Figure 1

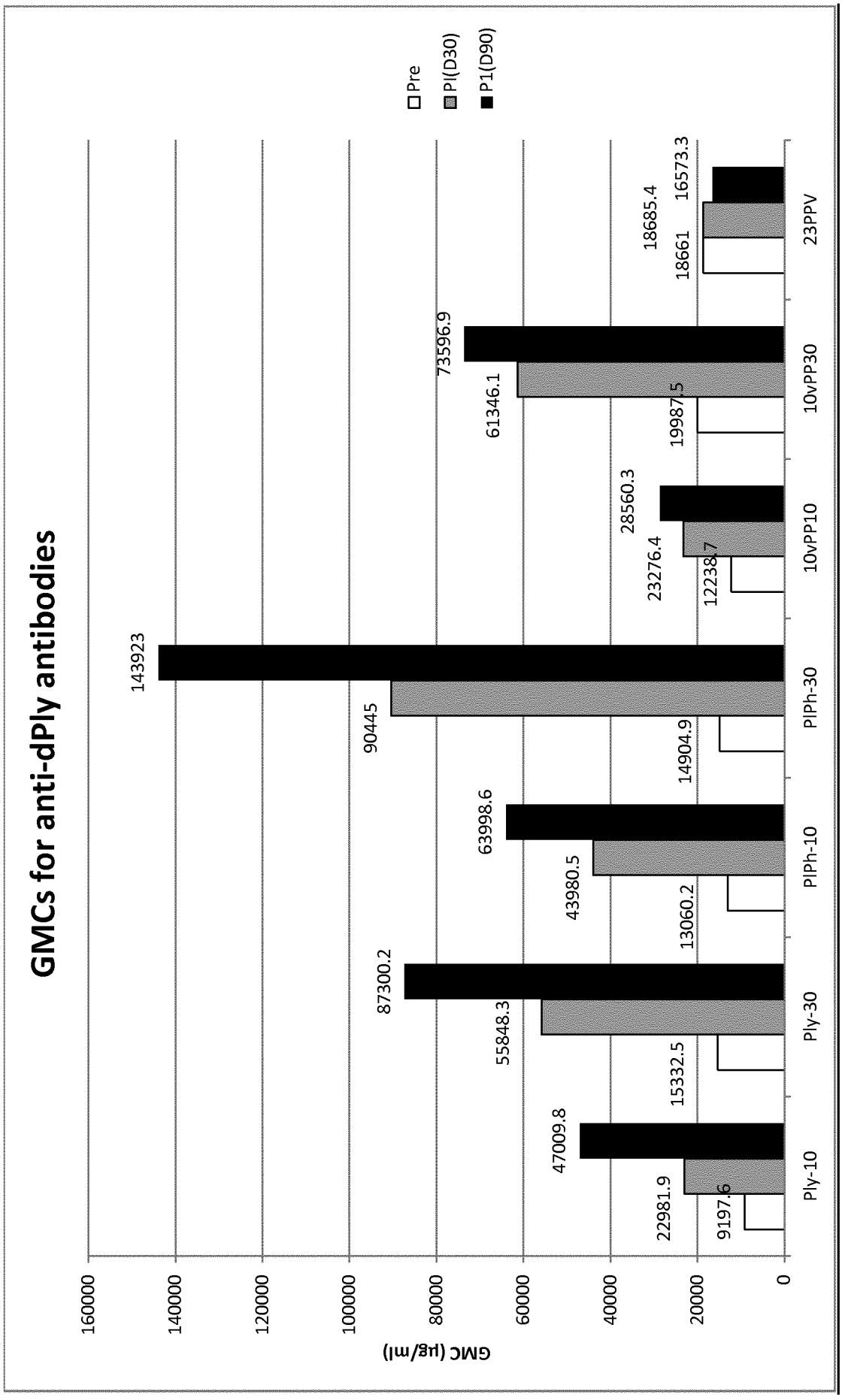

GMCs for anti-dPly antibodies
Pre
PI(D30)
P1(D90)
GMC (µg/ml)
0
20000
40000
60000
80000
100000
120000
140000
160000
Ply-10
Ply-30
PlPh-10
PlPh-30
10vPP10
10vPP30
23PPV
9197.6
22981.9
47009.8
15332.5
55848.3
87300.2
13060.2
43980.5
63998.6
14904.9
90445
143923
12238.7
23276.4
28560.3
19987.5
61346.1
73596.9
18661
18685.4
16573.3

Figure 2

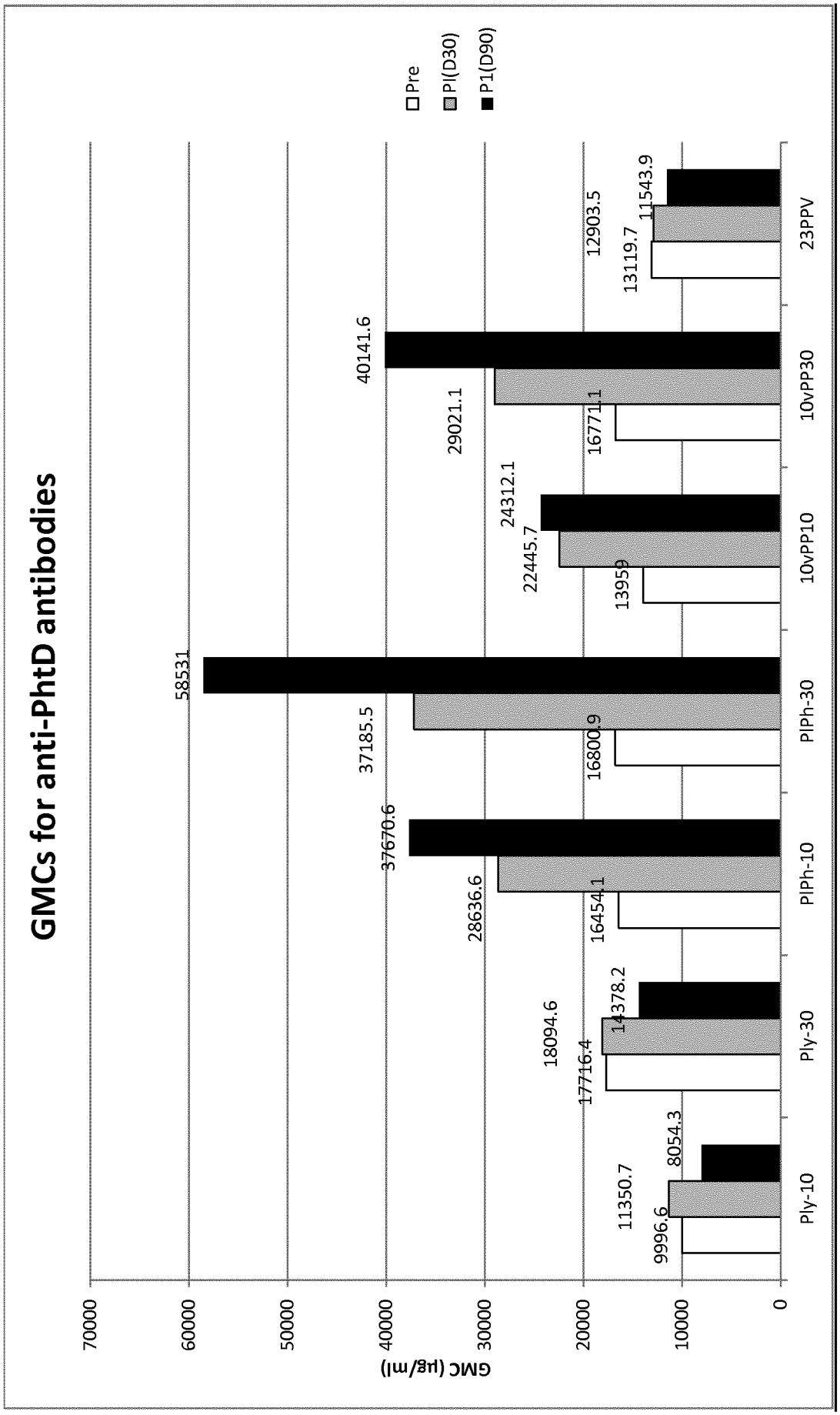

GMCs for anti-PhtD antibodies
Pre
PI(D30)
P1(D90)
GMC (µg/ml)
70000
60000
50000
40000
30000
20000
10000
0
Ply-10
Ply-30
PlPh-10
PlPh-30
10vPP10
10vPP30
23PPV
9996.6
8054.3
11350.7
17716.4
14378.2
18094.6
28636.6
16454.1
37670.6
16800.9
37185.5
58531
22445.7
13959
24312.1
29021.1
16771.1
40141.6
13119.7
11543.9
12903.5

Figure 3

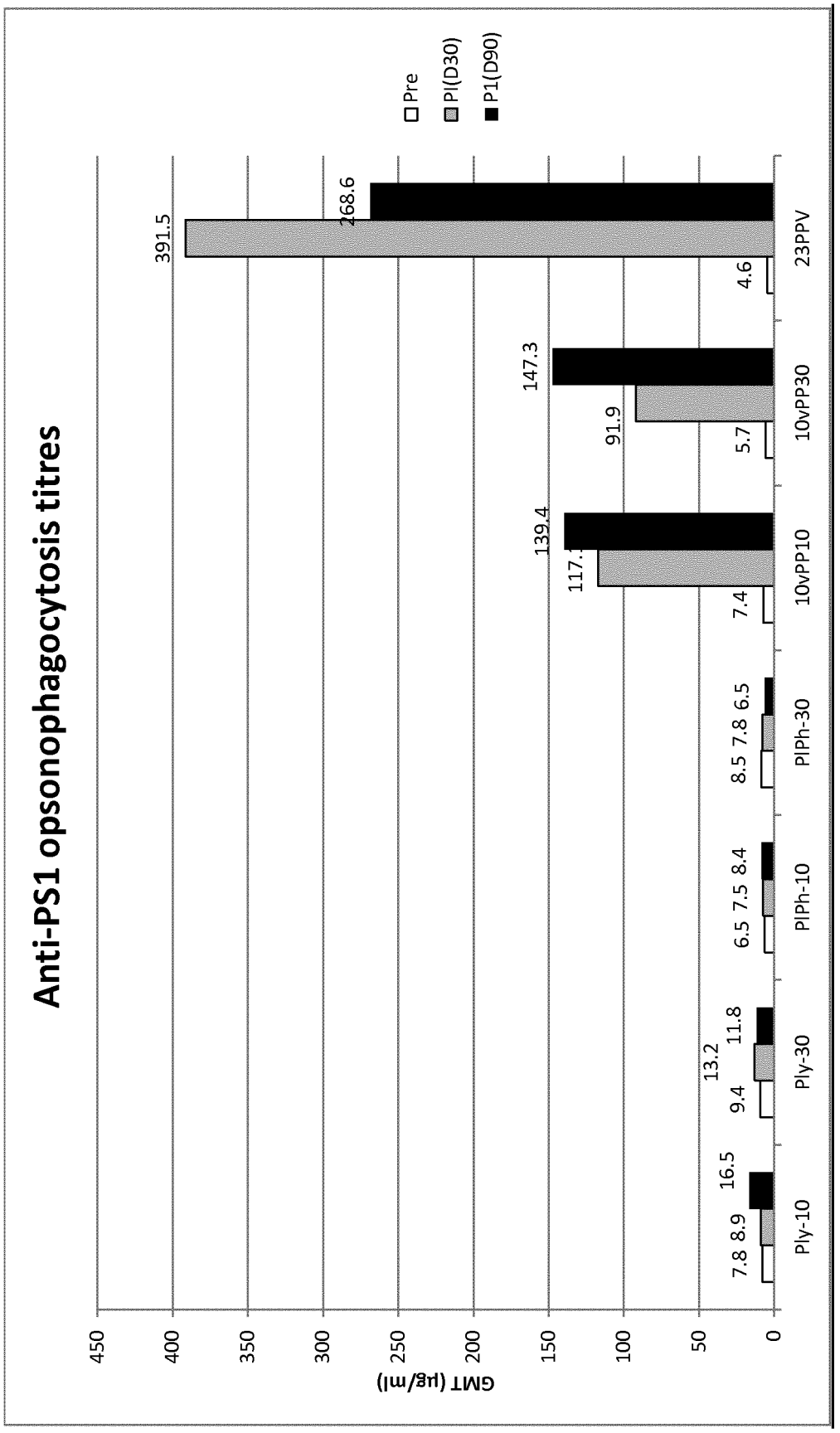

Anti-PS1 opsonophagocytosis titres
GMT (µg/ml)
Pre
PI(D30)
P1(D90)
0
50
100
150
200
250
300
350
400
450
7.8 8.9 16.5
9.4 13.2 11.8
6.5 7.5 8.4
8.5 7.8 6.5
7.4 139.4 117.1
5.7 147.3 91.9
4.6 391.5 268.6
Ply-10
Ply-30
PIPh-10
PIPh-30
10vPP10
10vPP30
23PPV

Figure 4

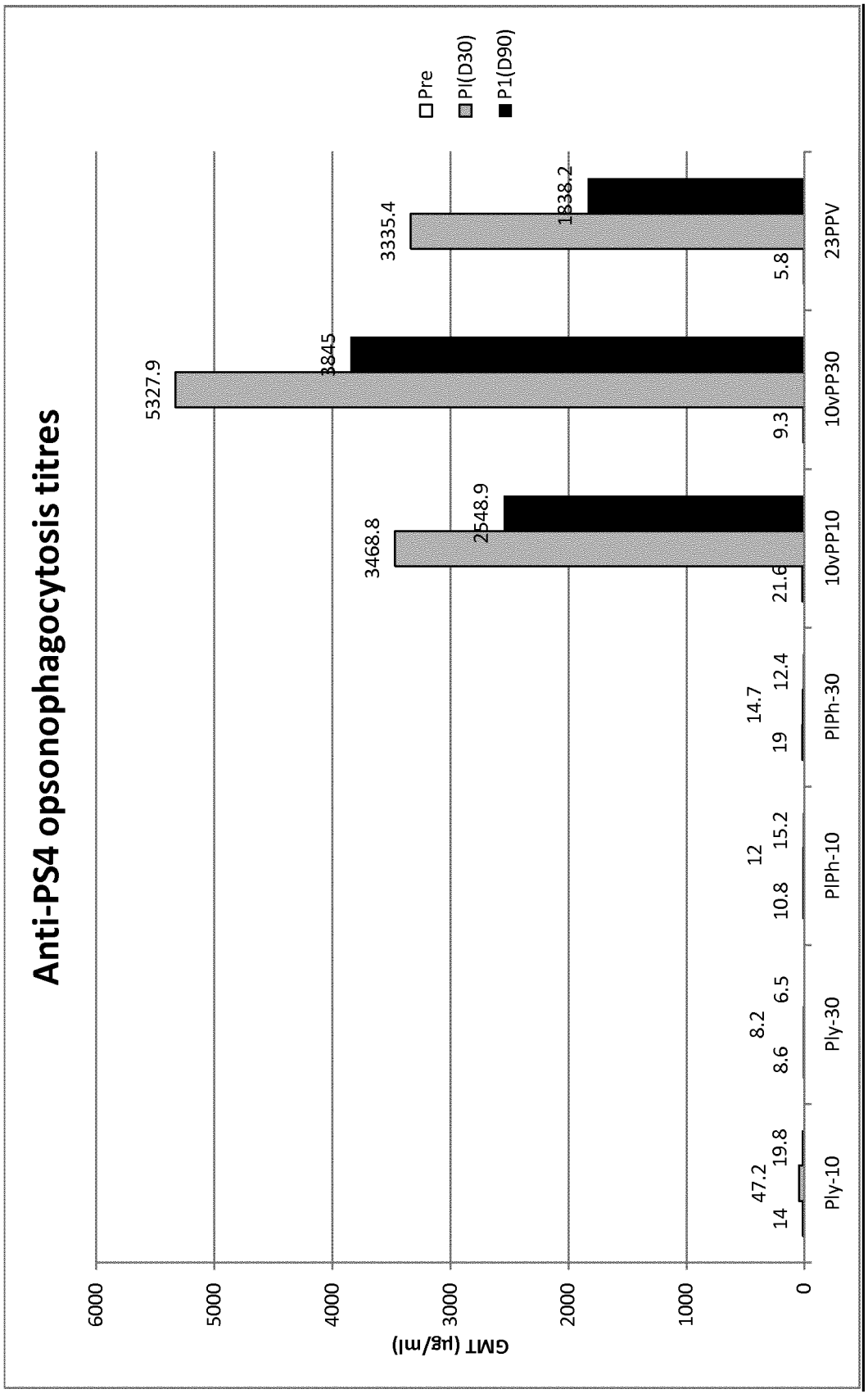

Anti-PS4 opsonophagocytosis titres
GMT (µg/ml)
0
1000
2000
3000
4000
5000
6000
Pre
PI(D30)
P1(D90)
Ply-10
Ply-30
PlPh-10
PlPh-30
10vPP10
10vPP30
23PPV
14
47.2
19.8
8.2
8.6
6.5
12
10.8
15.2
14.7
19
12.4
3468.8
2548.9
21.6
5327.9
3845
9.3
3335.4
1838.2
5.8

Figure 5

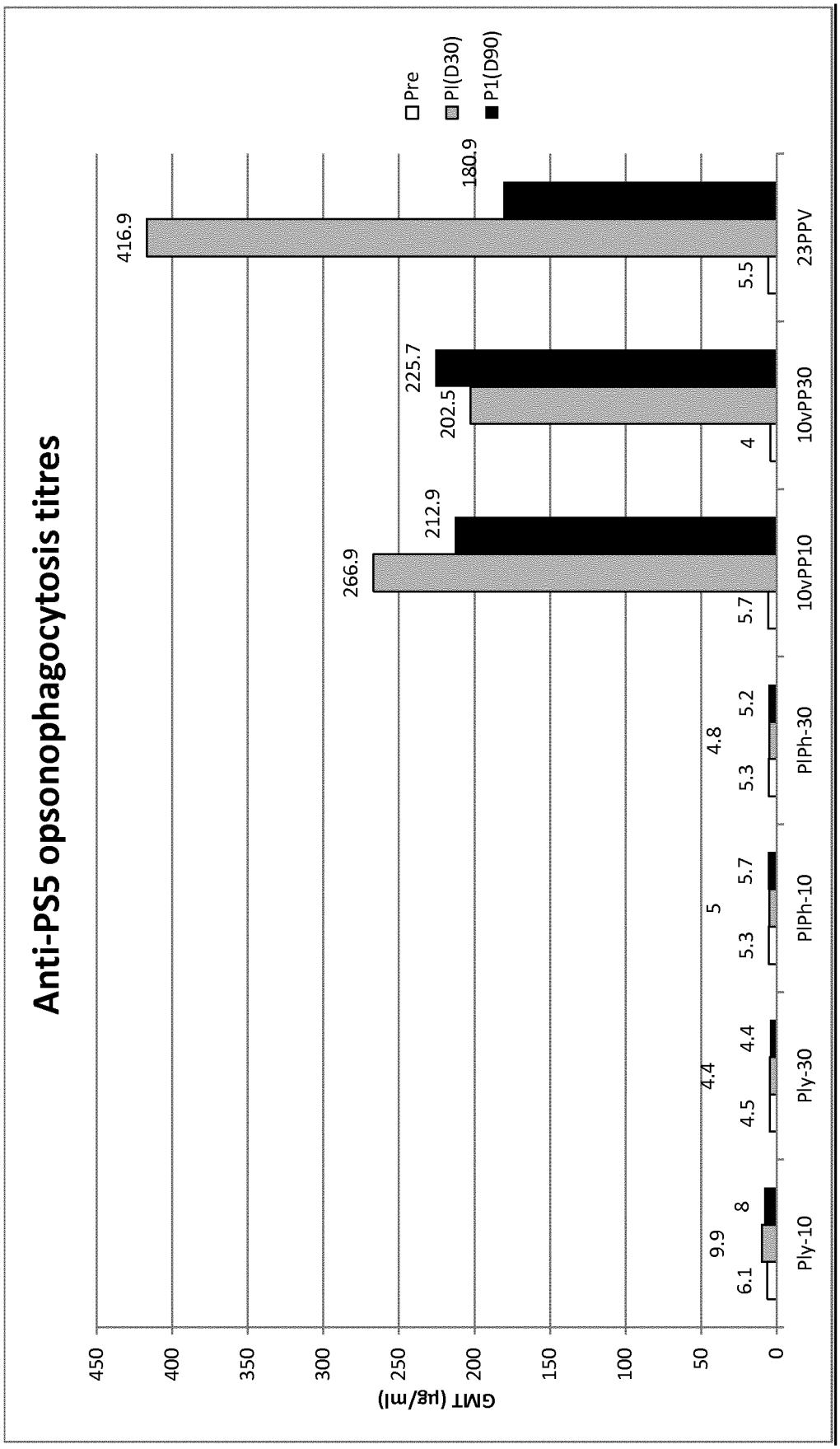

Anti-PS5 opsonophagocytosis titres
GMT (µg/ml)
0
50
100
150
200
250
300
350
400
450
Pre
PI(D30)
P1(D90)
Ply-10
Ply-30
PlPh-10
PlPh-30
10vPP10
10vPP30
23PPV
6.1
9.9
8
4.5
4.4
4.4
5.3
5
5.7
5.3
4.8
5.2
266.9
212.9
5.7
202.5
225.7
4
416.9
180.9
5.5

Figure 6

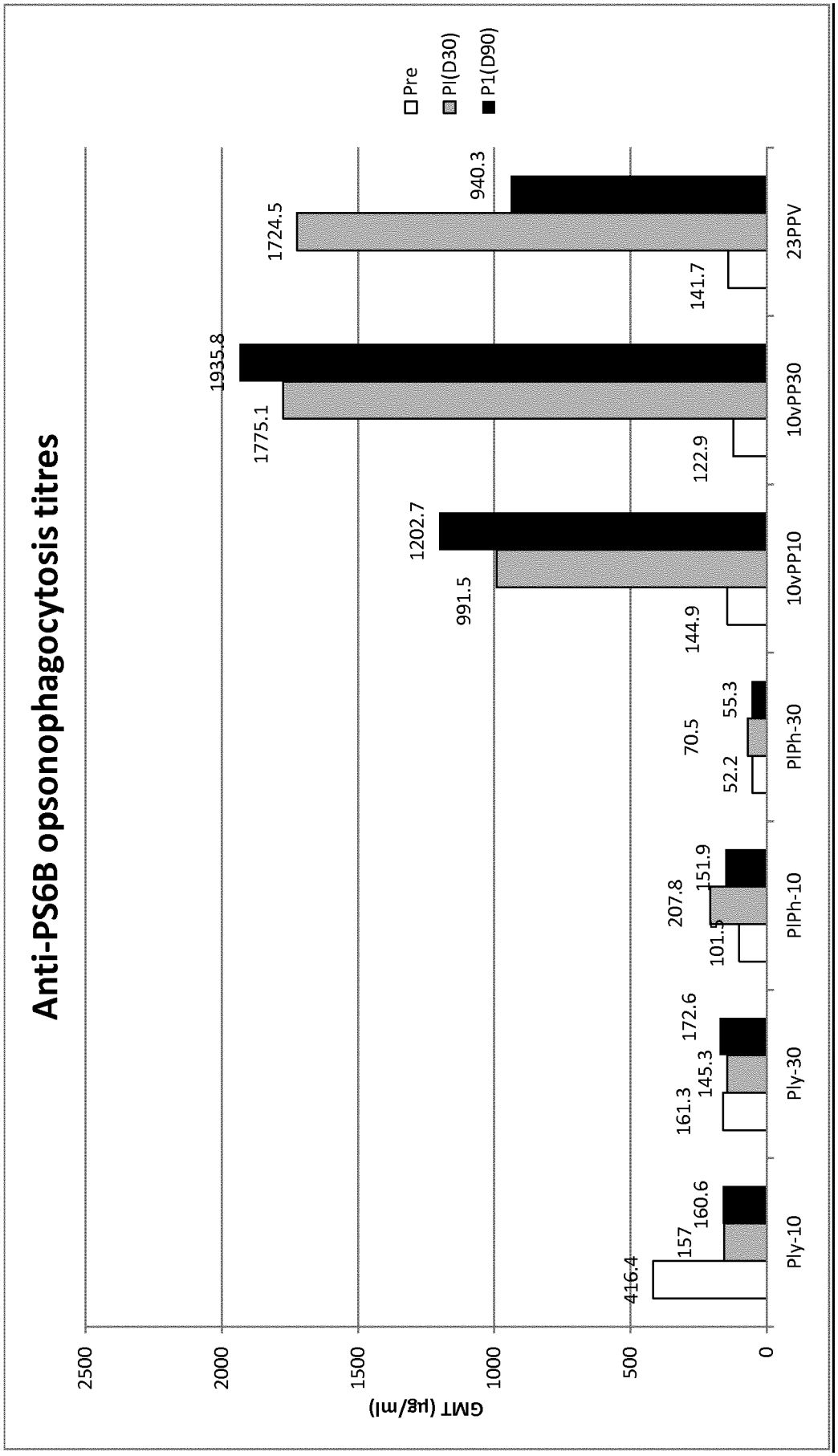

Anti-PS6B opsonophagocytosis titres
Pre
PI(D30)
P1(D90)
GMT (µg/ml)
2500
2000
1500
1000
500
0
Ply-10
Ply-30
PIPh-10
PIPh-30
10vPP10
10vPP30
23PPV
157
160.6
416.4
161.3
145.3
172.6
207.8
101.5
151.9
52.2
70.5
55.3
144.9
991.5
1202.7
122.9
1775.1
1935.8
141.7
1724.5
940.3

Figure 7

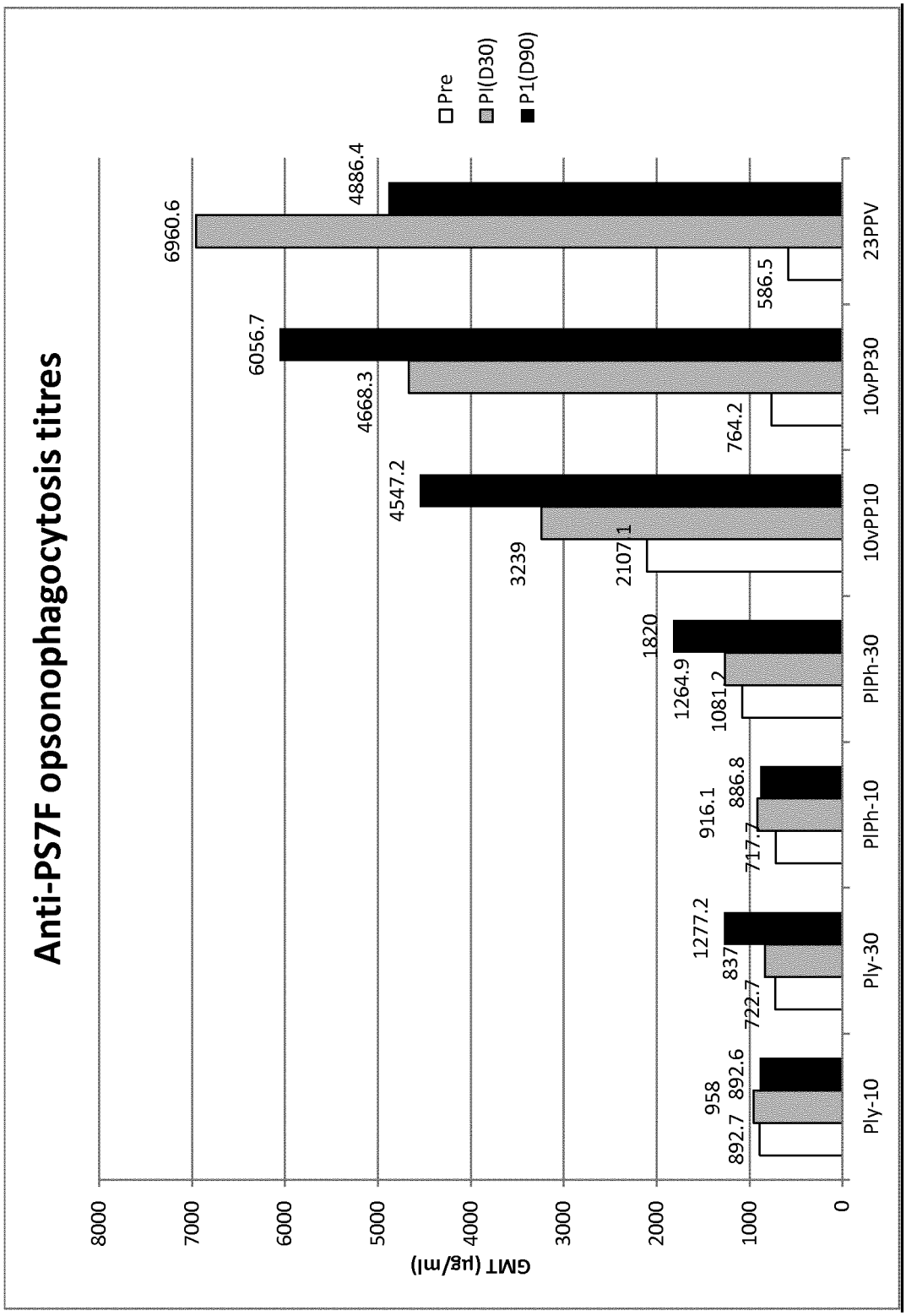

Anti-PS7F opsonophagocytosis titres
GMT (µg/ml)
Pre
PI(D30)
P1(D90)
0
1000
2000
3000
4000
5000
6000
7000
8000
Ply-10
892.7
892.6
958
Ply-30
722.7
837
1277.2
PlPh-10
717.7
886.8
916.1
PlPh-30
1081.2
1264.9
1820
10vPP10
2107.1
3239
4547.2
10vPP30
764.2
4668.3
6056.7
23PPV
586.5
6960.6
4886.4

Figure 8

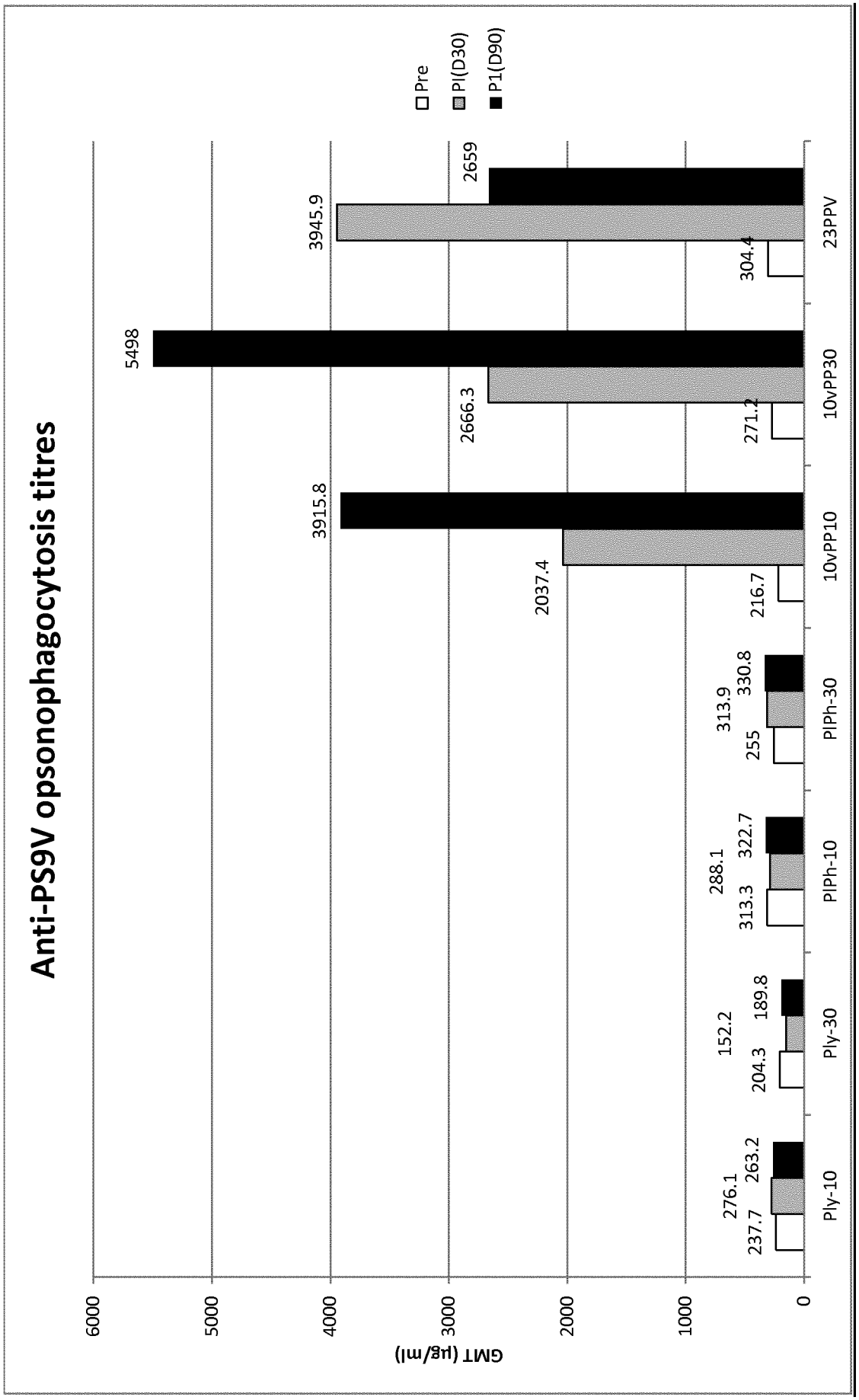

Anti-PS9V opsonophagocytosis titres
GMT (µg/ml)
0
1000
2000
3000
4000
5000
6000
Pre
PI(D30)
P1(D90)
Ply-10
237.7
263.2
276.1
Ply-30
204.3
189.8
152.2
PIPh-10
313.3
322.7
288.1
PIPh-30
255
330.8
313.9
10vPP10
2037.4
3915.8
216.7
10vPP30
2666.3
5498
271.2
23PPV
3945.9
2659
304.4

Figure 9

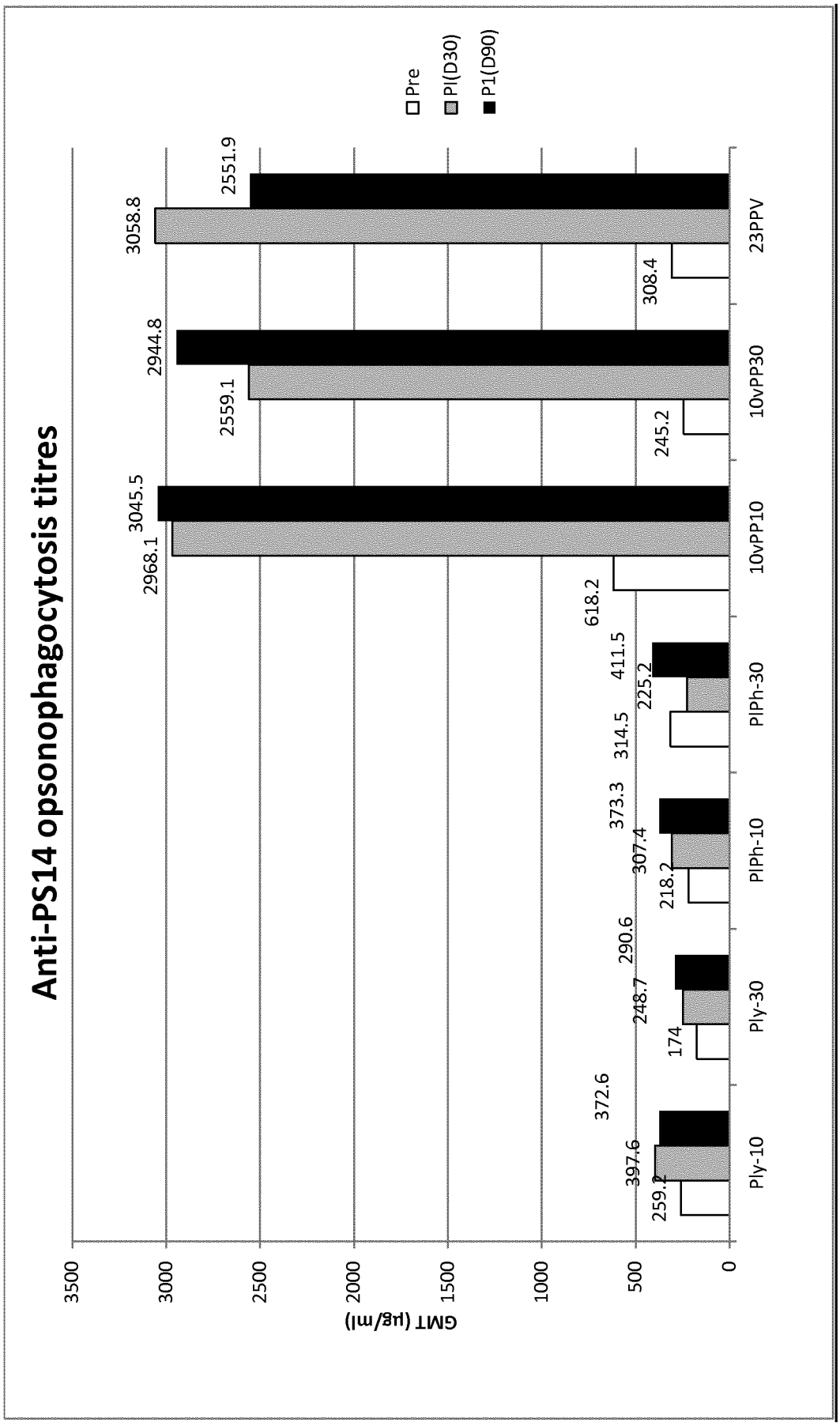

Anti-PS14 opsonophagocytosis titres
GMT (µg/ml)
0
500
1000
1500
2000
2500
3000
3500
Pre
PI(D30)
P1(D90)
Ply-10
259.2
397.6
372.6
Ply-30
174
248.7
290.6
PIPh-10
218.2
307.4
373.3
PIPh-30
225.2
314.5
411.5
10vPP10
618.2
2968.1
3045.5
10vPP30
245.2
2559.1
2944.8
23PPV
308.4
3058.8
2551.9

Figure 10

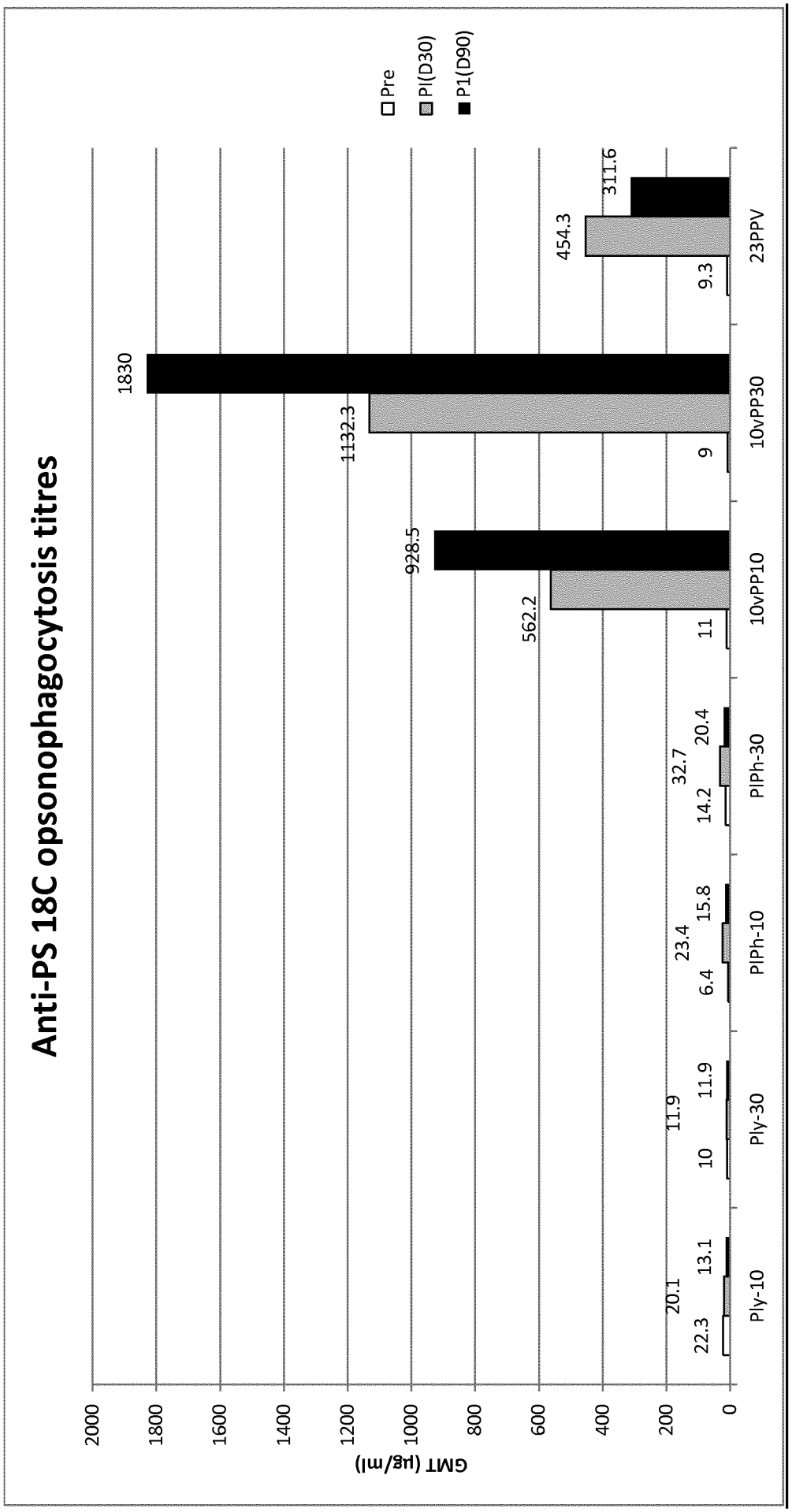

Anti-PS 18C opsonophagocytosis titres
GMT (µg/ml)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Pre
PI(D30)
P1(D90)
22.3
20.1
13.1
10
11.9
11.9
6.4
23.4
15.8
14.2
32.7
20.4
11
562.2
928.5
9
1132.3
1830
9.3
454.3
311.6
Ply-10
Ply-30
PlPh-10
PlPh-30
10vPP10
10vPP30
23PPV

Figure 11

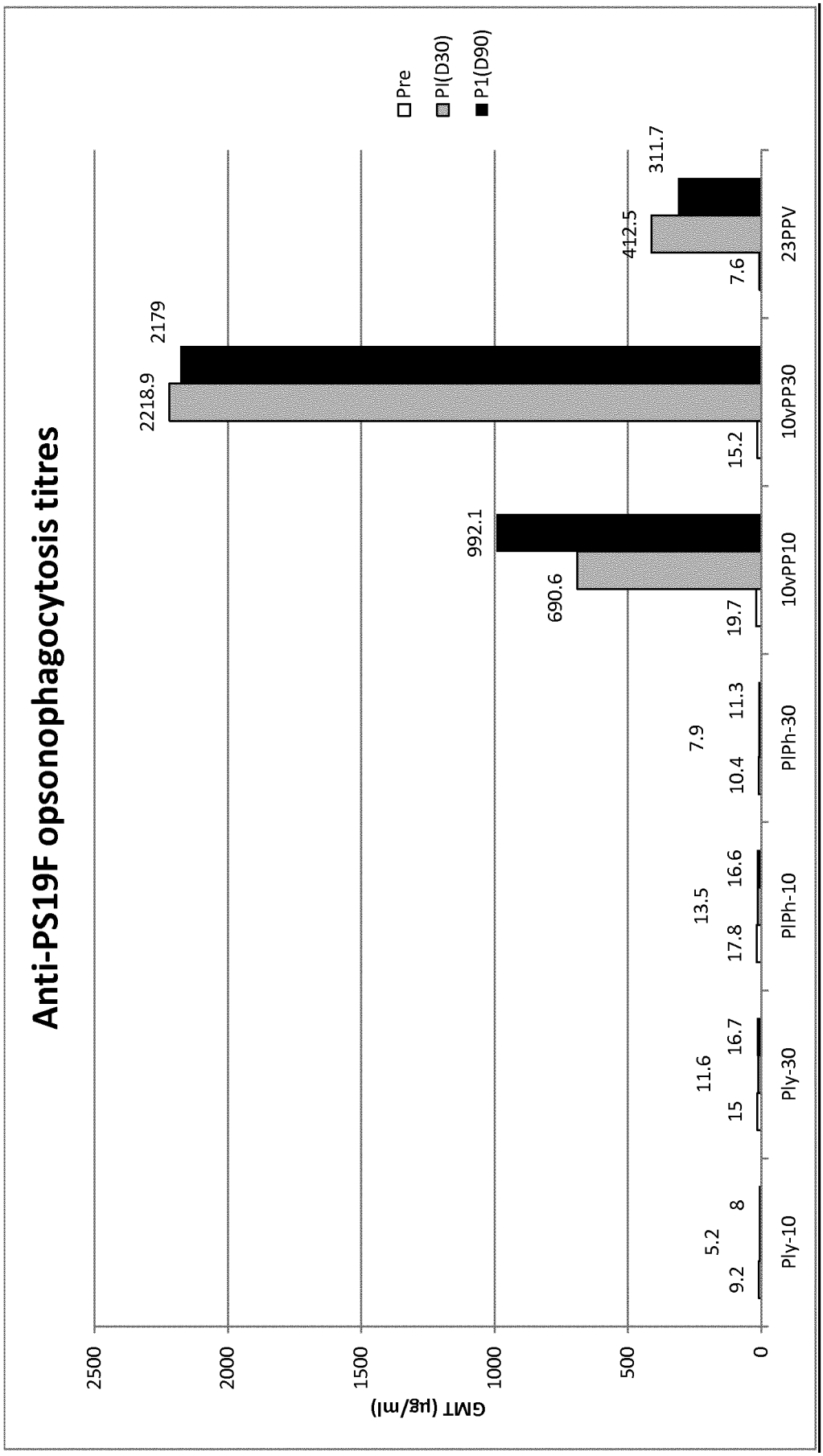

Anti-PS19F opsonophagocytosis titres
Pre
PI(D30)
P1(D90)
GMT (µg/ml)
2500
2000
1500
1000
500
0
9.2
5.2
8
11.6
15
16.7
13.5
17.8
16.6
7.9
10.4
11.3
19.7
690.6
992.1
15.2
2218.9
2179
7.6
412.5
311.7
Ply-10
Ply-30
PlPh-10
PlPh-30
10vPP10
10vPP30
23PPV

Figure 12

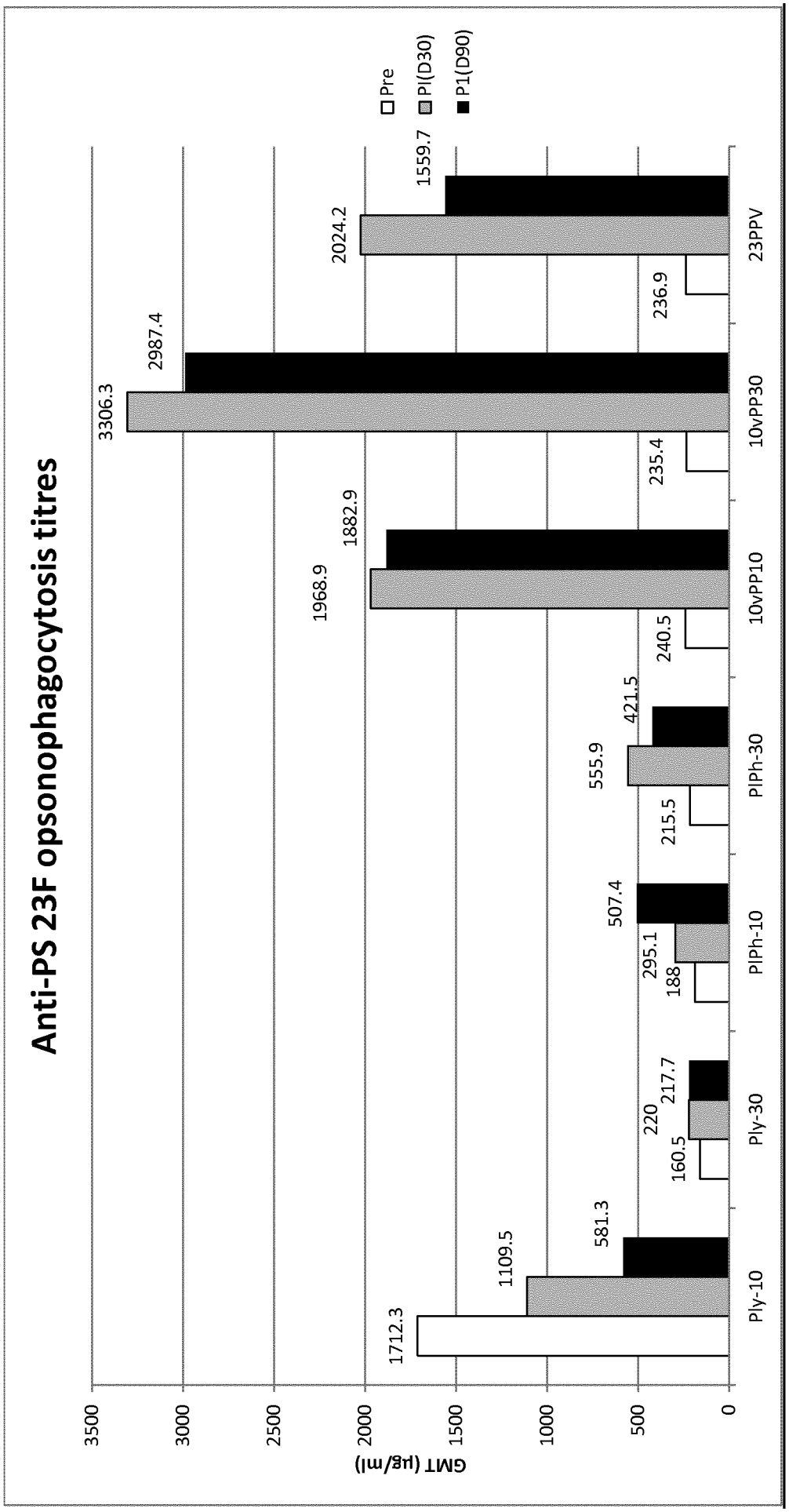

Anti-PS 23F opsonophagocytosis titres
Pre
PI(D30)
P1(D90)
GMT (µg/ml)
0
500
1000
1500
2000
2500
3000
3500
Ply-10
Ply-30
PIPh-10
PIPh-30
10vPP10
10vPP30
23PPV
1712.3
1109.5
581.3
160.5
220
217.7
188
295.1
507.4
215.5
555.9
421.5
240.5
1968.9
1882.9
235.4
3306.3
2987.4
236.9
2024.2
1559.7

Figure 13

SEQ ID NO 1: Ser Tyr Glu Leu Gly Arg His Gln Ala Gly Gln Val Lys Lys Glu Ser Asn Arg Val Ser Tyr Ile Asp Gly Asp Gln Ala Gly Gln Lys Ala Glu Asn Leu Thr Pro Asp Glu Val Ser Lys Arg Glu Gly Ile Asn Ala Glu Gln Ile Val Ile Lys Ile Thr Asp Gln Gly Tyr Val Thr Ser His Gly Asp His Tyr His Tyr Tyr Asn Gly Lys Val Pro Tyr Asp Ala Ile Ile Ser Glu Glu Leu Leu Met Lys Asp Pro Asn Tyr Gln Leu Lys Asp Ser Asp Ile Val Asn Glu Ile Lys Gly Gly Tyr Val Ile Lys Val Asp Gly Lys Tyr Tyr Val Tyr Leu Lys Asp Ala Ala His Ala Asp Asn Ile Arg Thr Lys Glu Glu Ile Lys Arg Gln Lys Gln Glu His Ser His Asn His Gly Gly Gly Ser Asn Asp Gln Ala Val Val Ala Ala Arg Ala Gln Gly Arg Tyr Thr Thr Asp Asp Gly Tyr Ile Phe Asn Ala Ser Asp Ile Ile Glu Asp Thr Gly Asp Ala Tyr Ile Val Pro His Gly Asp His Tyr His Tyr Ile Pro Lys Asn Glu Leu Ser Ala Ser Glu Leu Ala Ala Ala Glu Ala Tyr Trp Asn Gly Lys Gln Gly Ser Arg Pro Ser Ser Ser Ser Ser Tyr Asn Ala Asn Pro Ala Gln Pro Arg Leu Ser Glu Asn His Asn Leu Thr Val Thr Pro Thr Tyr His Gln Asn Gln Gly Glu Asn Ile Ser Ser Leu Leu Arg Glu Leu Tyr Ala Lys Pro Leu Ser Glu Arg His Val Glu Ser Asp Gly Leu Ile Phe Asp Pro Ala Gln Ile Thr Ser Arg Thr Ala Arg Gly Val Ala Val Pro His Gly Asn His Tyr His Phe Ile Pro Tyr Glu Gln Met Ser Glu Leu Glu Lys Arg Ile Ala Arg Ile Ile Pro Leu Arg Tyr Arg Ser Asn His Trp Val Pro Asp Ser Arg Pro Glu Gln Pro Ser Pro Gln Ser Thr Pro Glu Pro Ser Pro Ser Pro Gln Pro Ala Pro Asn Pro Gln Pro Ala Pro Ser Asn Pro Ile Asp Glu Lys Leu Val Lys Glu Ala Val Arg Lys Val Gly Asp Gly Tyr Val Phe Glu Glu Asn Gly Val Ser Arg Tyr Ile Pro Ala Lys Asp Leu Ser Ala Glu Thr Ala Ala Gly Ile Asp Ser Lys Leu Ala Lys Gln Glu Ser Leu Ser His Lys Leu Gly Ala Lys Lys Thr Asp Leu Pro Ser Ser Asp Arg Glu Phe Tyr Asn Lys Ala Tyr Asp Leu Leu Ala Arg Ile His Gln Asp Leu Leu Asp Asn Lys Gly Arg Gln Val Asp Phe Glu Ala Leu Asp Asn Leu Leu Glu Arg Leu Lys Asp Val Pro Ser Asp Lys Val Lys Leu Val Asp Asp Ile Leu Ala Phe Leu Ala Pro Ile Arg His Pro Glu Arg Leu Gly Lys Pro Asn Ala Gln Ile Thr Tyr Thr Asp Asp Glu Ile Gln Val Ala Lys Leu Ala Gly Lys Tyr Thr Thr Glu Asp Gly Tyr Ile Phe Asp Pro Arg Asp Ile Thr Ser Asp Glu Gly Asp Ala Tyr Val Thr Pro His Met Thr His Ser His Trp Ile Lys Lys Asp Ser Leu Ser Glu Ala Glu Arg Ala Ala Ala Gln Ala Tyr Ala Lys Glu Lys Gly Leu Thr Pro Pro Ser Thr Asp His Gln Asp Ser Gly Asn Thr Glu Ala Lys Gly Ala Glu Ala Ile Tyr Asn Arg Val Lys Ala Ala Lys Lys Val Pro Leu Asp Arg Met Pro Tyr Asn Leu Gln Tyr Thr Val Glu Val Lys Asn Gly Ser Leu Ile Ile Pro His Tyr Asp His Tyr His Asn Ile Lys Phe Glu Trp Phe Asp Glu Gly Leu Tyr Glu Ala Pro Lys Gly Tyr Thr Leu Glu Asp Leu Leu Ala Thr Val Lys Tyr Tyr Val Glu His Pro Asn Glu Arg Pro His Ser Asp Asn Gly Phe Gly Asn Ala Ser Asp His Val Arg Lys Asn Lys Val Asp Gln Asp Ser Lys Pro Asp Glu Asp Lys Glu His Asp Glu Val Ser Glu Pro Thr His Pro Glu Ser Asp Glu Lys Glu Asn His Ala Gly Leu Asn Pro Ser Ala Asp Asn Leu Tyr Lys Pro Ser Thr Asp Thr Glu Glu Thr Glu Glu Glu Ala Glu Asp Thr Thr Asp Glu Ala Glu Ile Pro Gln Val Glu Asn Ser Val Ile Asn Ala Lys Ile Ala Asp Ala Glu Ala Leu Leu Glu Lys Val Thr Asp Pro Ser Ile Arg Gln Asn Ala Met Glu Thr Leu Thr Gly Leu Lys Ser Ser Leu Leu Leu Gly Thr Lys Asp Asn Asn Thr Ile Ser Ala Glu Val Asp Ser Leu Leu Ala Leu Leu Lys Glu Ser Gln Pro Ala Pro Ile

Figure 14

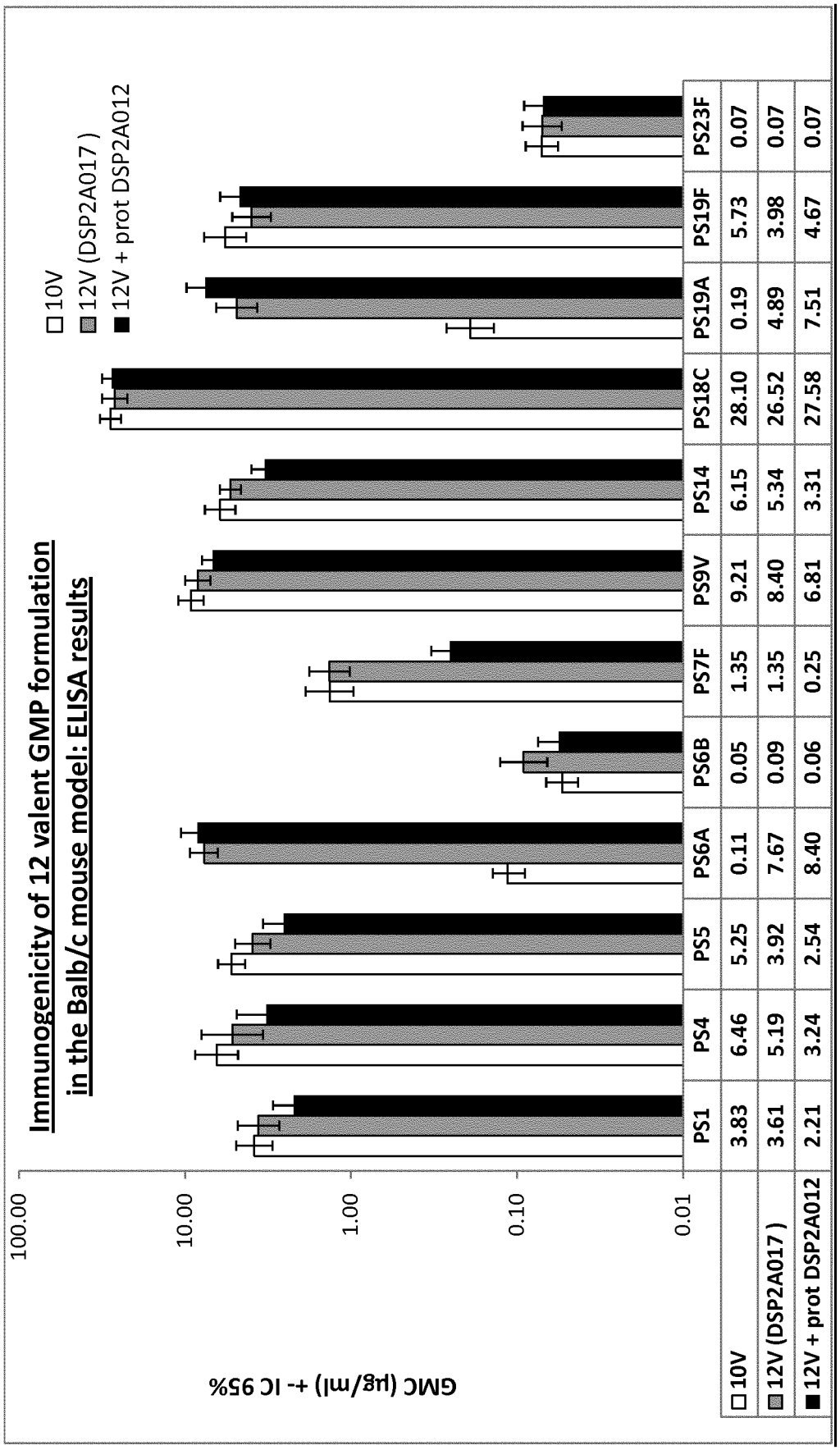

Immunogenicity of 12 valent GMP formulation
in the Balb/c mouse model: ELISA results
10V
12V (DSP2A017)
12V + prot DSP2A012
GMC (µg/ml) +- IC 95%
100.00
10.00
1.00
0.10
0.01
PS1 PS4 PS5 PS6A PS6B PS7F PS9V PS14 PS18C PS19A PS19F PS23F
10V 3.83 6.46 5.25 0.11 0.05 1.35 9.21 6.15 28.10 0.19 5.73 0.07
12V (DSP2A017) 3.61 5.19 3.92 7.67 0.09 1.35 8.40 5.34 26.52 4.89 3.98 0.07
12V + prot DSP2A012 2.21 3.24 2.54 8.40 0.06 0.25 6.81 3.31 27.58 7.51 4.67 0.07

Figure 15

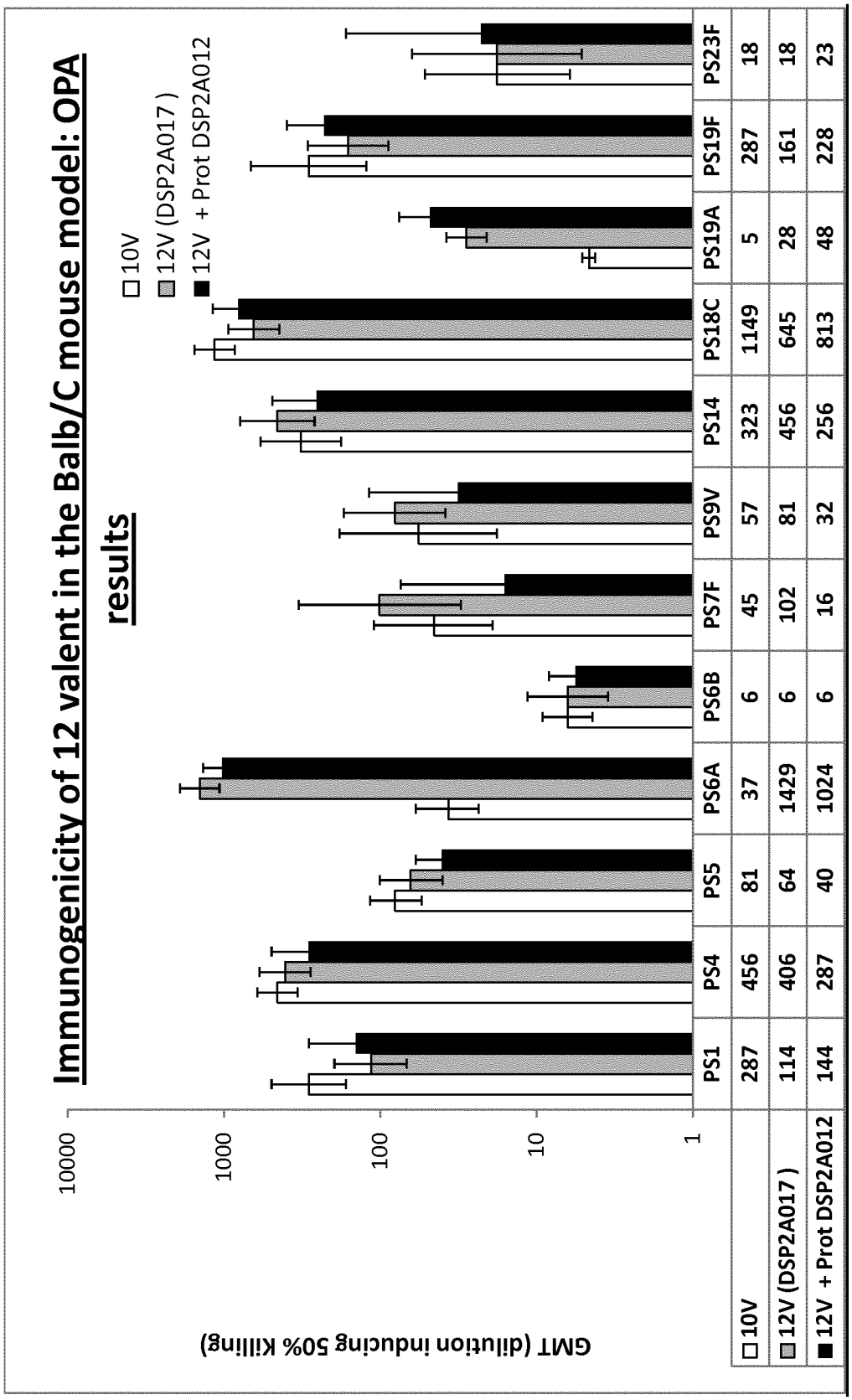

Immunogenicity of 12 valent in the Balb/C mouse model: OPA results
10V
12V (DSP2A017)
12V + Prot DSP2A012
GMT (dilution inducing 50% Killing)
10000
1000
100
10
1
PS1 PS4 PS5 PS6A PS6B PS7F PS9V PS14 PS18C PS19A PS19F PS23F
10V 287 456 81 37 6 45 57 323 1149 5 287 18
12V (DSP2A017) 114 406 64 1429 6 102 81 456 645 28 161 18
12V + Prot DSP2A012 144 287 40 1024 6 16 32 256 813 48 228 23

Figure 16

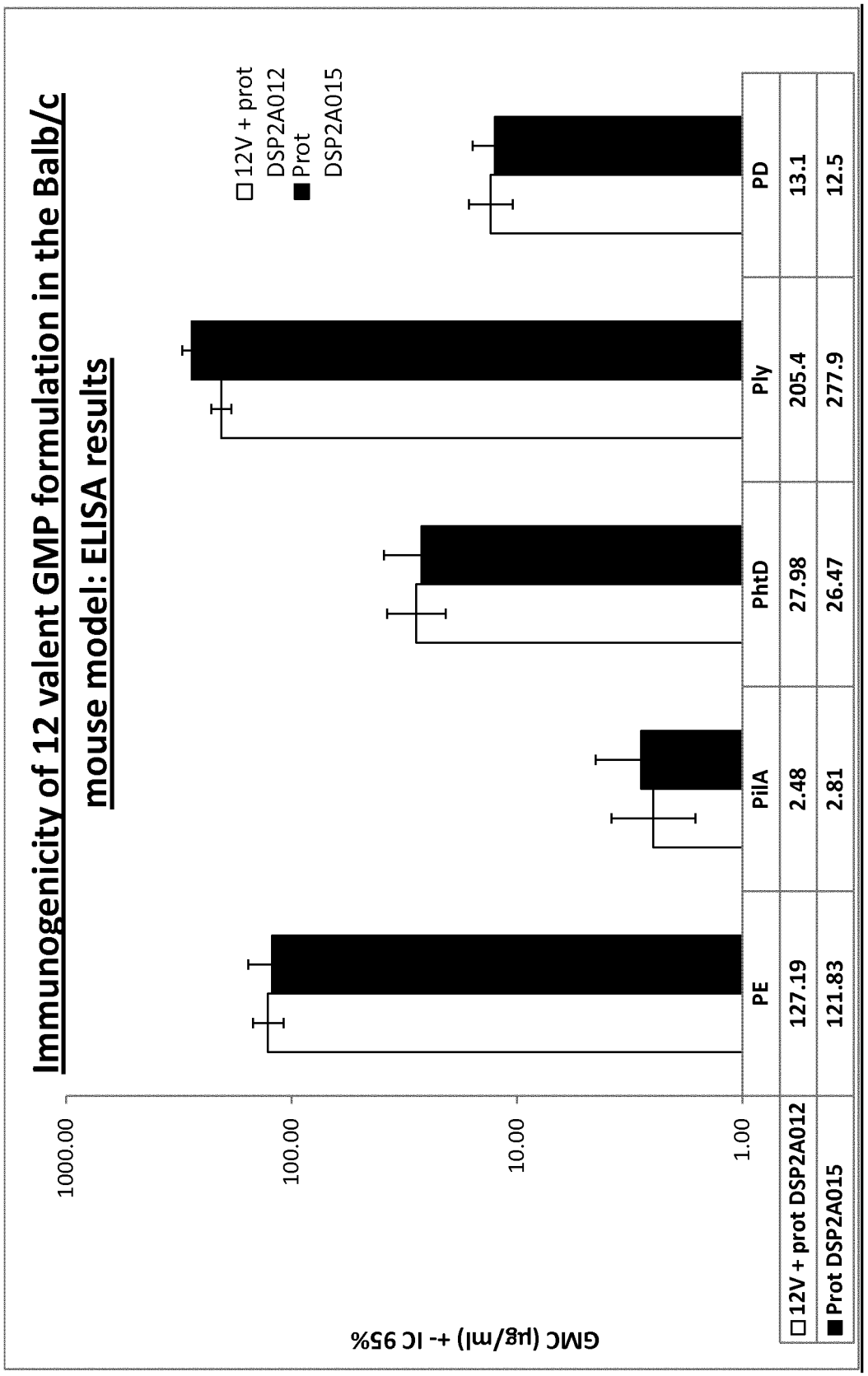
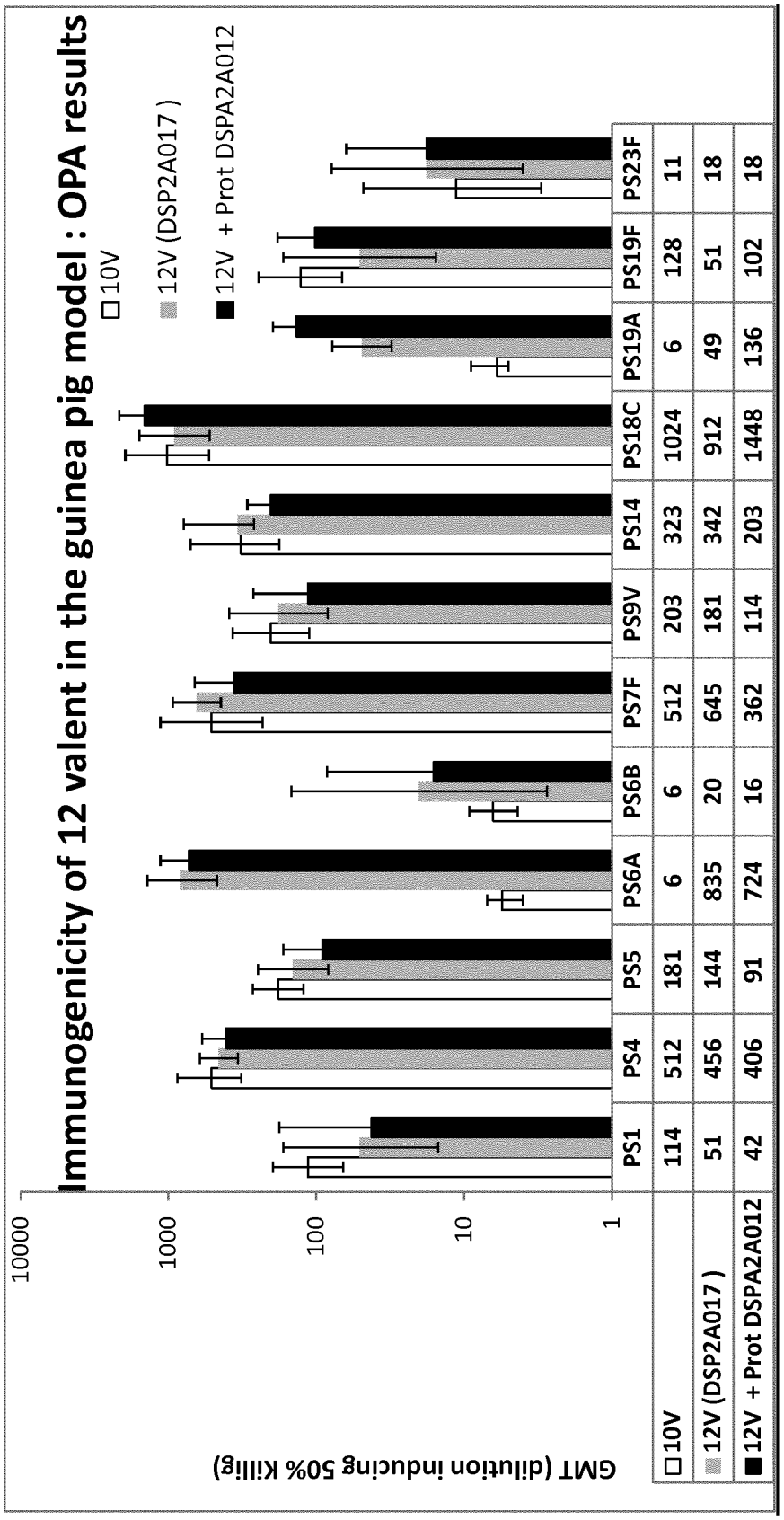

Immunogenicity of 12 valent GMP formulation in the Balb/c mouse model: ELISA results
12V + prot DSP2A012
Prot DSP2A015
GMC (µg/ml) +- IC 95%
1000.00
100.00
10.00
1.00
PE
PilA
PhtD
Ply
PD
12V + prot DSP2A012 127.19 2.48 27.98 205.4 13.1
Prot DSP2A015 121.83 2.81 26.47 277.9 12.5

Figure 17



	PS1	PS4	PS5	PS6A	PS6B	PS7F	PS9V	PS14	PS18C	PS19A	PS19F	PS23F
10V	114	512	181	6	6	512	203	323	1024	6	128	11
12V (DSP2A017)	51	456	144	835	20	645	181	342	912	49	51	18
12V + Prot DSPA2A012	42	406	91	724	16	362	114	203	1448	136	102	18

Figure 18

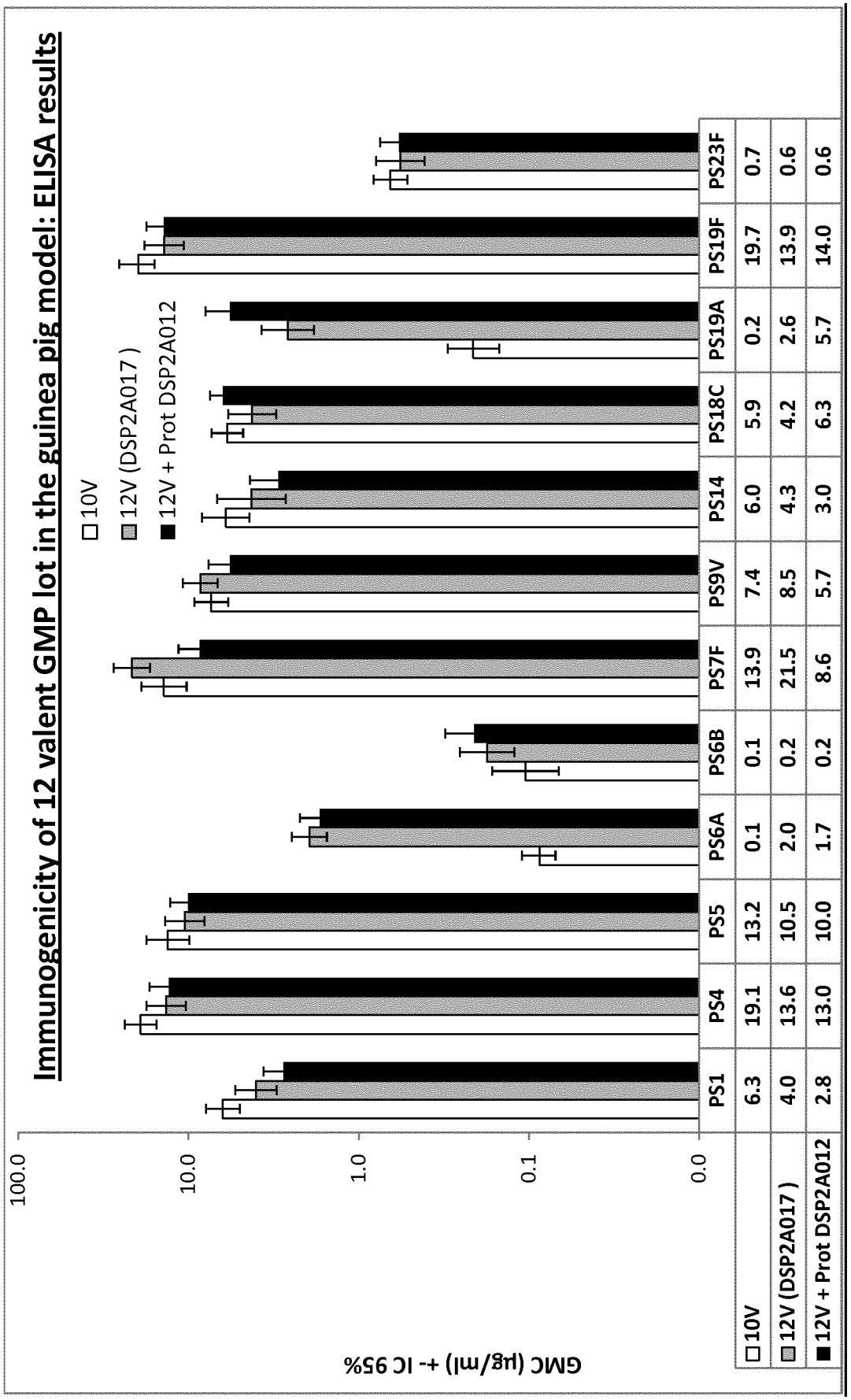
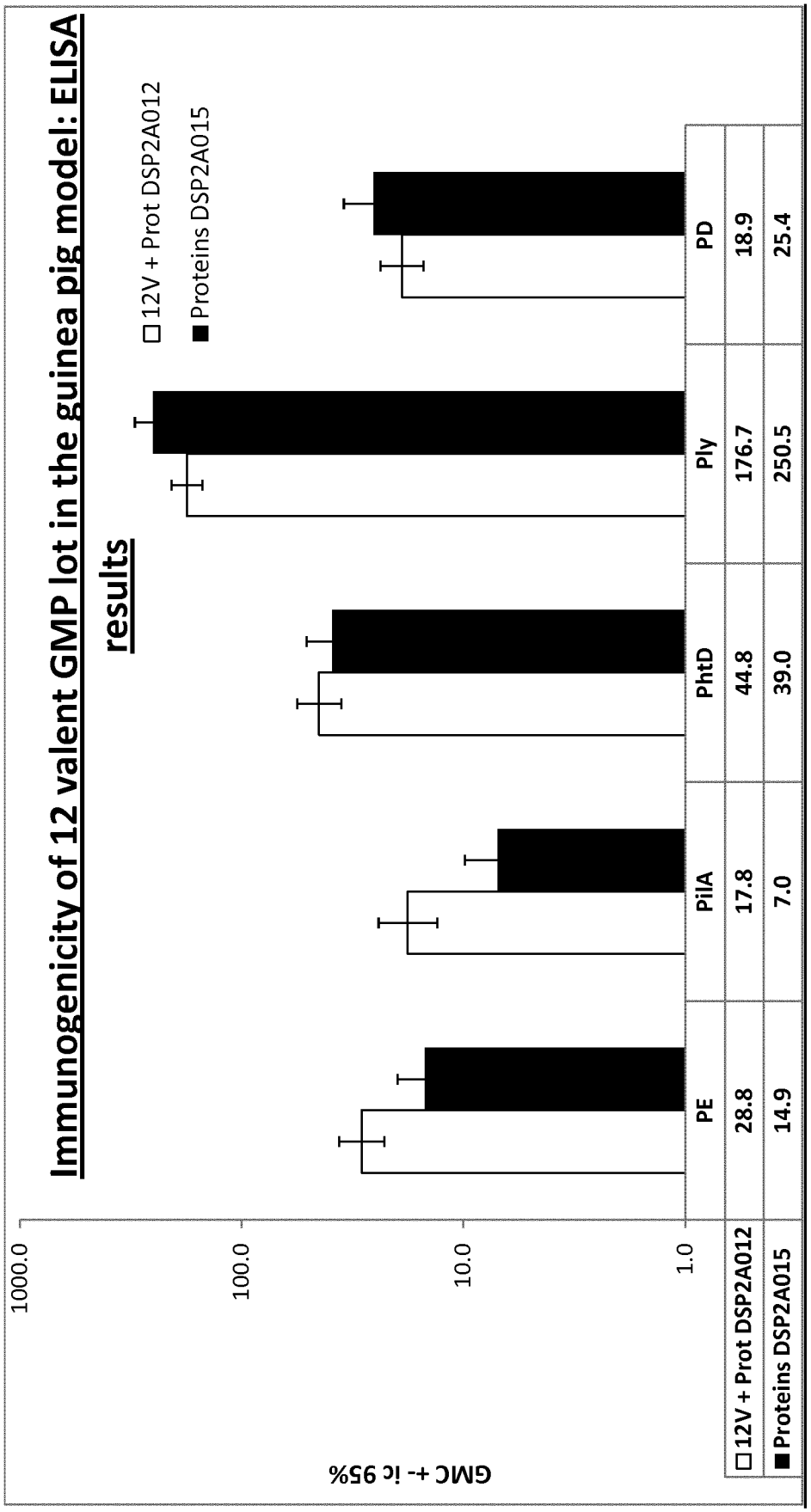

Immunogenicity of 12 valent GMP lot in the guinea pig model: ELISA results
10V
12V (DSP2A017)
12V + Prot DSP2A012
GMC (µg/ml) +- IC 95%
100.0
10.0
1.0
0.1
0.0
PS1 PS4 PS5 PS6A PS6B PS7F PS9V PS14 PS18C PS19A PS19F PS23F
10V 6.3 19.1 13.2 0.1 0.1 13.9 7.4 6.0 5.9 0.2 19.7 0.7
12V (DSP2A017) 4.0 13.6 10.5 2.0 0.2 21.5 8.5 4.3 4.2 2.6 13.9 0.6
12V + Prot DSP2A012 2.8 13.0 10.0 1.7 0.2 8.6 5.7 3.0 6.3 5.7 14.0 0.6

Figure 19


Immunogenicity of 12 valent GMP lot in the guinea pig model: ELISA
results
12V + Prot DSP2A012
Proteins DSP2A015
GMC +- ic 95%
1000.0
100.0
10.0
1.0
PE
PilA
PhtD
Ply
PD
12V + Prot DSP2A012 28.8 17.8 44.8 176.7 18.9
Proteins DSP2A015 14.9 7.0 39.0 250.5 25.4