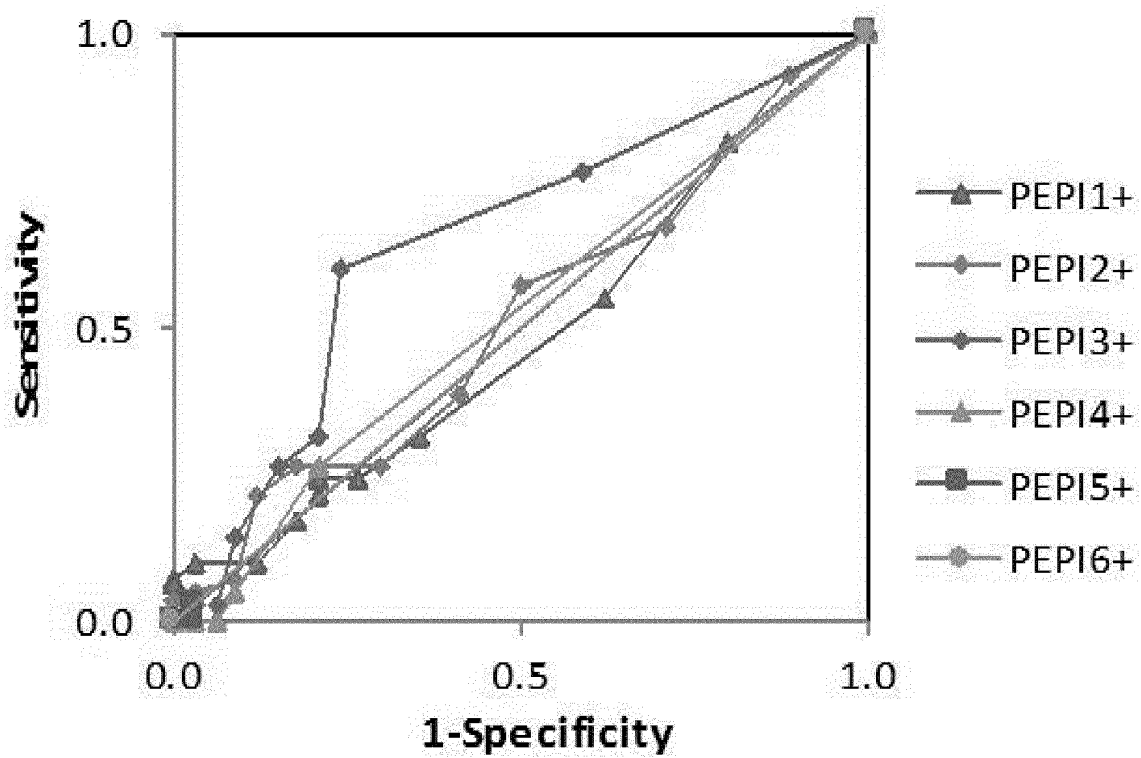
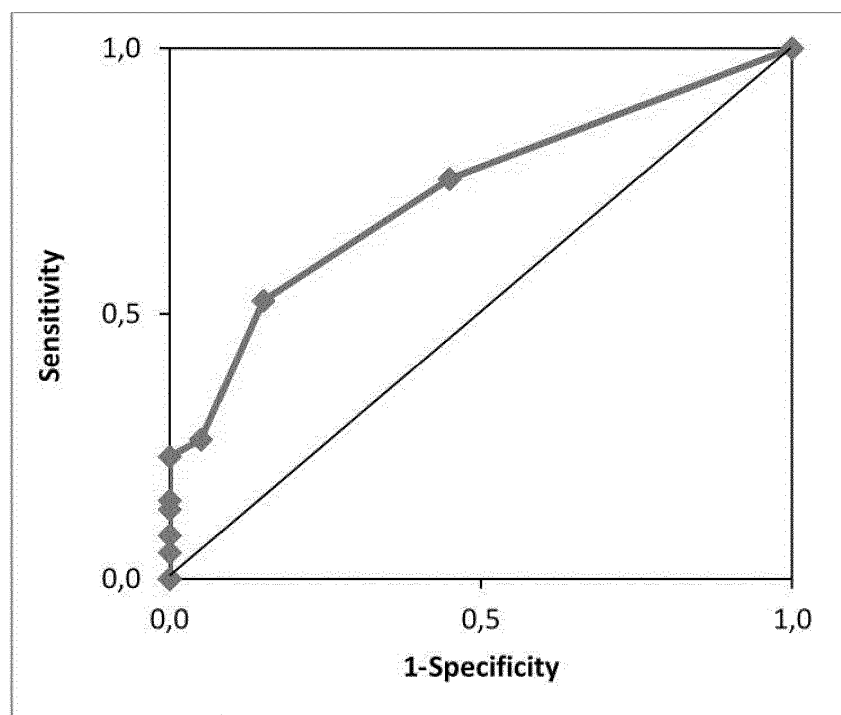


1/25
Figure 1



2/25
Figure 2



3/25
Figure 3

A

Patient ID	#epitope / HPV-16 E6 Pools																#epitope / HPV-16 E7 Pools							
	1-19	11-29	21-39	31-49	41-59	51-69	61-79	71-89	81-99	91-109	101-119	111-129	121-139	131-149	141-159	1-19	11-29	21-39	31-49	41-59	51-69	61-79	71-89	81-99
1	TN	TN	TN	FN	TN	FP	TN	TN	TN	TN	FN	TN	TN	TN	TN	FP	TN	TN	TN	FP	TN	TN	TN	TN
2	FN	FN	TN	TN	TN	FP	TN	TN	TN	TN	TN	TN	TN	TN	TN	FP	TN	TN	TN	FP	TN	TN	TN	TN
3	TN	TN	TN	TN	TN	FP	TN	TN	TN	TN	FN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN
6	TN	TN	TN	FN	TN	FP	TN	TN	TN	TN	FN	TN	TN	TN	TN	FP	TN	TN	TN	FP	TN	TN	TN	FP
7	TN	TN	TN	TN	TN	FN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN
8	TN	FN	TN	FN	TN	FN	TN	FP	TN	TN	FN	TN	TN	TN	FN	TN	TN	TN	TN	FN	TN	TN	TN	TN
9	TN	TN	TN	TN	FN	FN	TN	FP	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN
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13	TN	TN	TN	TN	TN	FN	TN	TN	TN	FN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN
16	TN	TN	TN	TN	TN	FP	TN	TN	TN	FN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN
18	TN	TN	TN	TN	TN	FP	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	FP	TN	TN	TN	TN
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103	TN	FN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN
105	TN	TN	TN	TN	TN	FP	FN	TN	TN	TN	TN	TN	TN	TN	TN	FP	TN	TN	FP	TN	TN	TN	TN	TN
107	TN	TN	TN	TN	TN	TN	TN	TN	TN	FN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	TN	FN	TN	TN

B

Patient ID	#epitope / HPV-16 E6 Pools																#epitope / HPV-16 E7 Pools							
	1-19	11-29	21-39	31-49	41-59	51-69	61-79	71-89	81-99	91-109	101-119	111-129	121-139	131-149	141-159	1-19	11-29	21-39	31-49	41-59	51-69	61-79	71-89	81-99
1	TN	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	TN	TN	FP	FP	FP	TN	TN	FP	FP	FP	FP	FP
2	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	TN	TN	TN	FP	FP	FP	FP	TN	TN	FP	TN	FP	FP	FP
3	FP	FP	TN	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	TN	TN	FP	TN	TN	FP	FP
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7	FP	FP	FP	FP	FP	FP	TN	FP	FP	FP	FP	FP	TN	FP	FP	FP	TN	TN	TN	FP	TN	TN	FP	FP
8	FP	FP	TN	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	TN	TN	FP	TN	FP	FP	FP
9	FP	FP	TN	FP	FP	FP	TN	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	TN	TN	FP	TN	FP	FP	FP
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11	FP	FP	FP	FP	FP	FP	FP	TN	FP	FP	FP	FP	TN	FP	FP	FP	FP	TN	TN	FP	TN	TN	FP	FP
13	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	TN	FP	FP	FP	FP	FP	TN	FP	FP	FP	TN	FP	FP
16	FP	FP	FP	FP	FP	FP	TN	FP	FP	FP	FP	TN	TN	FP	FP	FP	FP	TN	FP	FP	TN	FP	FP	FP
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103	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	TN	FP	FP	FP	FP	TN	TN	FP	TN	TN	FP	FP
105	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	TN	FP	FP	FP	FP	FP	FP	TN	TN	FP	TN	FP	FP	FP
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Figure 4

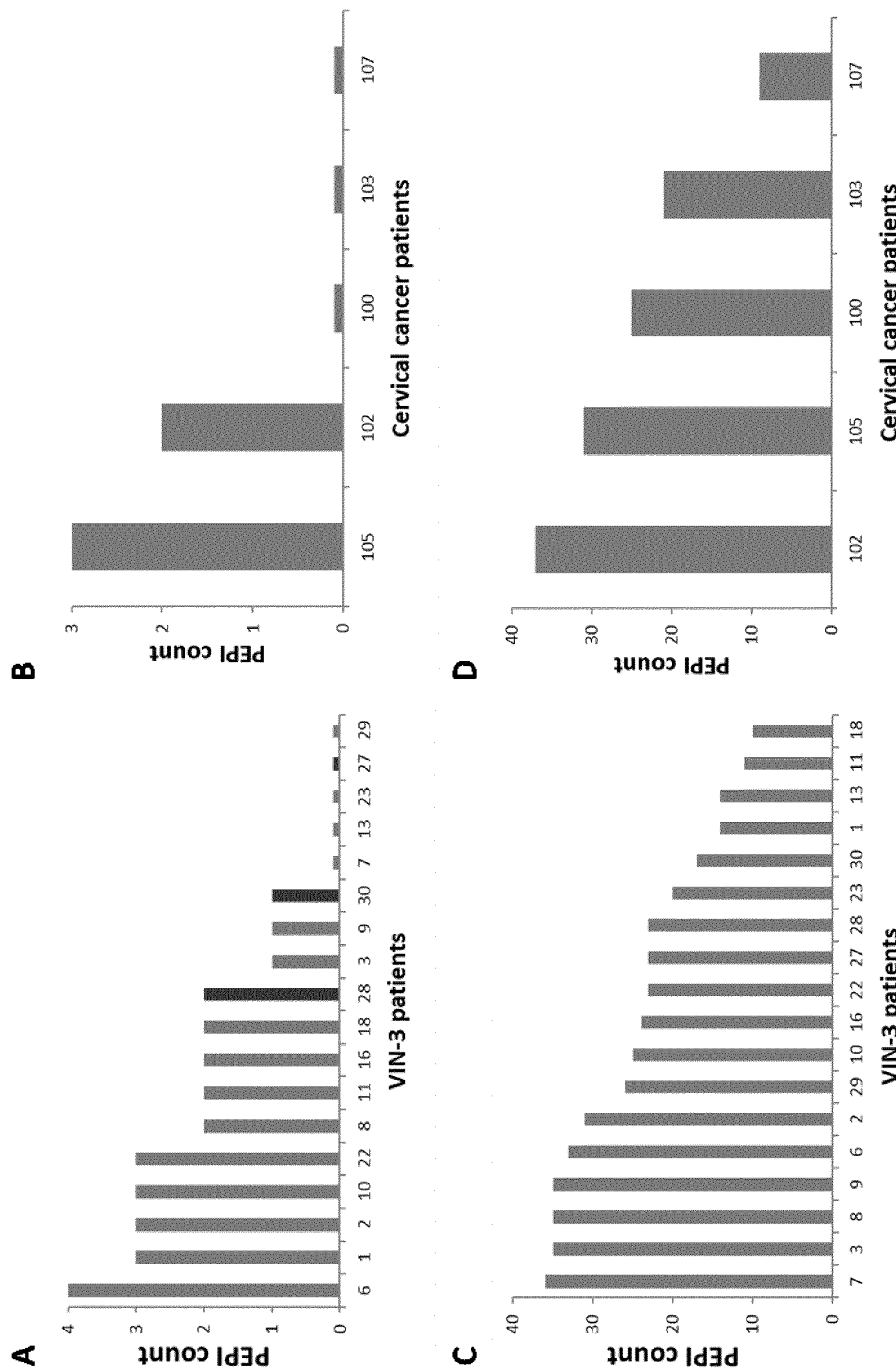
A

Pat ID	#PEPI / HPV-16 E6				E7	
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1	FP	TP	TP	FN	TN	FN
2	FP	TP	TP	TN	TN	TP
3	TP	TP	TP	TP	TN	TP
6	TP	TP	TP	FN	TP	TP
7	TP	TP	TP	TP	TN	TP
8	TP	TP	TP	FN	FP	TP
9	TP	TP	TP	FN	FP	TP
10	FP	TP	TP	FN	TN	TP
11	TP	TP	FN	FN	TN	TP
13	TP	TP	FN	FN	TN	FN
16	TP	TP	TP	FN	FP	TP
18	FP	TP	FN	FN	FN	TP
22	TP	TP	TP	FN	FN	FN
23	FP	TP	TP	FN	TN	TN
27	TP	TP	TP	FN	FN	FN
28	TP	TP	TP	FN	TN	FN
29	FP	TP	TP	FN	FP	TP
30	FP	FP	TN	TN	FN	FN
100	TP	TP	TP	FN	TN	TP
102	TP	TP	TP	FN	FN	TP
103	TP	TP	TP	FN	TN	TN
105	TP	TP	TP	TP	TN	TN
107	TP	TP	FN	FN	TN	FN

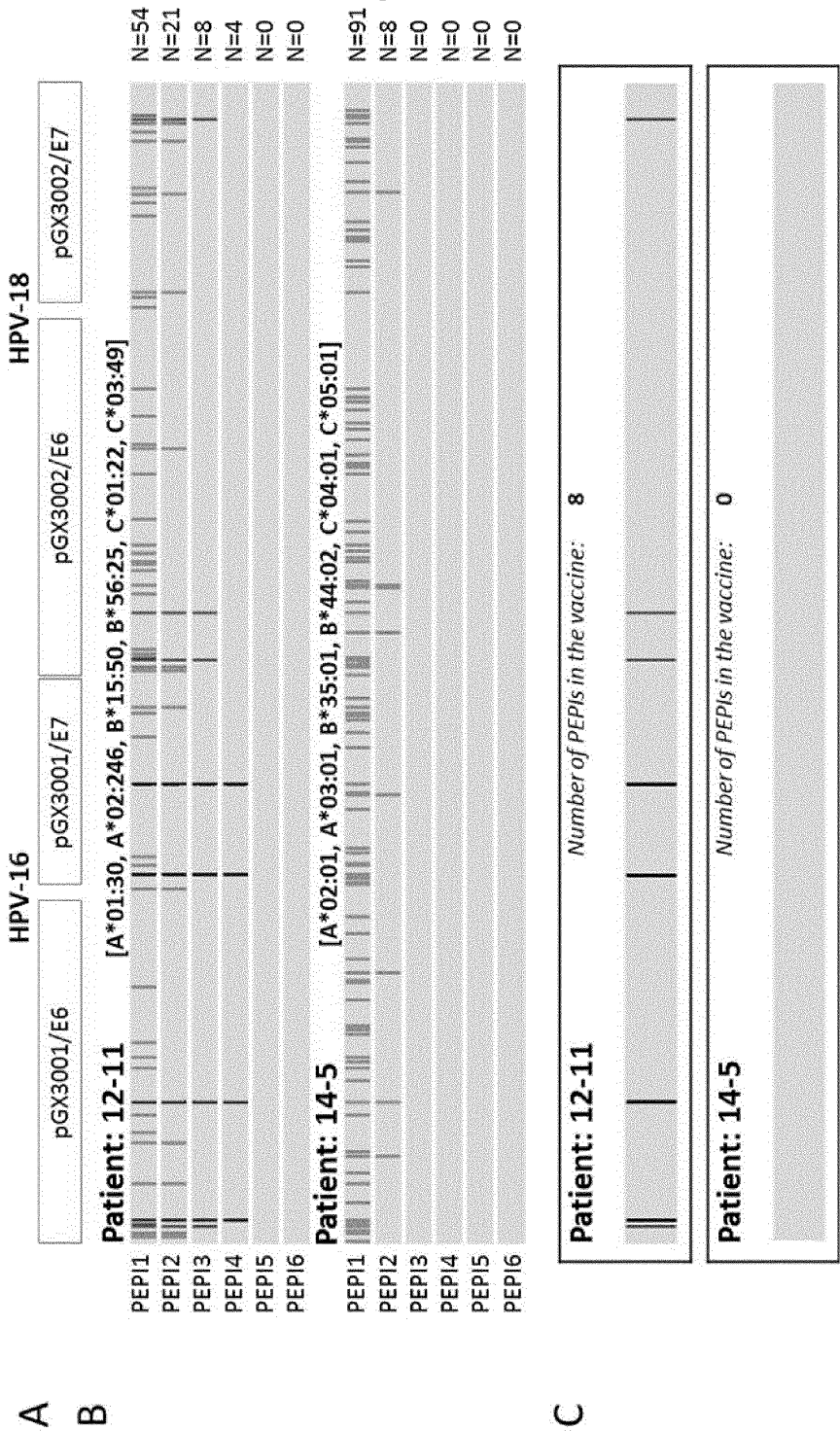
B

Patient ID	# epitope / HPV-16 E6&E7 pools					
	E6.1	E6.2	E6.3	E6.4	E7.1	E7.2
1	FP	TP	TP	FN	FP	TP
2	FP	TP	TP	TN	TN	TP
3	TP	TP	TP	FN	FP	TP
6	TP	TP	TP	FN	TP	TP
7	TP	TP	TP	FN	FP	TP
8	TP	TP	TP	FN	FP	TP
9	TP	TP	TP	FN	FP	TP
10	FP	TP	TP	FN	FP	TP
11	TP	TP	TP	FN	FP	TP
13	TP	TP	TP	FN	TN	TP
16	TP	TP	TP	FN	TN	TP
18	FP	TP	TP	FN	FN	TP
22	TP	TP	TP	FN	TP	TP
23	FP	TP	TP	FN	FP	FP
27	TP	TP	TP	FN	TP	TP
28	TP	TP	TP	FN	FP	TP
29	FP	TP	TP	FN	FP	TP
30	FP	FP	FP	TN	FN	TP
100	TP	TP	TP	FN	FP	TP
102	TP	TP	TP	FN	TP	TP
103	TP	TP	TP	FN	TN	FP
105	TP	TP	TP	FN	TN	FP
107	TP	TP	TP	FN	FP	TP

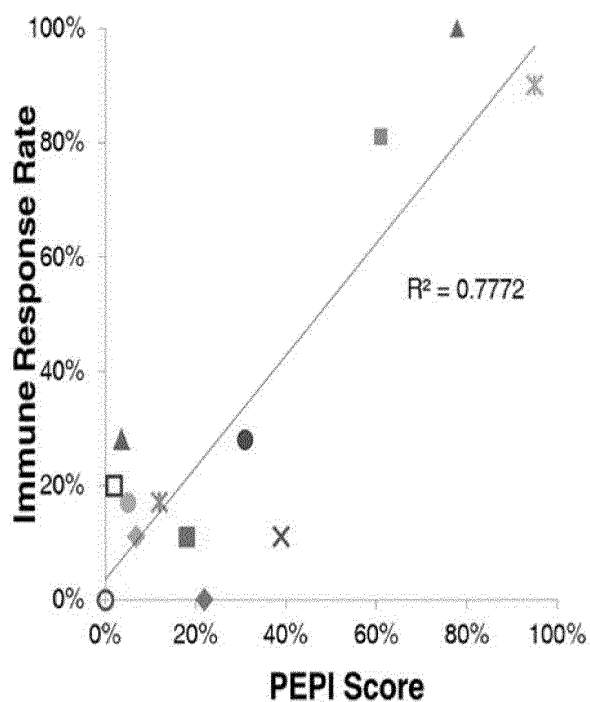
5/25
Figure 5



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Figure 6

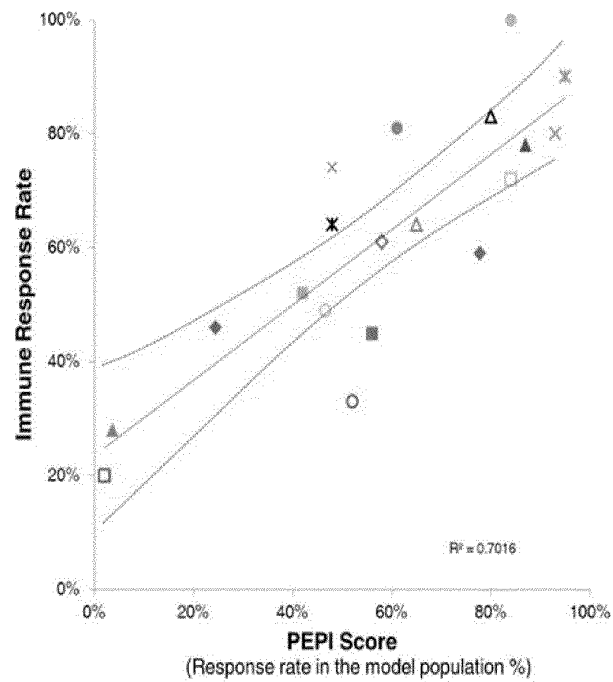


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Figure 7



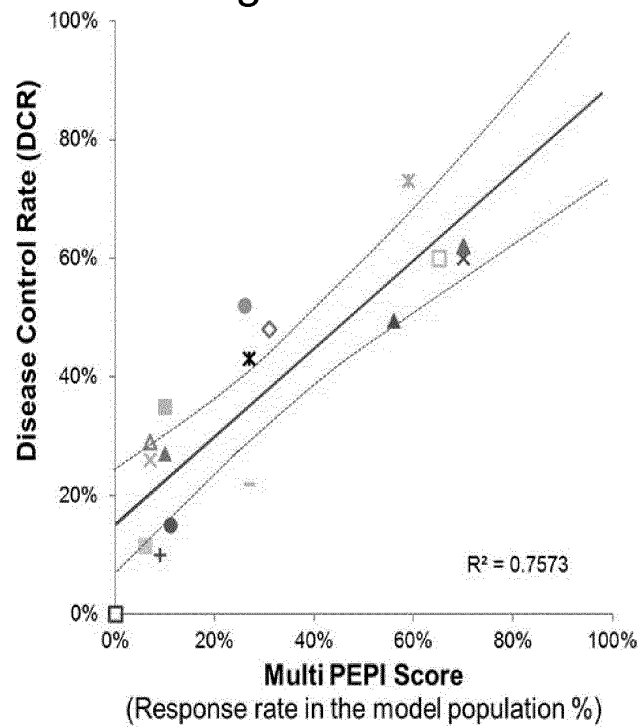
- ◆ MMNLMQPKTQQTYTYD (JUP)
- GRGSTTTNYLLDRDDYRNTSD (ADA17)
- ◆ LKKGAADGGKLDGNAKLNRSK (BAP31)
- × FPPKDDHTLKFLYDDNQRPYPP (TOP2A)
- QRPPFSQLHRFLADALNT (DDR1)
- × RYRKPDYTLDDGHGLLRFKST (Abl-2)
- ALDQCKTSCALMQQHYDQTSCFSSP (ITGB8)
- STAPPAHGVTSAPDTRPAGSTAPP (Muc-1)
- ▲ YLEPGPVTA (gp-100)
- × MTPGTQSPFFLLLLTLTVV (Muc-1)
- SSKALQRPV (Bcr-abl)
- ▲ RMFPNAPYL (WT1)
- RMFPNAPYL (WT1, HLA-A*0201)

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Figure 8



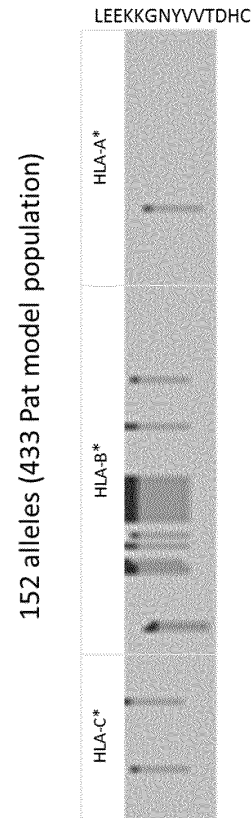
- StimuVax (Merck)
- ▲ gp100 vaccine (Sloan-Kettering Institute)
- IMA901 (phase I, Immatics)
- ✕ IMA901 (phase II, Immatics)
- OICT107 (Cedars-Sinai Medical Center)
- ProstVac (Bavarian Nordic)
- ✦ Synchrotope TA2M (Mannkind Co.)
- MELITAC 12.1 (Fred Hutchinson CRC)
- ✦ WT1 vaccine (NCRC Hospital, Tokyo)
- Ipilimumab (NY-ESO-1, MSKCC)
- ▲ VGX-3100 (Inovio)
- ✕ HIVIS-1 (Karolinska)
- ✕ ImMucin (VaxiBio)
- NY-ESO-1 OLP (Osaka University)
- △ GVX301 (University Genoa)
- ▲ WT1 vaccine (MSKCC)
- WT1 vaccine (CBF)
- ◇ DPX-0907 (ImmunoVaccine Inc.)
- Melanoma peptide vaccine (University of Virginia)

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Figure 9

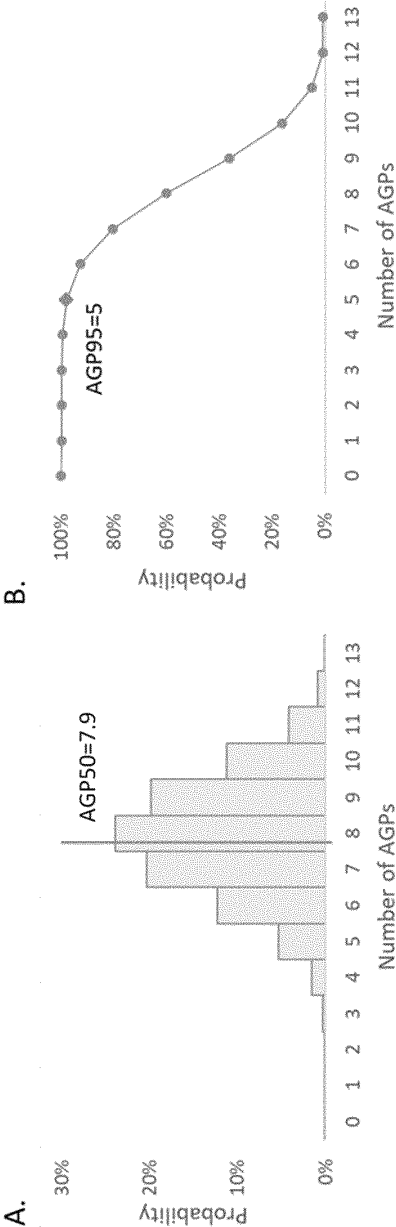


- ✕ IMA901 (phase I, Immatix)
- ⊞ IMA901 (phase II, Immatix)
- ▣ Ipilimumab (NY-ESO-1, MSKCC)
- ✕ HPV-SLP (Leiden University)
- ▲ HPV-SLP (Leiden University)
- gp100 - 2 peptides (BMS)
- ⊞ ImMucin (VaxilBio)
- ▣ StimuVax (Merck)
- ▲ VGX-3100 (Inovio) [7]
- ◆ TSPP (Siena University)
- ✕ KIF20A-66 peptide (Chiba Tokushukai Hospital)
- ▲ Peptide vaccine (Kumamoto University)
- ✕ 7-peptide cocktail vaccine (Kinki University)
- ▲ GVX301 (University Genoa)
- ▣ MAGE-A3 Trojan (Abramson Cancer Center)
- PepCan (University of Arkansas)
- ▣ Melanoma peptide vaccine (University of Virginia)

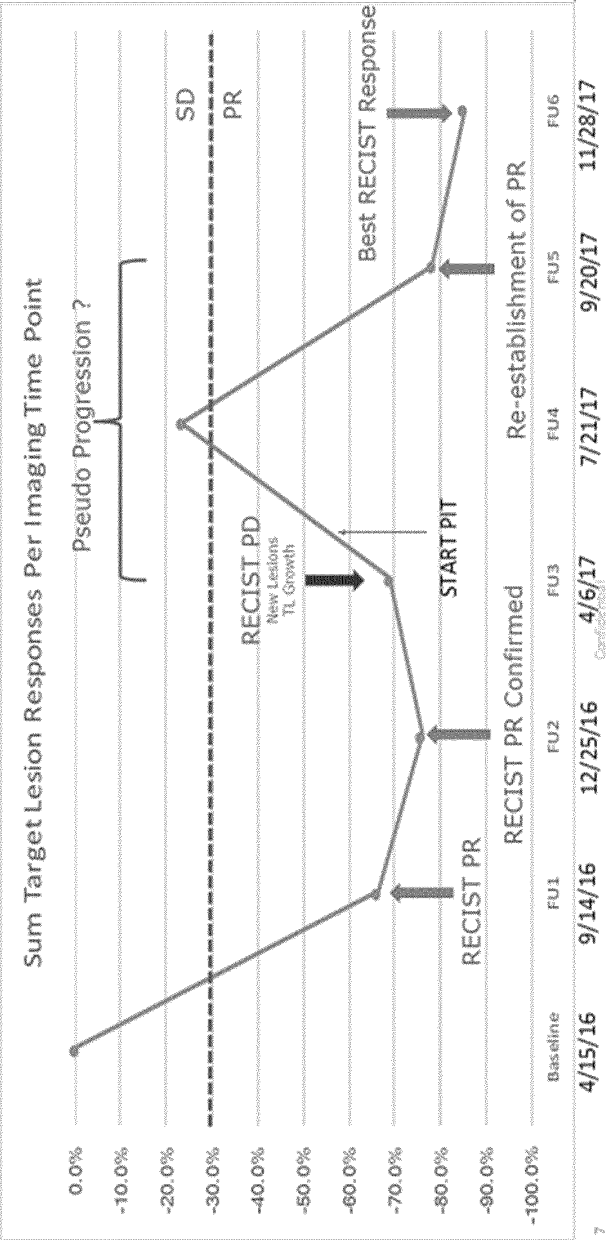
10/25
Figure 10



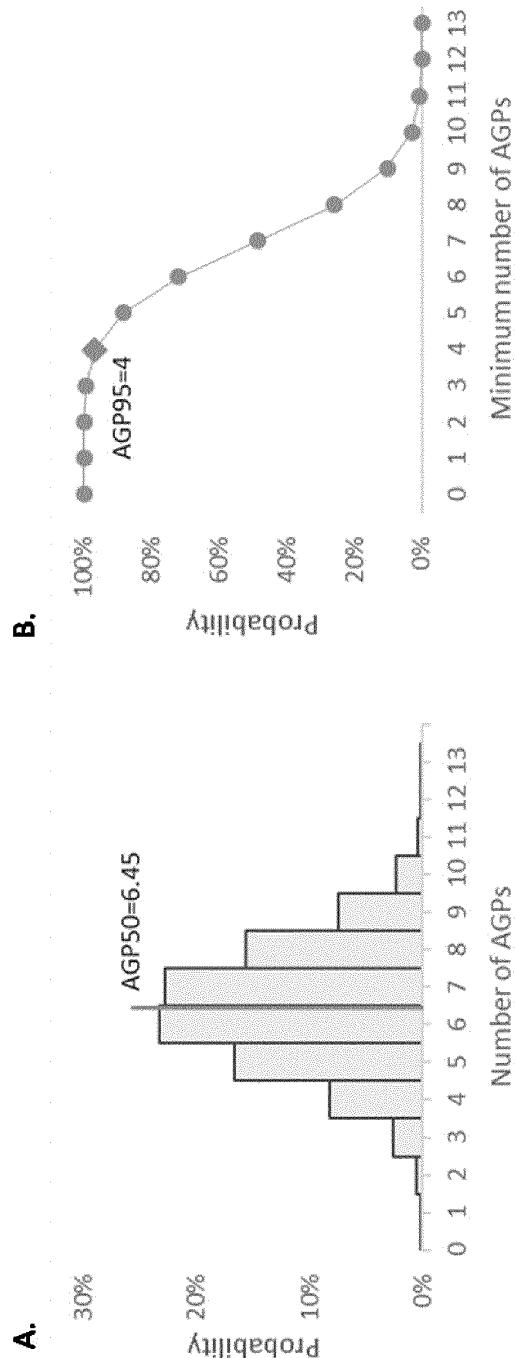
11/25
Figure 11



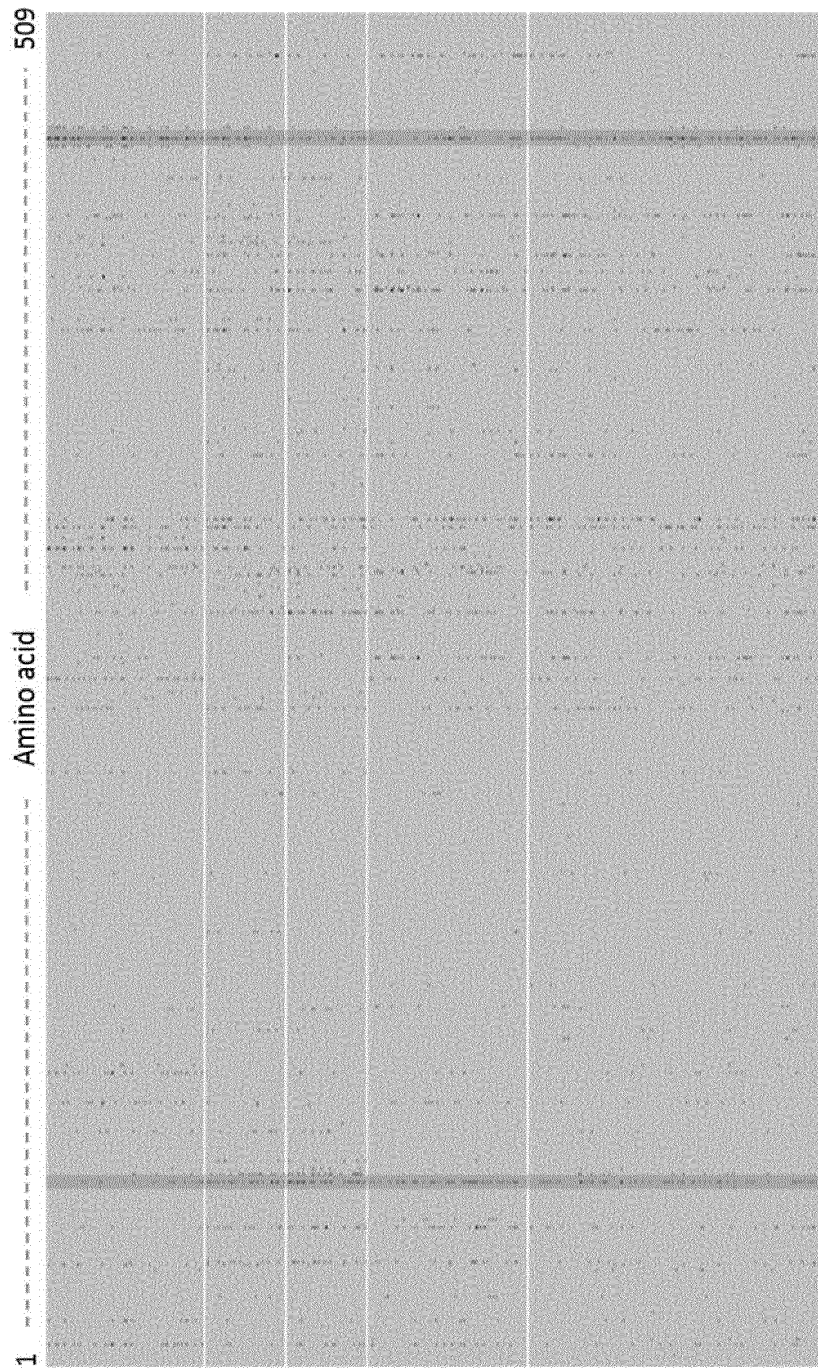
12/25
Figure 12



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Figure 13

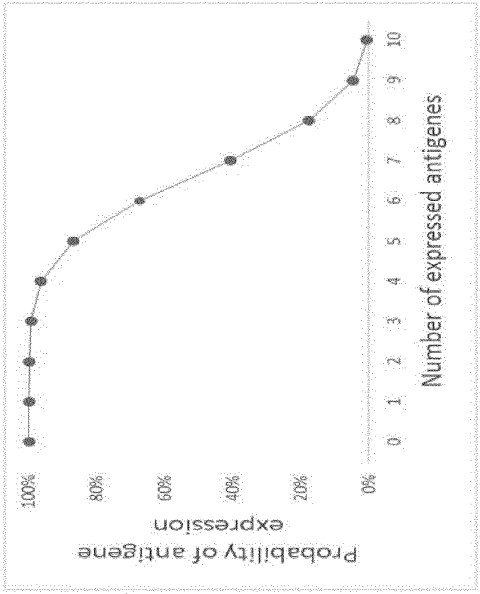


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Figure 14



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Figure 15

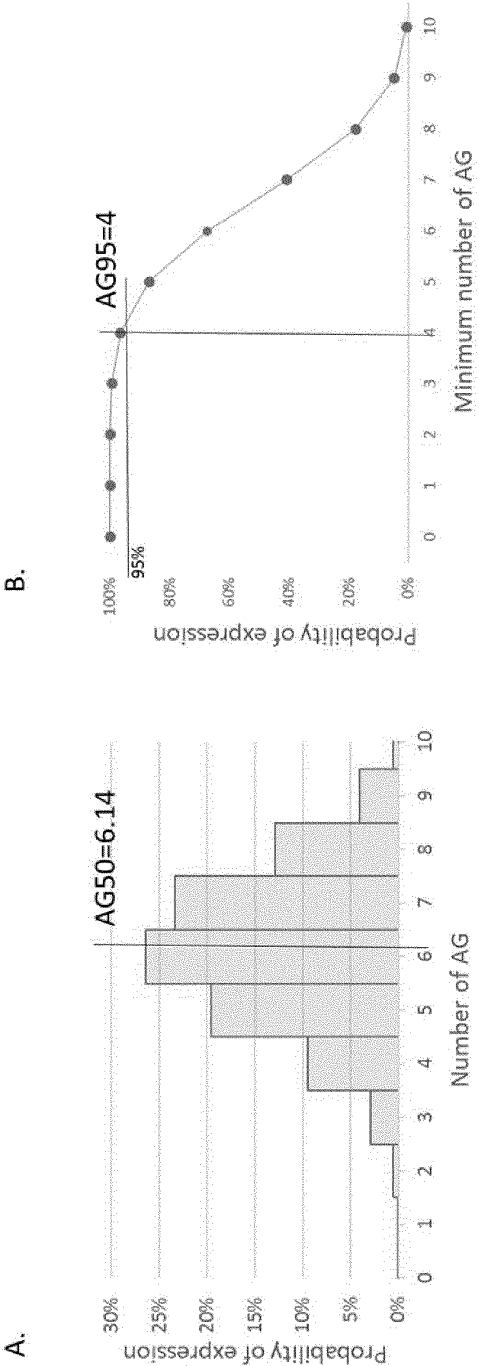


Conclusion

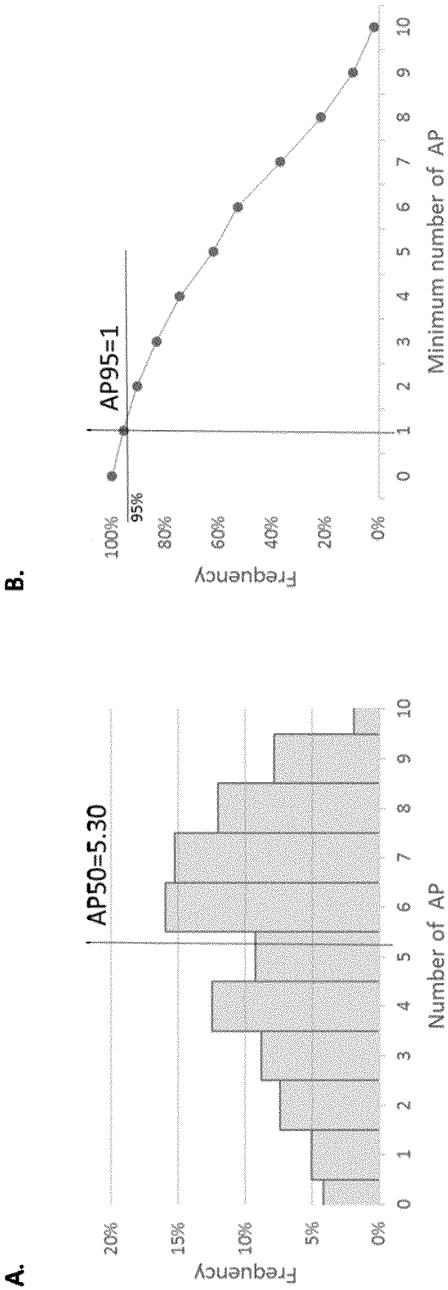
- 1. 99% of breast tumors express ≥ 3 antigens
- 2. No biopsy is needed

Antigens	Expression rate
Cancer testis antigens	Determined from 1053 tumor samples
AKAP-4	85%
BORIS	71%
SPAG9	88%
PRAME	55%
NY-SAR-35	48%
MAGE-A9	44%
NY-BR-1	47%
SURVIVIN	71%
MAGE-A11	59%
HOM-TES-85	47%

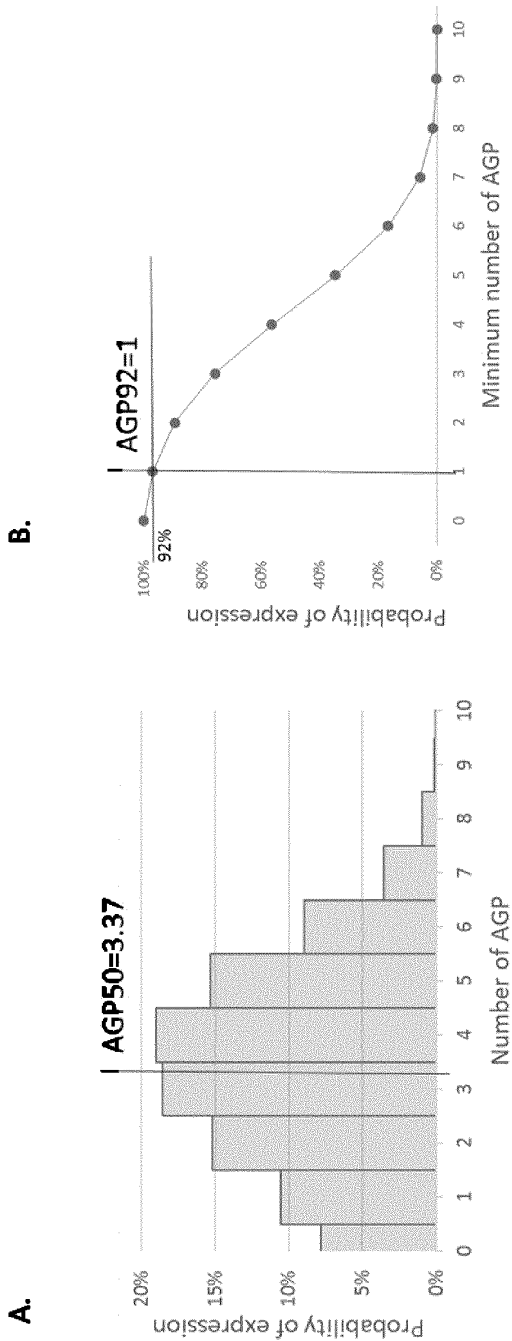
16/25
Figure 16



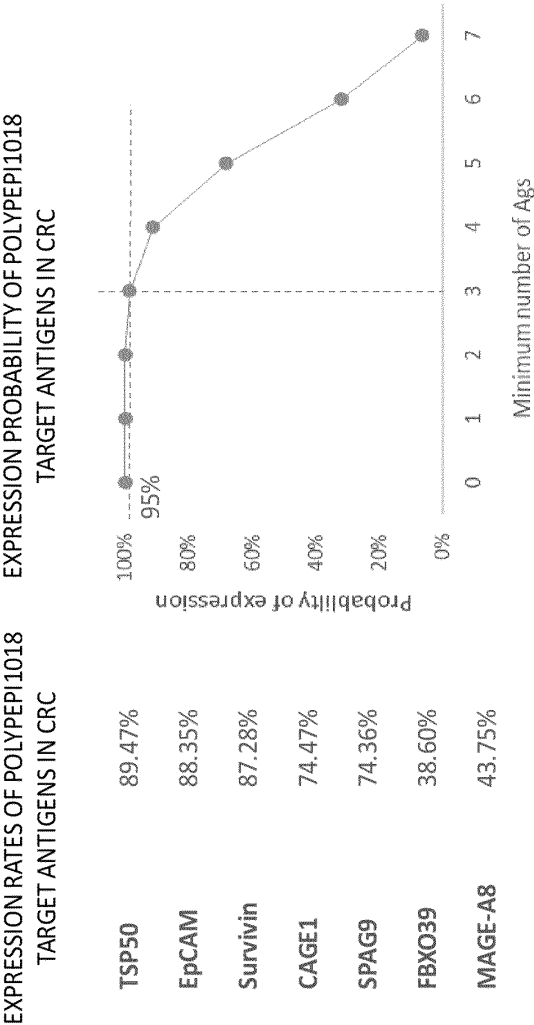
17/25
Figure 17



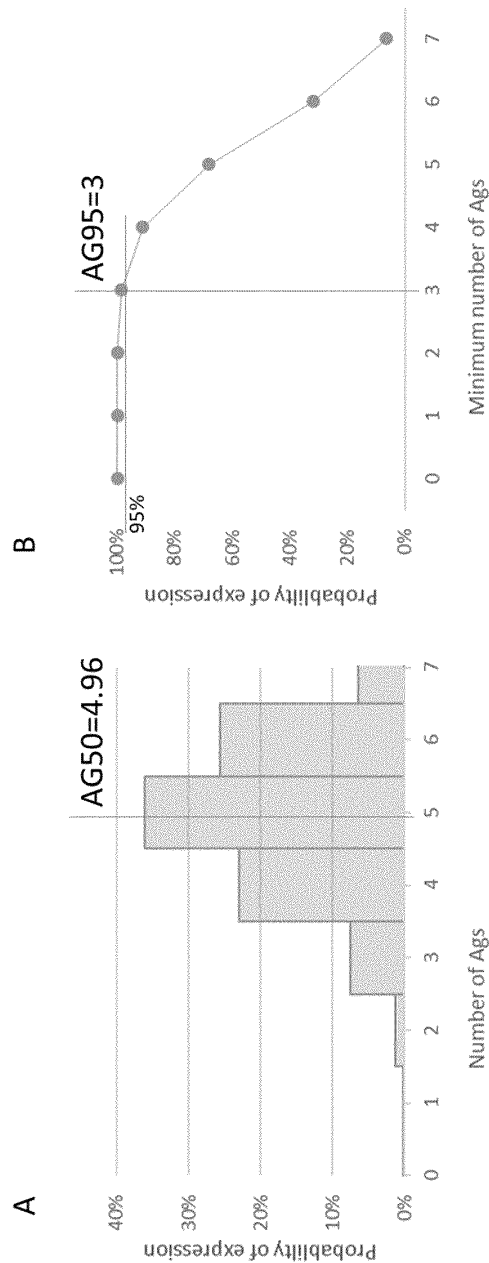
18/25
Figure 18



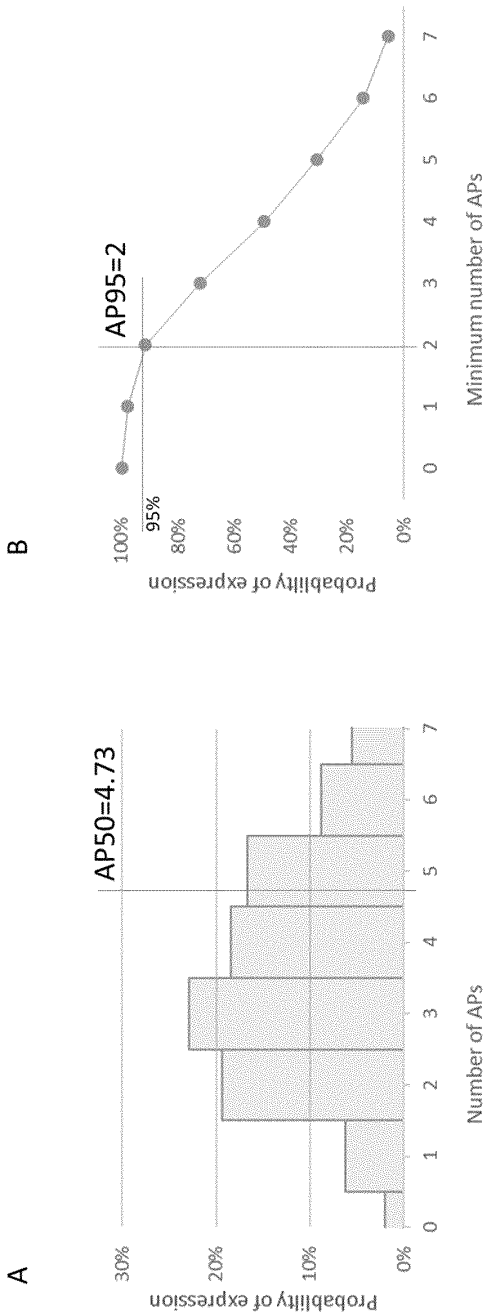
19/25
Figure 19



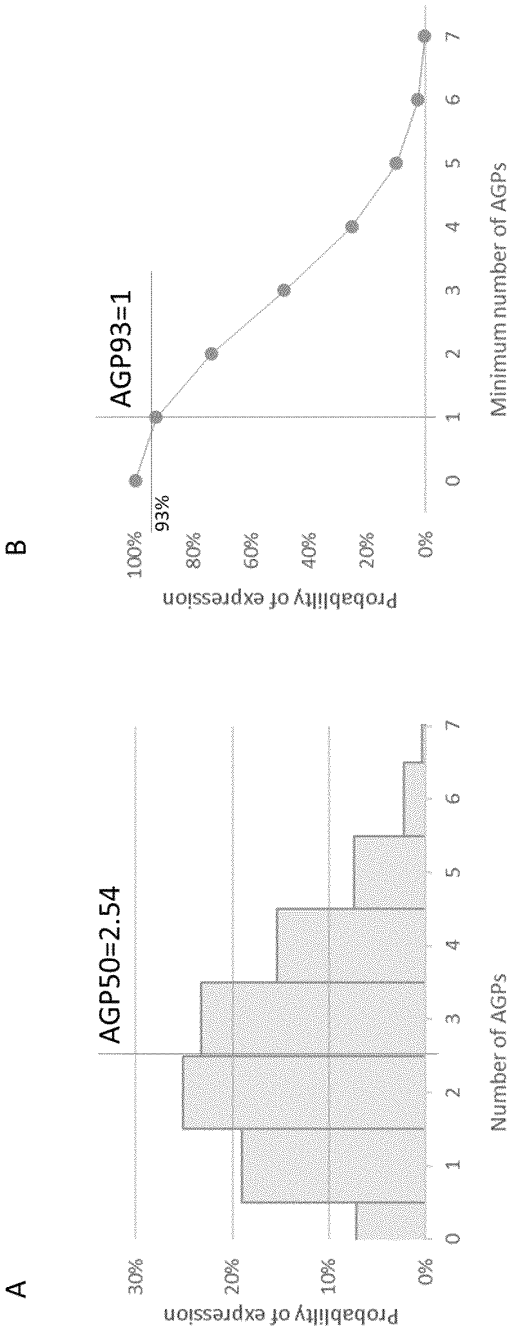
20/25
Figure 20



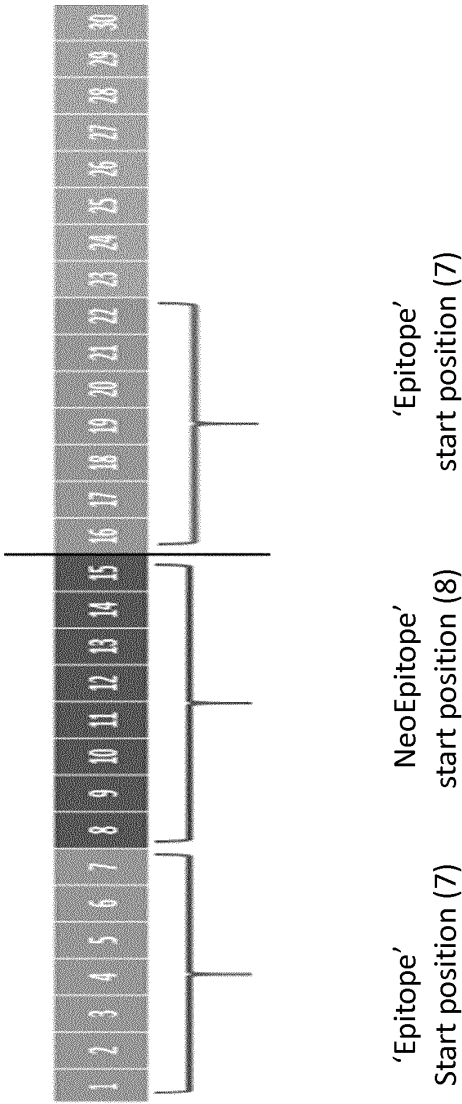
21/25
Figure 21



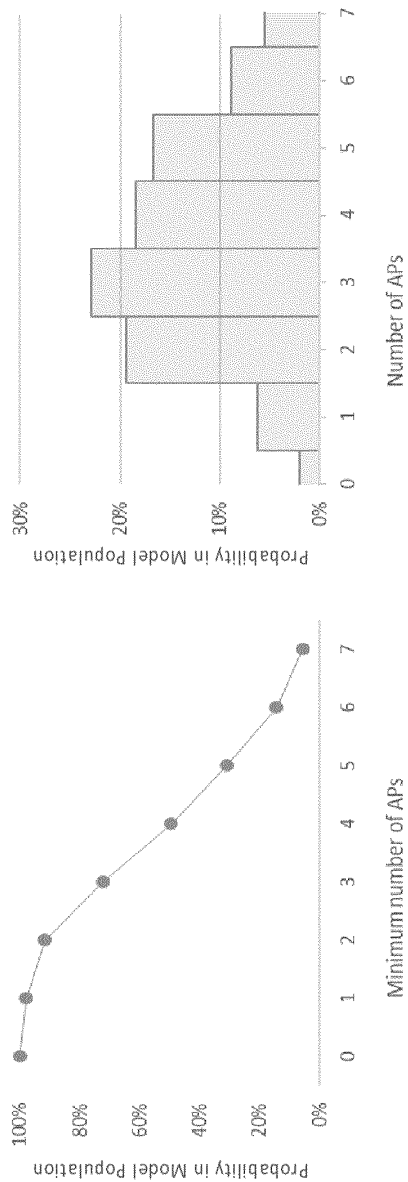
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Figure 22



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Figure 23



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Figure 24



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Figure 25

