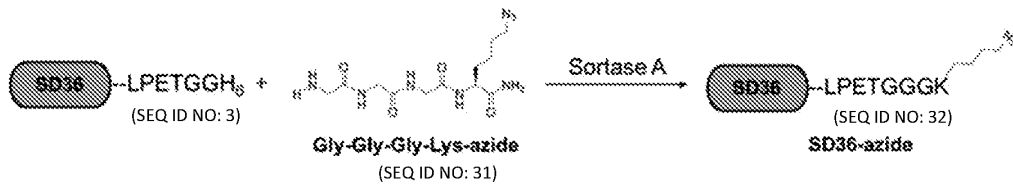


FIG. 7A

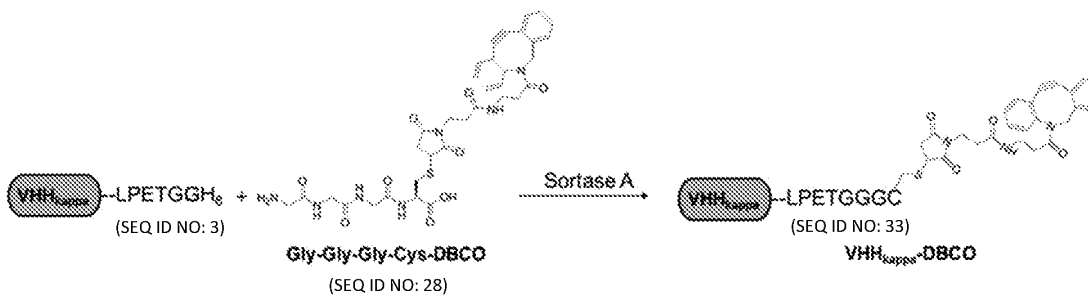


FIG. 7B

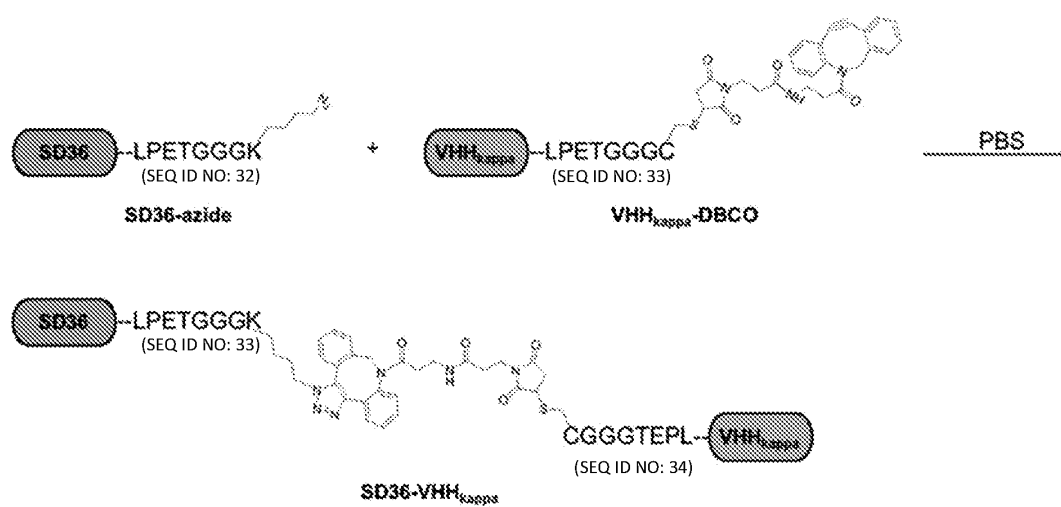


FIG. 7C

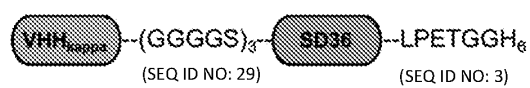


FIG. 7D

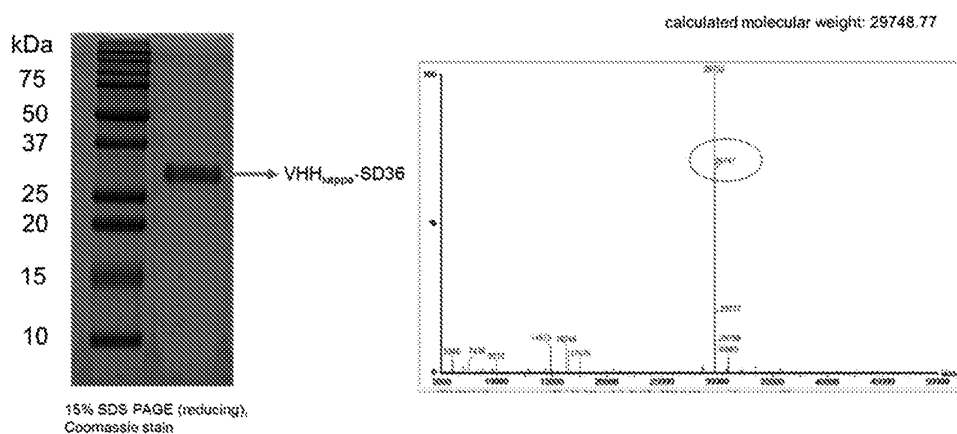


FIG. 7E

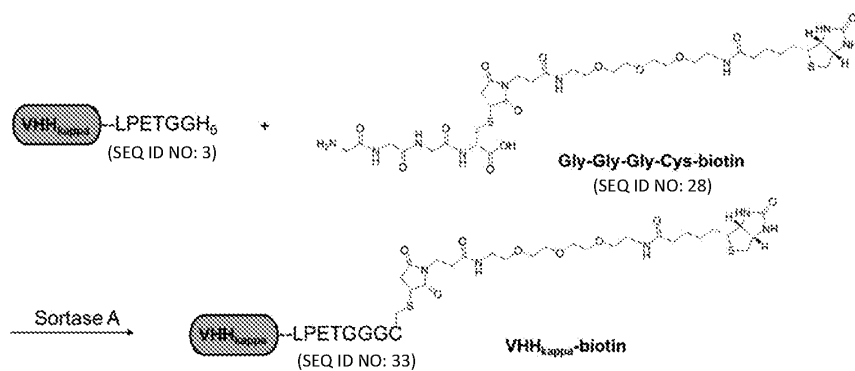


FIG. 8A

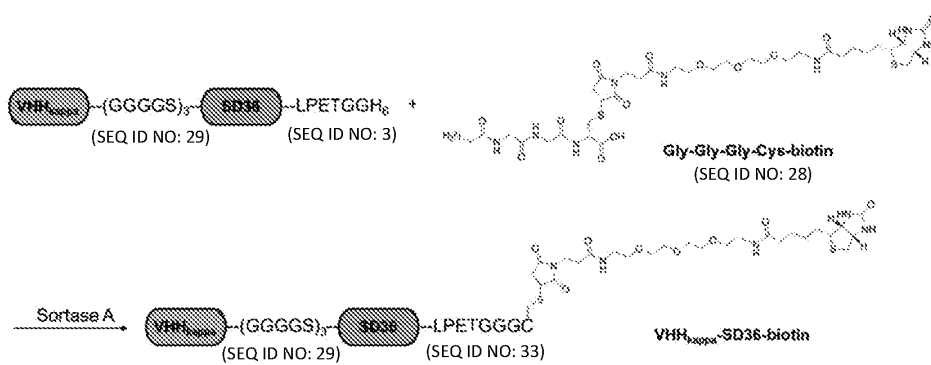


FIG. 8B

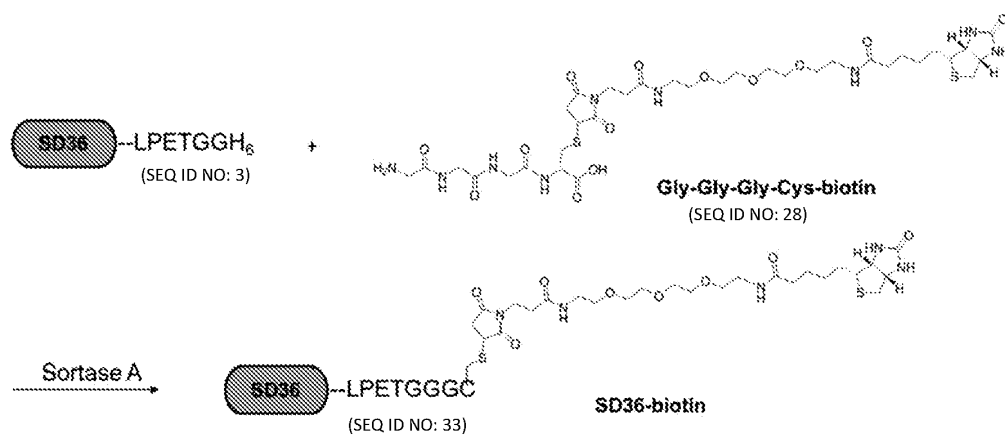
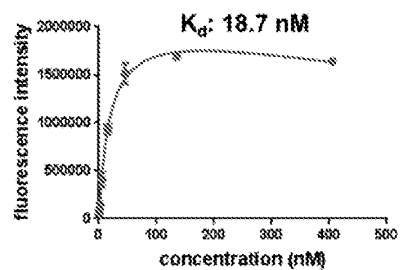


FIG. 8C

SD36-biotin

A/Wisconsin/629-D00015/2009 (H1N1)pdm09



A/Hong Kong/8/1968 (H3N2)

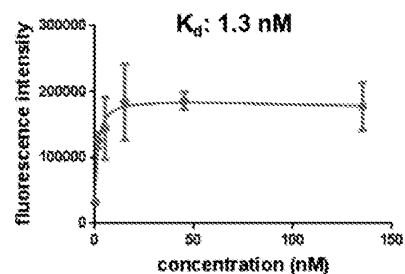
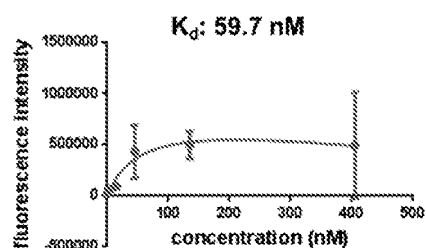


FIG. 9A

VHH_{kappa}-SD36-biotin (genetic fusion)

A/Wisconsin/629-D00015/2009 (H1N1)pdm09



A/Hong Kong/8/1968 (H3N2)

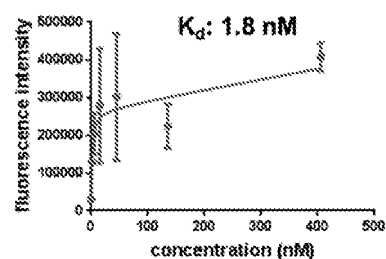
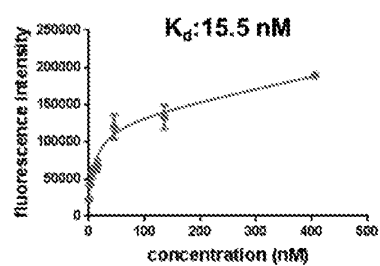


FIG. 9B

VHH_{kappa}-SD36 (C to C conjugation by click reaction)

A/Wisconsin/629-D00015/2009 (H1N1)pdm09



A/Hong Kong/8/1968 (H3N2)

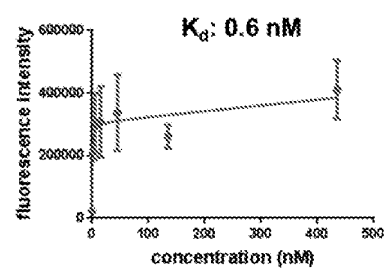


FIG. 9C

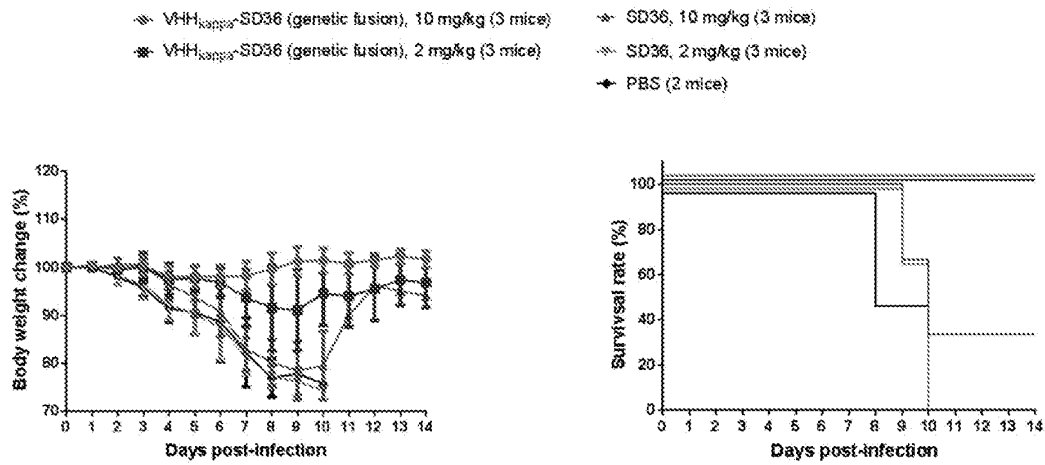


FIG. 10A

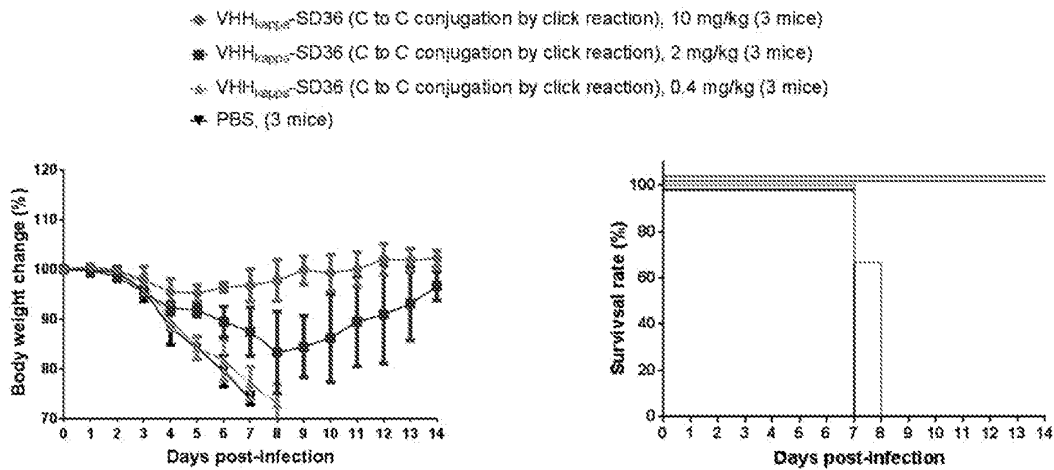


FIG. 10B

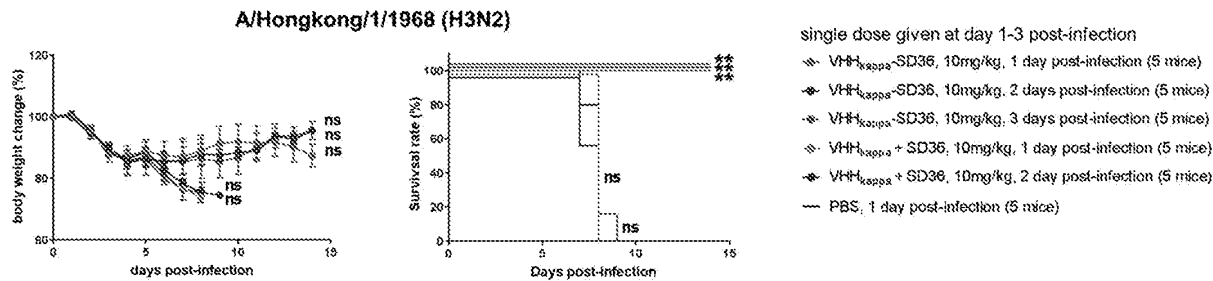


FIG. 10C

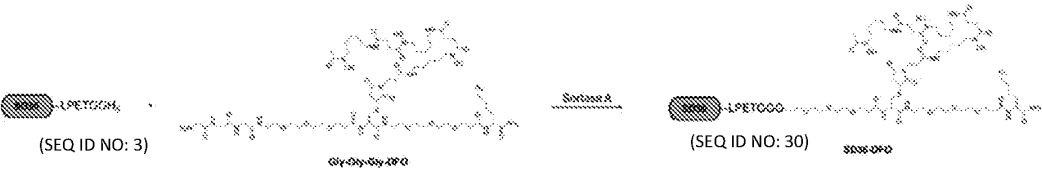


FIG. 11A

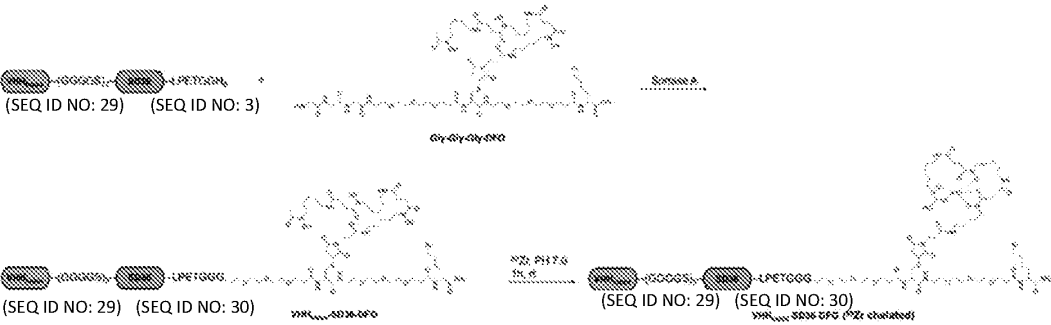


FIG. 11B

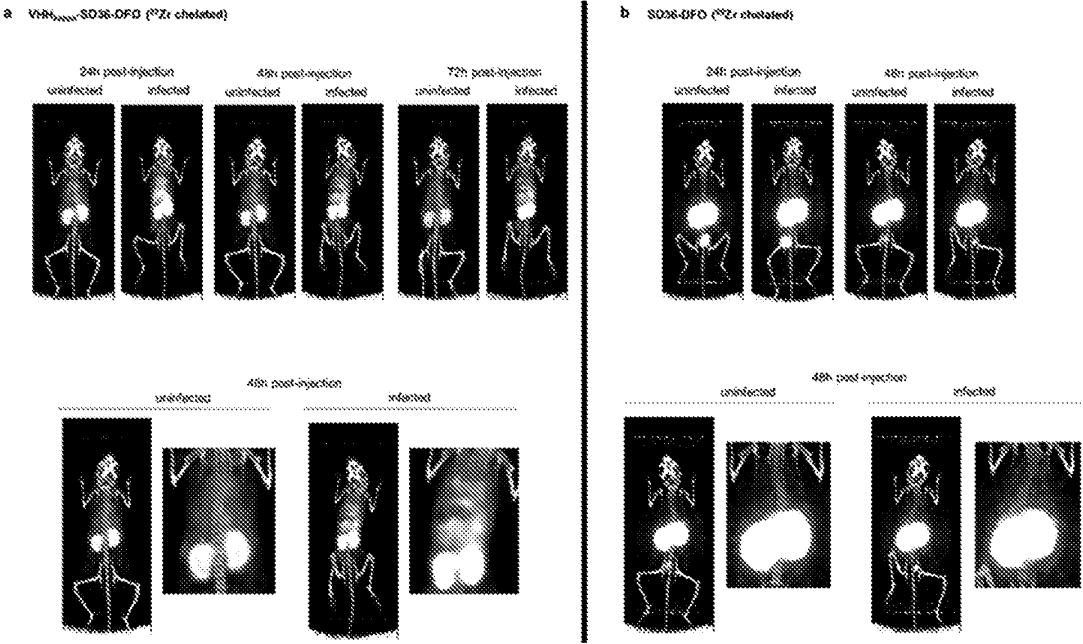


FIG. 12



FIG. 13A

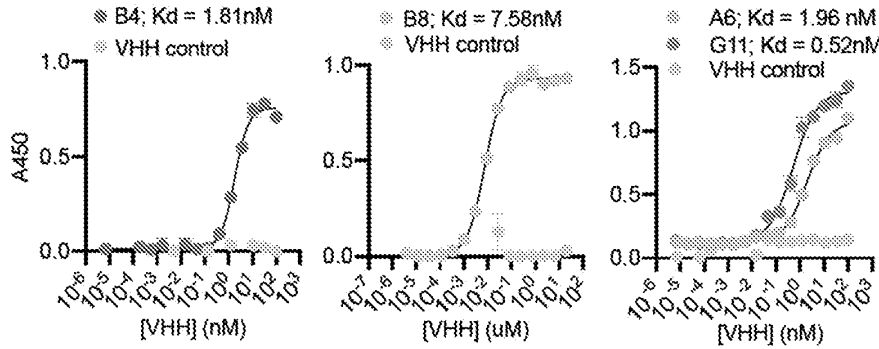


FIG. 13B

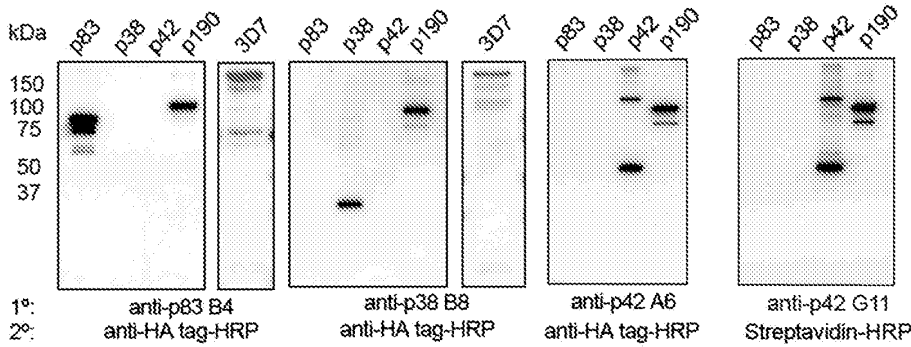


FIG. 13C

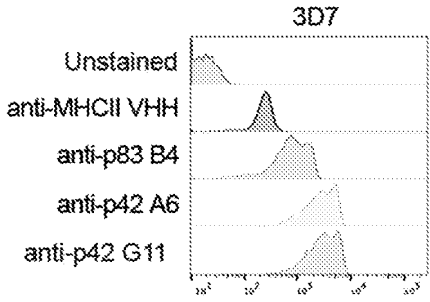


FIG. 13D

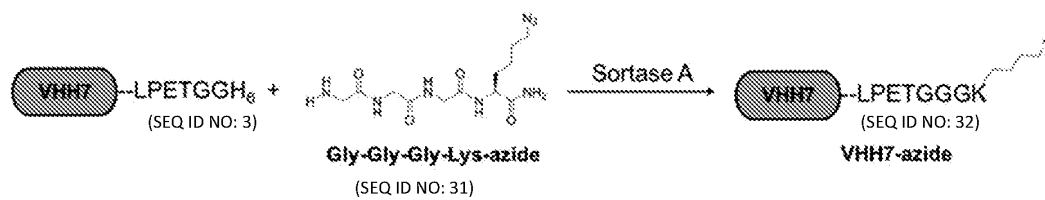


FIG. 14A

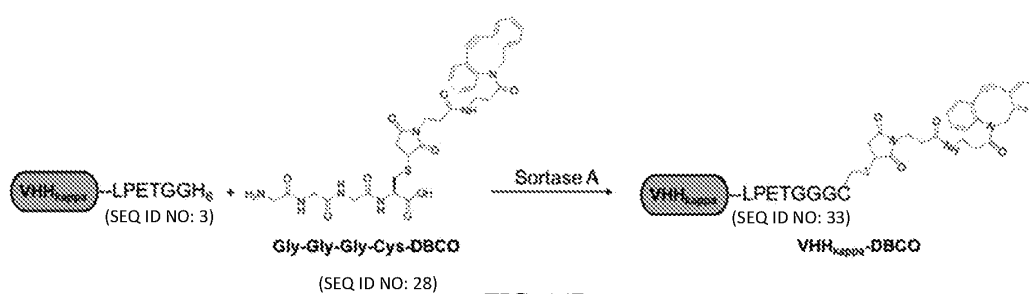


FIG. 14B

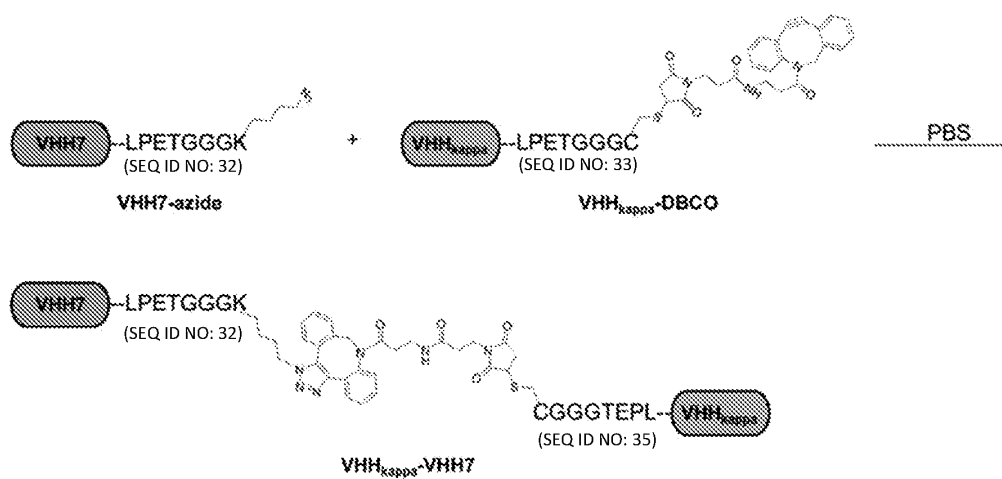


FIG. 14C

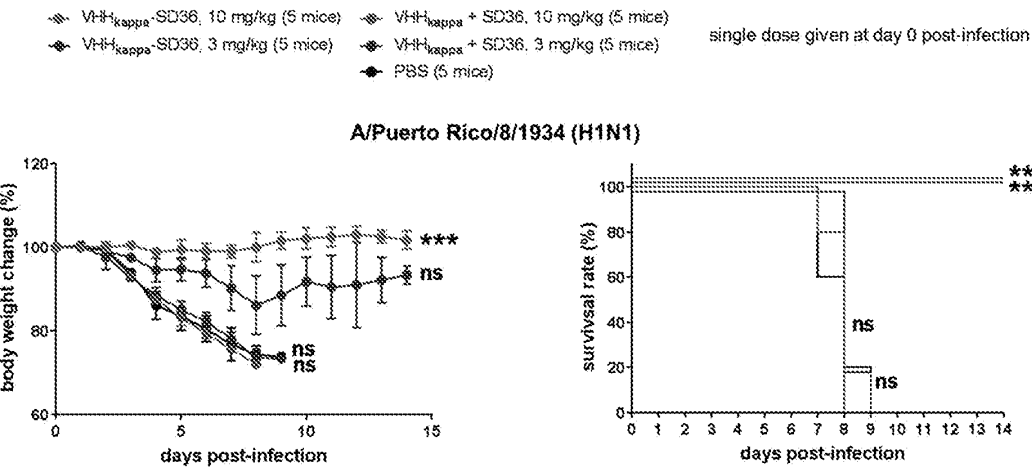


FIG. 14D

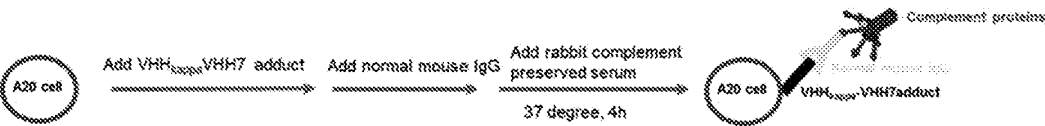


FIG. 15A

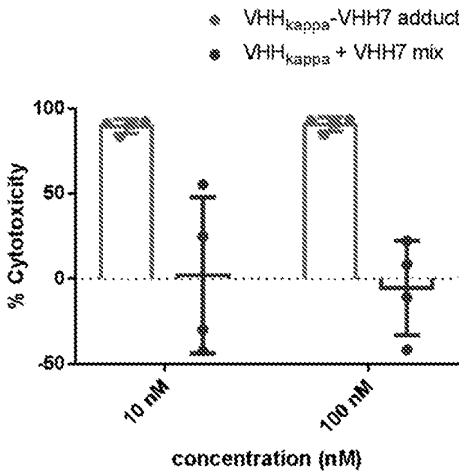


FIG. 15B

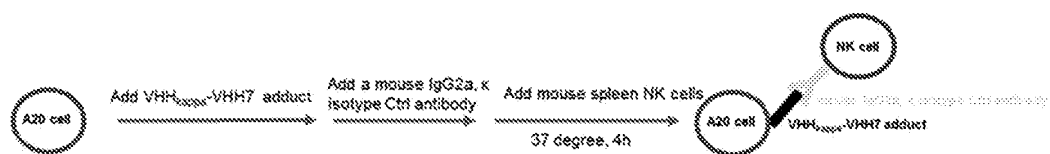


FIG. 16A

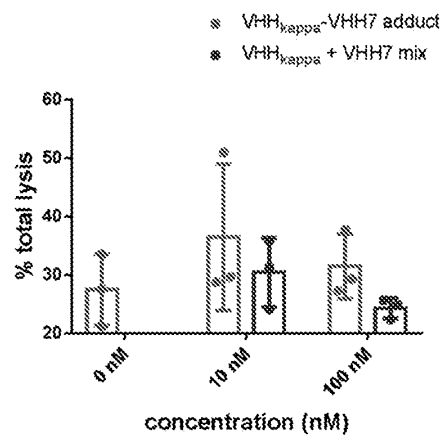


FIG. 16B



FIG. 17A

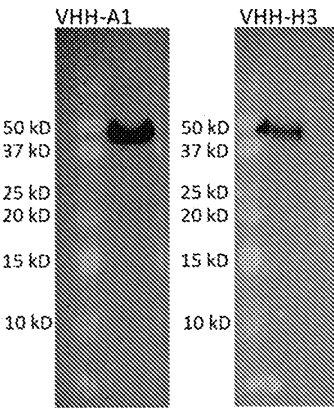


FIG. 17B

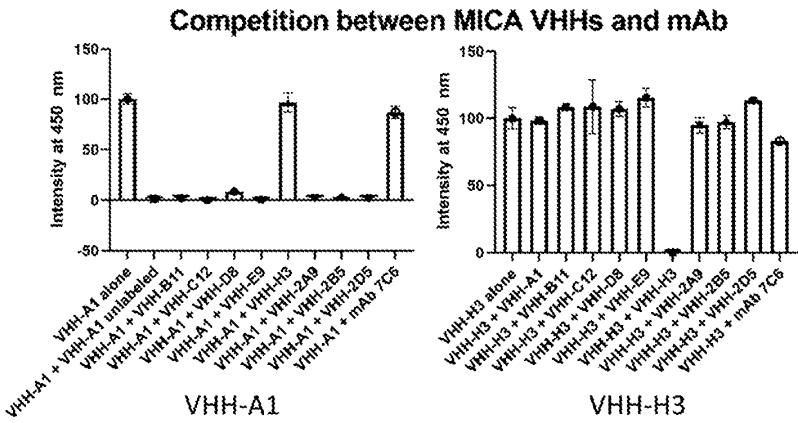


FIG. 17C

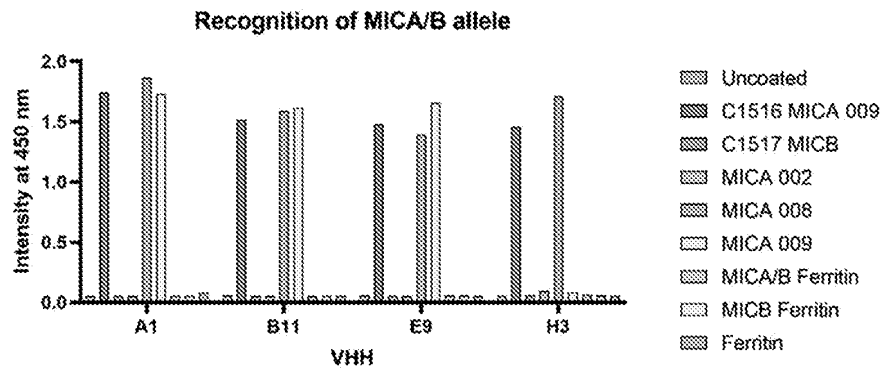


FIG. 17D

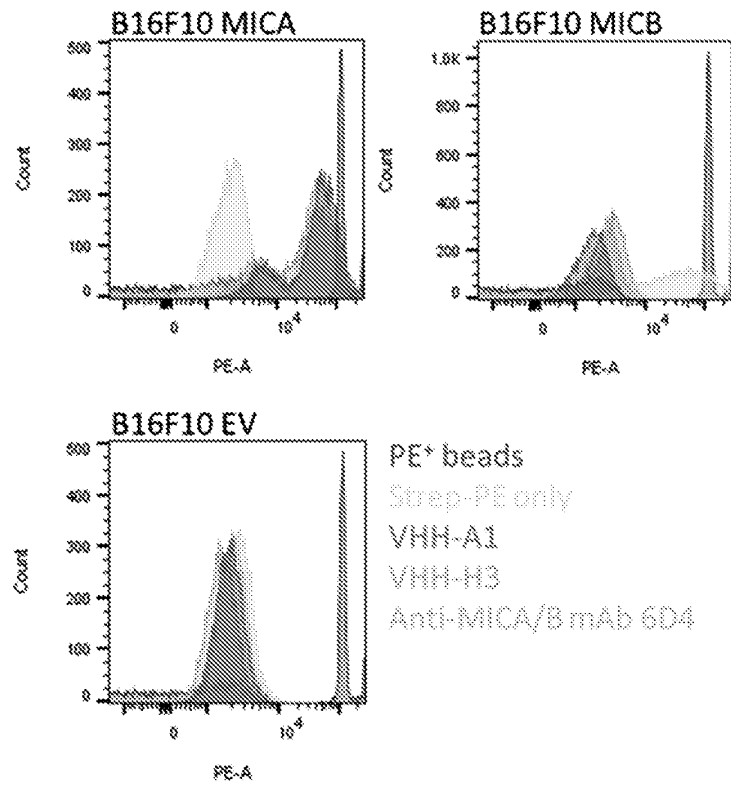


FIG. 17E

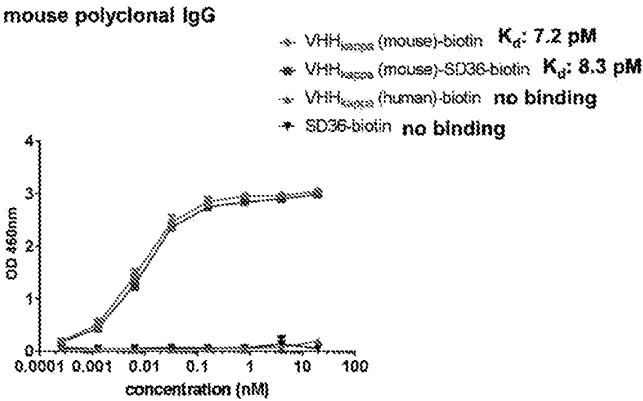


FIG. 18A

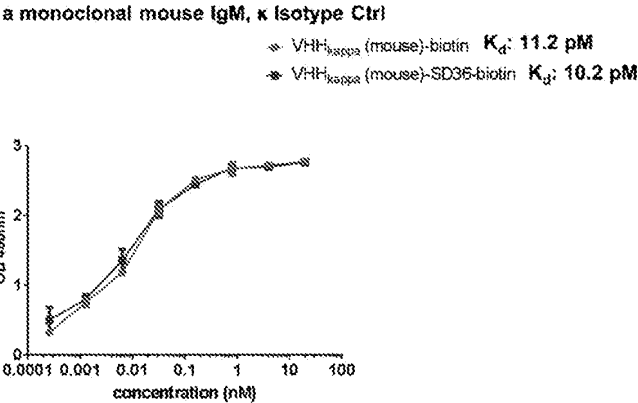


FIG. 18B

mouse polyclonal IgA

- VHH_{kappa} (mouse)-biotin K_d : 508.4 pM
- VHH_{kappa} (mouse)-SD35-biotin K_d : 434.2 pM

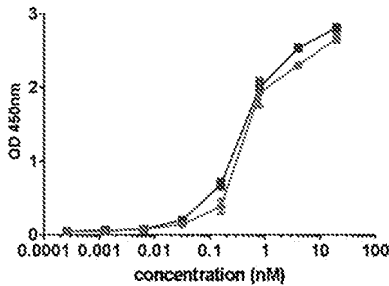


FIG. 18C

	VHH _{kappa} -zanamivir	ALB1-zanamivir	zanamivir	VHH _{kappa}
A/Puerto Rico/8/1934 (H1N1)	21.5	35.5	0.2	no inhibition
A/WSN/33 (H1N1)	9.9	16.1	0.4	no inhibition
A/California/07/2009 (H1N1)	44.3	21.5	0.2	no inhibition
A/Hong Kong/8/1968 (H3N2)	16.9	26.3	0.6	no inhibition
B/Florida/4/2006	255.2	313.9	1.6	no inhibition
B/Brisbane/60/2008	198.3	220.5	2.9	no inhibition

IC50 (nM)

FIG. 19A

- VHH_{kappa}-zanamivir
- ALB1-zanamivir
- zanamivir
- Vt-H_{kappa}

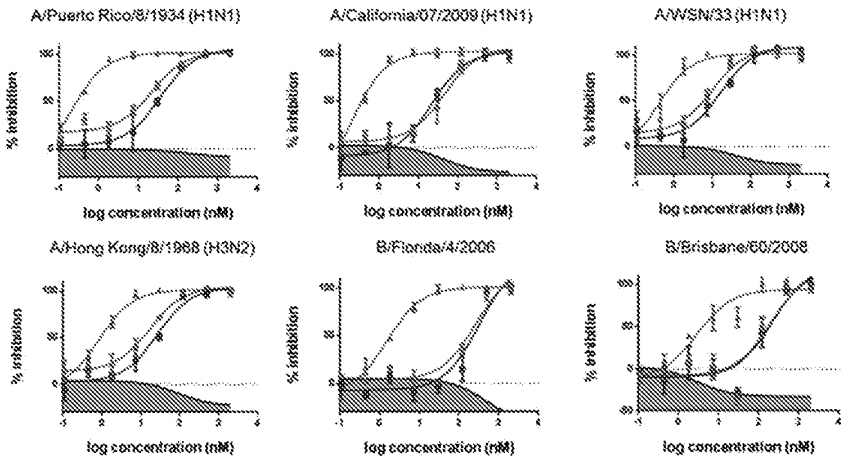


FIG. 19B

Influenza A virus -- A/Wisconsin/629-D00015/2009 (H1N1)pdm0

K_d : 15.5 nM

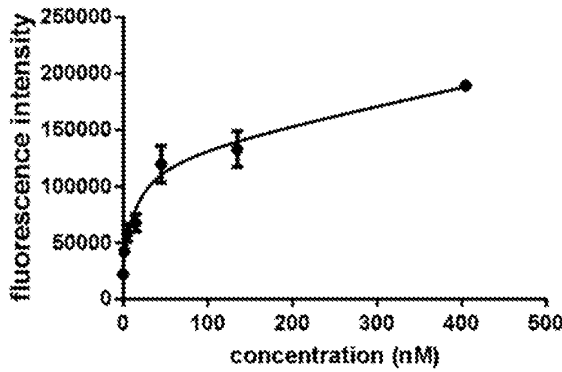


FIG. 20A

Influenza A virus -- A/Hong Kong/8/1968 (H3N2)

K_d : 0.6 nM

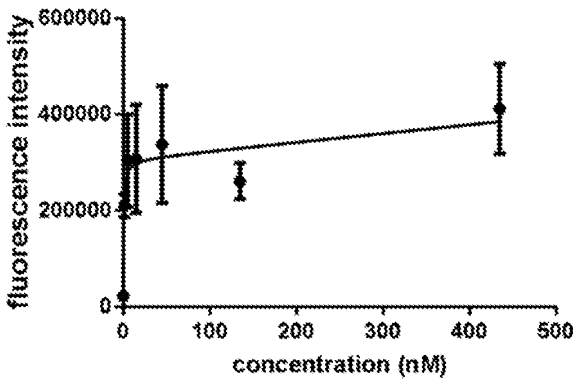


FIG. 20B

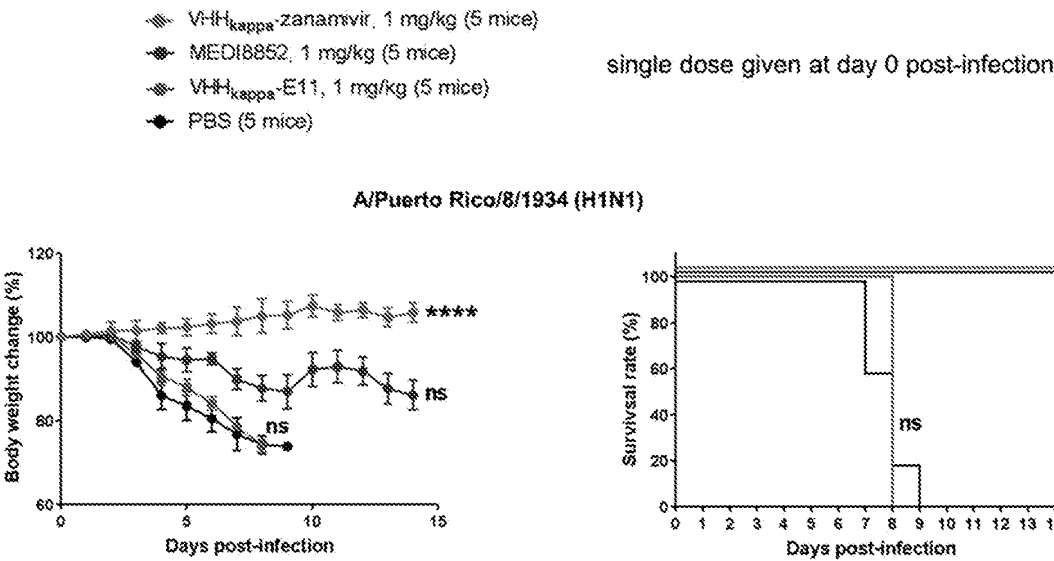


FIG. 21

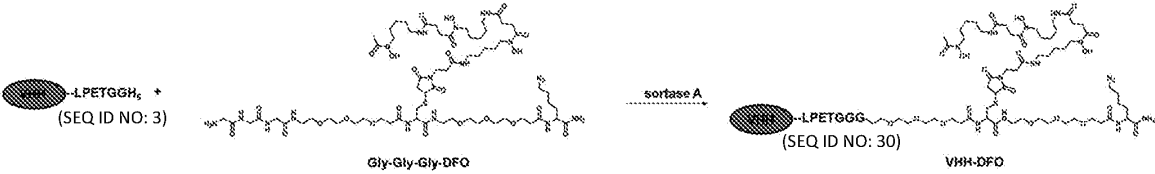


FIG. 22A

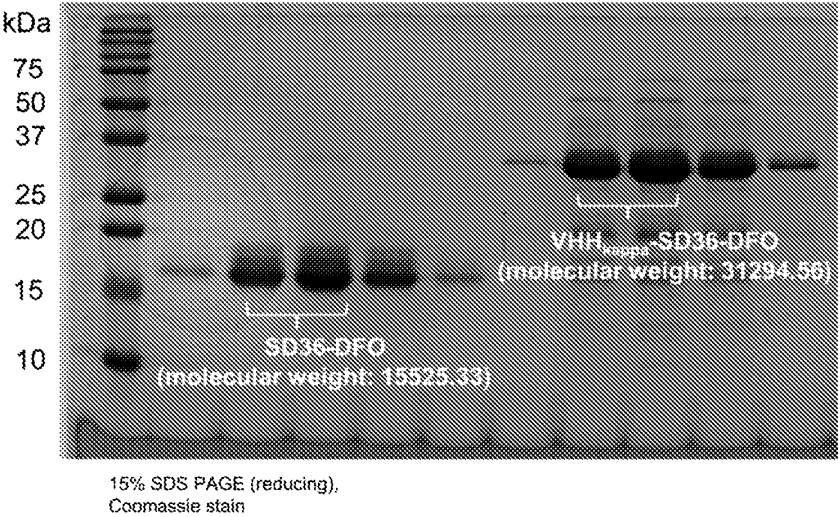


FIG. 22B

- VHH_{kappa}-zanamivir adduct (10 nM)
- VHH_{kappa} (10 nM) + zanamivir (10 nM) mix

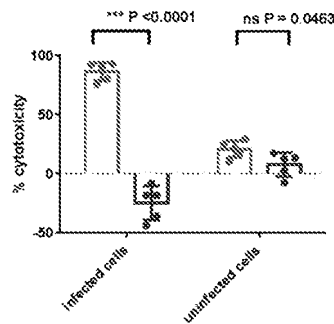


FIG. 23A

- VHH_{kappa}-zanamivir adduct (10 nM)
- VHH_{kappa} (10 nM) + zanamivir (10 nM) mix

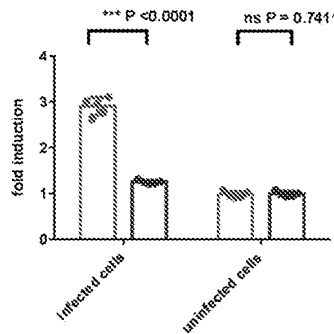
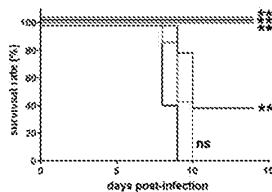
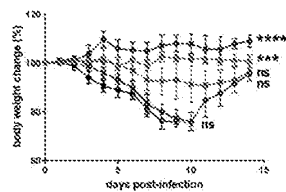


FIG. 23B

A/Puerto Rico/8/1934 (H1N1)



single dose given at day 0 post-infection

- VHH_{kappa}-zanamivir, 1 mg/kg (5 mice)
- VHH_{kappa}-zanamivir, 0.3 mg/kg (5 mice)
- ALB1-zanamivir, 10 mg/kg (5 mice)
- ALB1-zanamivir, 3 mg/kg (5 mice)
- ALB1-zanamivir, 1 mg/kg (5 mice)
- PBS (5 mice)

FIG. 23C

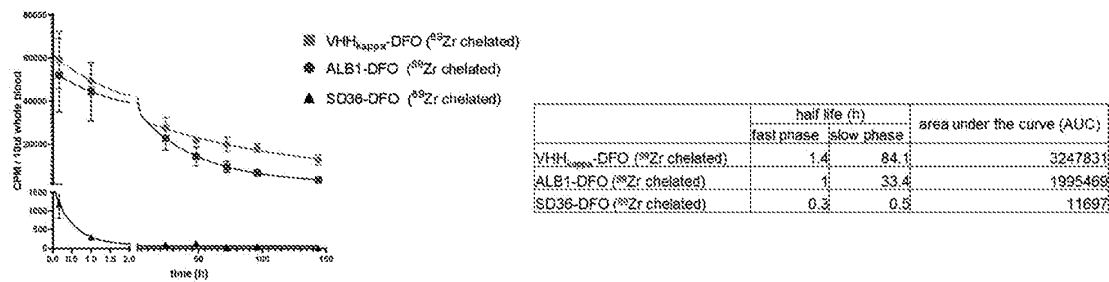


FIG. 23D

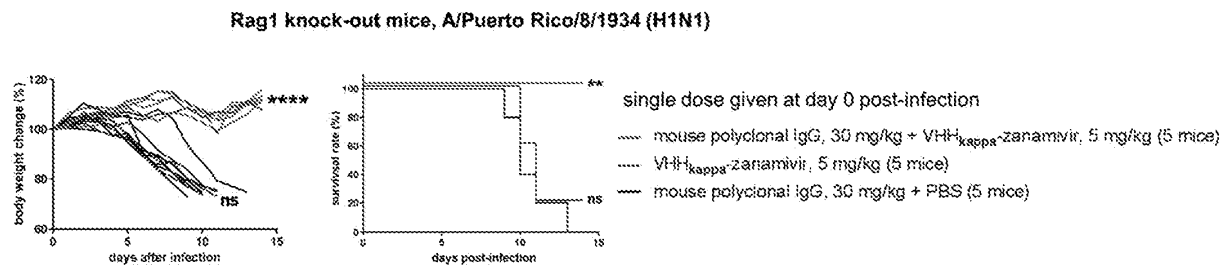


FIG. 23E

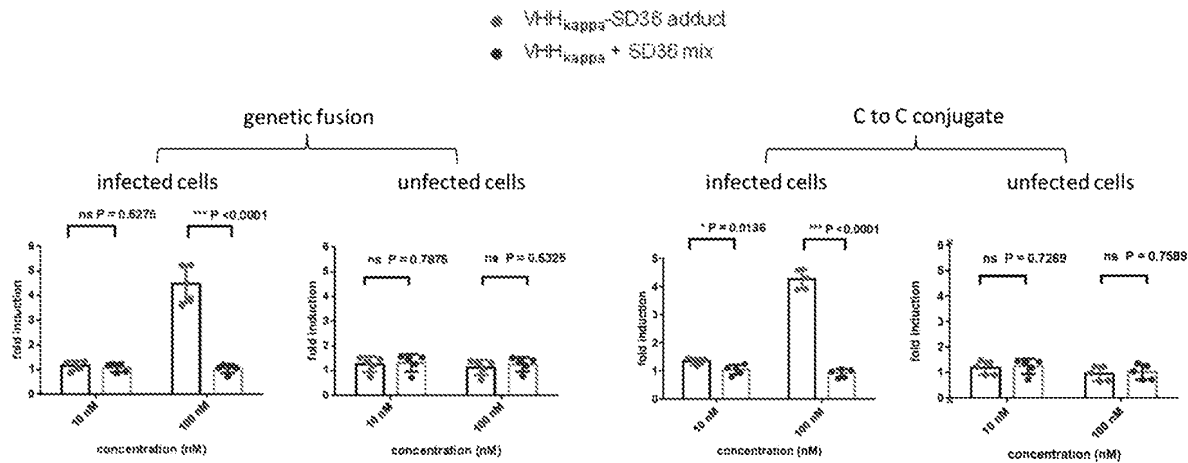


FIG. 24A

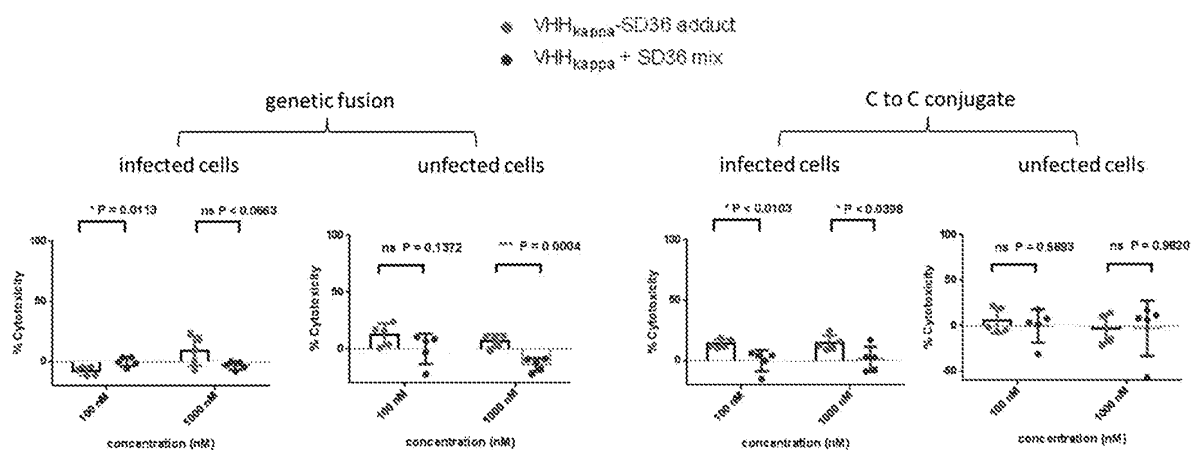


FIG. 24B



AVQLVESGGGLVQPGNSLRSLSCAASGFTFRSFGMSWVRQAPGKEPEWVSSISGSGSDTLYADSVKG
RFTISRDNAKTTLYLQMNSLKPEDTAVYYCTIGGSLRSSQGTQVTVSSGGLPETGGHHHHHHH
(SEQ ID NO: 38)

FIG. 25A

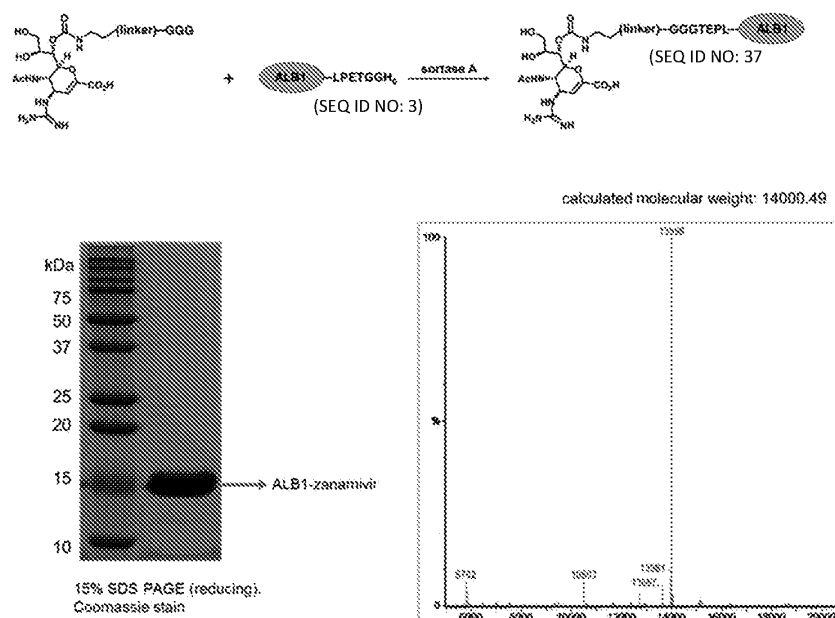


FIG. 25B

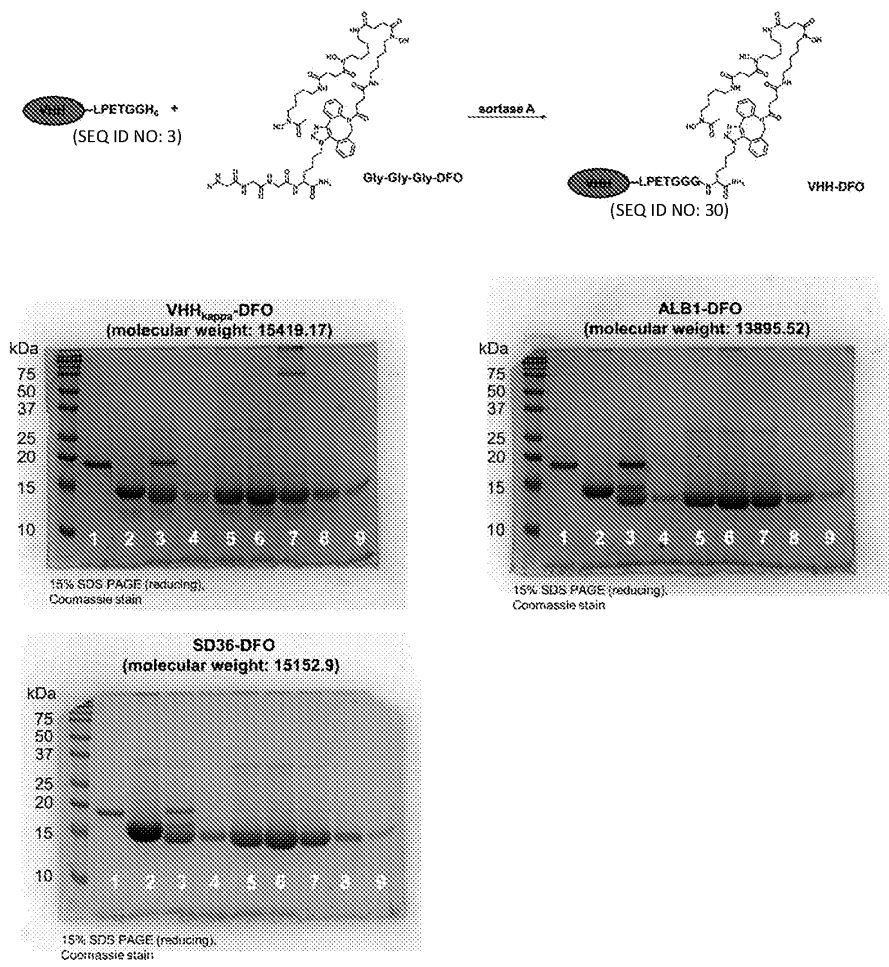


FIG. 26