

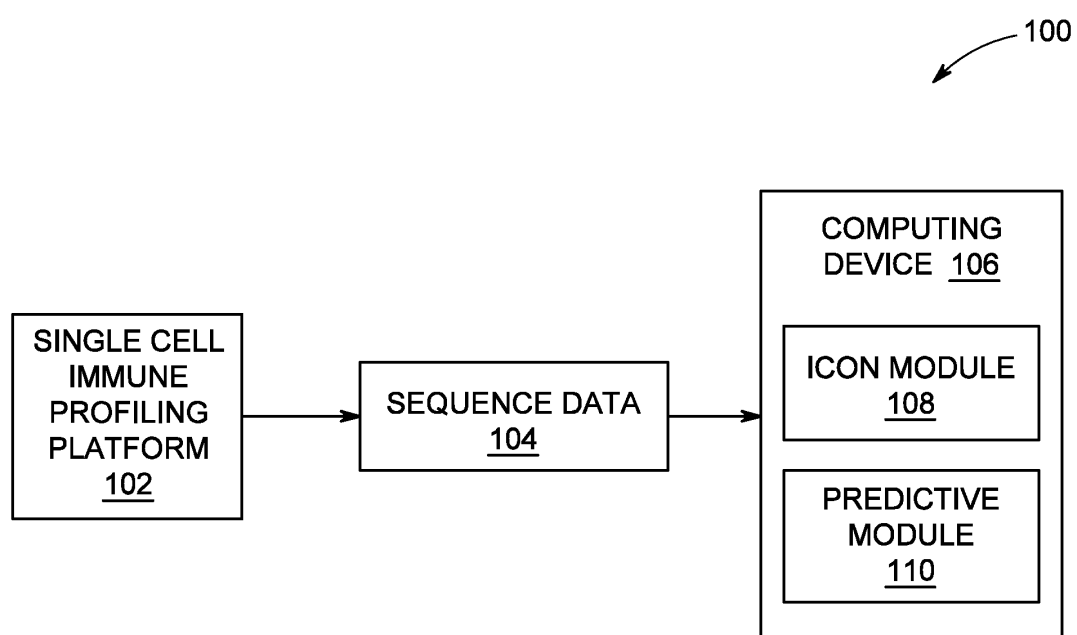


FIG. 1

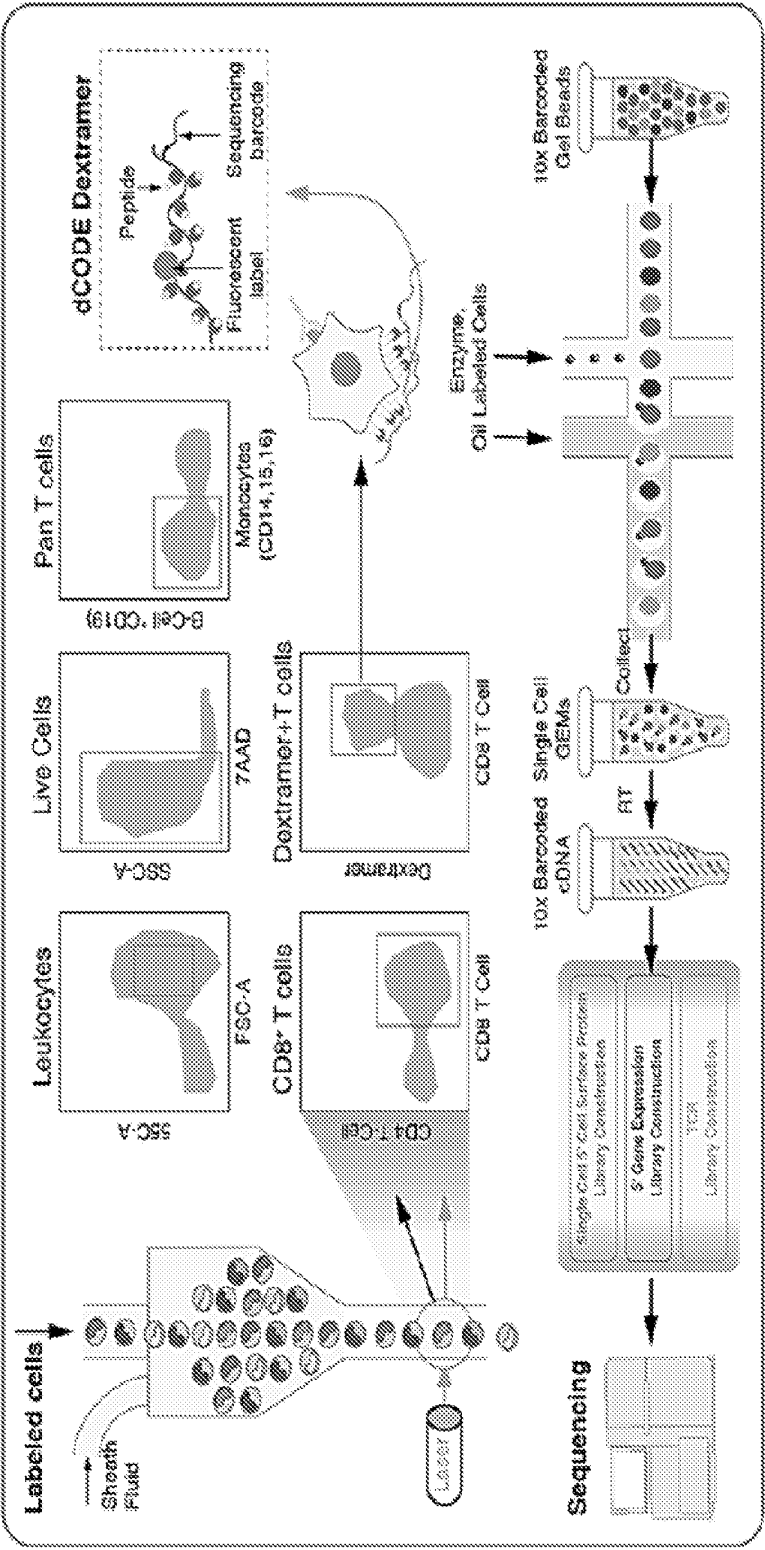


FIG. 2

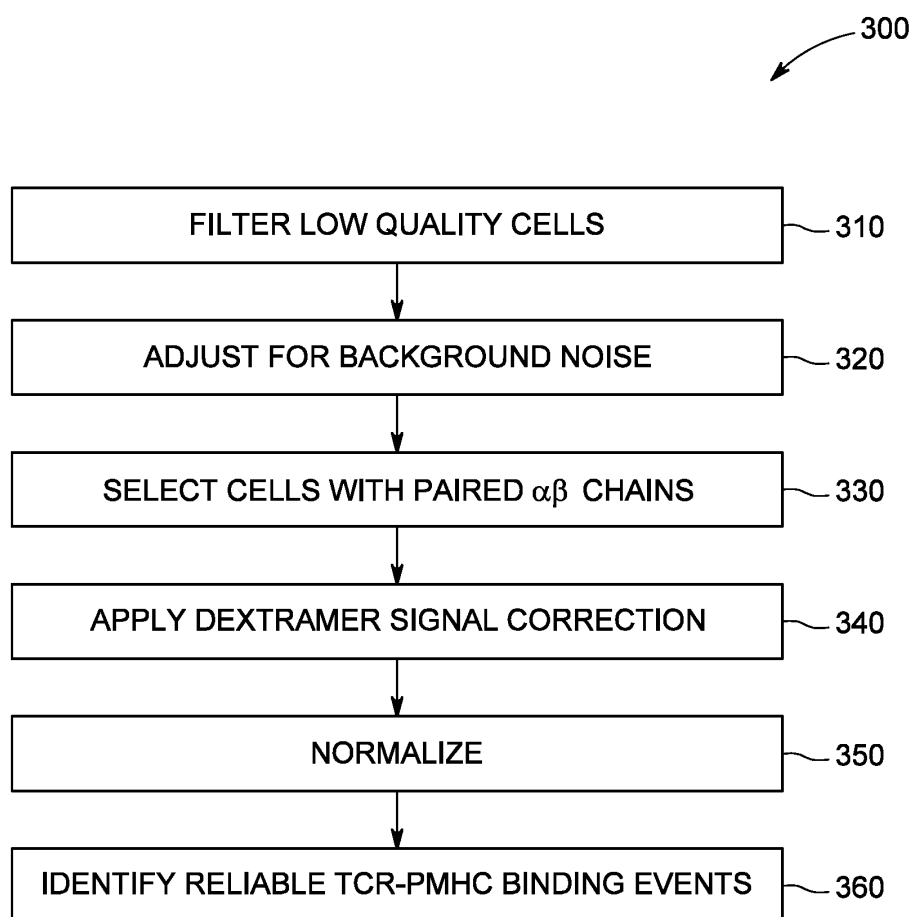


FIG. 3

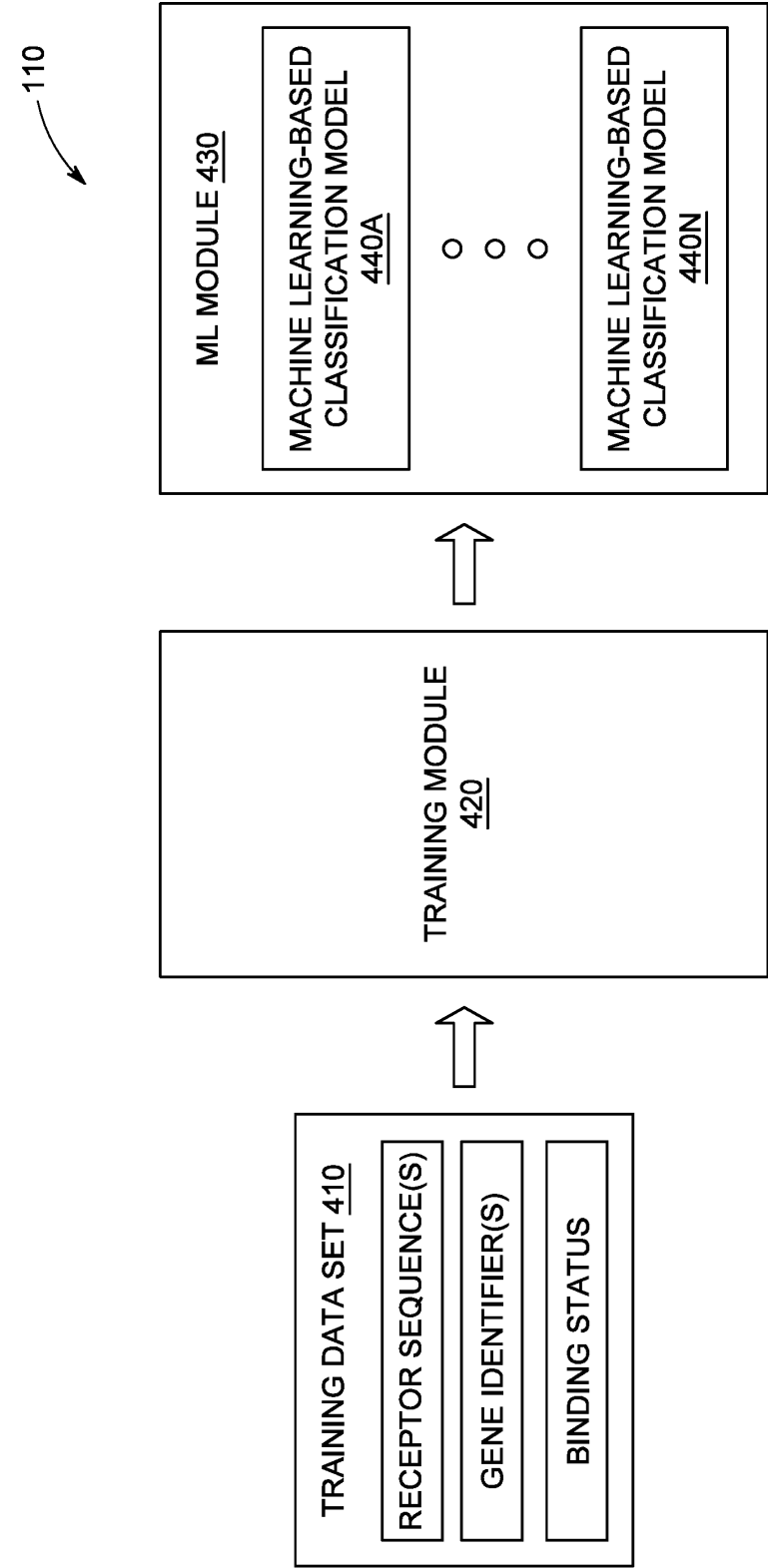


FIG. 4

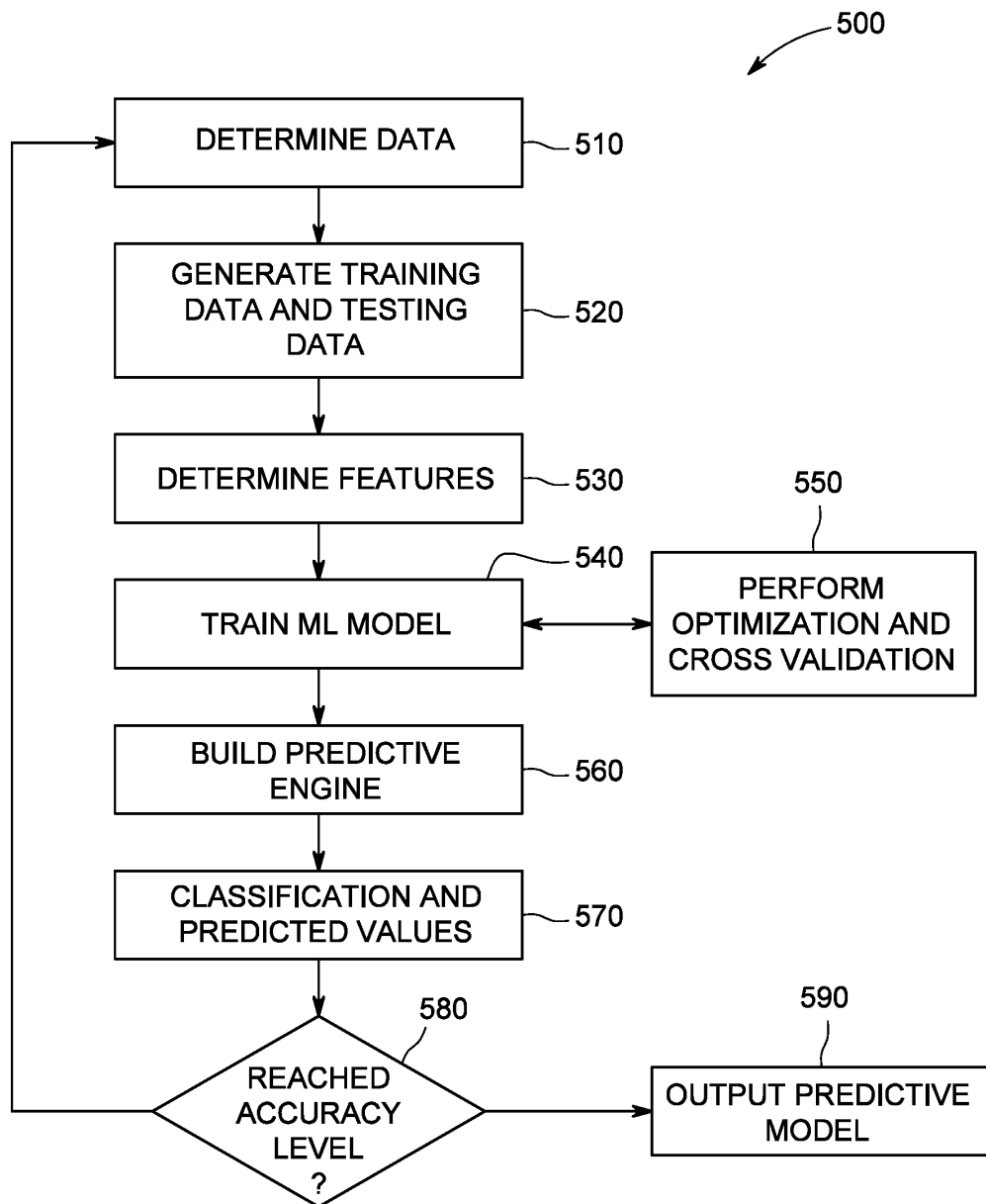


FIG. 5

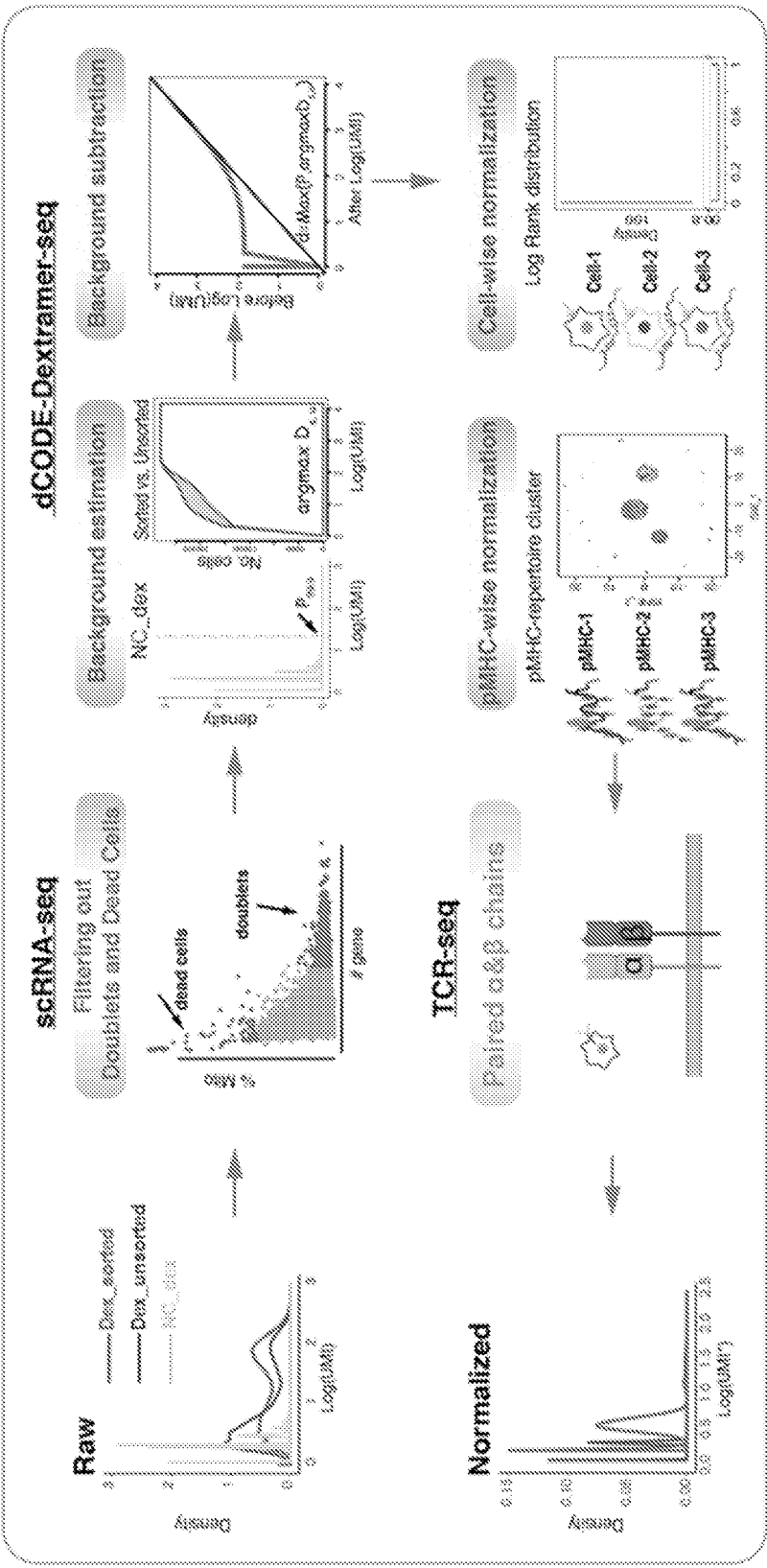


FIG. 6A

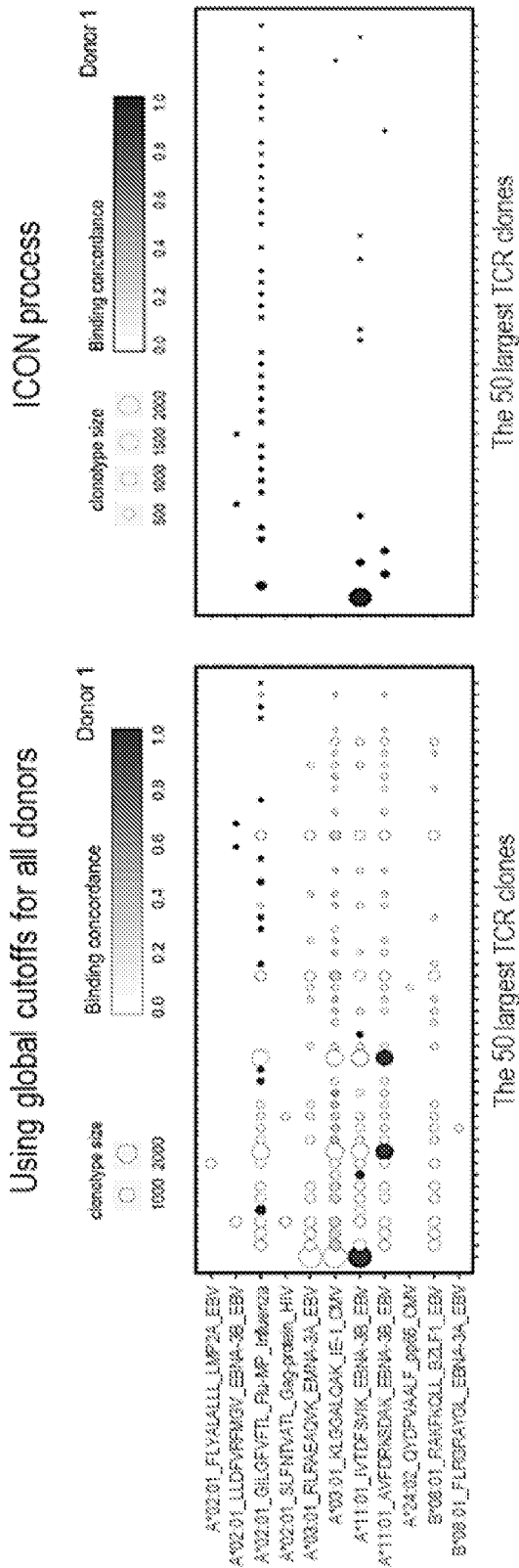


FIG.6B

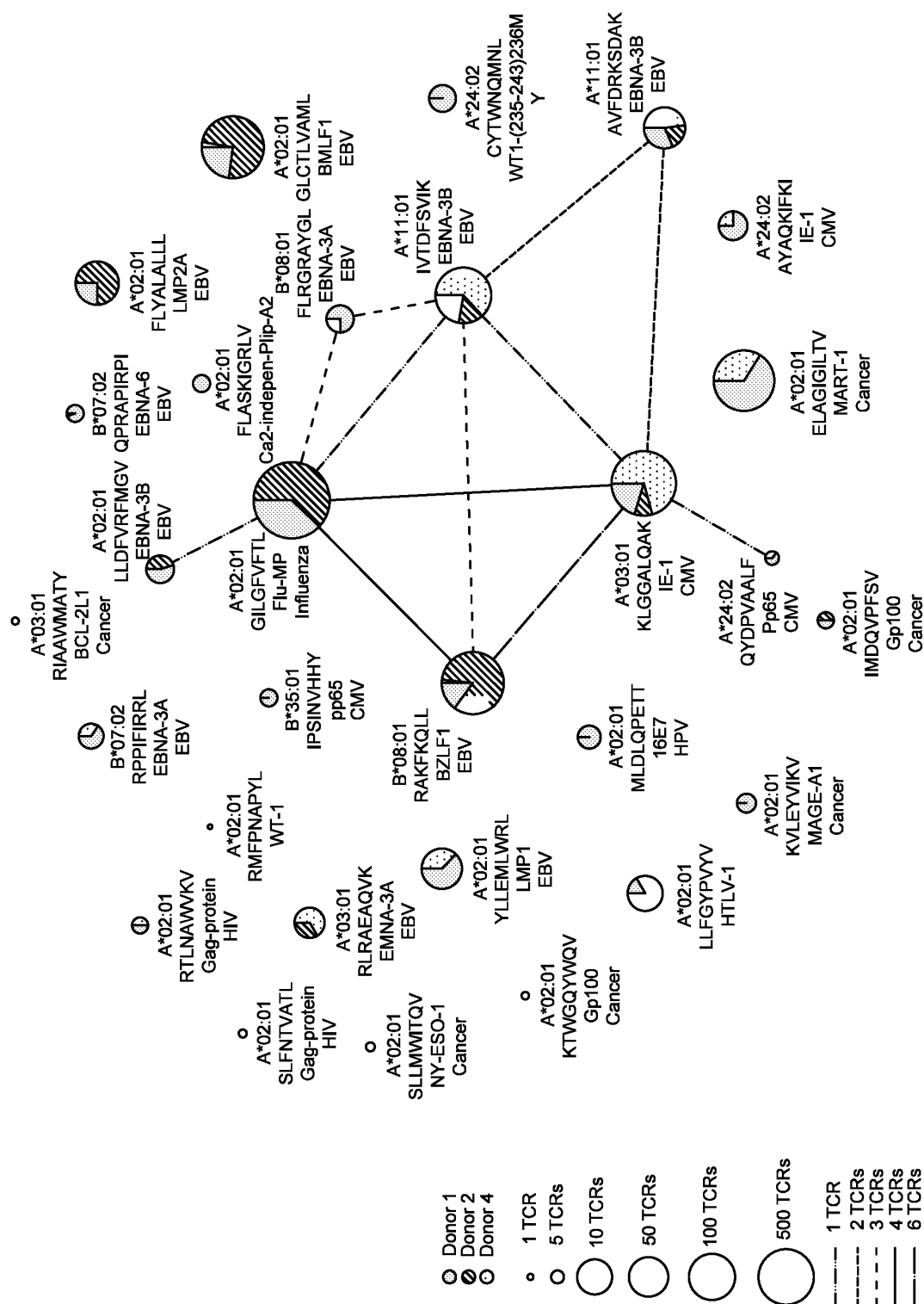


FIG. 7A

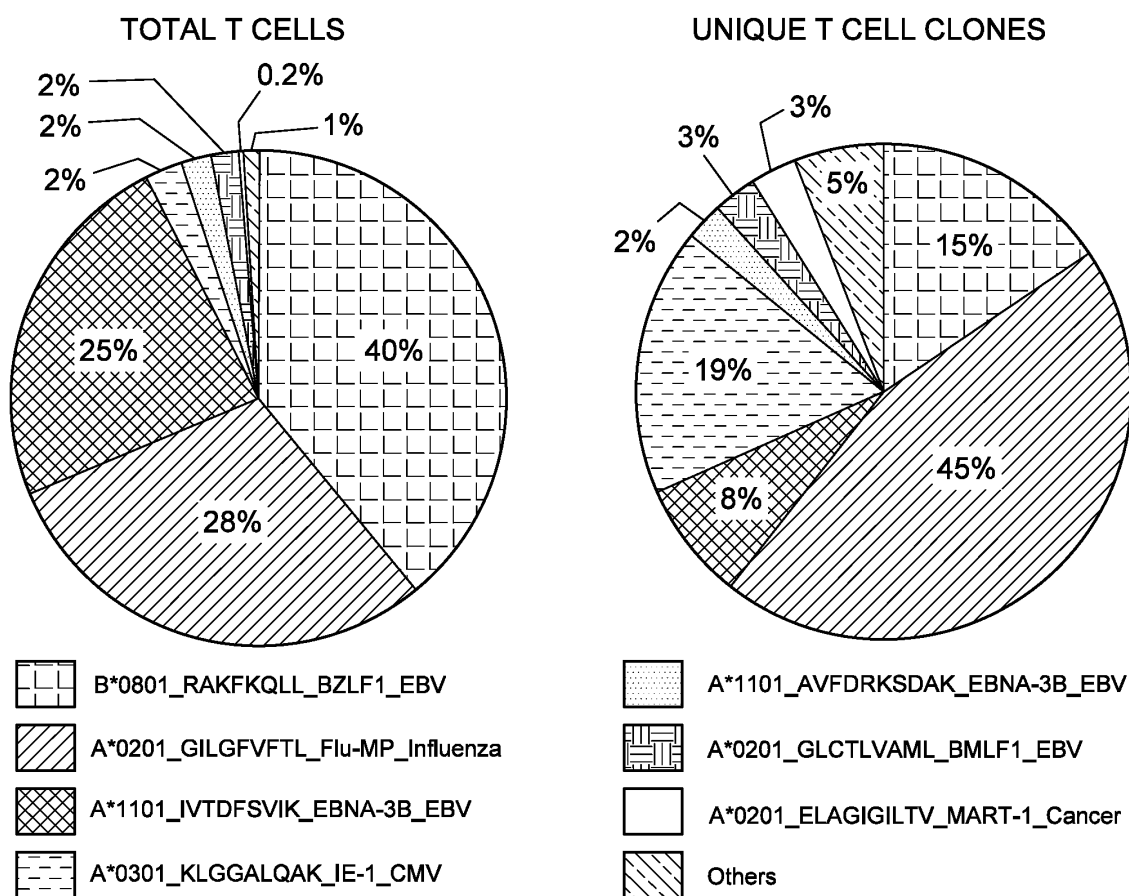


FIG. 7B

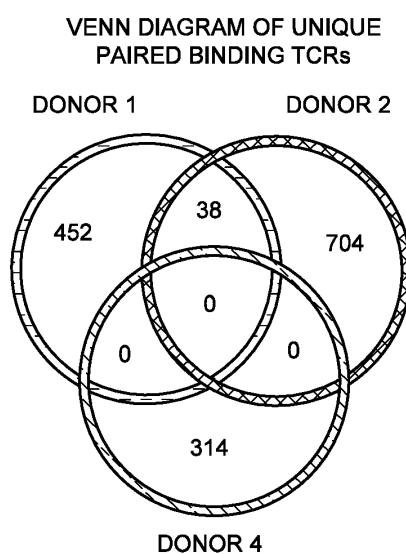


FIG. 7C

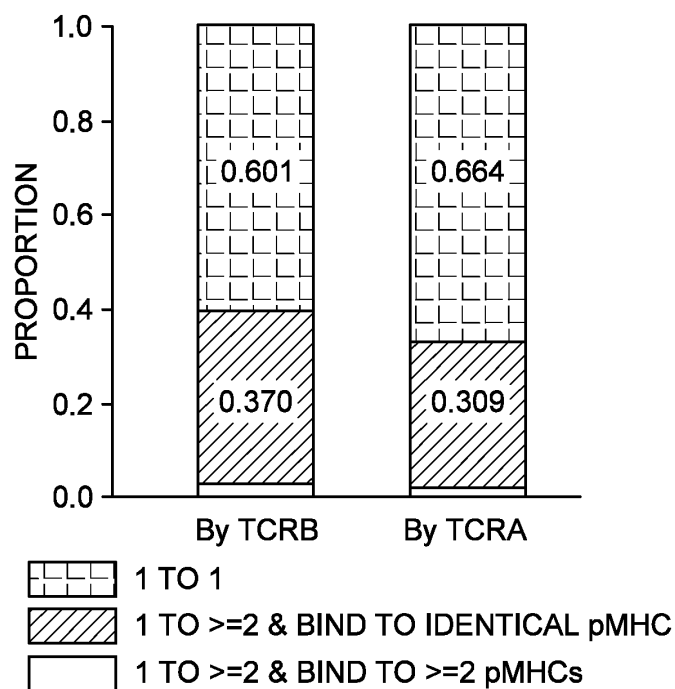


FIG. 7D

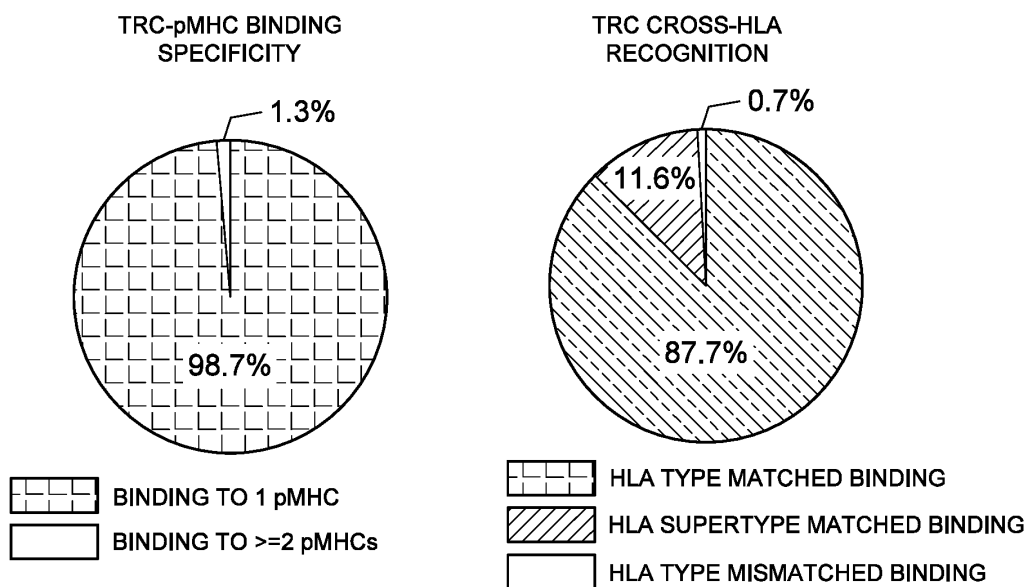
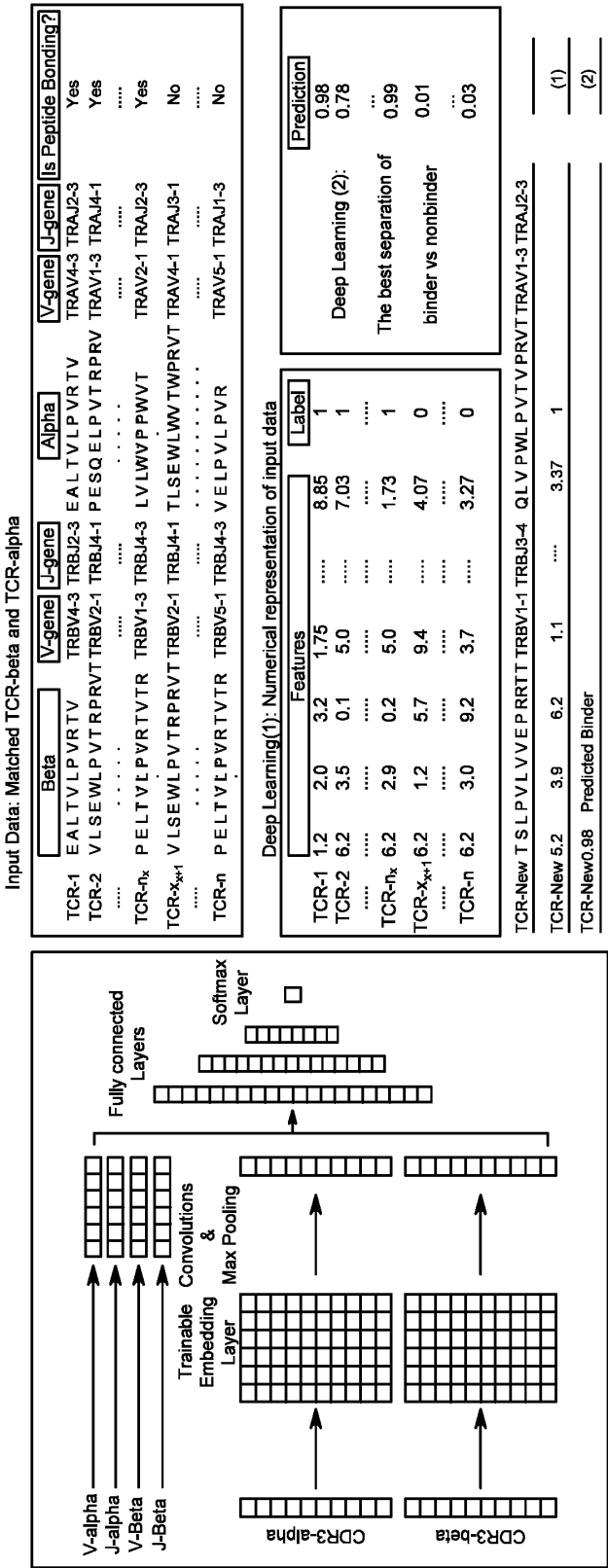


FIG. 7E



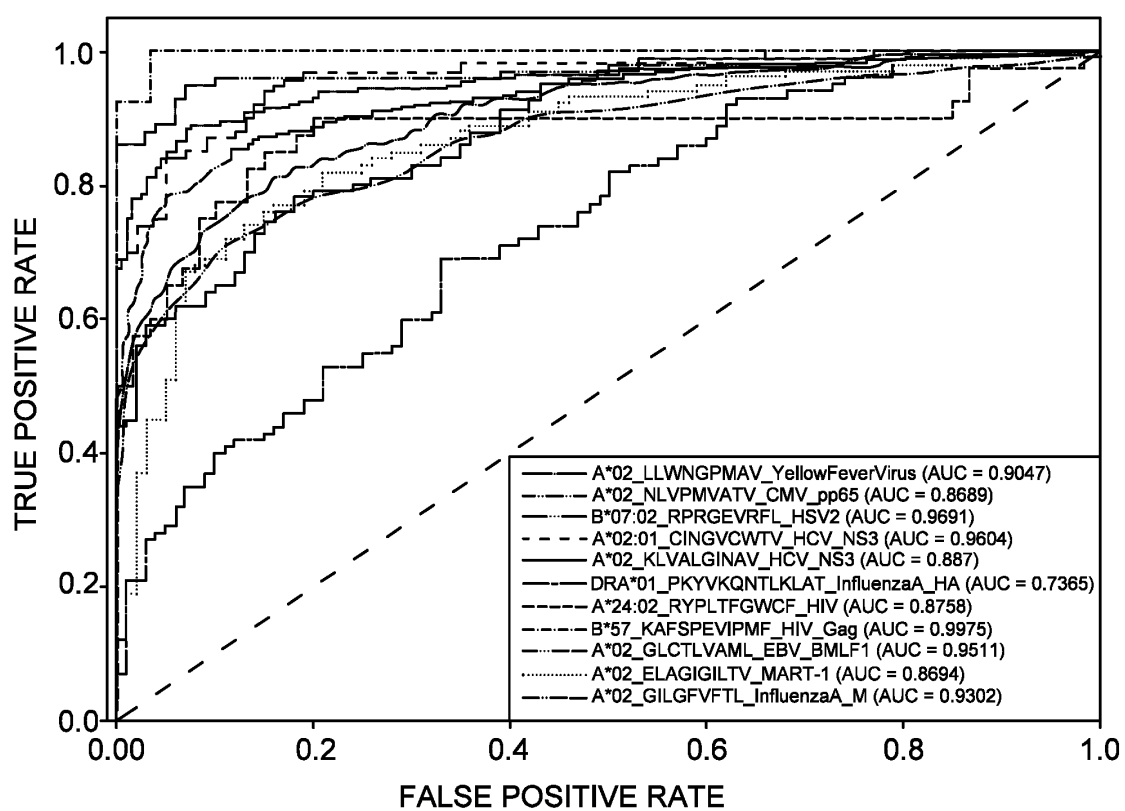


FIG. 8B

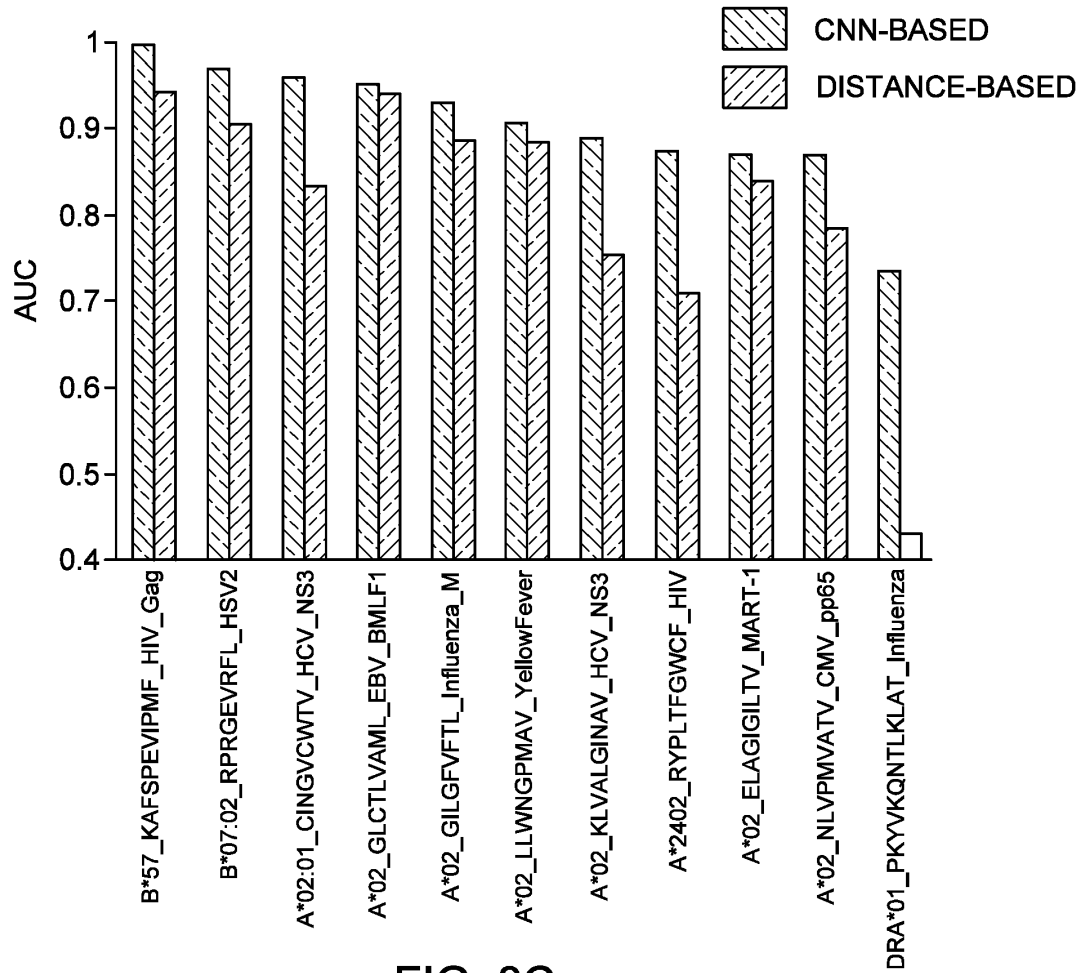


FIG. 8C

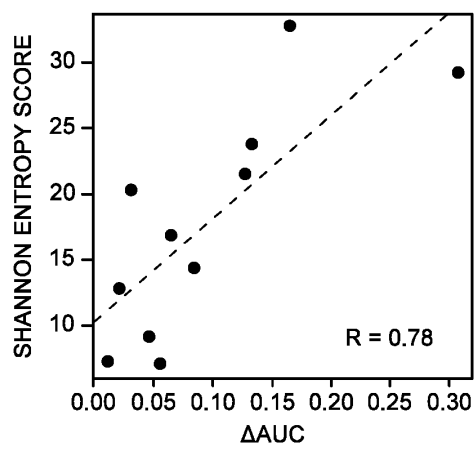


FIG. 8D

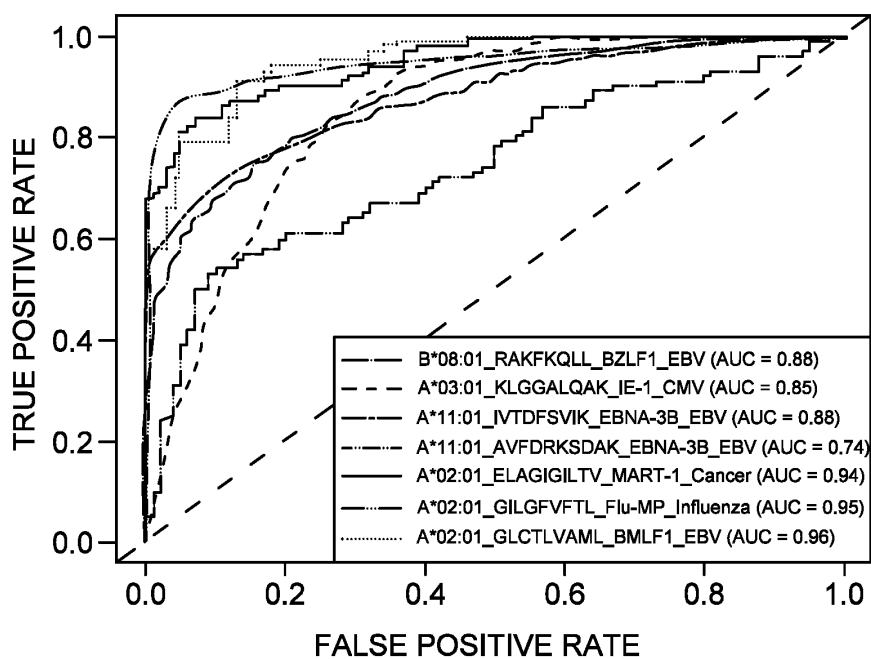


FIG. 9A

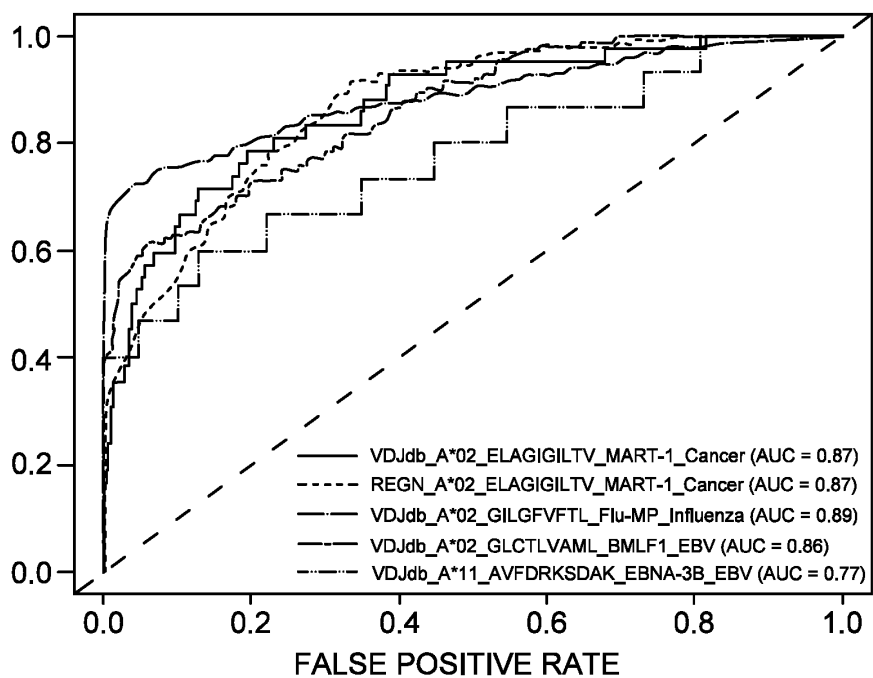


FIG. 9B

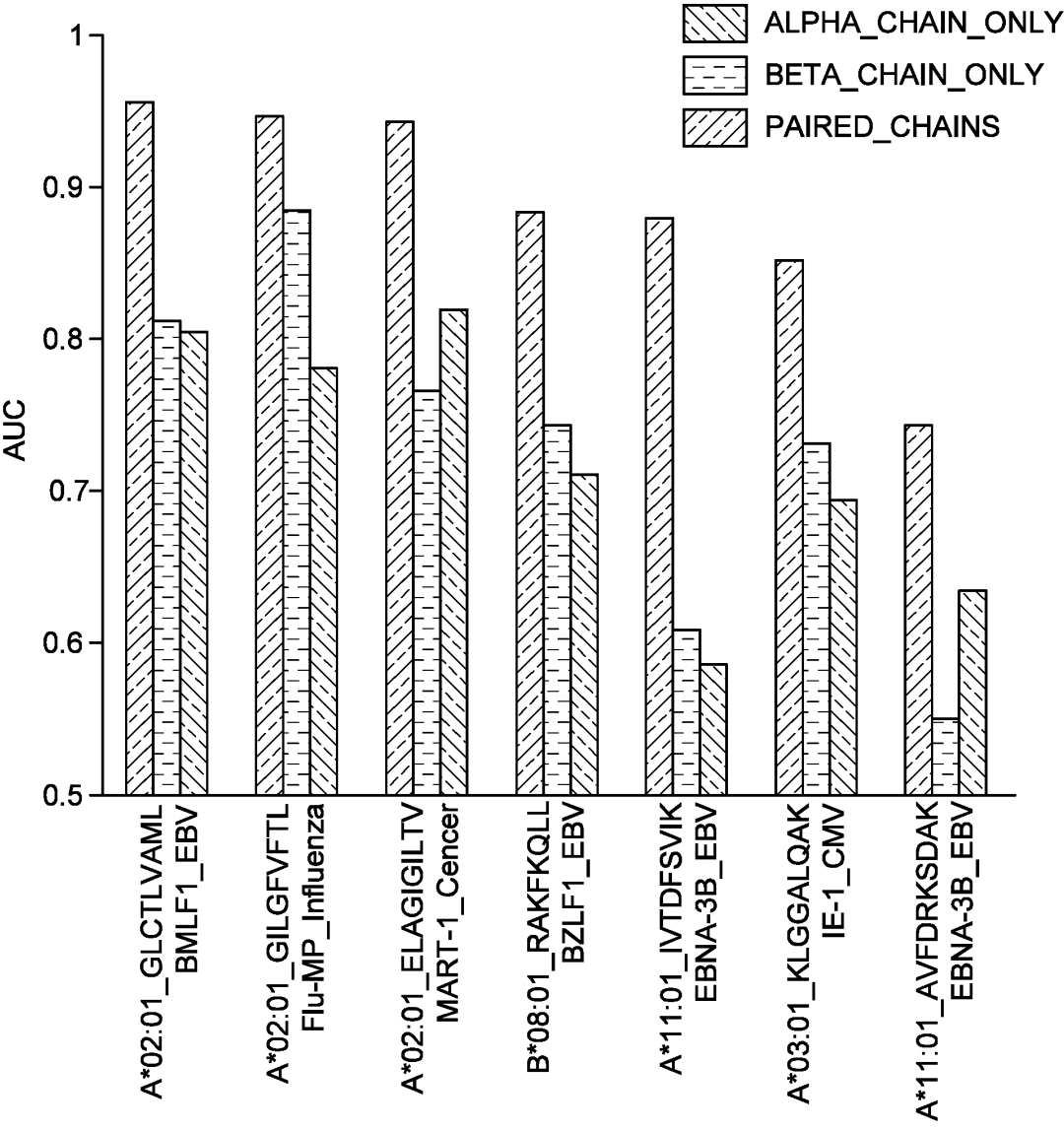
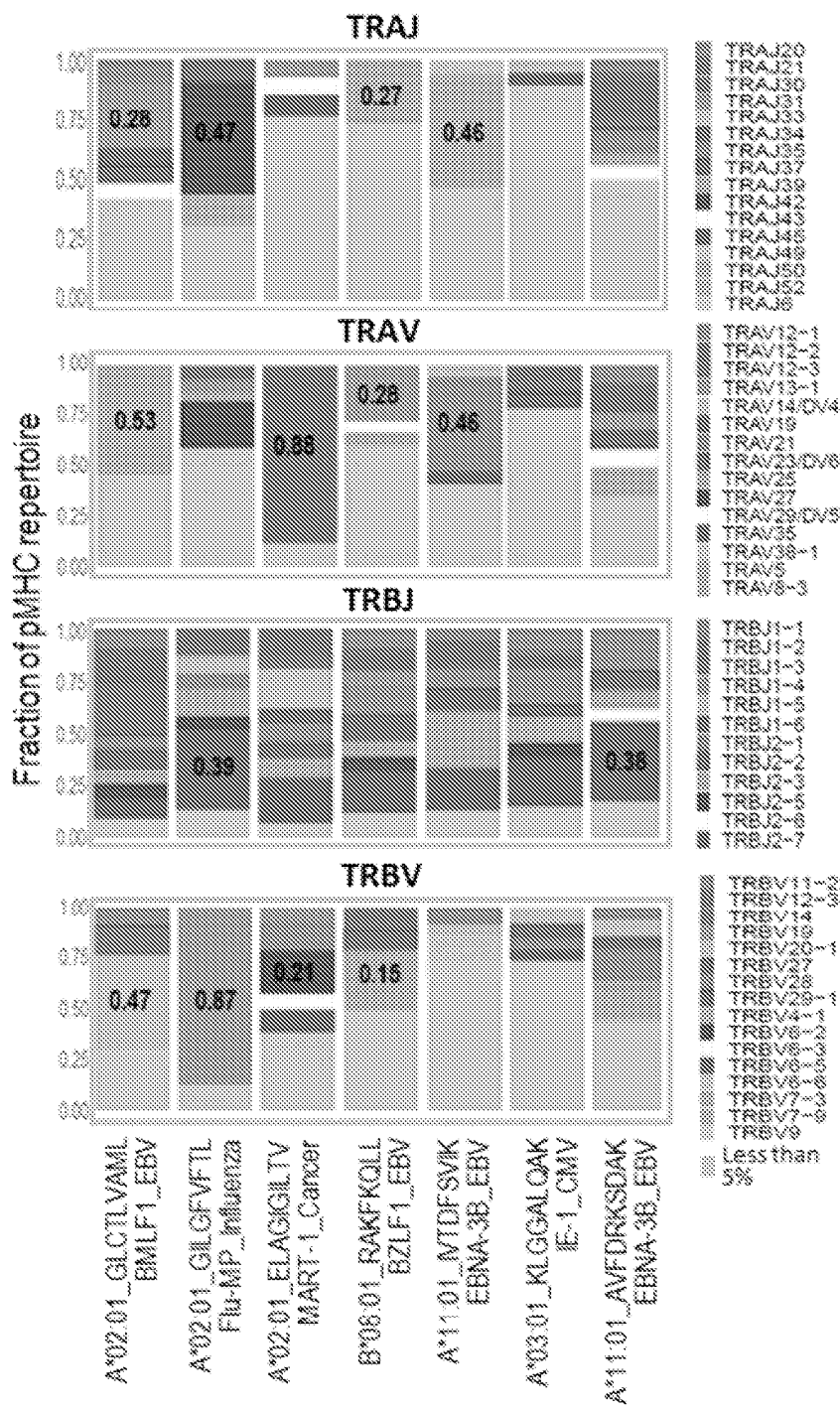


FIG. 9C

FIG. 9D



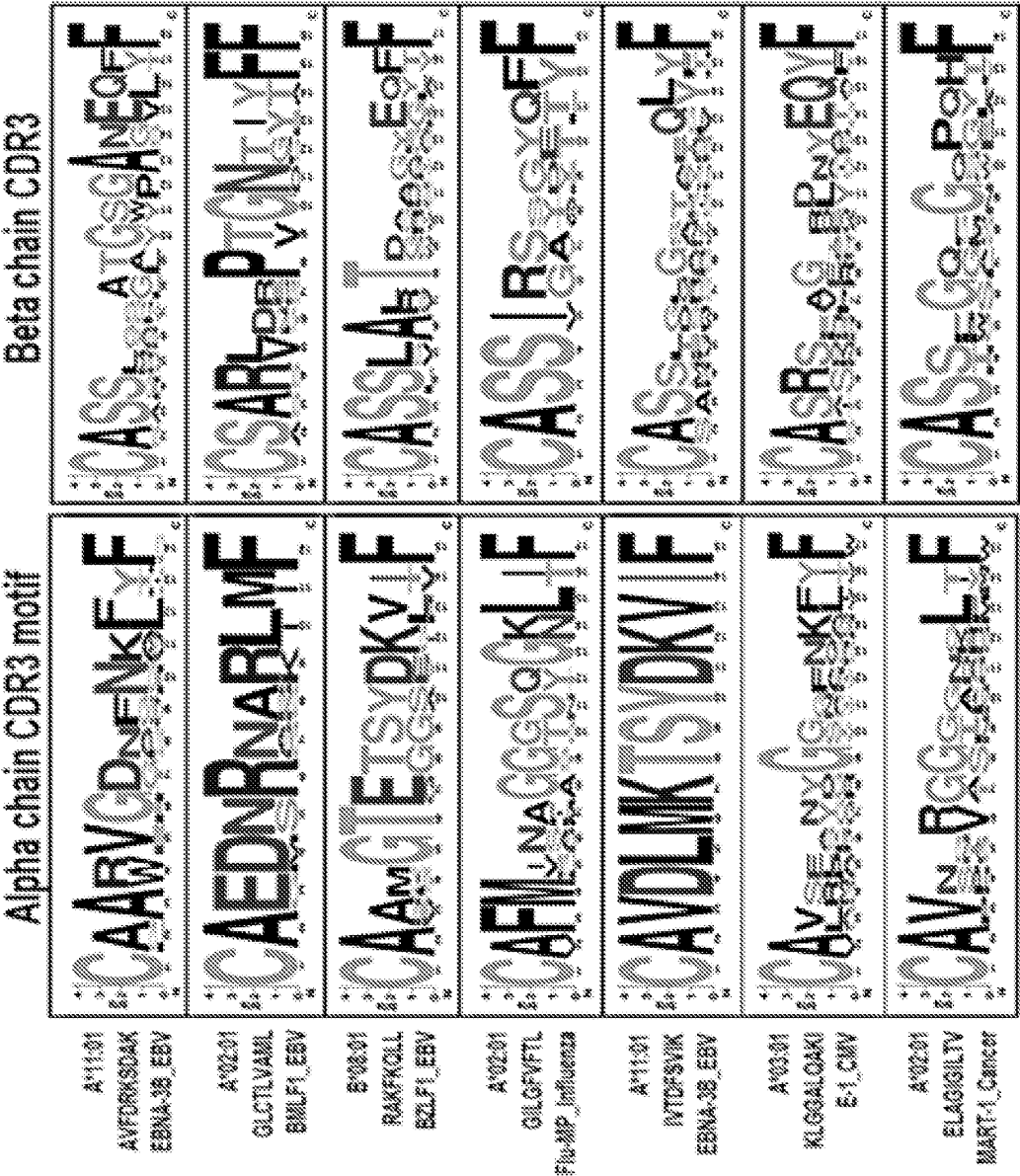


FIG. 9E

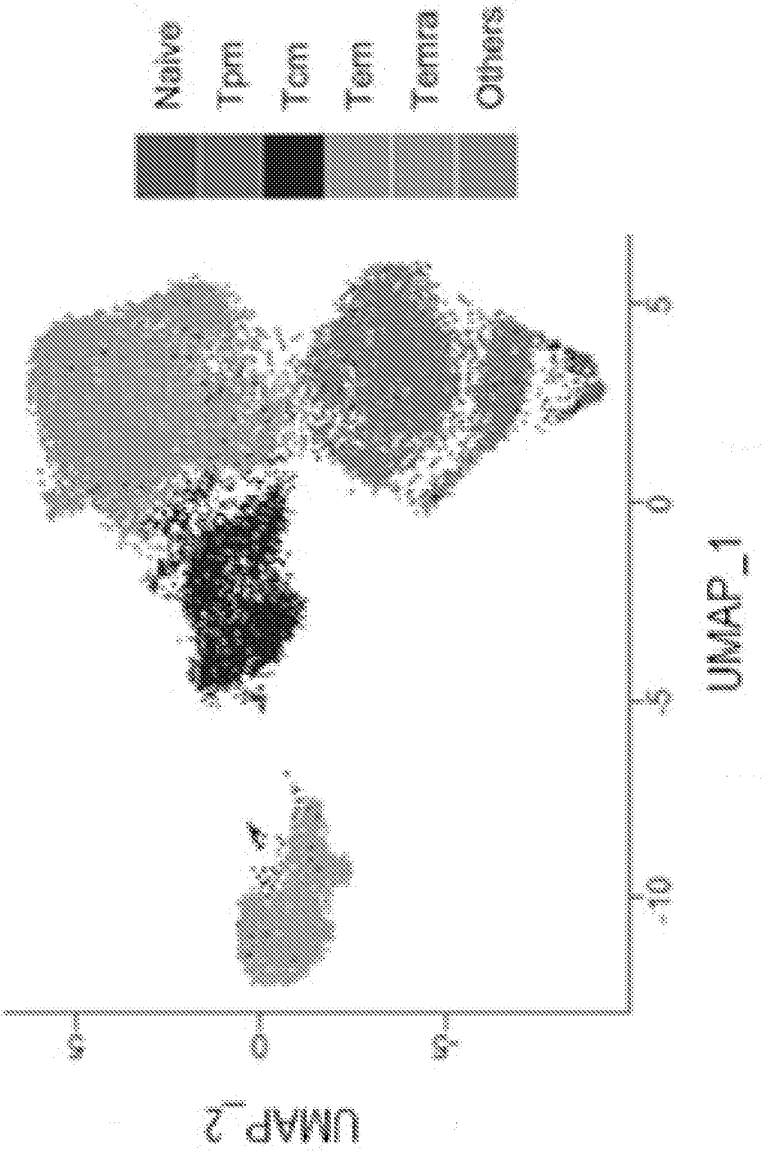


FIG. 10A

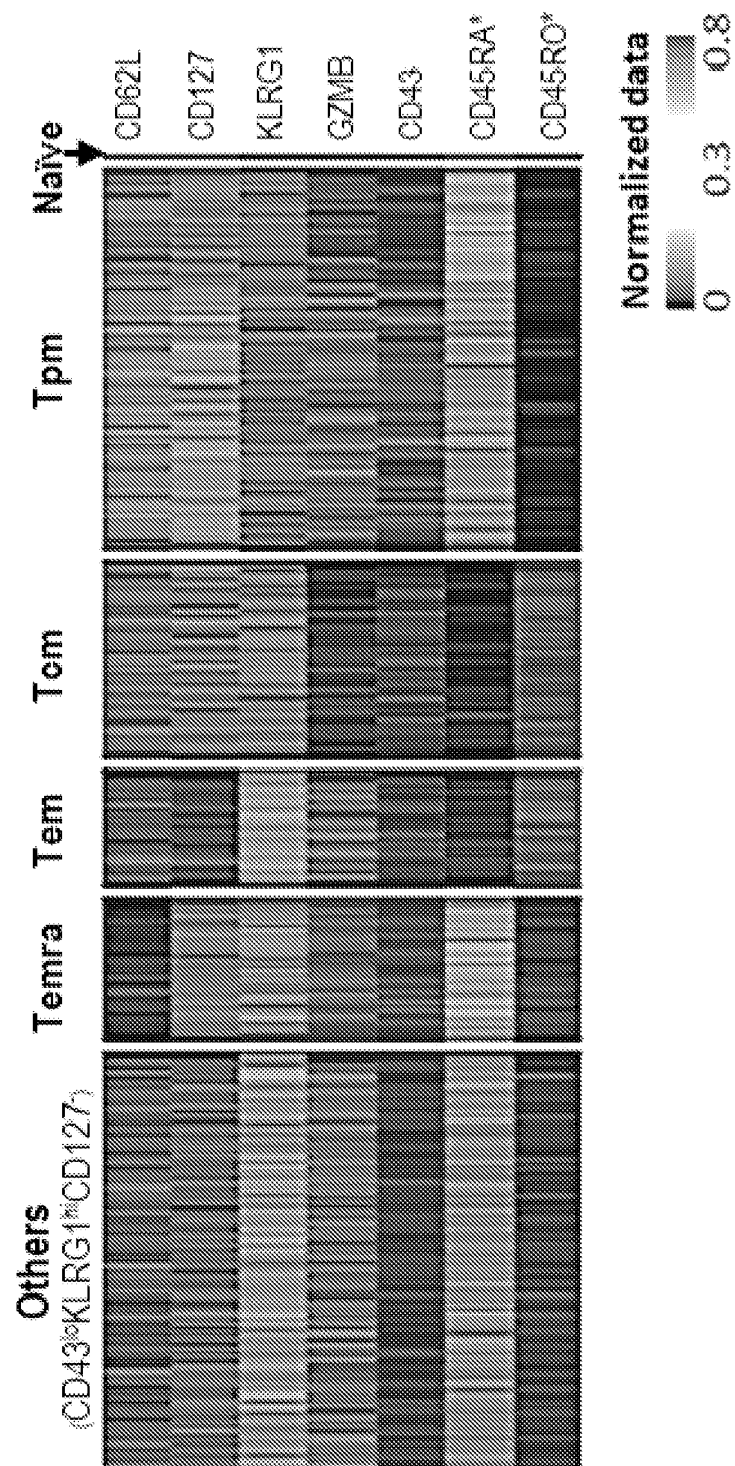


FIG. 10B

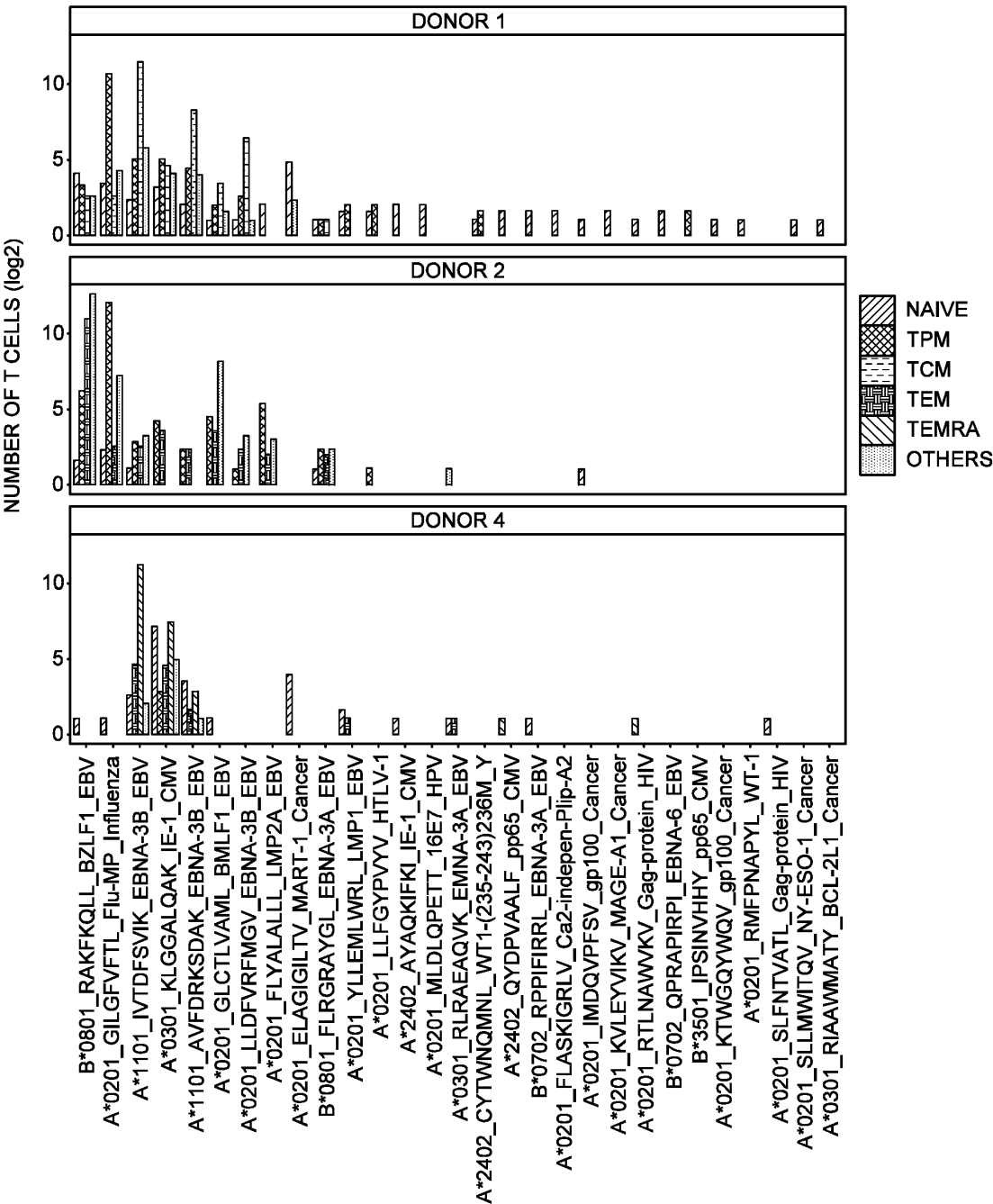


FIG. 10C

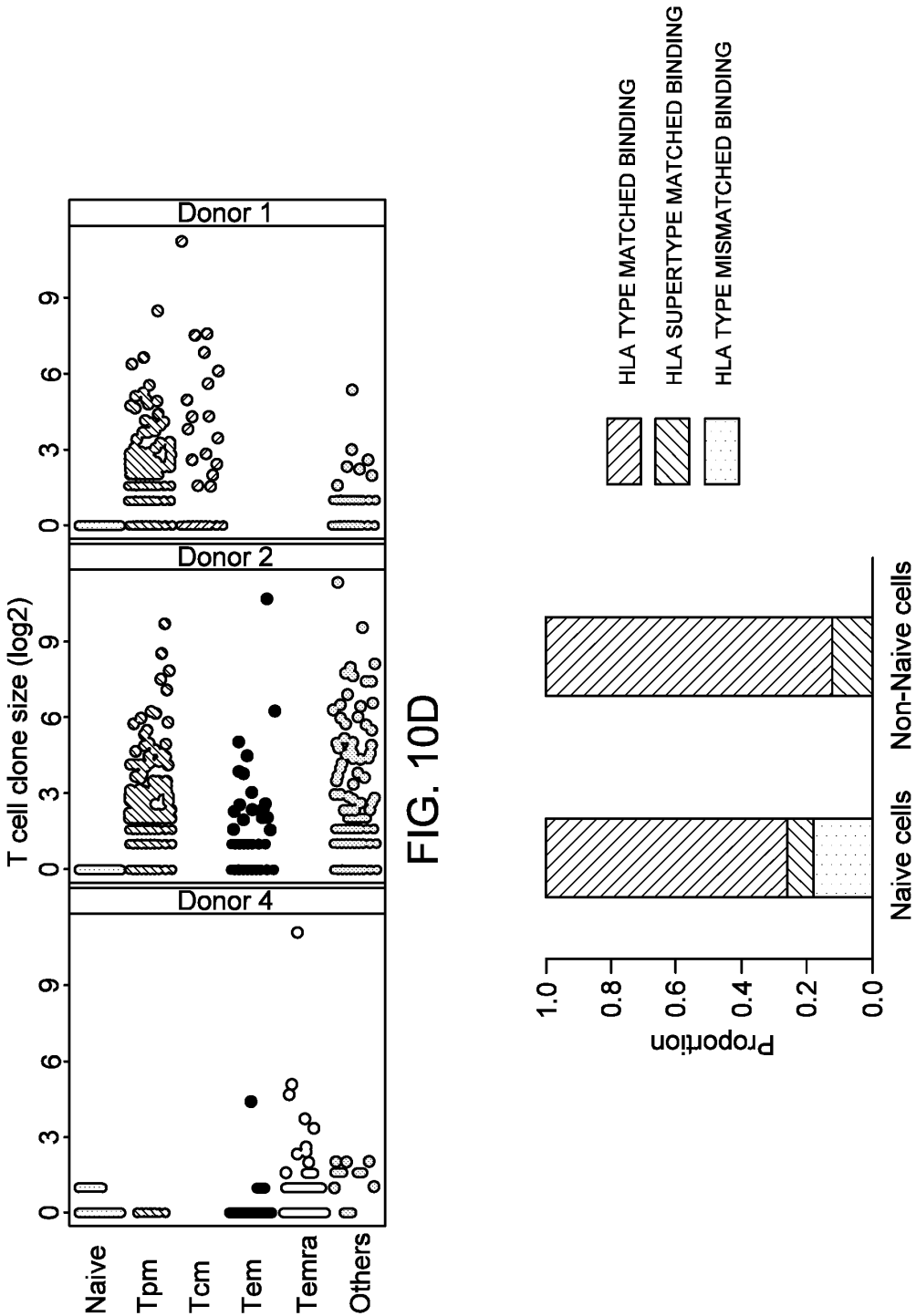
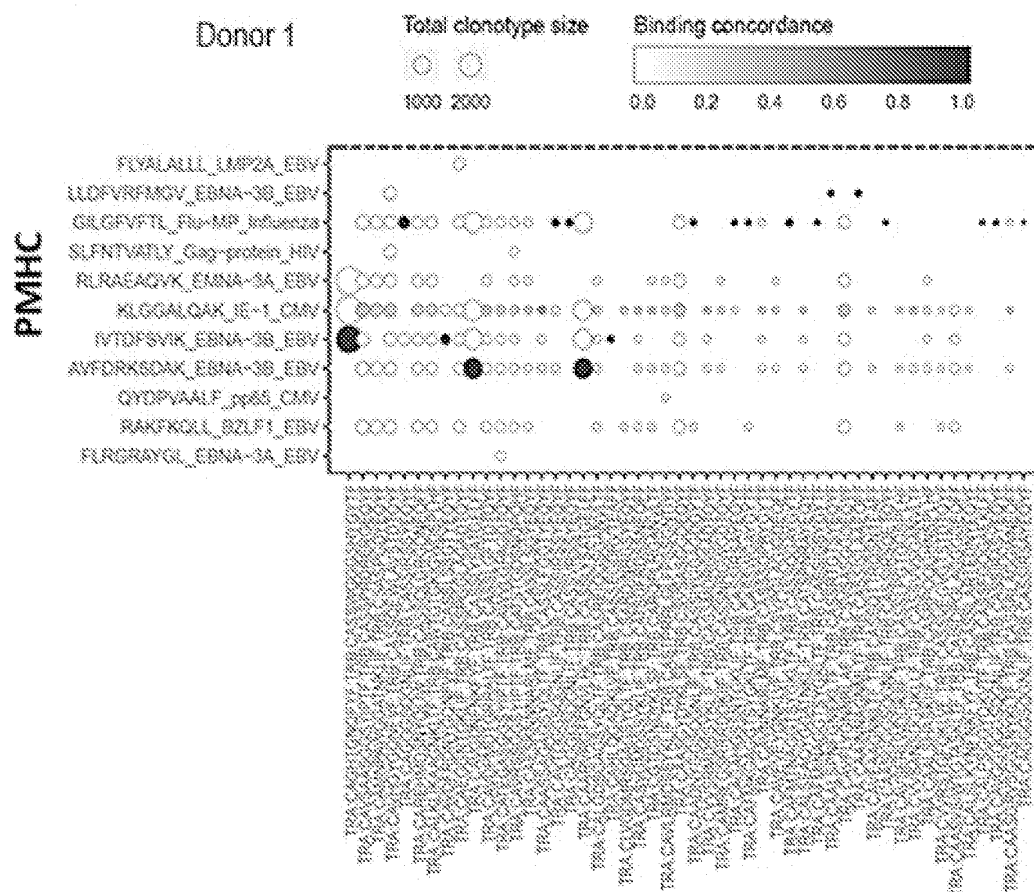


FIG. 10D

FIG. 10E



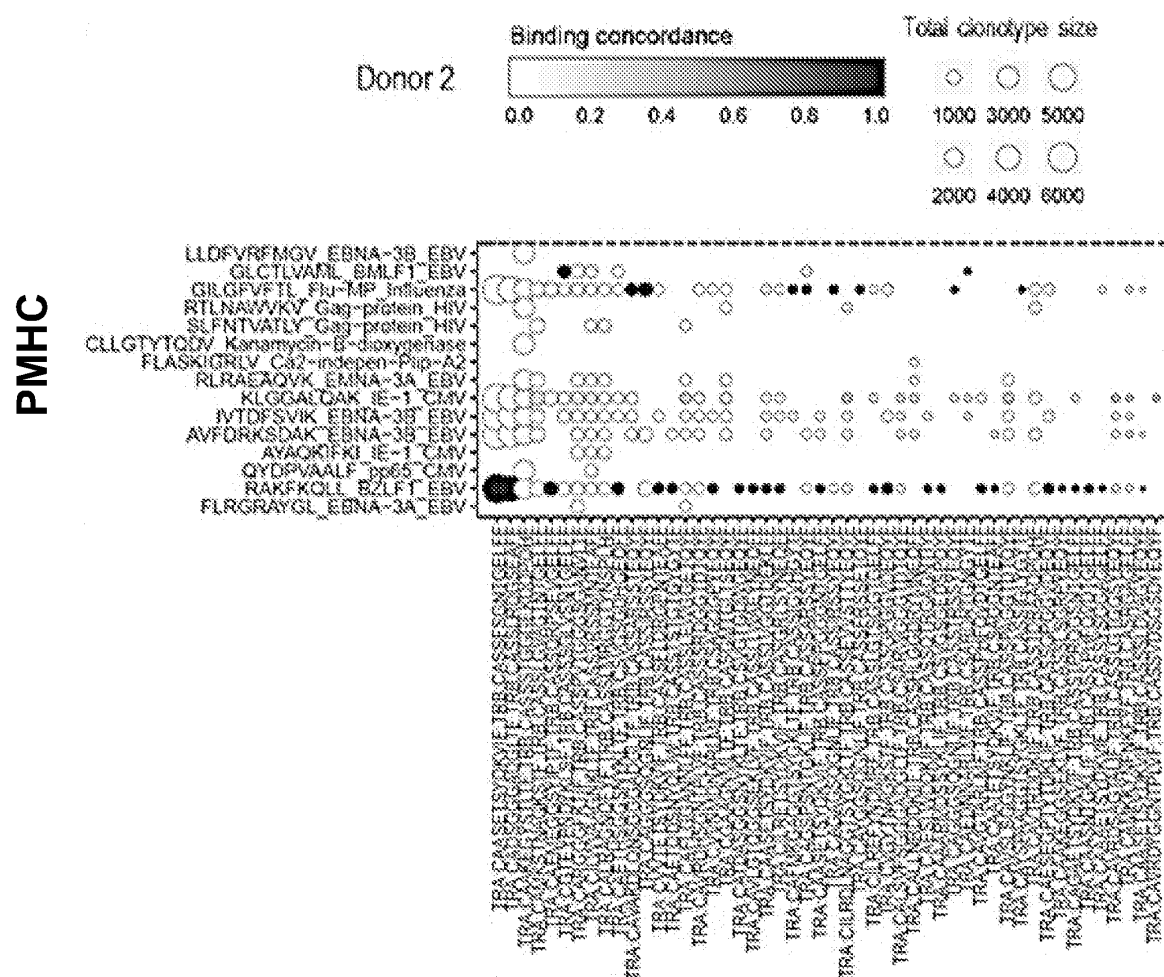


FIG. 11A (CONTINUED)

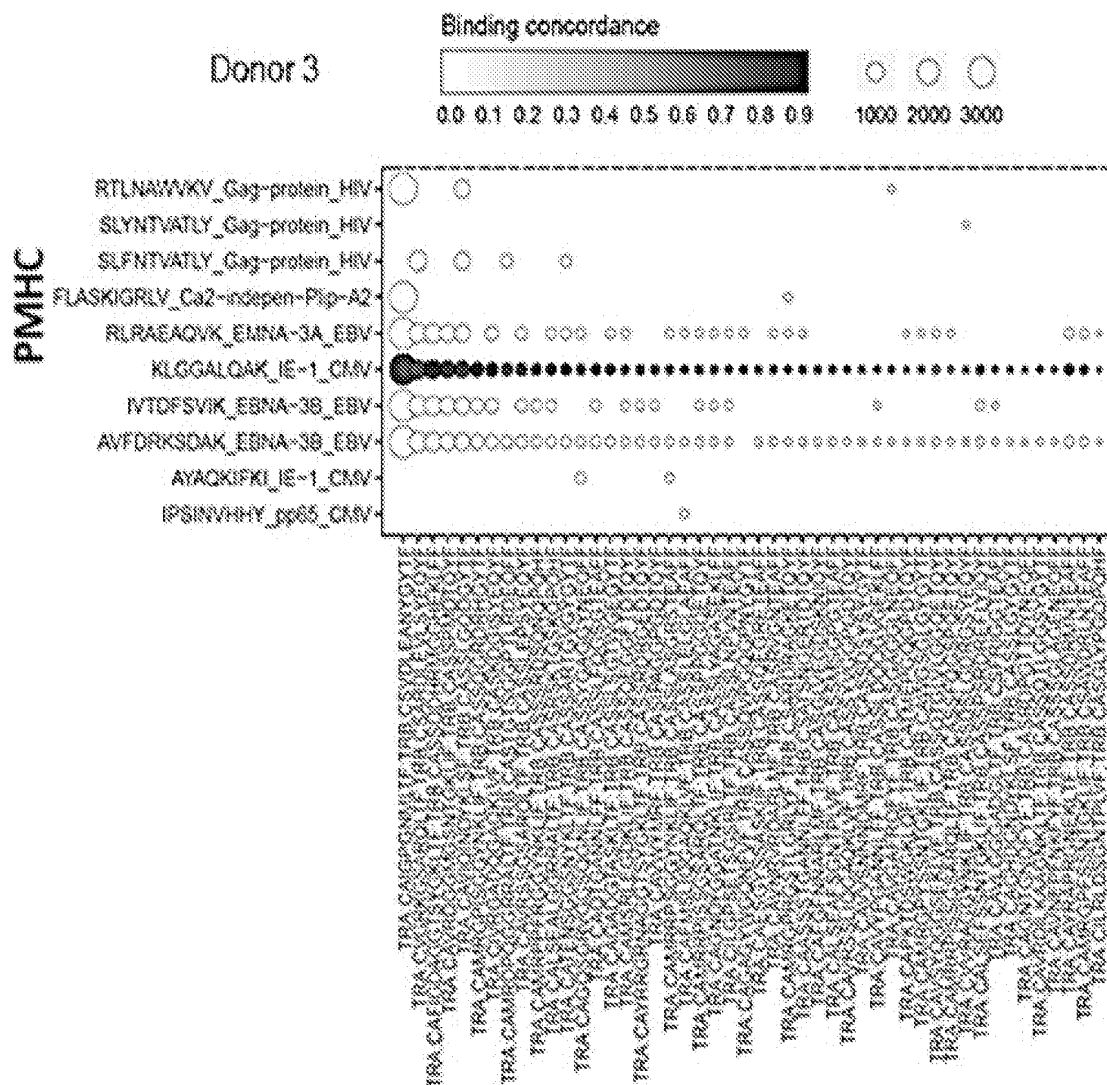
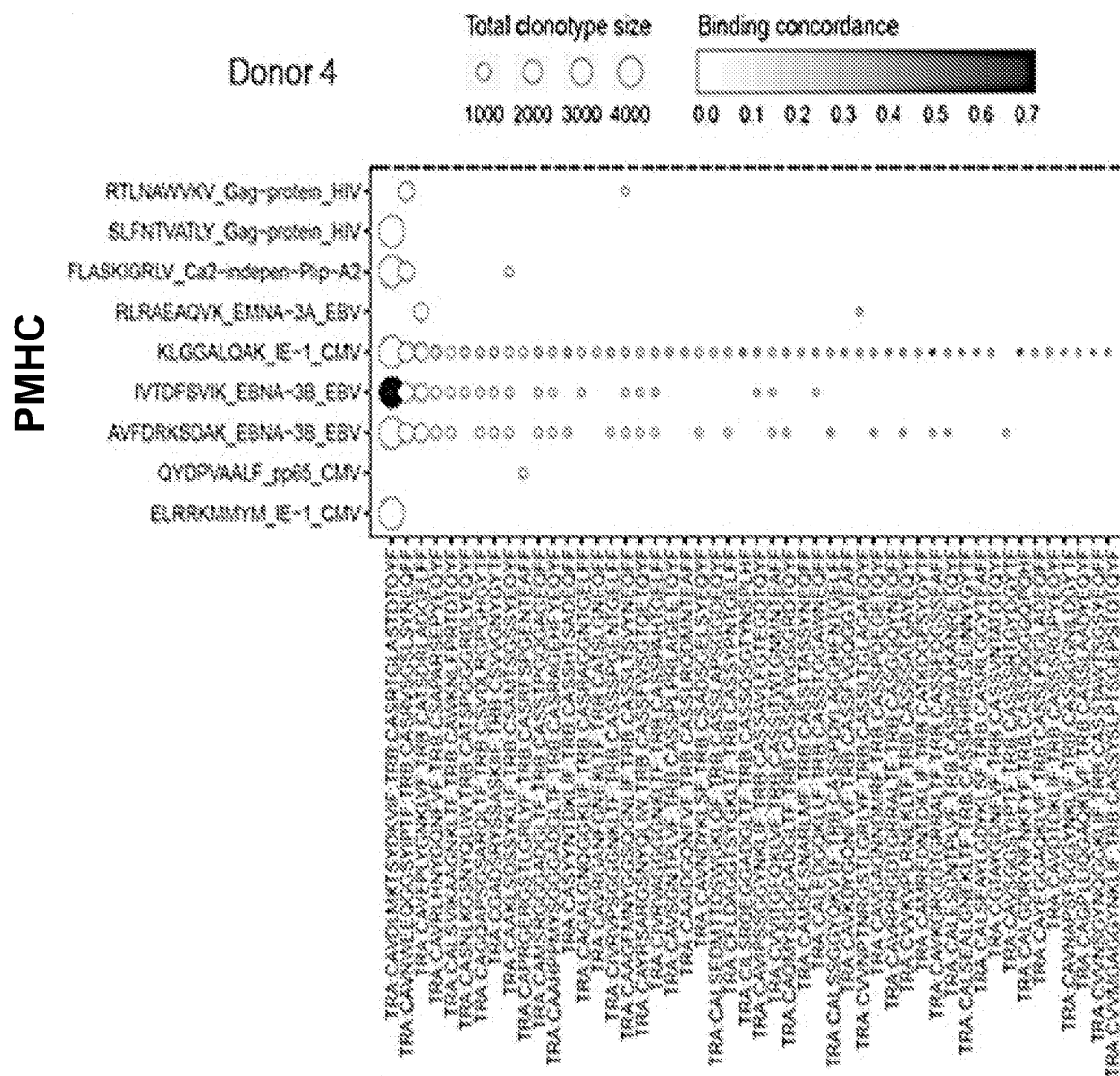


FIG. 11A (CONTINUED)



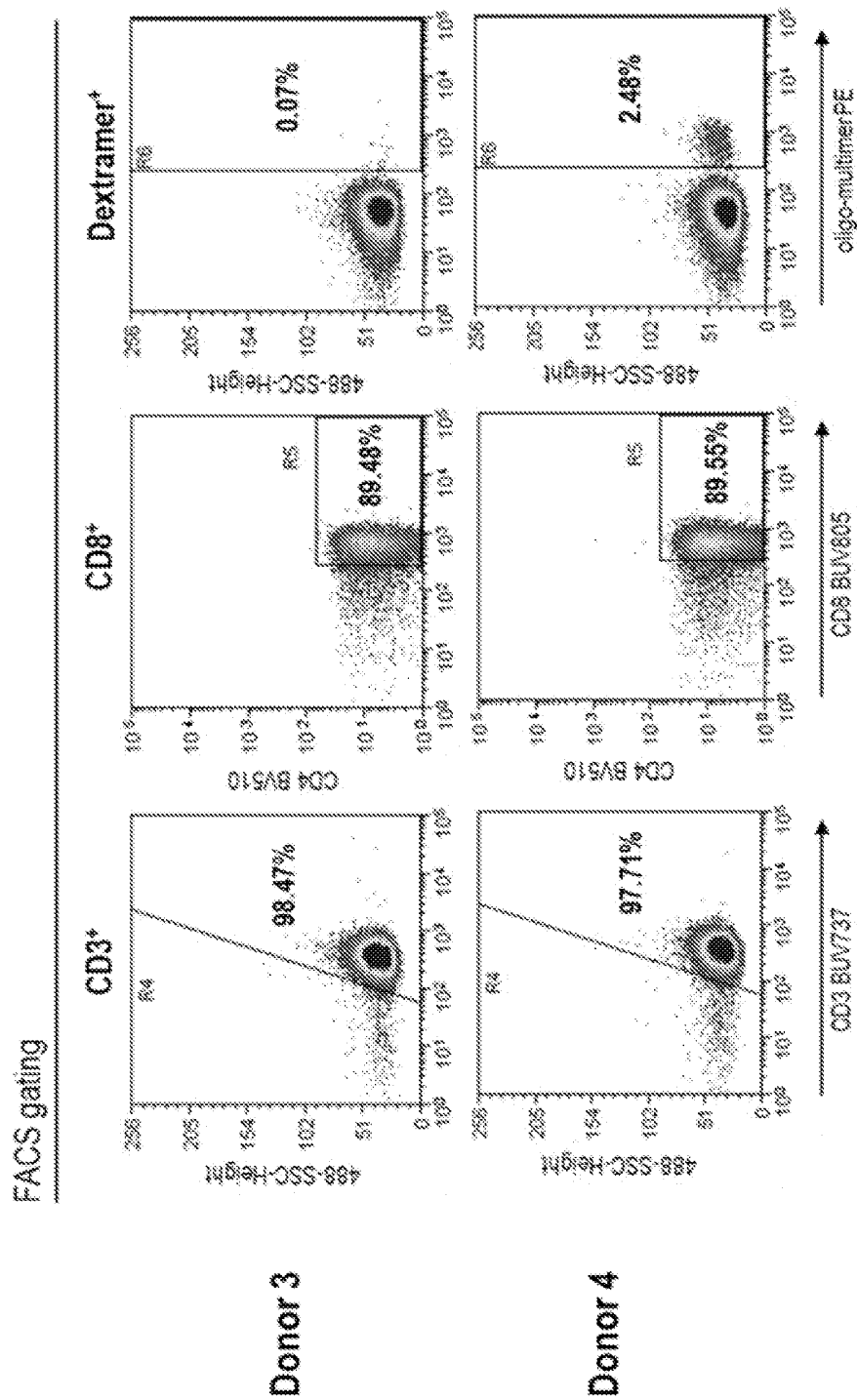


FIG. 11B

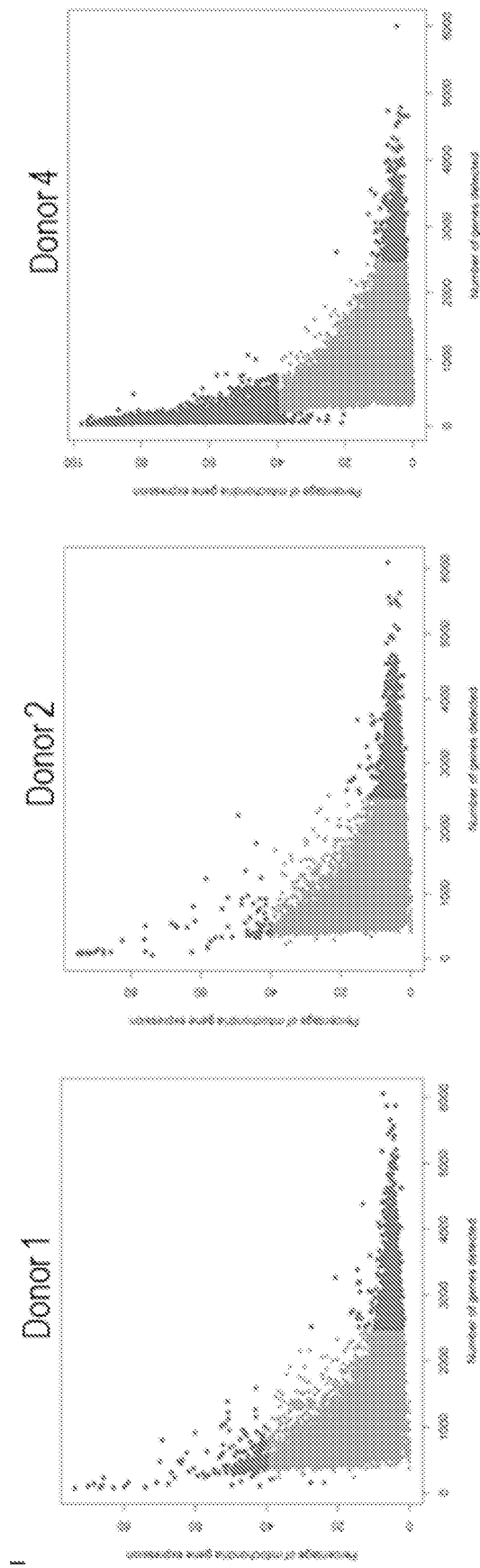


FIG. 12A

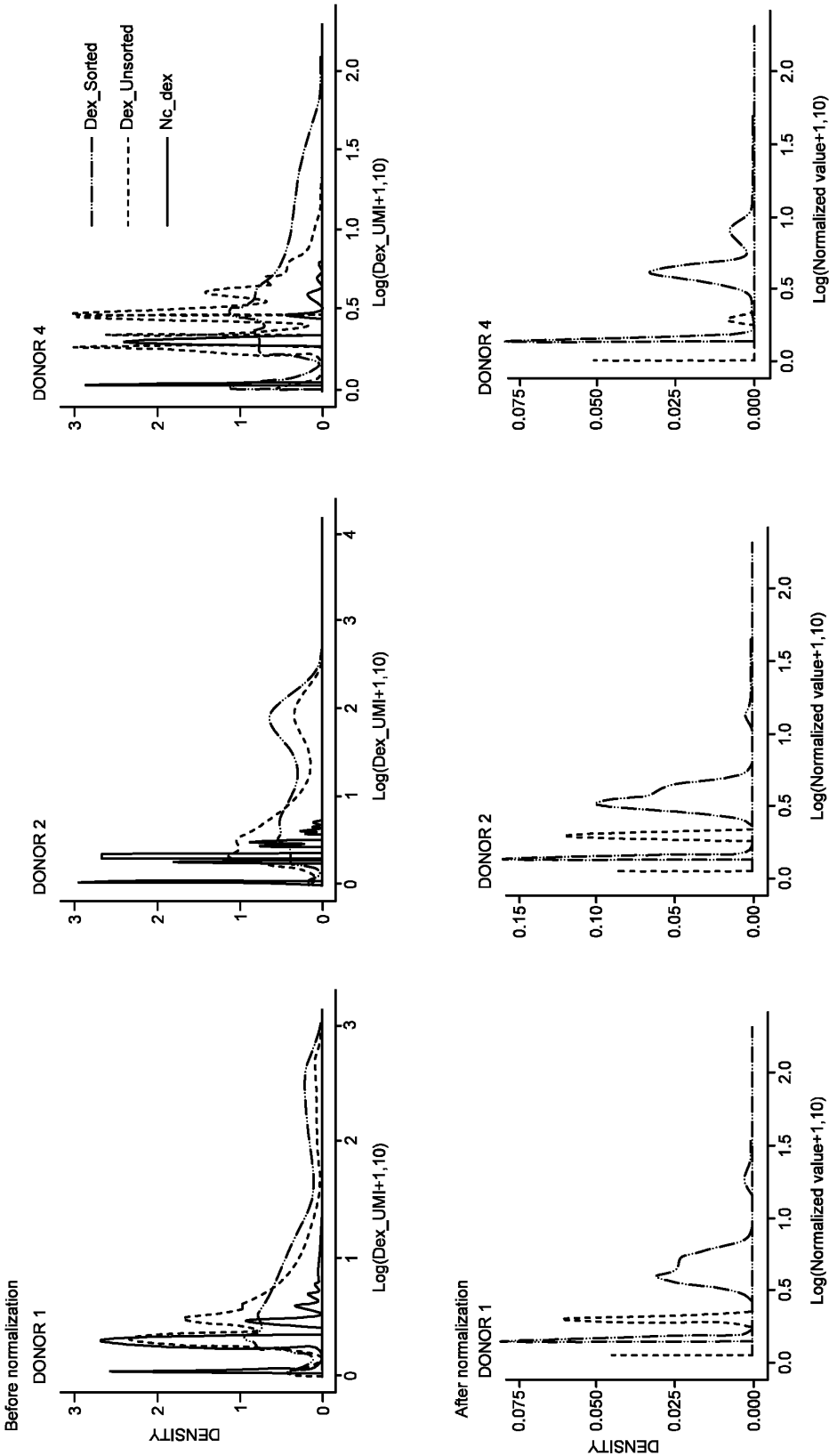


FIG. 12B

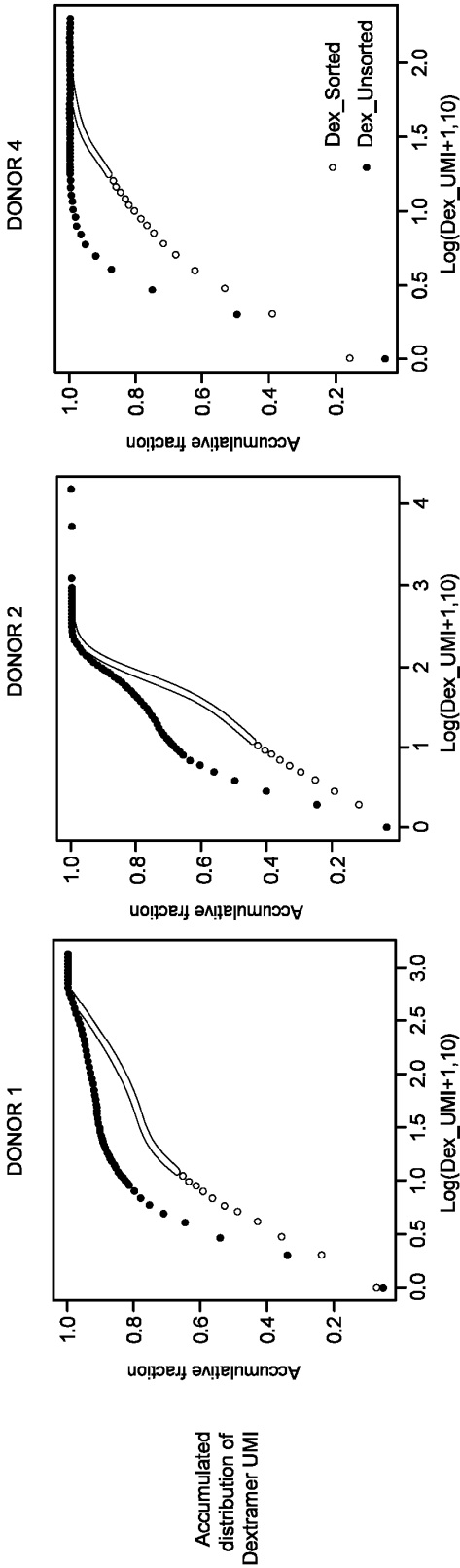


FIG. 12C

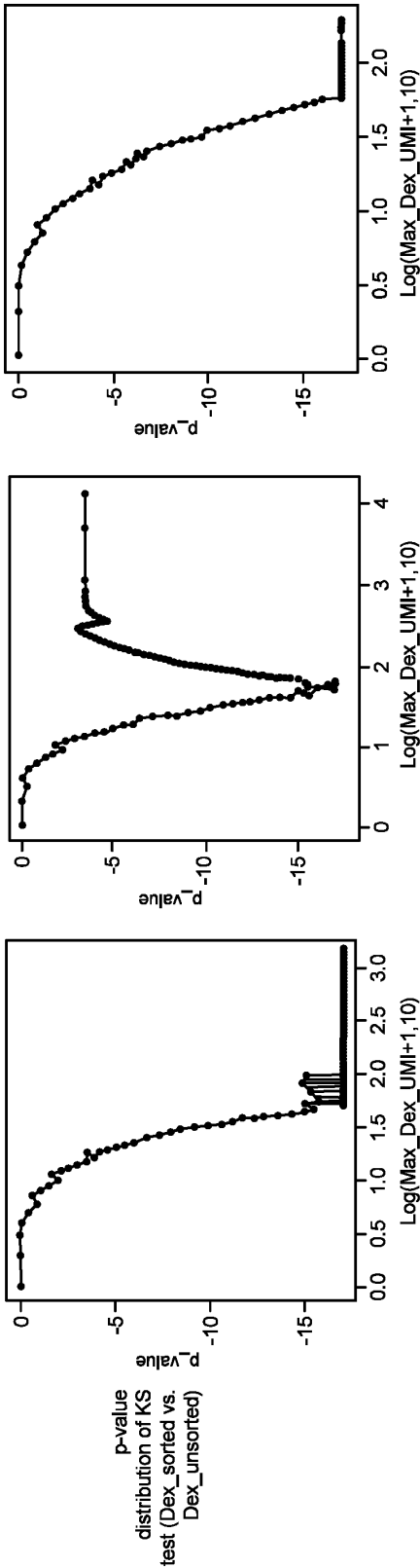


FIG. 12D

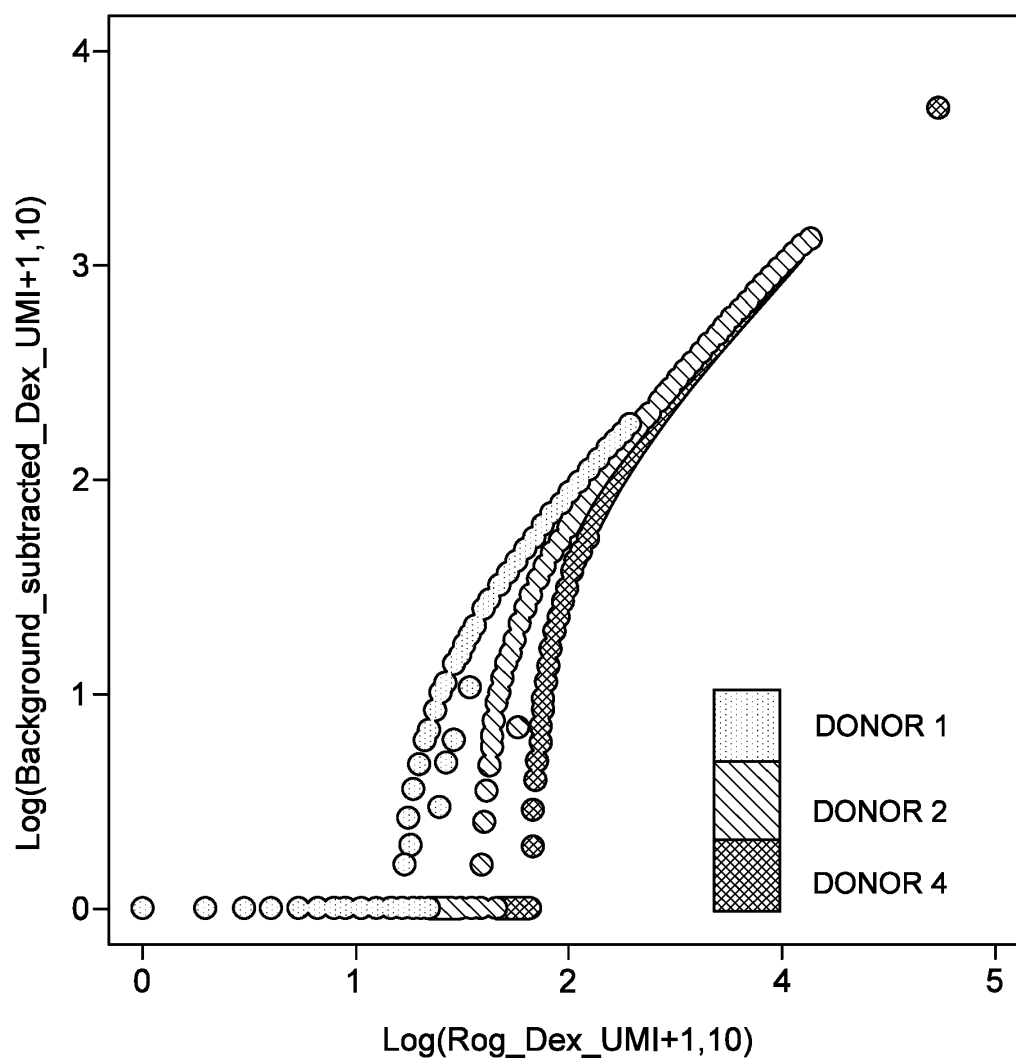


FIG. 12E

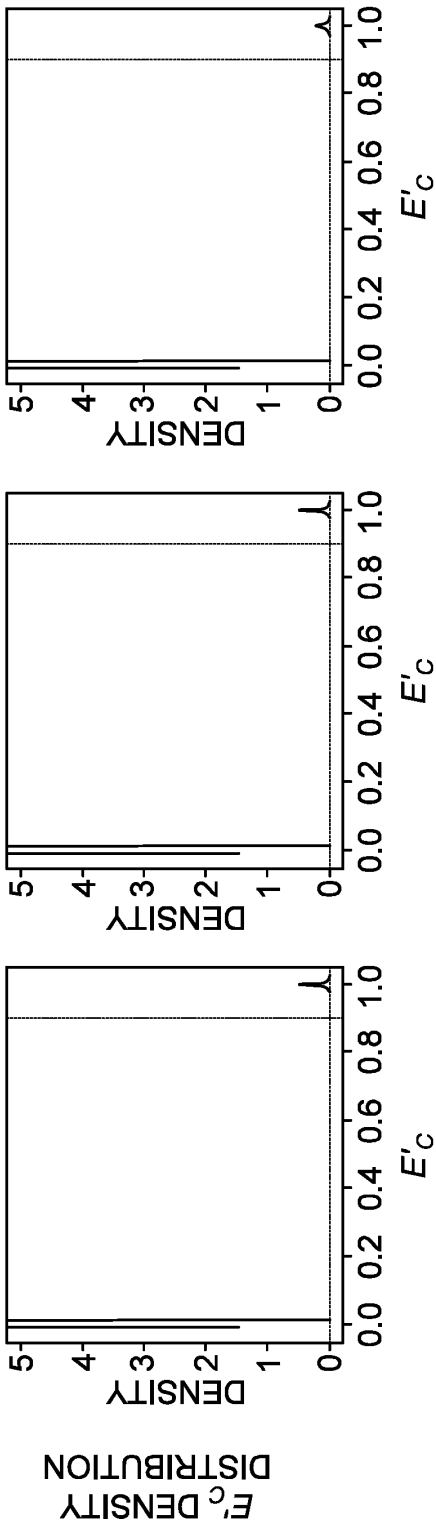


FIG. 12F

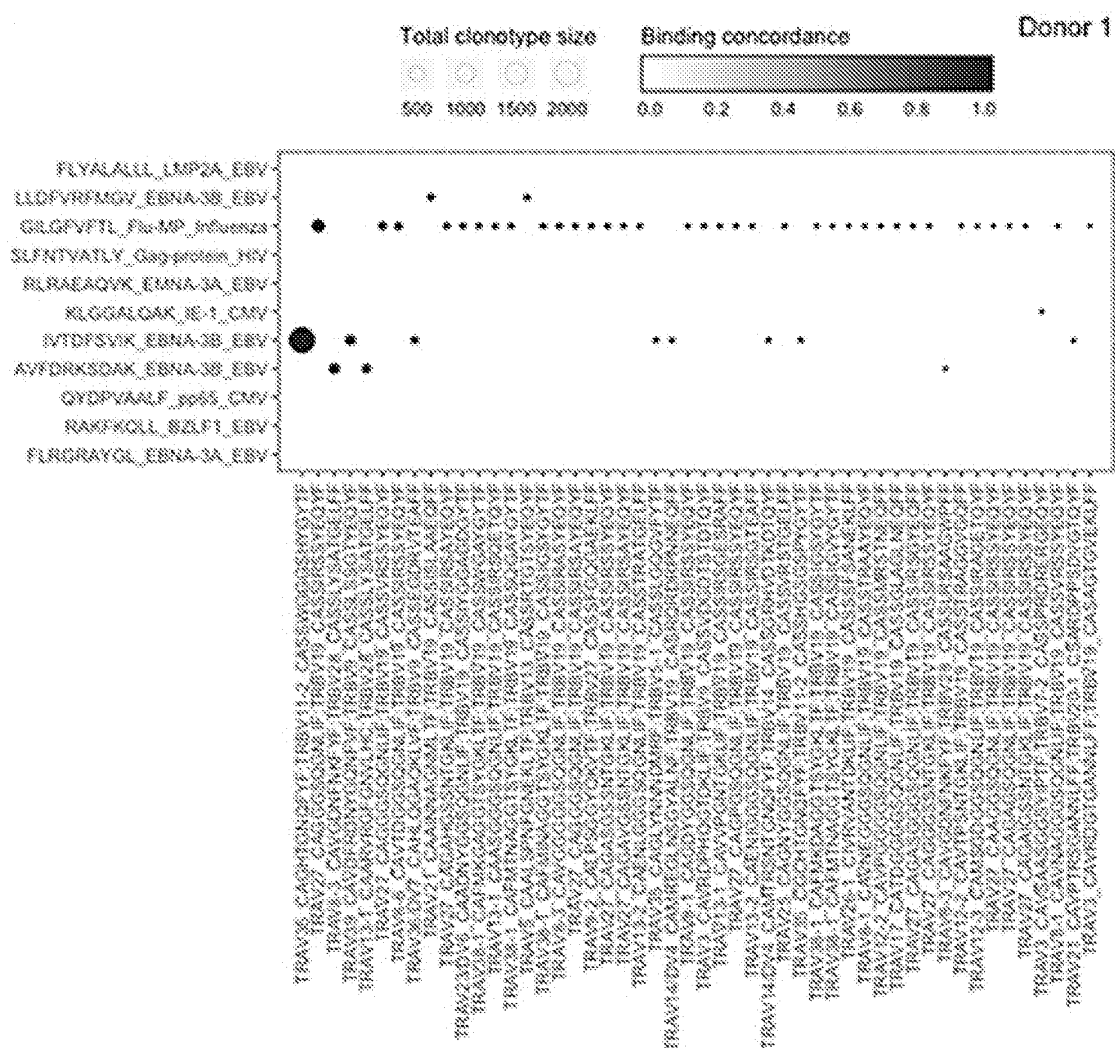
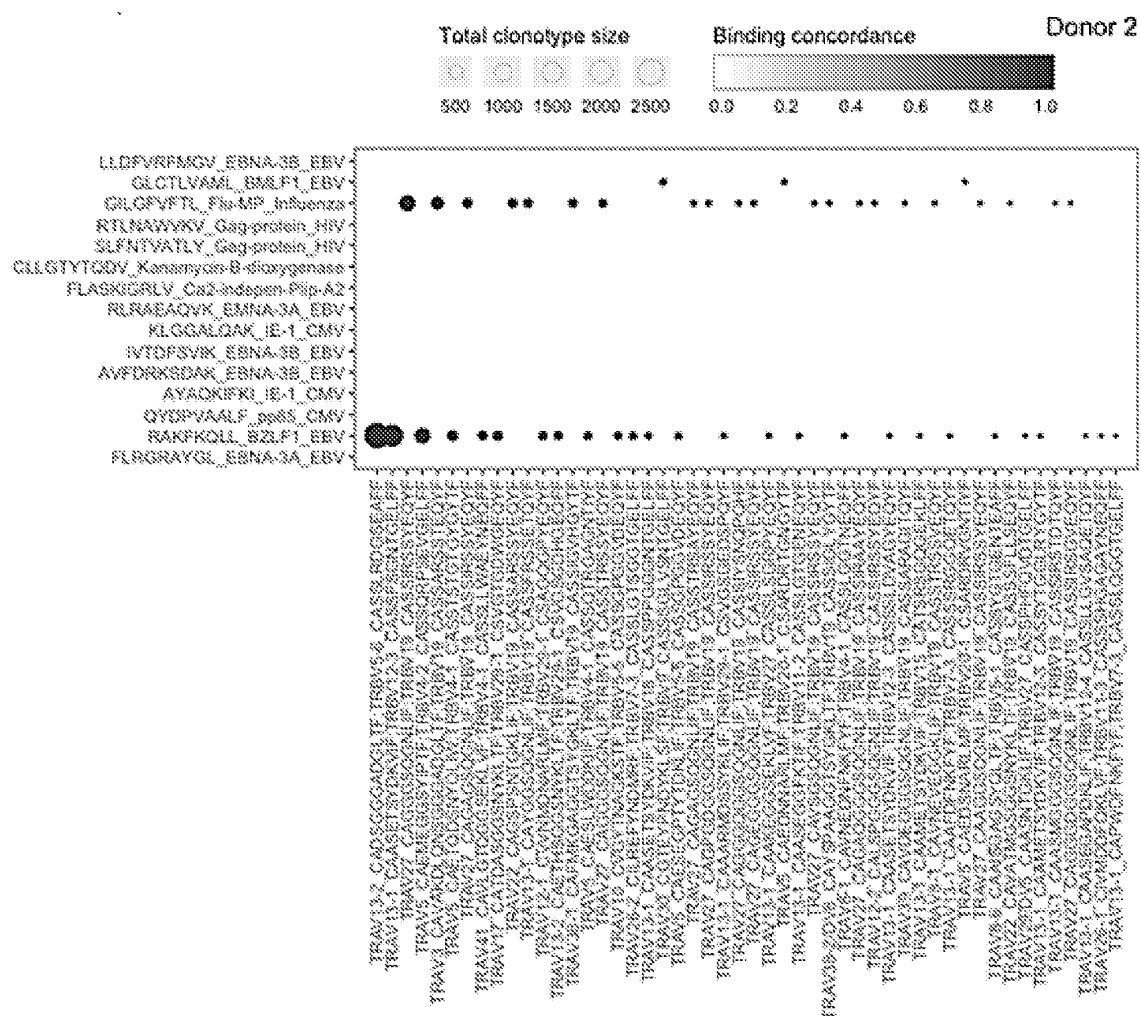


FIG. 13A



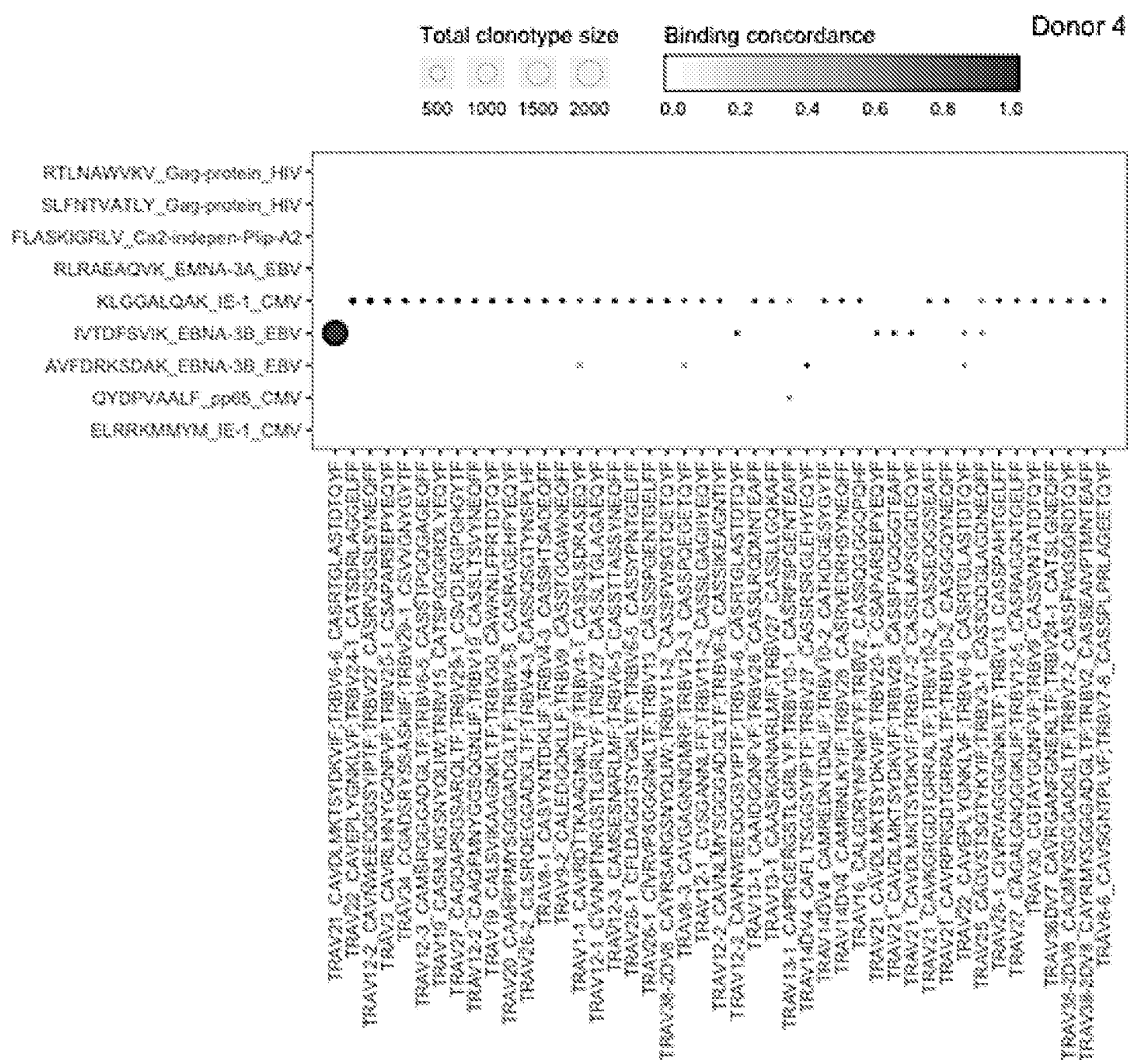


FIG. 13C

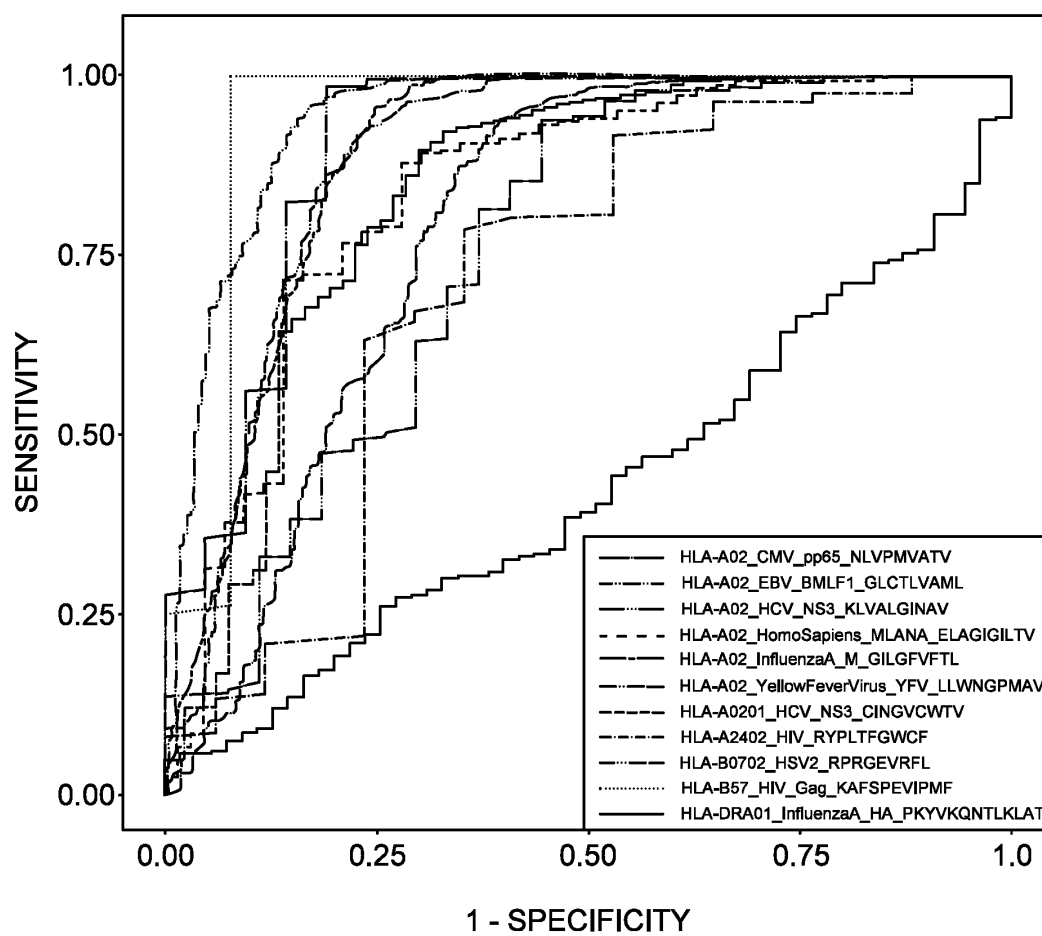


FIG. 14A

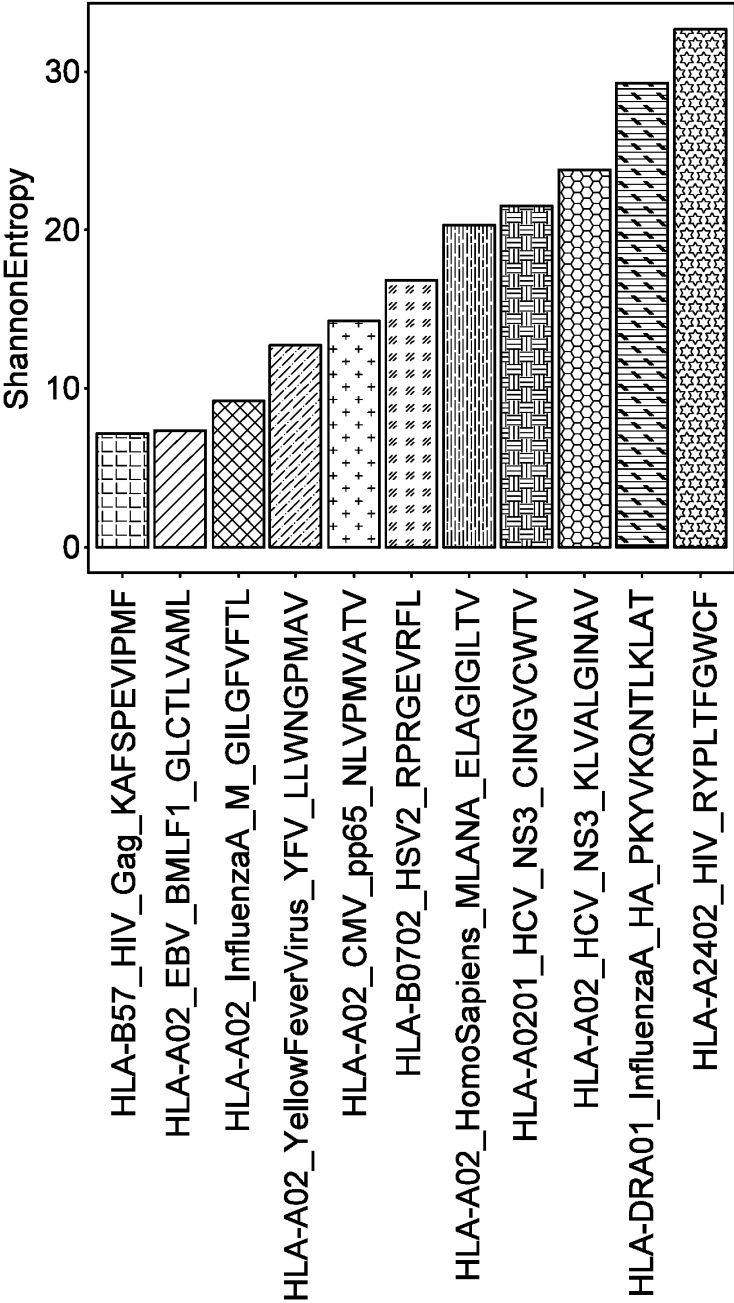


FIG. 14B

FIG. 15A

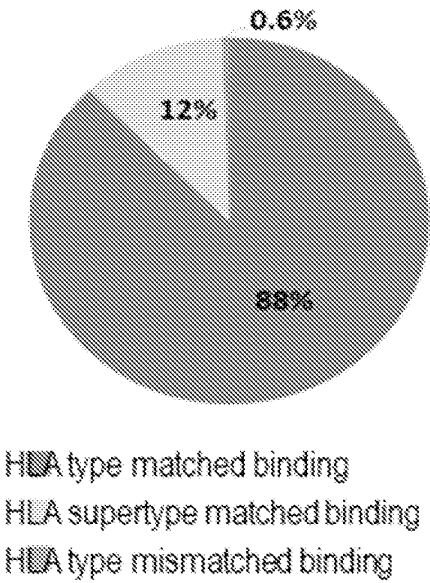
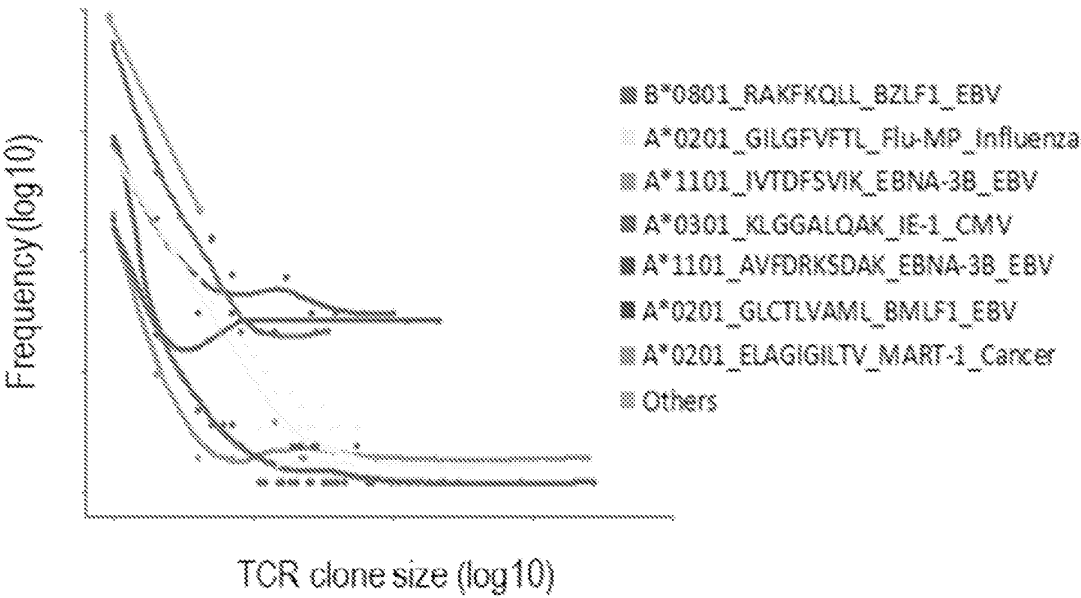


FIG. 15B



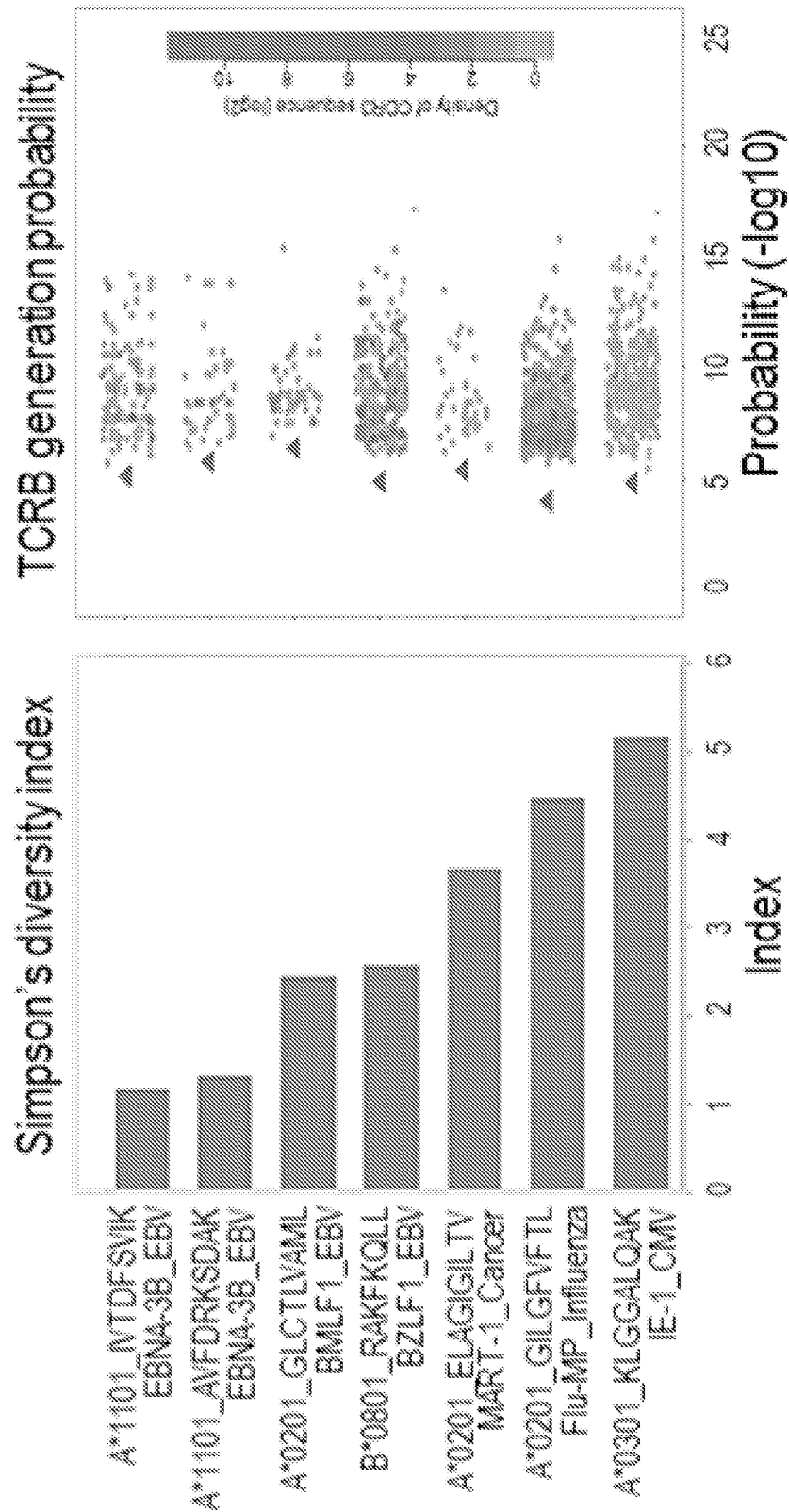
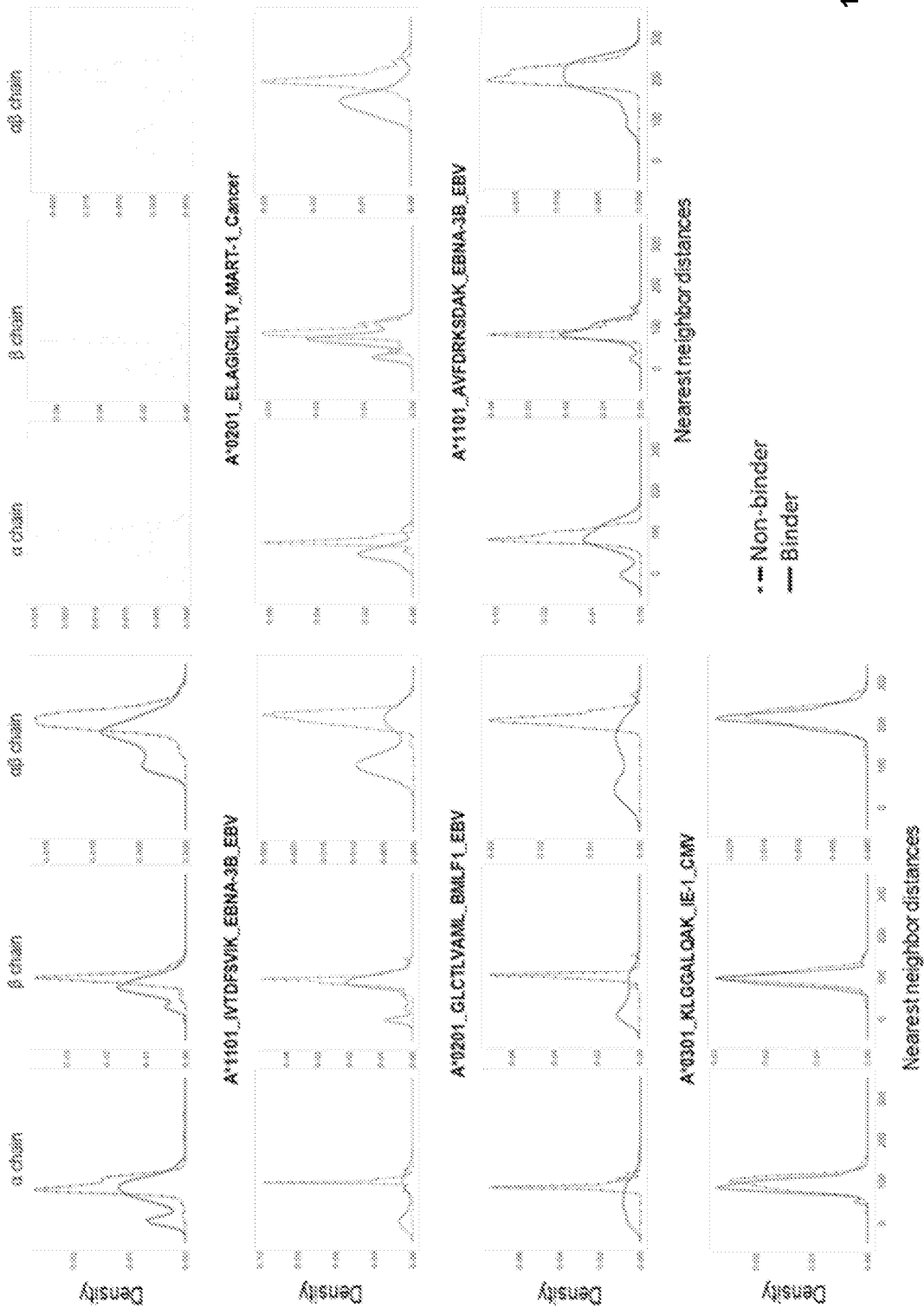


FIG. 15C



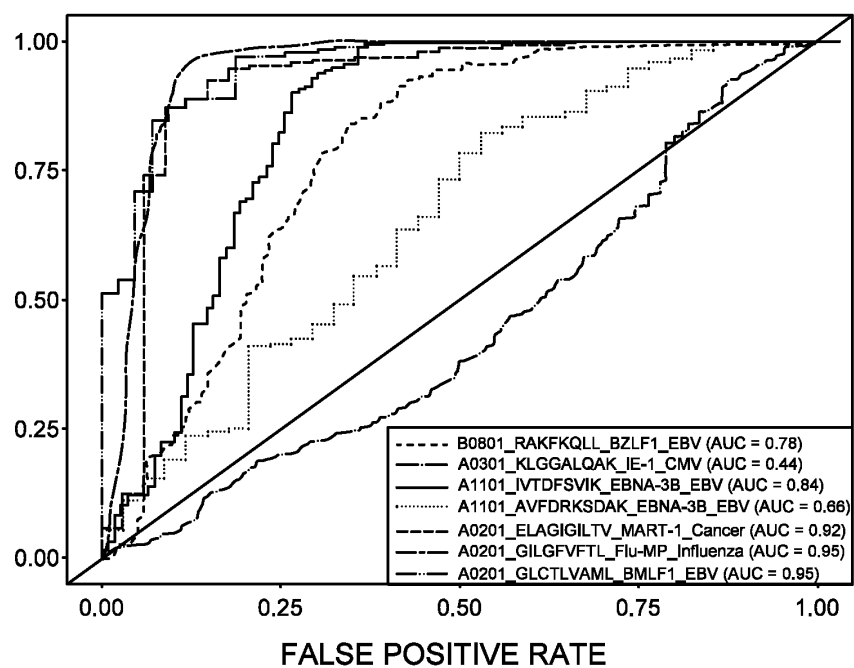


FIG. 16B

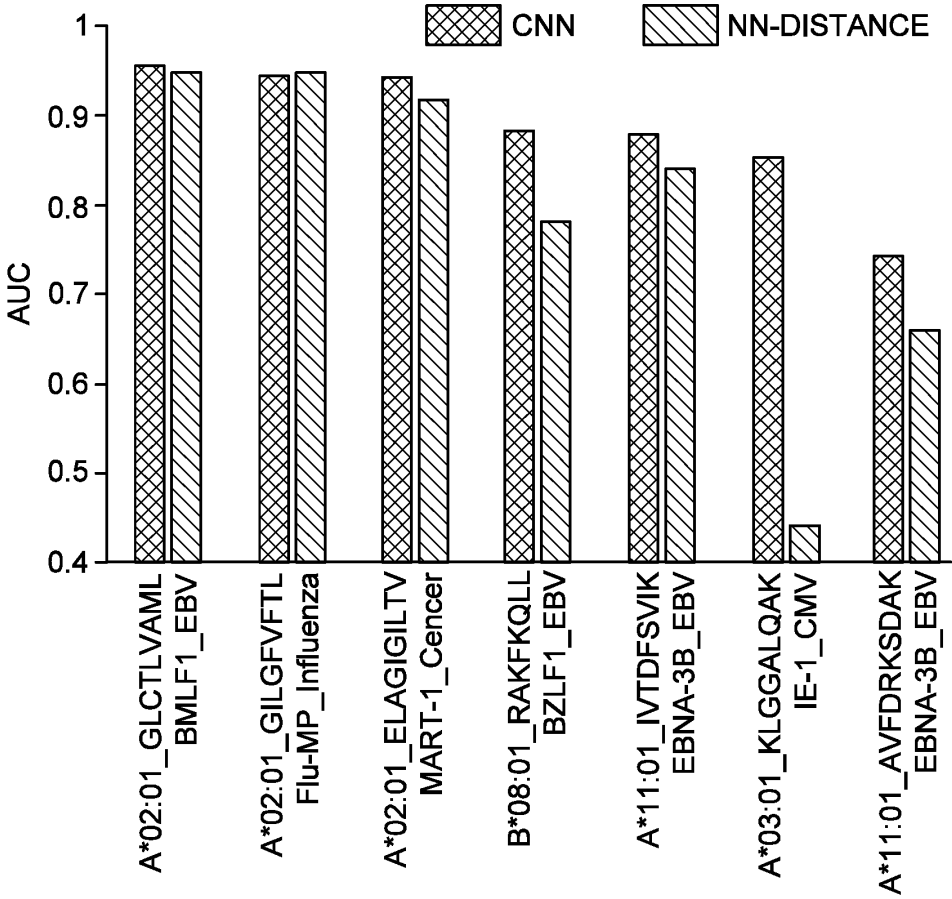


FIG. 16C

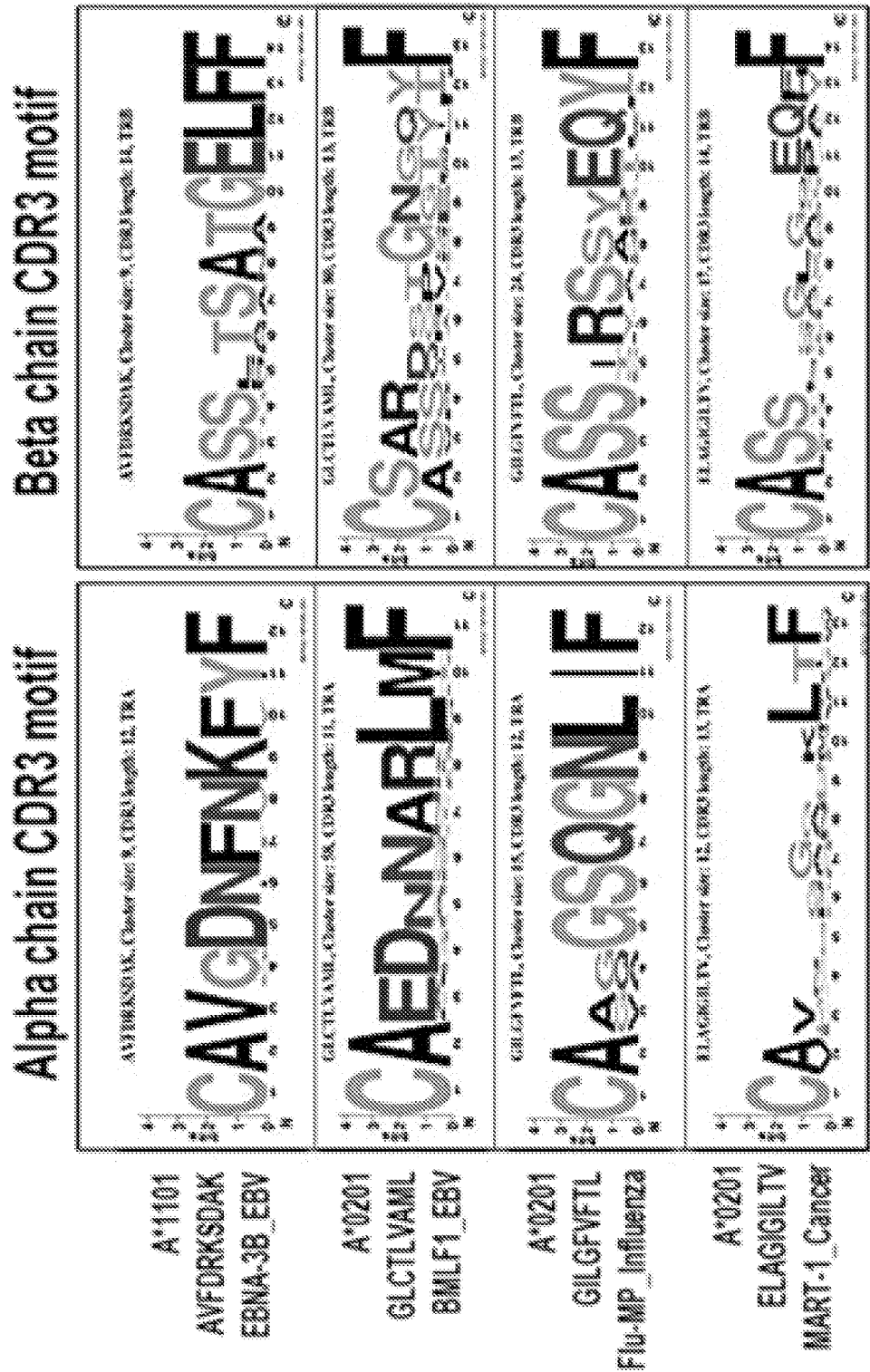


FIG. 17A

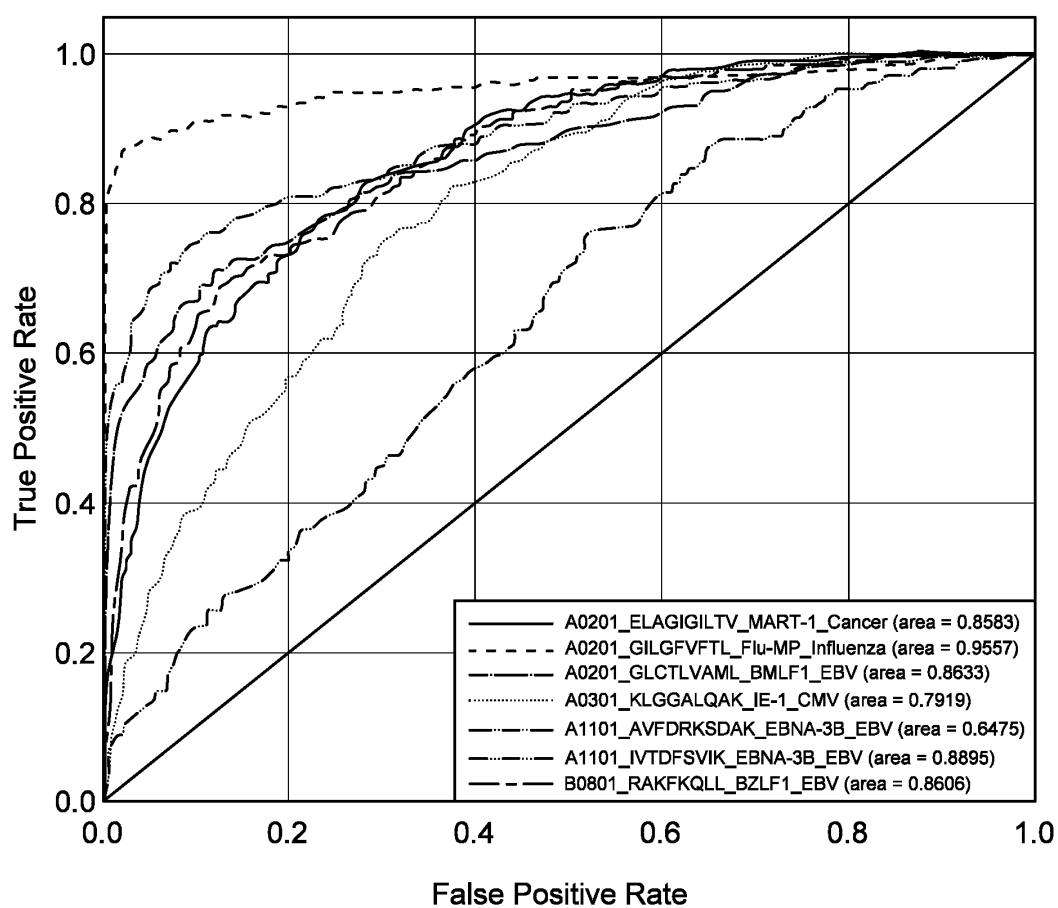


FIG. 17B

FIG. 18B

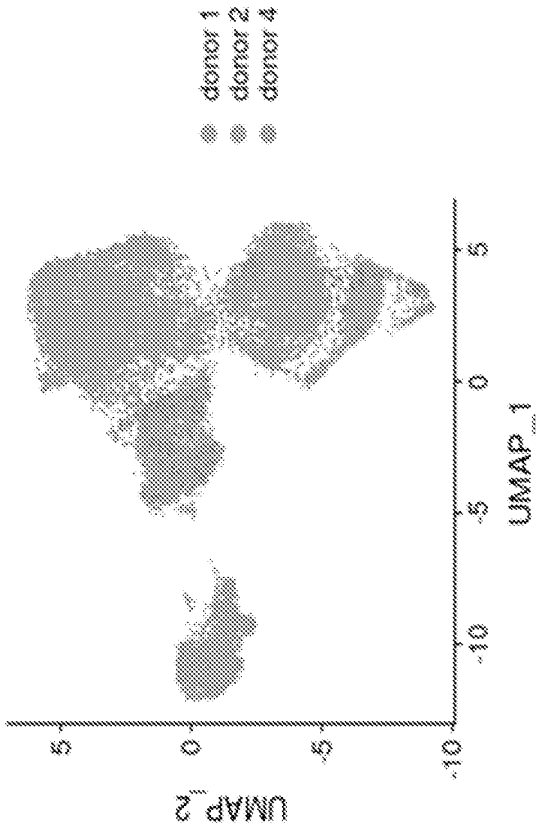
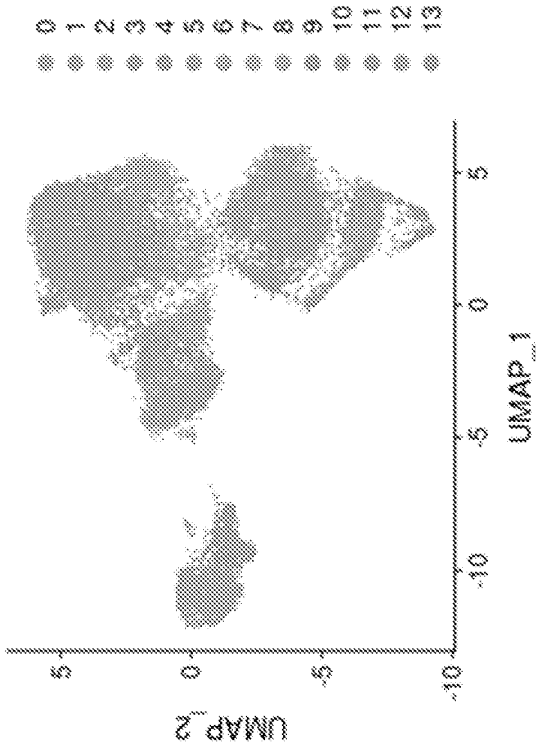


FIG. 18A



Donor	Provider	Gender	Age	Race	BMI	Smoking status	HLA alleles				Virus status			
							HLA-A1	HLA-A2	HLA-B1	HLA-B2	CMV	EBV	Others	
Donor 1	StemCell Technology	Female	NA	NA	22.7	NA	2:01	11:01	35:01:00	NA	NA	NA	HBV-1, HBV-2, HBV/HCV	
Donor 2		Male	NA	NA	42.5	NA	2:01	1:01	8:01	NA	NA	NA	negative	
Donor 3	AllCells	Female	38	white	24	non-smoker	24:02:00	29:02:00	35:02:00	44:03:00	+	-	HBV, HBV, HCV	
Donor 4		Male	31	white	35.5	non-smoker	3:01	3:01	7:02	57:01:00	-	-	negative	

FIG. 19

Cat#	HLA allele	Peptide	Annotation	NetMHC HLA allele prediction
WC2197	A*0301	KLGGALQAK	IE-1/CMV	HLA-A0301,HLA-A1101
WD2149	A*1101	AVFDRKSDAK	EBNA 3B/EBV	HLA-A0301,HLA-A1101
WB2161	A*0201	GILGFVFTL	Flu MP/Influenza	HLA-A0201
WI2148	B*0801	RAKFKQLL	BZLF1/EBV	HLA-B0801
WD2175	A*1101	IVTDFSVIK	EBNA 3B/EBV	HLA-A0301,HLA-A1101
WB2162	A*0201	ELAGIGILTV	MART-1/Cancer	HLA-A0201
WB2130	A*0201	GLCTLVAML	BMLF1/EBV	HLA-A0201
WC2656	A*0301	RLRAEAQVK	EMNA 3A/EBV	HLA-A0301
WB2143	A*0201	LLDFVRFMGV	EBNA 3B/EBV	HLA-A0201,HLA-A0101,HLA-B0801
WI2147	B*0801	FLRGRAYGL	EBNA 3A/EBV	HLA-A0201,HLA-B0801
WB3529	A*0201	FLYALALLL	LMP2A/EBV	HLA-A2402,HLA-A2902,HLA-A0201
WB2646	A*0201	RTLNAWVKV	Gag protein/HIV	HLA-B5701,HLA-A1101
WB2141	A*0201	LLFGYPVYV	HTLV-1	HLA-A2902,HLA-A0201
WF2196	A*2402	AYAQKIFKI	IE-1/CMV	HLA-A2402,HLA-B0801
WB3531	A*0201	YLLEMLWRL	LMP1/EBV	HLA-A2402,HLA-A0201,HLA-B0801
WB5335	A*0201	FLASKIGRLV	CA2+-indepn.Plip A2	HLA-A0201,HLA-B0801
WF2133	A*2402	QYDPVAALF	pp65/CMV	HLA-A2402,HLA-A2902
WB2660	A*0201	KTWGQYWQV	gp100/Cancer/	HLA-B5701,HLA-A0201
WB3474	A*0201	KVLEYVIKV	MAGE-A1/Cancer/	HLA-A0201
WB2652	A*0201	MLDLQPETT	16E7/HPV	na
WH2165	B*0702	QPRAPIRPI	EBNA 6/EBV	HLA-B0702
WB2158	A*0201	IMDQVPFSV	gp100/Cancer/	HLA-A0201,HLA-A0101
WB3247	A*0201	SLLMWITQV	NY-ESO-1/Cancer/	HLA-A0201
WH2166	B*0702	RPPIFIRRL	EBNA 3A/EBV	HLA-B0702
WB3340	A*0201	SLFNTVATLY	Gag protein/HIV	HLA-A2902,HLA-B3501,HLA-A0301,HLA-A0201, HLA-A1101,HLA-A0101
WB2132	A*0201	NLVPMVATV	pp65/CMV	HLA-A0201
WB3338	A*0201	SLFNTVATL	Gag protein/HIV	HLA-A0201
WB2177	A*0201	RMFPNAPYL	WT-1	HLA-A2402,HLA-A2902,HLA-B5701,HLA-A0201
WB2191	A*0201	YLNDHLEPWI	BCL-X/Cancer/	HLA-A0201
WI2137	B*0801	ELRRKMMYM	IE-1/CMV	HLA-B0801
WA2131	A*0101	VTEHDTLLY	IE-1/CMV	HLA-A2902,HLA-B4402,HLA-A0101
WB3697	A*0201	CLLWSFQTS	Tyrosinase/Cancer/	HLA-A0201
WB3497	A*0201	KVAELVHFL	MAGE A3/Cancer/	HLA-A0201
WB5066	A*0201	CLLGTYTQDV	Kanamycin B dioxygenase	HLA-A0201,HLA-B0801
WB3307	A*0201	LLMGTLGIVC	HPV 16E7, 82-91	HLA-A0201
WB2144	A*0201	CLGGLTMV	LMP-2A/EBV	HLA-A0201
WB2139	A*0201	ILKEPVHGV	RT/HIV	HLA-A0201
WF2639	A*2402	CYTWNQMNL	WT1 (235-243)236M->Y	HLA-A2402
WB2157	A*0201	KLQCVDLHV	PSA 146-154	HLA-A0201
WB3339	A*0201	SLYNTVATLY	Gag protein/HIV	HLA-A2902,HLA-B3501,HLA-A0301,HLA-A0201, HLA-A1101,HLA-A0101
WC2632	A*0301	RIAAWMATY	BCL-2L1/Cancer/	HLA-A2902,HLA-B3501,HLA-A0301,HLA-B5701, HLA-A1101,HLA-A0101
WK2138	B*3501	IPSINVHHY	pp65/CMV	HLA-B3501
WH2136	B*0702	TPRVTGGGAM	pp65/CMV	HLA-B3501,HLA-B0702
WH2135	B*0702	RPHERNGFTVL	pp65/CMV	HLA-B0702,HLA-B0801
NI3233	NR(B0801)	AAKGRGAAL	NC	na
WB2666	A*0201	ALIAPVHAV	NC	na
WF3231	A*2402	AYSSAGASI	NC	na
WH3397	B*0702	GPAESAAGL	NC	na
WA3580	A*0101	SLEGGGLGY	NC	na
WA3579	A*0101	STEGGGLAY	NC	na

FIG. 20

SUBSTITUTE SHEET (RULE 26)

pMHC	Donor 1		Donor 2		Donor 4		All donor summary	
	total binding T cells	unique TCR clones	total binding T cells	unique TCR clones	total binding T cells	unique TCR clones	total binding T cells	unique TCR clones
B*08:01_RAKFKQLL_BZLF1_EBV	35	34	8,229	196	1	1	8,265	229
A*02:01_GLGPFVTL_Flu-MP_Influenza	1,573	278	4,271	447	1	1	5,945	693
A*11:01_IVTDFSVK_EBNA-3B_EBV	2,860	27	20	19	2,317	76	5,197	121
A*03:01_KLGGALQAK_IE-1_CMV	79	58	28	26	357	204	464	288
A*11:01_AVFDRKSDAK_EBNA-3B_EBV	351	12	8	8	19	18	378	37
A*02:01_GLCTLVAML_BMLF1_EBV	16	10	310	33	1	1	327	43
A*02:01_LDFVRFMGV_EBNA-3B_EBV	92	6	13	5	0	0	105	11
A*02:01_FLYALALL_LMP2A_EBV	3	3	49	8	0	0	52	11
A*02:01_ELAGGILTV_MART-1_Cancer	31	28	0	0	14	14	45	42
B*08:01_FLRGRAYGL_EBNA-3A_EBV	3	3	12	9	0	0	15	12
A*02:01_YLEMLWRL_LMP1_EBV	5	5	0	0	3	3	8	8
A*02:01_LFGYPVYV_HTLV-1	5	5	1	1	0	0	6	6
A*24:02_AYAQKIFK_IE-1_CMV	3	3	0	0	1	1	4	4
A*03:01_RLR4EAQVK_EMNA-3A_EBV	0	0	1	1	2	2	3	3
B*07:02_RPPFIRRL_EBNA-3A_EBV	2	2	0	0	1	1	3	3
A*24:02_CYTWNQMNL_WT1-(235-243)23	3	3	0	0	0	0	3	3
A*02:01_MLDLQPETT_16E7_HPV	3	3	0	0	0	0	3	3
A*24:02_QYDPVAAIF_pp65_CMV	2	2	0	0	1	1	3	3
A*02:01_RTINAWVKV_Gag-protein_HIV	1	1	0	0	1	1	2	2
A*02:01_IMDQVPFSV_gp100_Cancer	1	1	1	1	0	0	2	2
B*07:02_QPRAPIRPI_EBNA-6_EBV	2	2	0	0	0	0	2	2
A*02:01_FLASKIGRLV_Ca2-indepen-Flip-A	2	2	0	0	0	0	2	2
A*02:01_KVLEYVIKV_MAGE-A1_Cancer	2	2	0	0	0	0	2	2
B*35:01_IPSINVHHY_pp65_CMV	2	2	0	0	0	0	2	2
A*02:01_SLFNTVATL_Gag-protein_HIV	0	0	0	0	1	1	1	1
A*02:01_KTWGQYWQV_gp100_Cancer	1	1	0	0	0	0	1	1
A*02:01_SLLMWITQV_NY-ESO-1_Cancer	1	1	0	0	0	0	1	1
A*02:01_RMFNPAPYL_WT-1	1	1	0	0	0	0	1	1
A*03:01_RIAAWMATY_BCL-2L1_Cancer	1	1	0	0	0	0	1	1

FIG. 21

pMHC	Peptide Hydrophobicity		Peptide polarity		Peptide bulkiness	
	average of TCR contact positions only	average of all positions	average of TCR contact positions only	average of all positions	average of TCR contact positions only	average of all positions
KLGGALQAK_IE-1_CMV	-0.08	-0.10	8.88	8.54	10.21	13.16
GILGFVFTL_Flu-MP_Influenza	1.13	2.27	7.00	6.43	14.69	16.44
ELAGIGILTV_MART-1_Cancer	2.05	1.76	7.10	7.30	12.40	15.48
RAKFKQLL_BZLF1_EBV	1.03	-0.45	6.87	8.33	18.55	16.78
GLCTLVAML_BMLF1_EBV	1.70	2.30	6.80	6.38	16.23	16.24
AVFDRKSDAK_EBNA-3B_EBV	-3.18	-0.95	11.00	9.54	12.79	14.29
IVTDFSVIK_EBNA-3B_EBV	2.00	1.26	7.33	7.72	18.61	17.60

FIG. 22

pMHC	Peptide	Number of unique TCR
A*02_InfluenzaA_M_GILGFVFTL	GILGFVFTL	1187
A*02_YellowFeverVirus_YFV_LLWNGPMAV	LLWNGPMAV	525
A*02_CMV_pp65_NLVPMVATV	NLVPMVATV	390
A*02_EBV_BMLF1_GLCTLVAML	GLCTLVAML	274
B*07:02_HSV2_RPRGEVRFL	RPRGEVRFL	127
A*02:01_HCV_NS3_CINGVCWTV	CINGVCWTV	83
A*02_HCV_NS3_KLVALGINAV	KLVALGINAV	75
DRA*01_InfluenzaA_HA_PKYVKQNTLKLAT	PKYVKQNTLKLAT	70
A*02_HomoSapiens_MLANA_ELAGIGILTV	ELAGIGILTV	57
B*57_HIV_Gag_KAFSPEVIPMF	KAFSPEVIPMF	33
A*24:02_HIV_RYPLTFGWCF	RYPLTFGWCF	30

FIG. 23

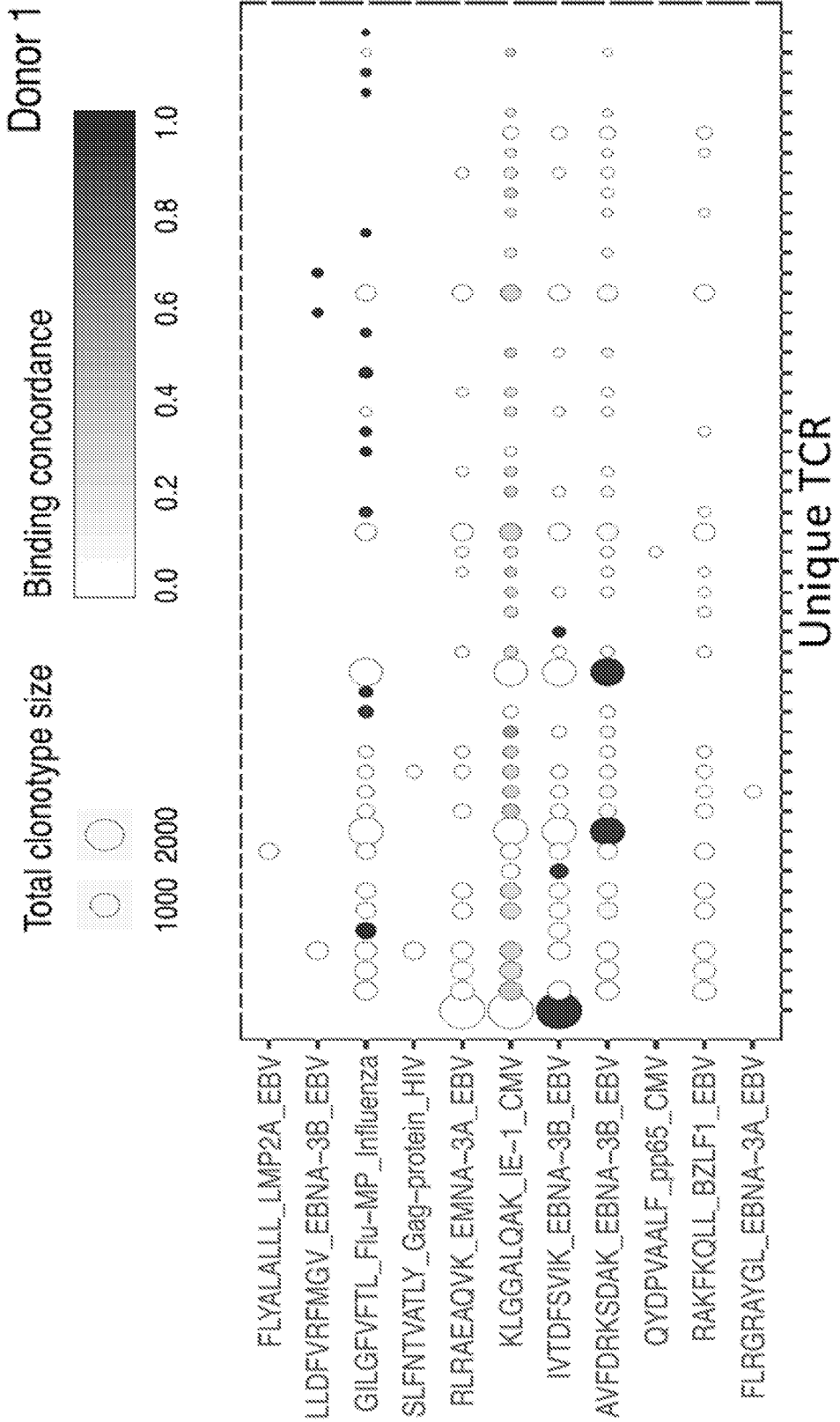


FIG. 24

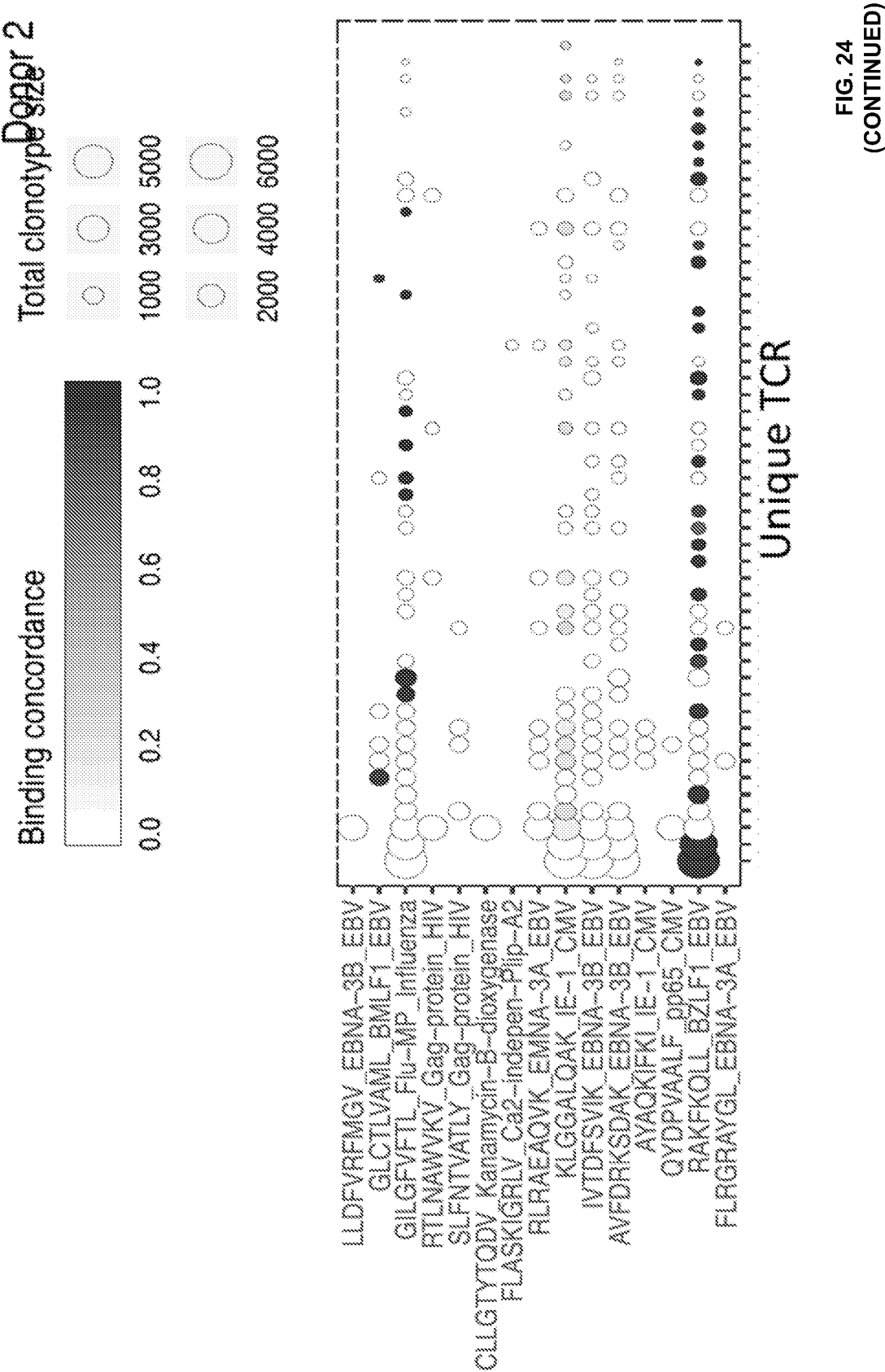


FIG. 24
(CONTINUED)

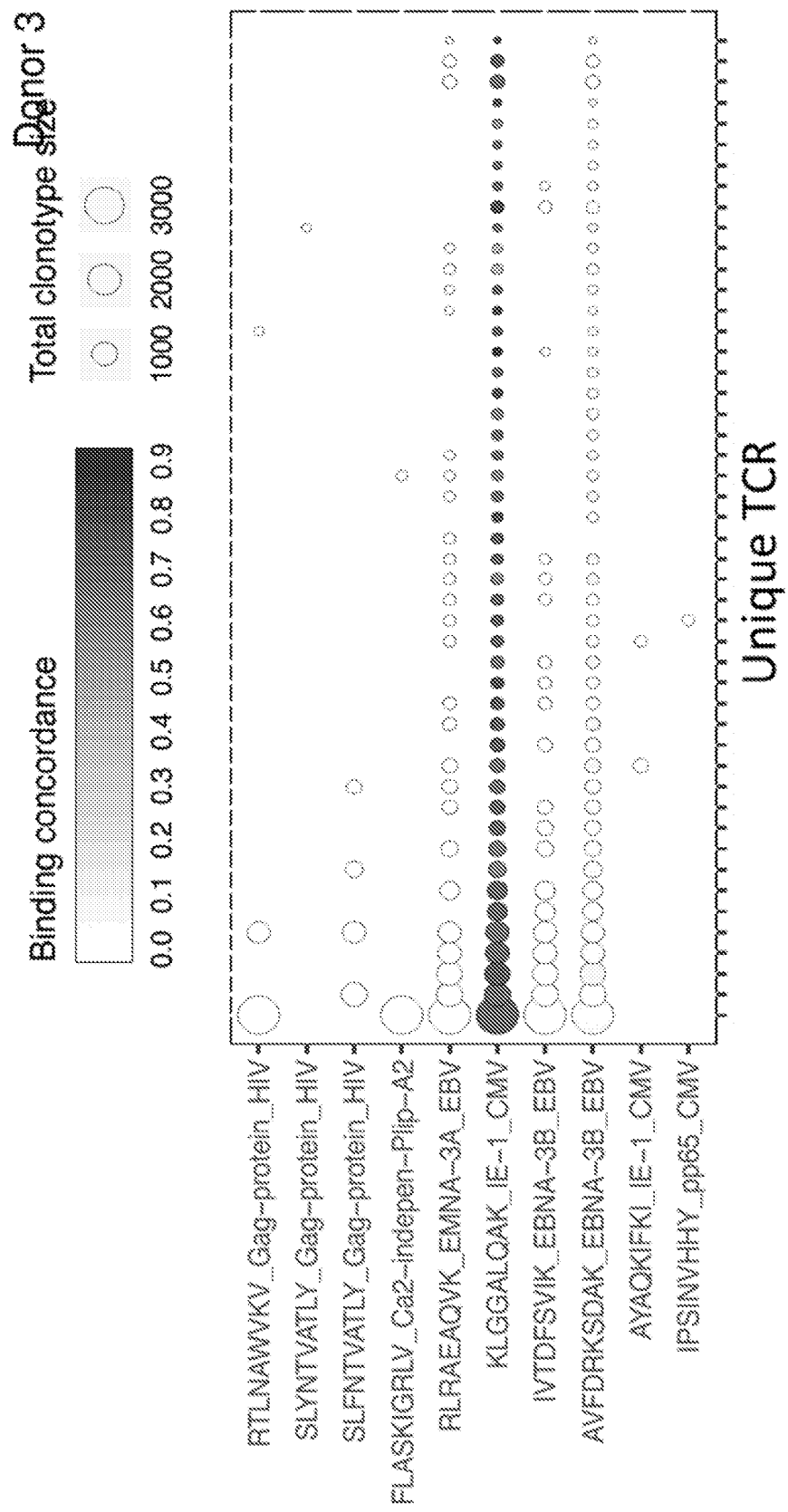


FIG. 24
(CONTINUED)

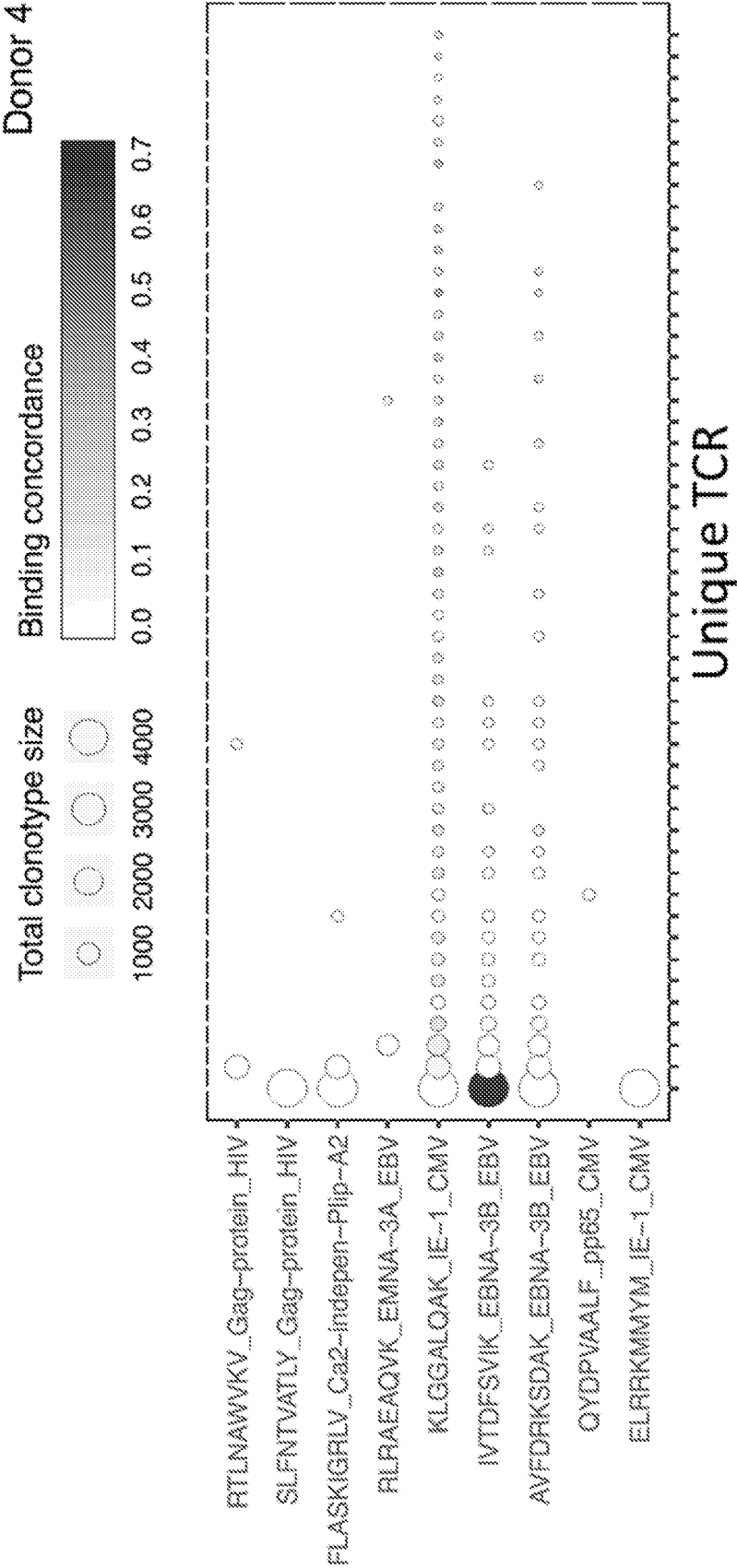


FIG. 24
(CONTINUED)

ICON (Integrative Context-specific Normalization)

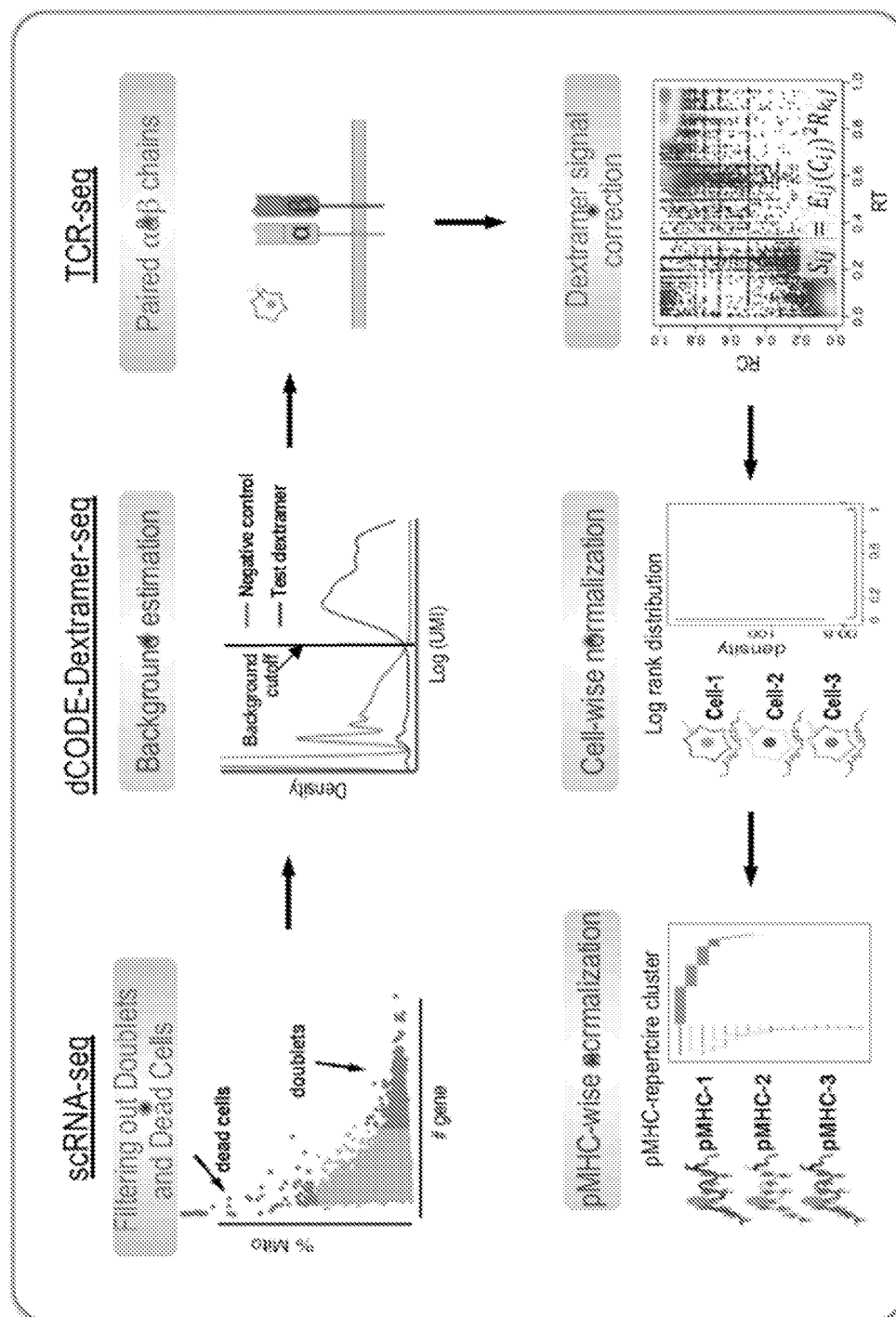
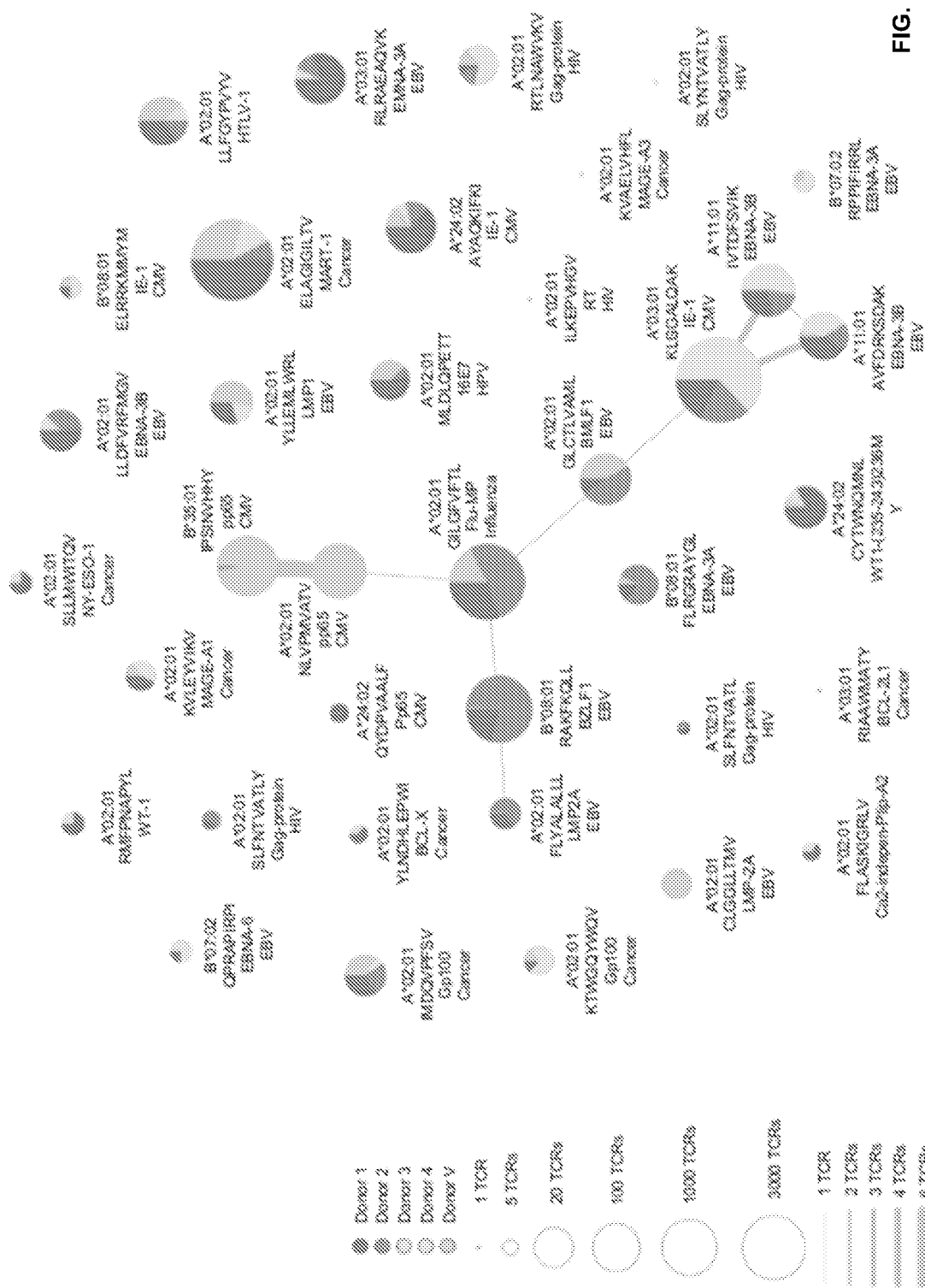


FIG. 25A



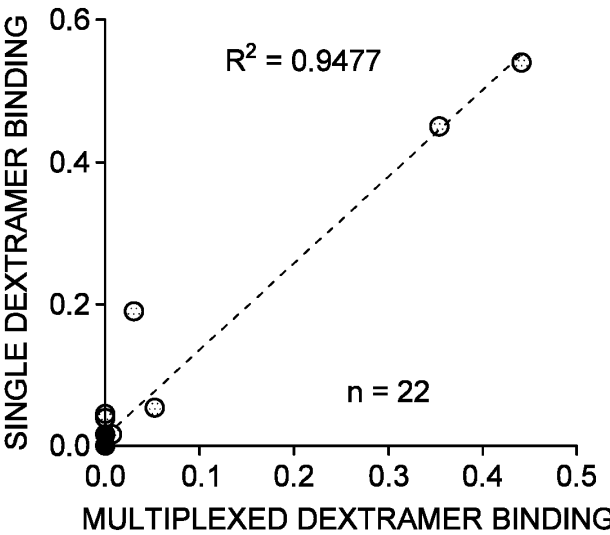


FIG. 25C

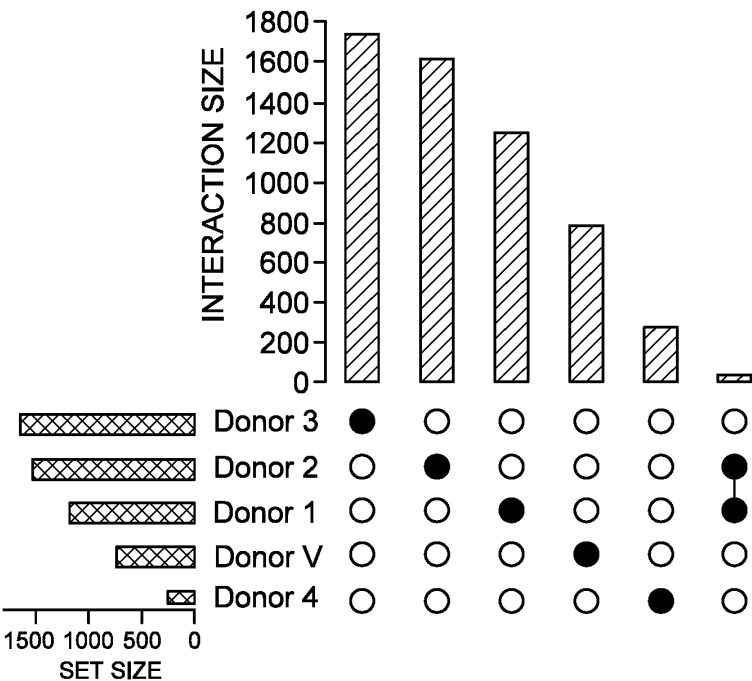


FIG. 25D

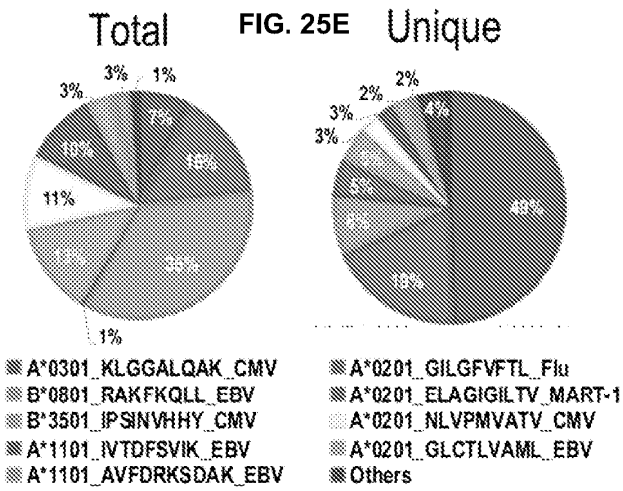
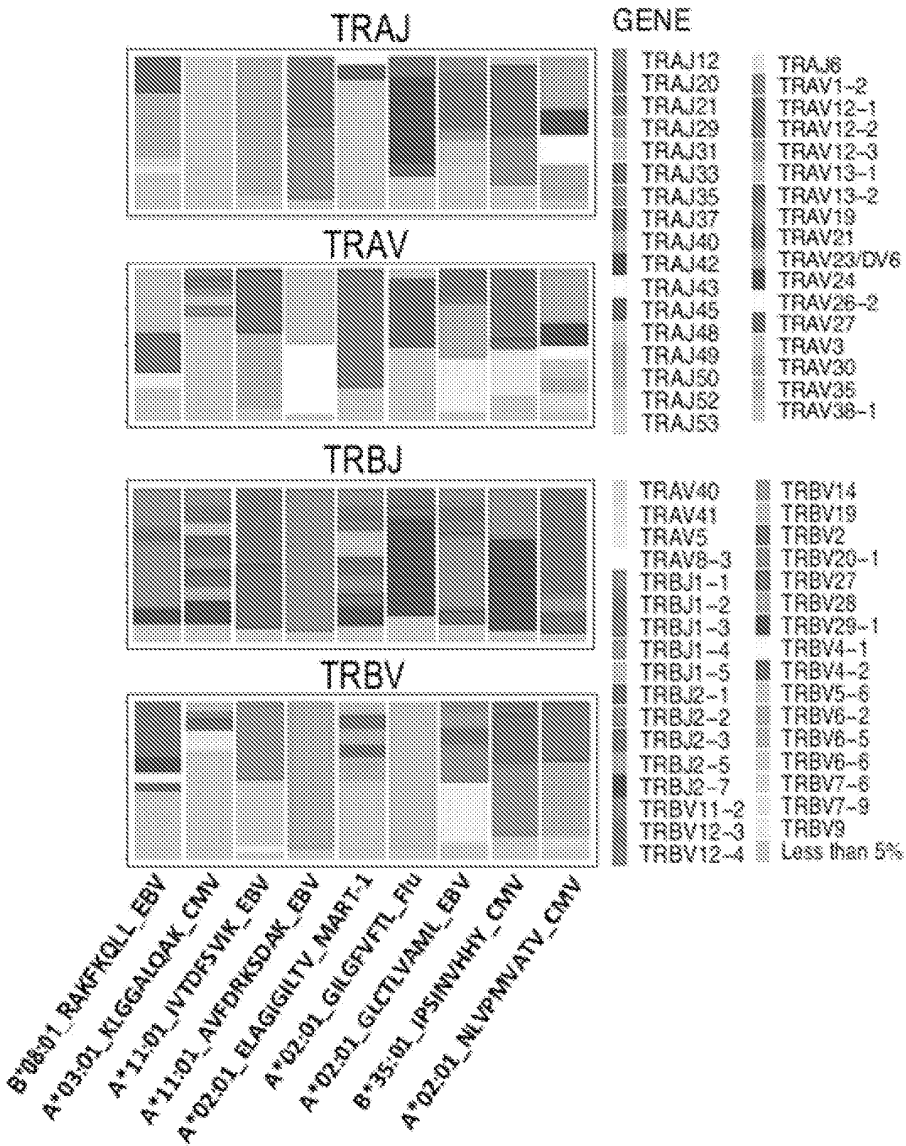


FIG. 25F



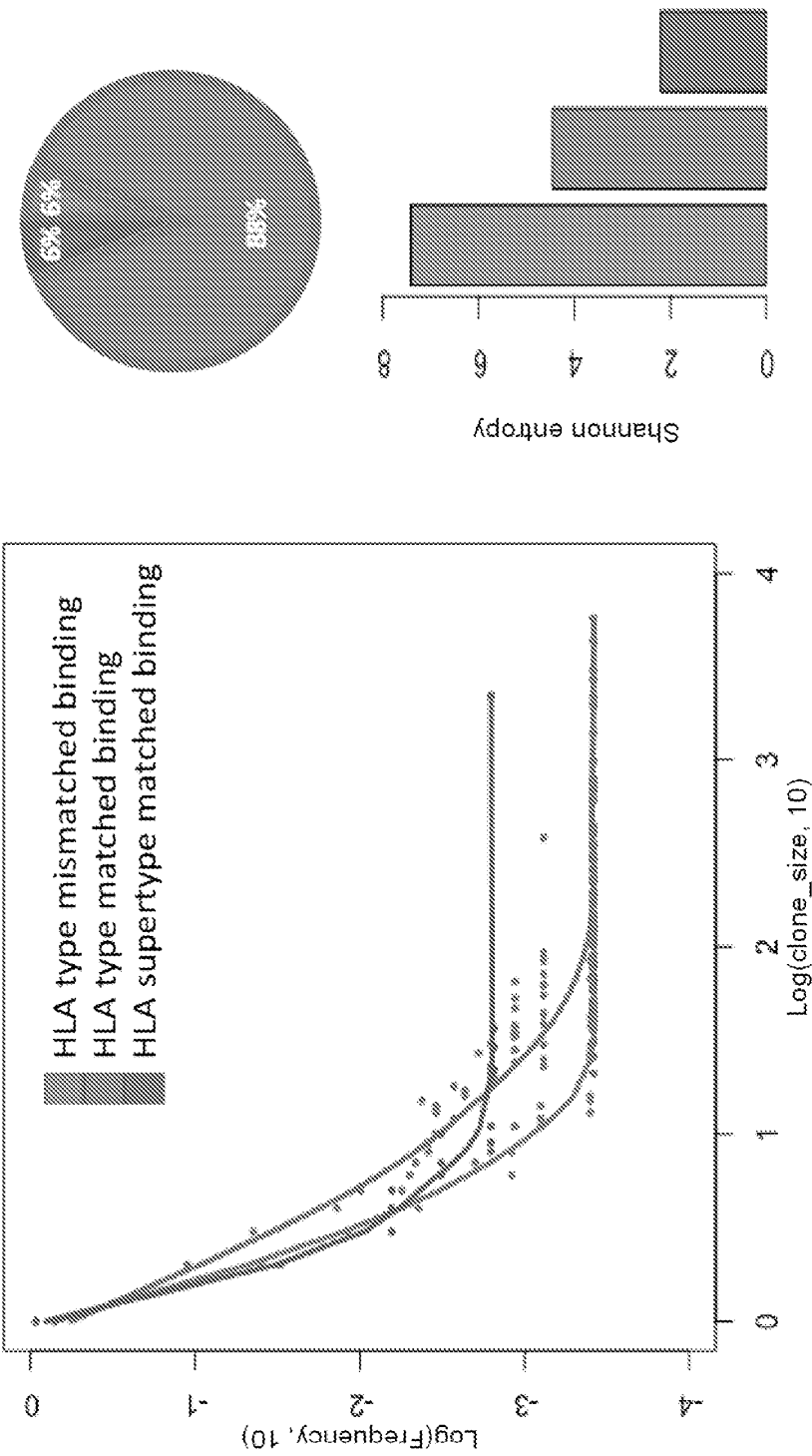


FIG. 25G

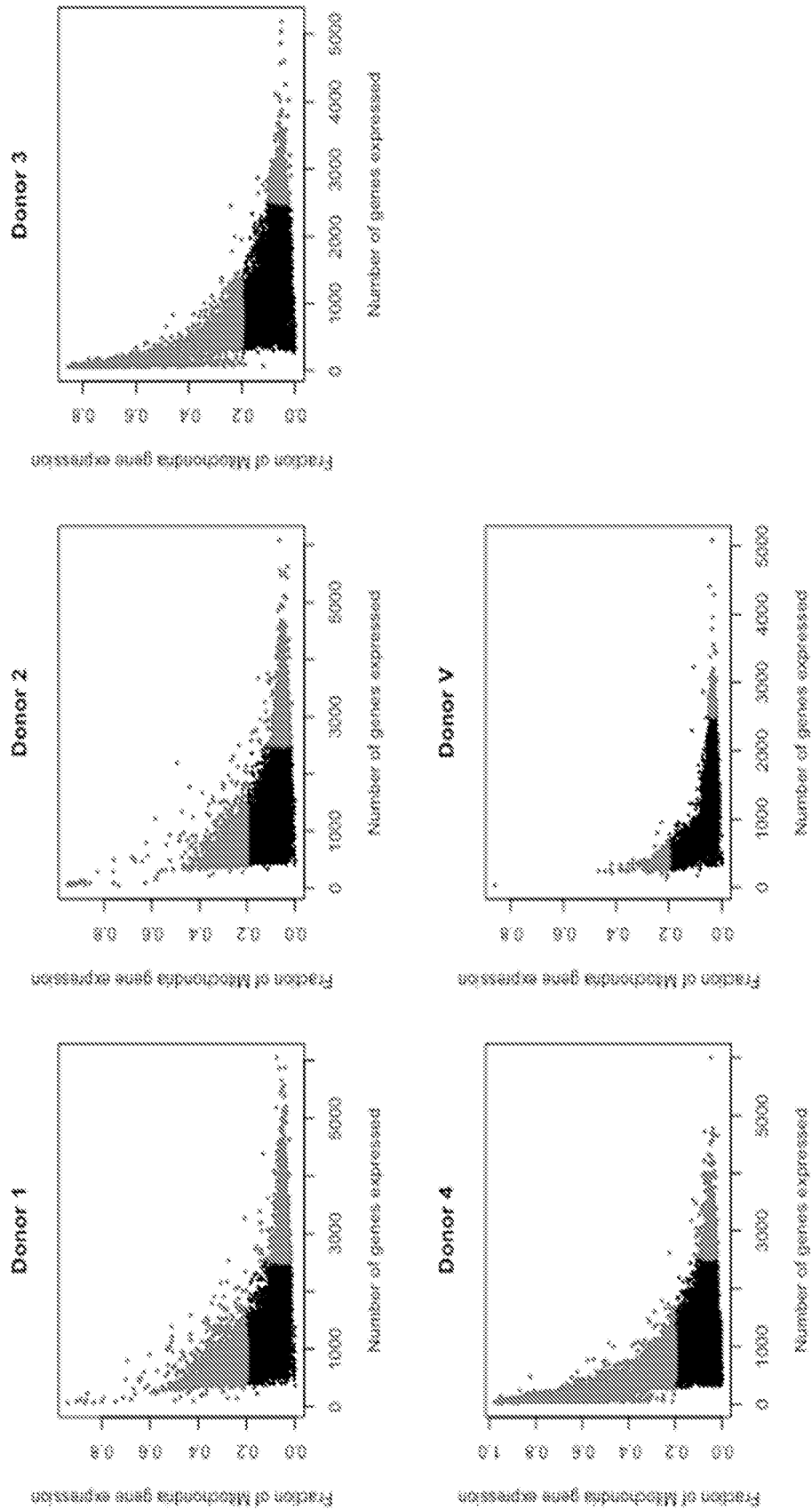


FIG. 26A

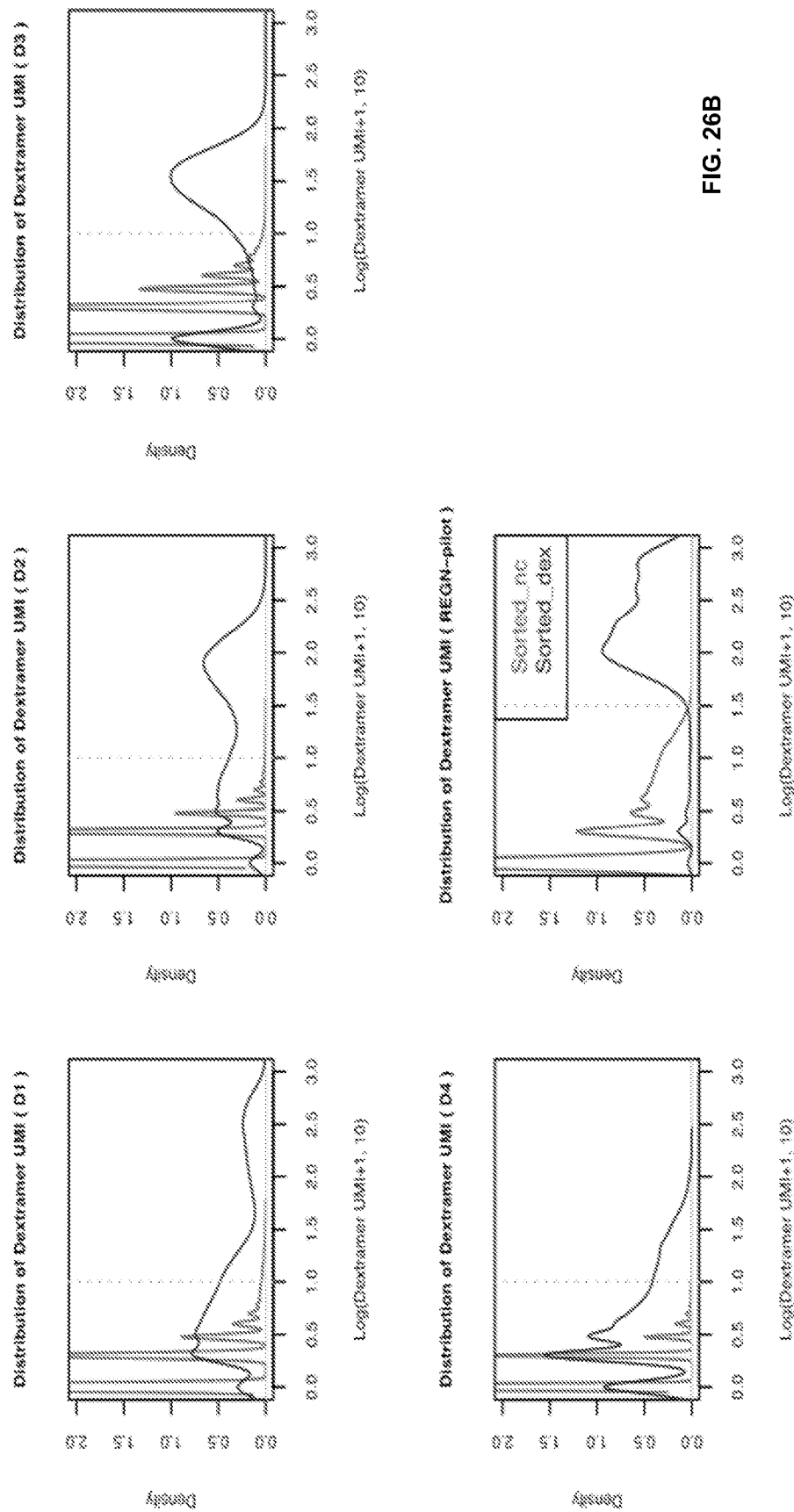
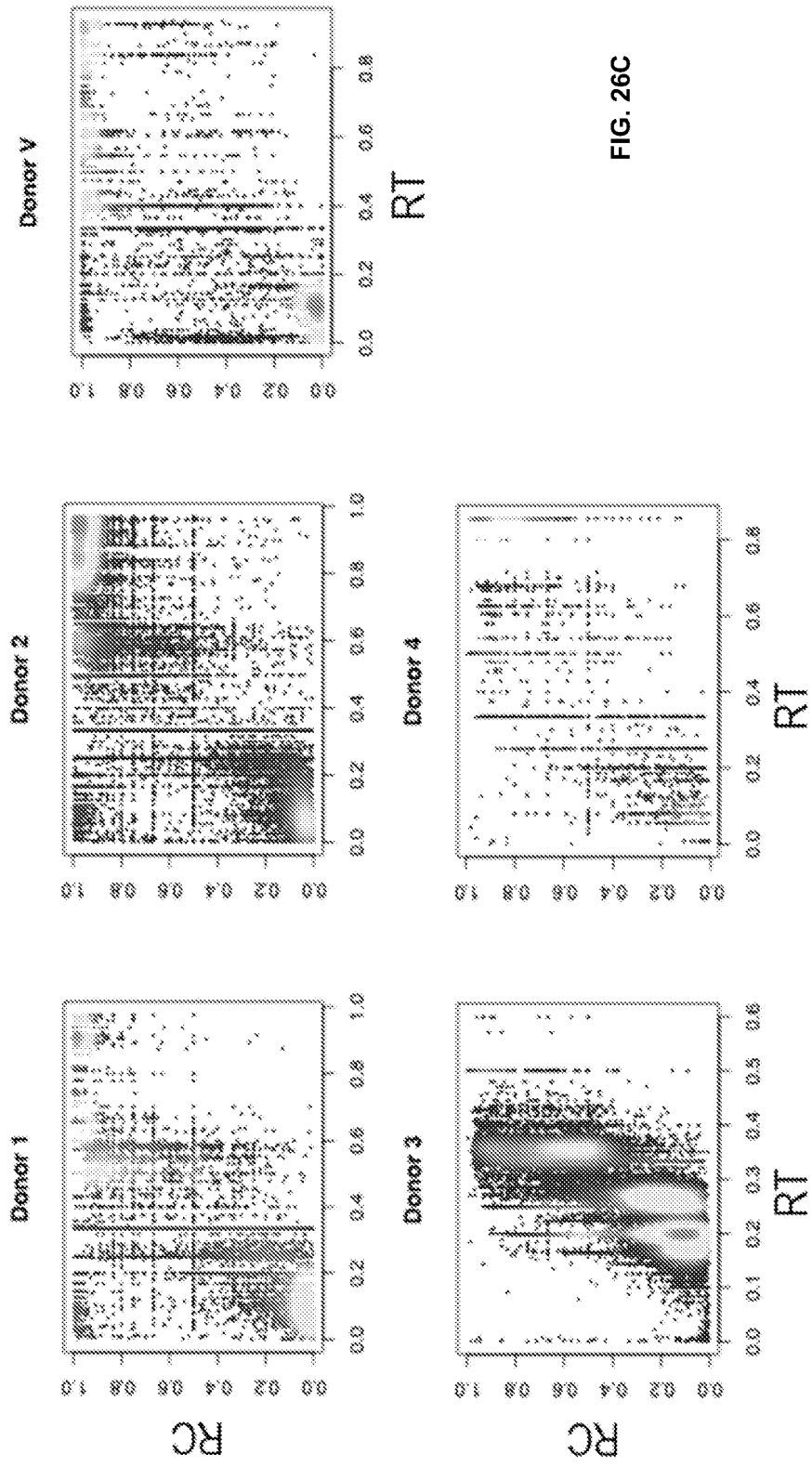


FIG. 26B



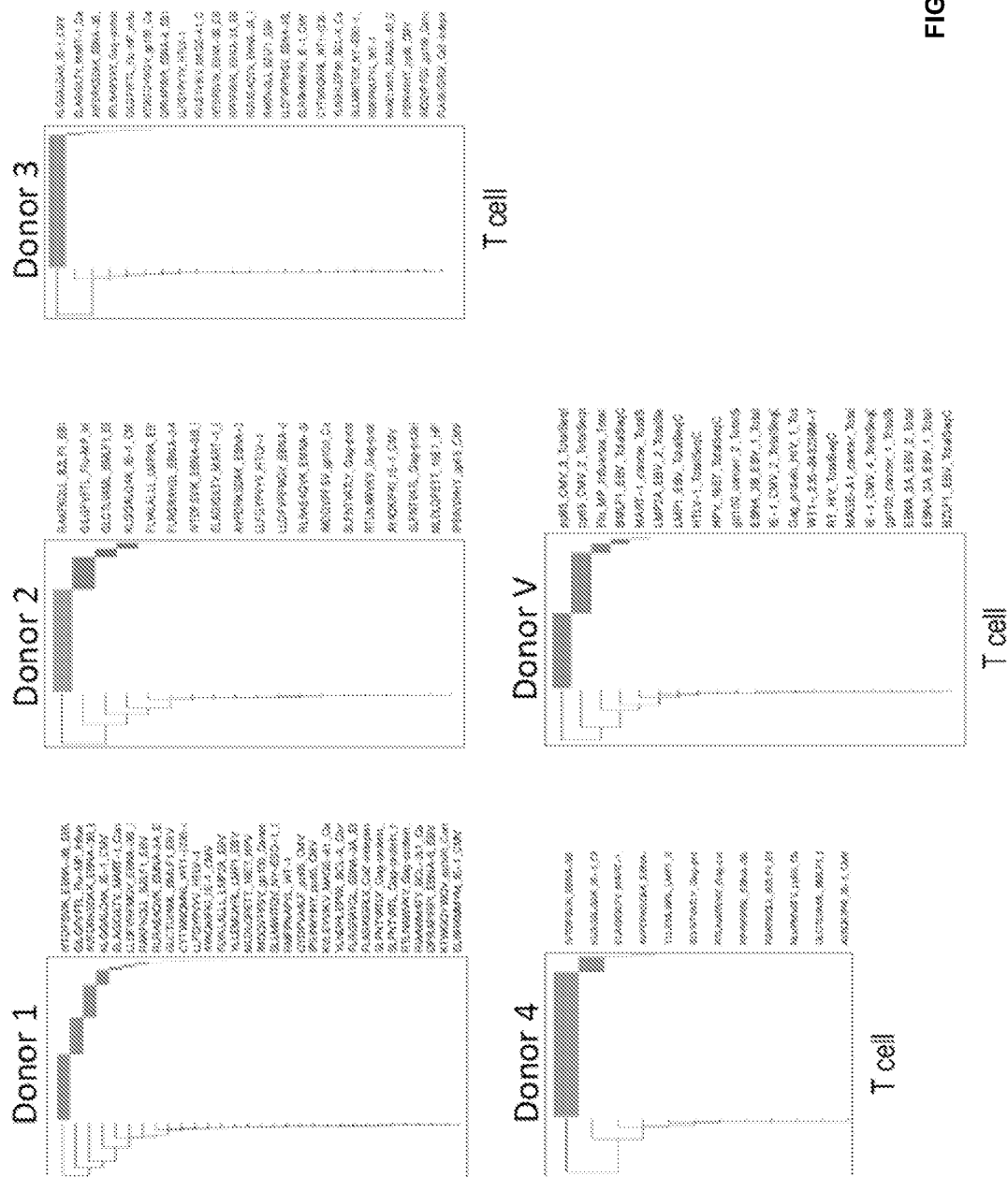


FIG. 26D

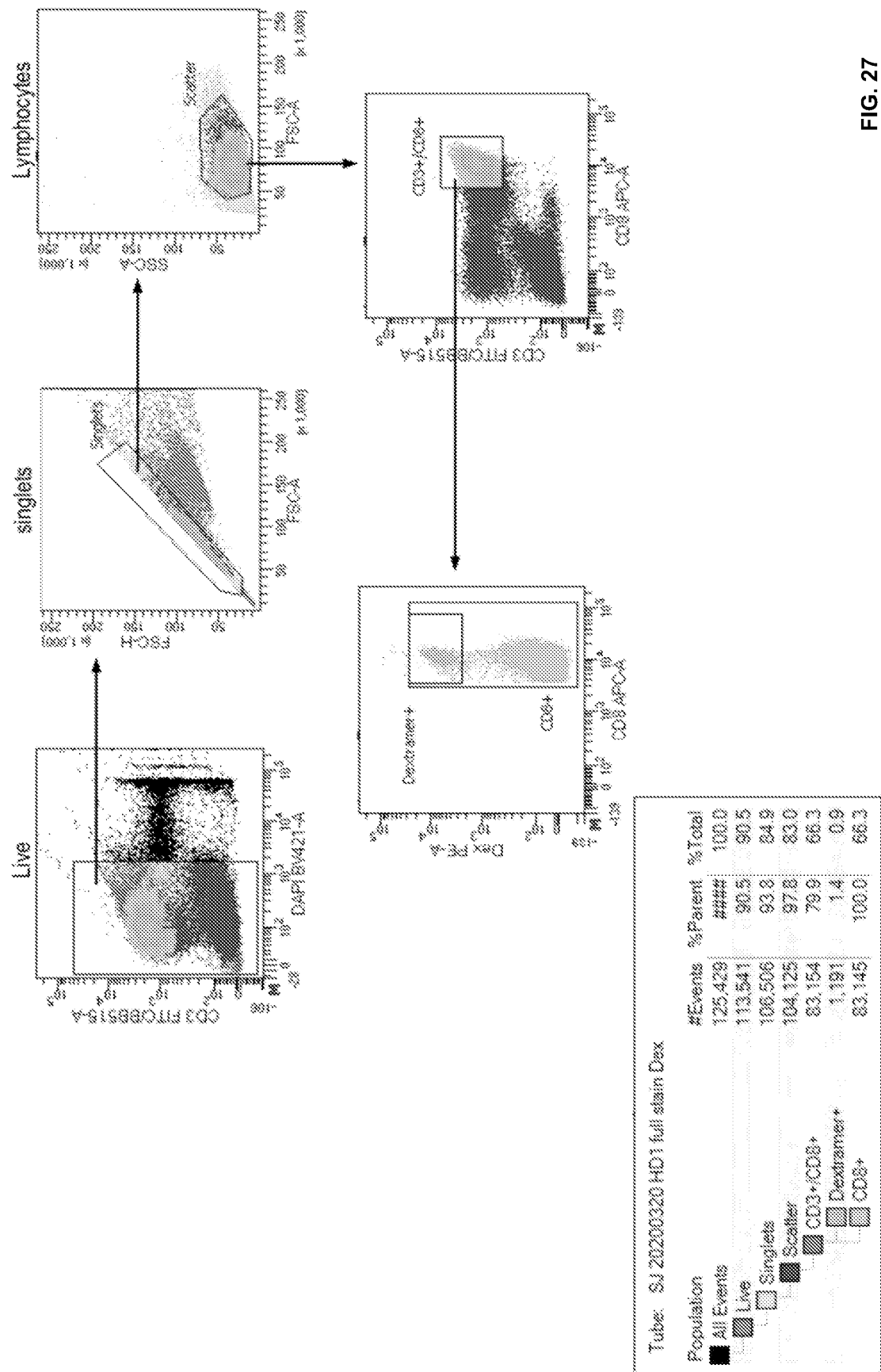


FIG. 27

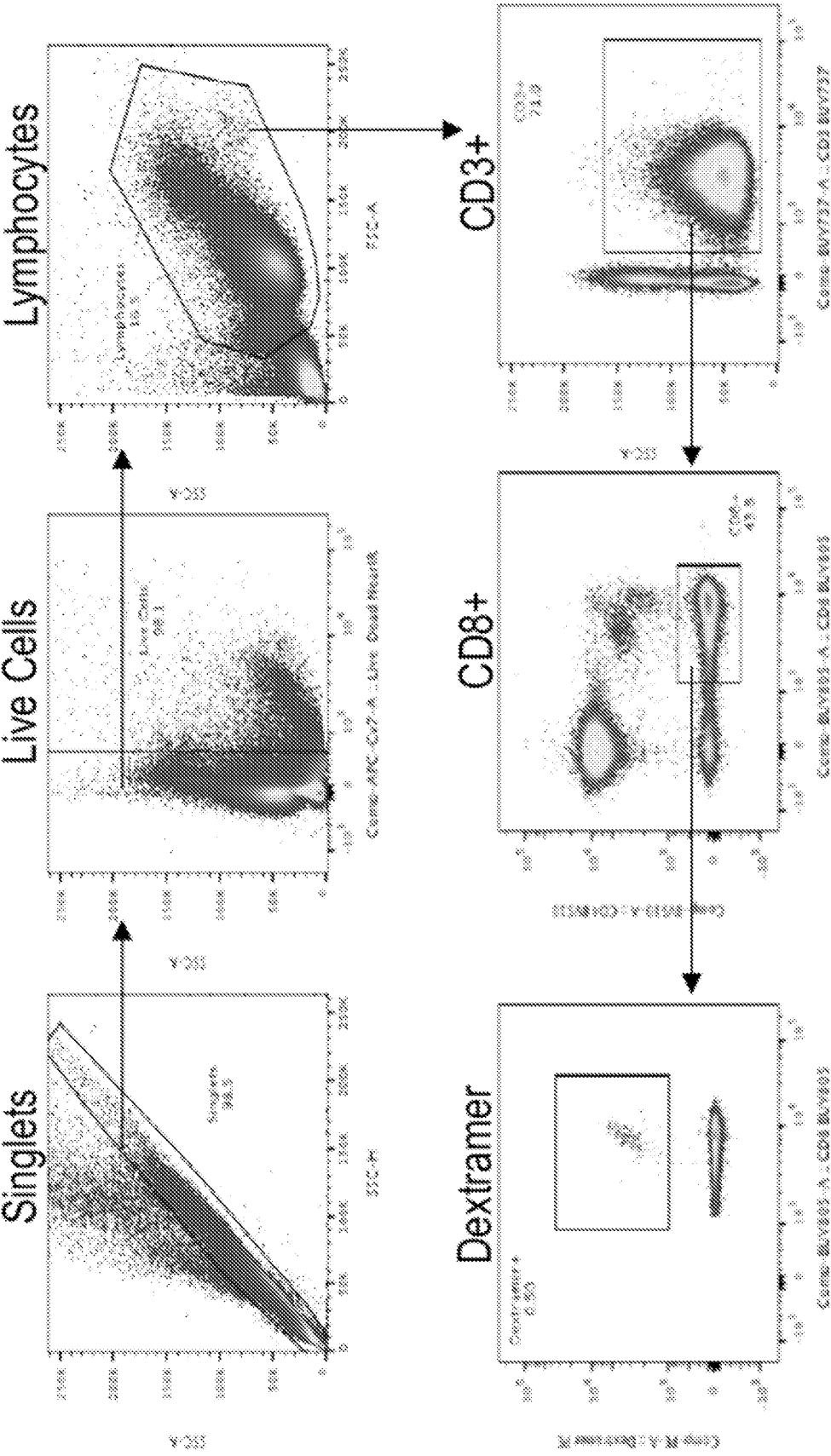


FIG. 28A

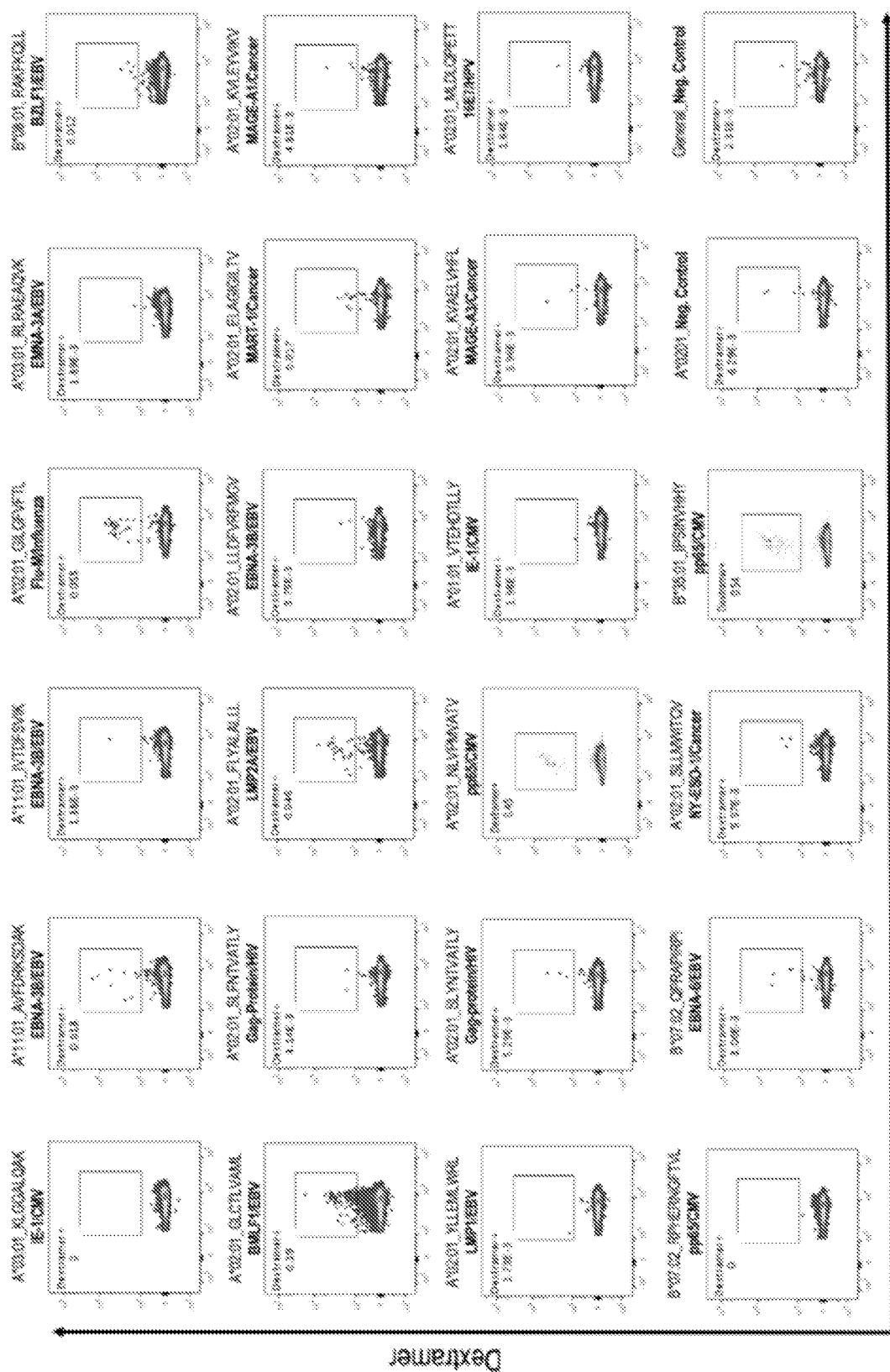


FIG. 28B

100+100

FIG. 29

pRNC	Donor 1		Donor 2		Donor 3		Donor 4		Donor 5		All donor summary	
	total	unique	total	unique	total	unique	total	unique	total	unique	total	unique
A108-01_BARTICULI_SBP1_FSV	1,09	104	1,835	371	2	2	1	1	1	1	1,848	479
A102-01_GAG-PV-F1_Pu-MP_influence	1,758	336	5,787	571	7	7	0	0	821	181	8,365	1,097
A102-01_PSVN100V_gag2_CMV	3	3	1	1	1	1	0	0	6,981	275	8,988	288
A102-01_NLPMVAVATV_gag2_CMV	6	6	0	0	0	0	3	1	3,611	163	3,617	164
A111-01_NY25SVKX_BNA 38_FSV	2,110	40	52	20	3	3	2,263	70	0	0	5,036	111
A103-01_KLGALGAK_R-1_CMV	699	511	1,128	547	1,823	1,584	243	163	0	0	3,893	2,863
A102-01_GACTRVAMN_BMP1_FSV	55	13	1,385	23	0	0	1	1	475	43	1,885	117
A111-01_AVVORNSQW_BNA 38_FSV	1,316	38	32	38	34	34	13	13	8	3	1,379	79
A102-01_SAGAGKTV_MART-1_Cancer	146	146	24	24	25	25	14	14	88	84	2,397	297
A102-01_NLWVRNAGV_BNA 38_FSV	117	8	11	8	2	2	0	0	0	0	130	14
A102-01_FYVIAALL_CMPA1_FSV	8	6	130	12	0	0	0	0	0	0	138	13
A108-01_FYGNAPV1_BNA 3A_FSV	2	2	38	40	0	0	0	0	1	1	41	17
A102-01_WGQVYVY_FYV-1	9	9	16	4	3	3	0	0	16	16	28	20
A103-01_HLAAAGQV1_BNA 3A_FSV	24	24	4	4	2	2	0	0	0	0	30	28
A102-01_CAGGLTMY_BMP-2A_FSV	6	6	0	0	0	0	0	0	27	7	33	7
A102-01_VYEMWHL_BMP1_FSV	7	5	0	0	0	0	3	3	13	9	23	17
A124-02_CYVWGNM1_VF111235-2430	14	14	0	0	2	2	0	0	1	1	17	13
A102-01_BAG1VHAGV_gag100_cancer	5	5	4	1	1	0	0	0	5	5	23	13
A124-02_NYAG26FK1_R-1_CMV	9	8	2	2	0	0	1	1	2	2	24	14
A102-01_STLAAVVVYV_Sag protein_FSV	1	1	2	2	8	8	1	1	3	3	14	14
A103-01_MLKGQVET1_1617_FSV	7	7	1	1	0	0	0	0	0	0	10	10
A102-01_VGSEVWVY_MAGE-A3_cancer	3	3	0	0	3	3	0	0	1	1	7	7
A102-01_KTAVG2YVWQV_gyBHL_cancer	1	1	0	0	0	0	0	0	1	1	7	7
A108-01_S1AKKAMMY1_H-1_CMV	1	1	0	0	2	2	0	0	1	1	4	4
A107-02_NYVHSH1_BNA 3A_FSV	0	0	0	0	2	2	1	1	1	1	4	4
A102-01_H1AAVYV10V_NY450-1_cancer	3	3	0	0	1	1	0	0	0	0	4	4
A107-01_ZYVRAHSH1_BNA 6_FSV	1	1	0	0	3	3	0	0	0	0	4	4
A102-01_BAPFAPV1_WT-3	3	3	0	0	1	1	0	0	0	0	4	4
A102-01_SIFNTVATV_Sag protein_FSV	1	1	2	2	0	0	0	0	0	0	3	3
A102-01_VYNGH1P9V_BCL-2_cancer	2	2	0	0	1	1	0	0	0	0	3	3
A102-01_F1AS6GRLV_Ca2+-inhibitor_P10	2	2	0	0	1	1	0	0	0	0	3	3
A124-02_QYGVAAK3_gag1_CMV	8	3	0	0	0	0	0	0	0	0	8	8
A102-01_SIFNTVATV_Sag protein_FSV	1	1	1	1	0	0	0	0	0	0	2	2
A102-01_KXSPYHGV_RT_FSV	0	0	0	0	0	0	0	0	1	1	1	1
A102-01_SIFNTVATV_Sag protein_FSV	0	0	0	0	0	0	1	1	0	0	1	1
A102-01_VYAG1VH1_MAGE-A3_cancer	0	0	0	0	1	1	0	0	0	0	1	1
A103-01_HLAAAGQV1_BCL-2L1_cancer	1	1	0	0	0	0	0	0	0	0	1	1

FIG. 30A

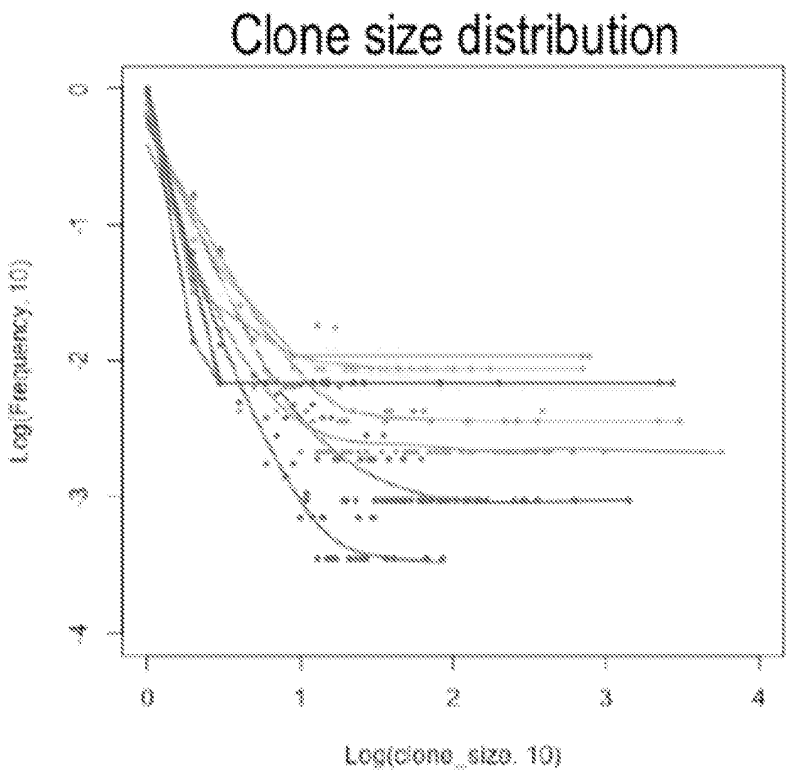
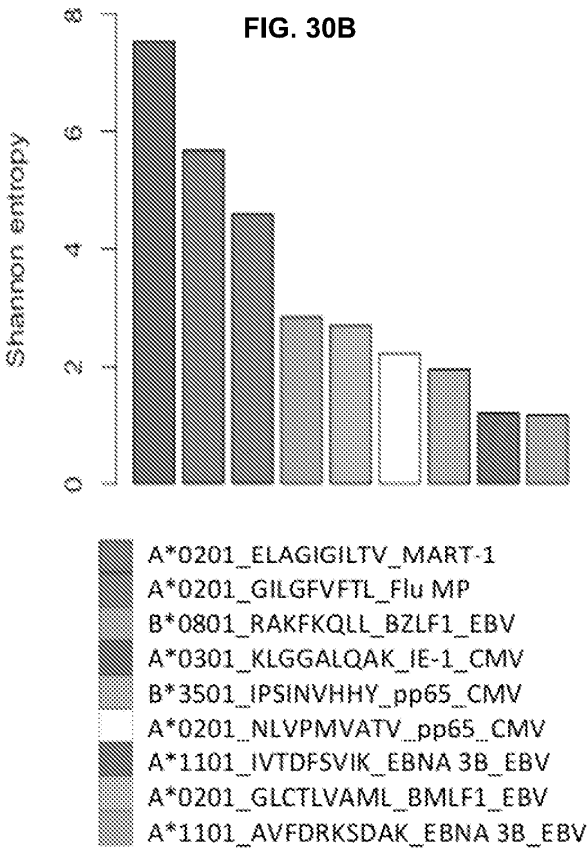


FIG. 30B



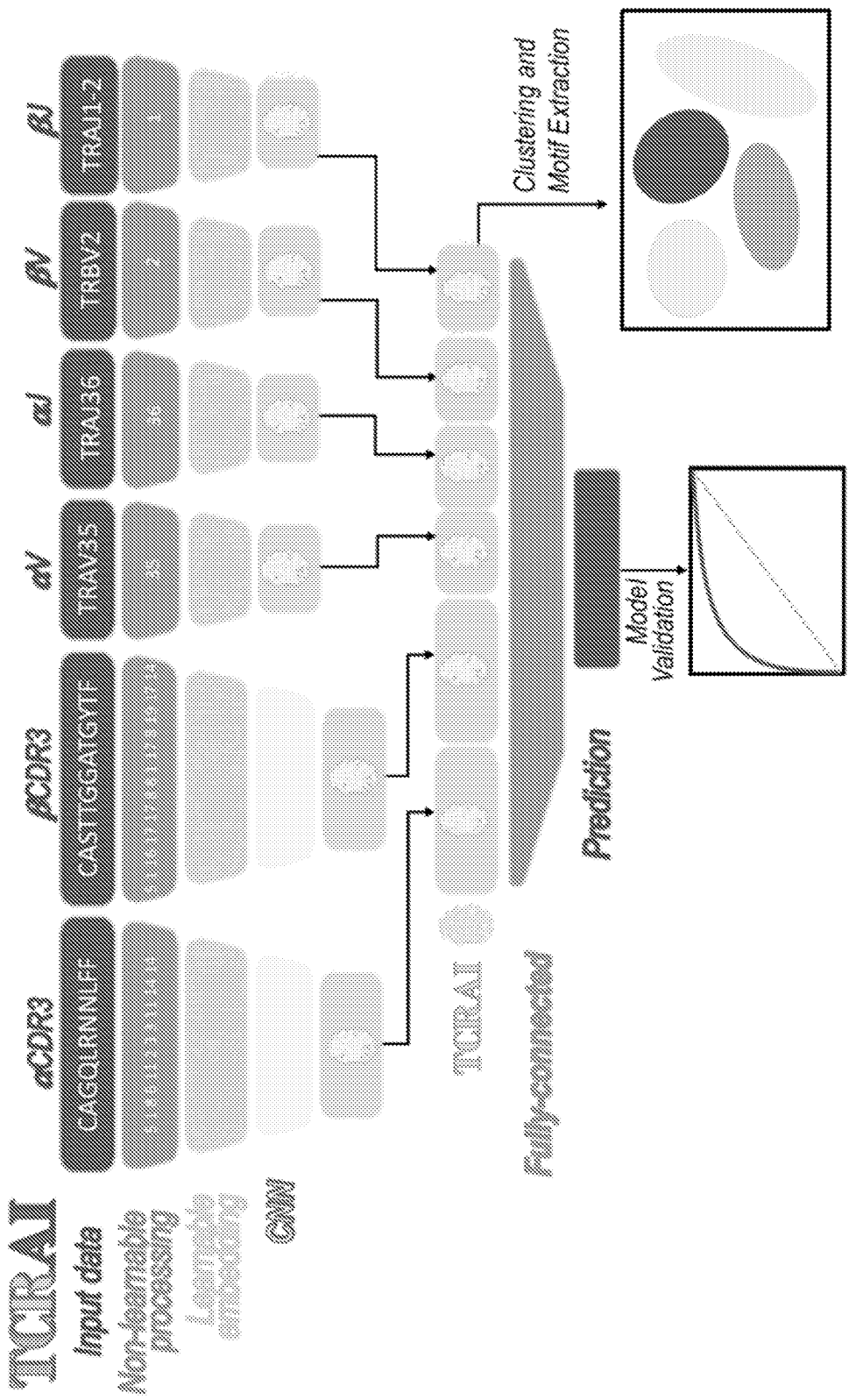


FIG. 31B

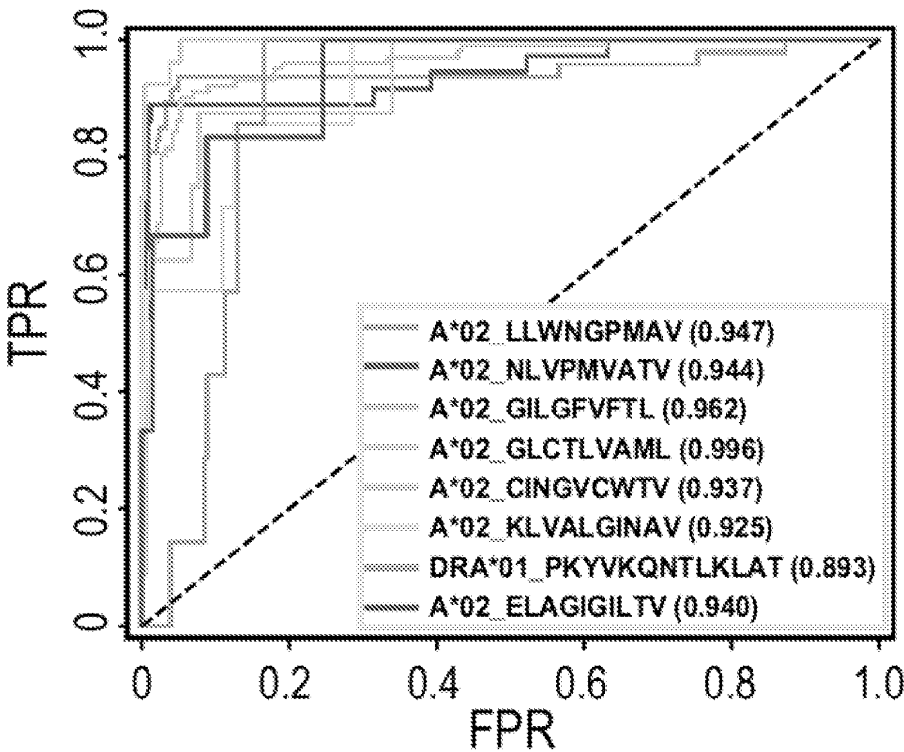


FIG. 31C

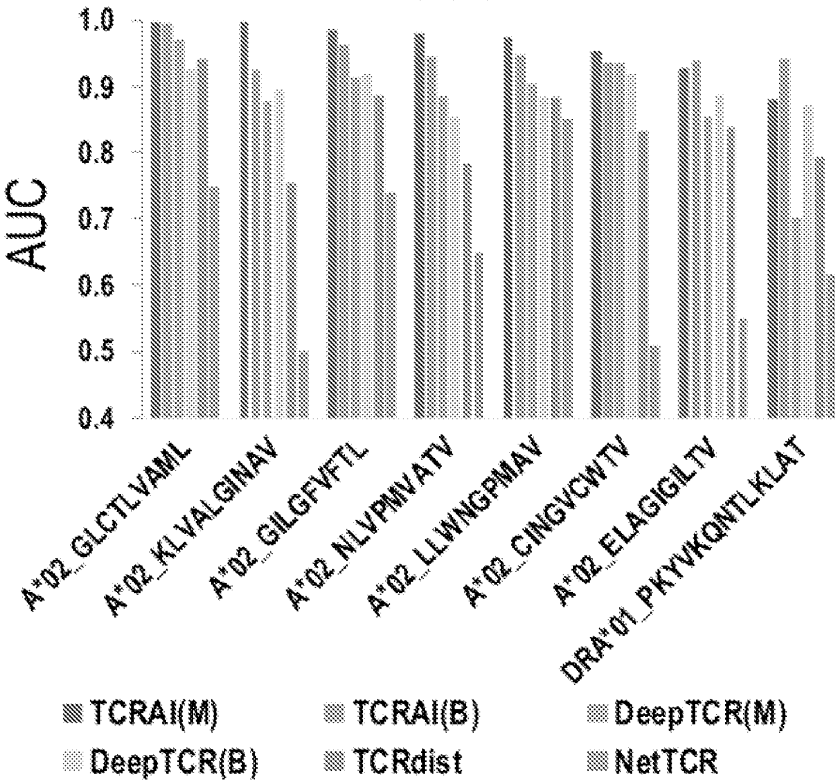


FIG. 32A

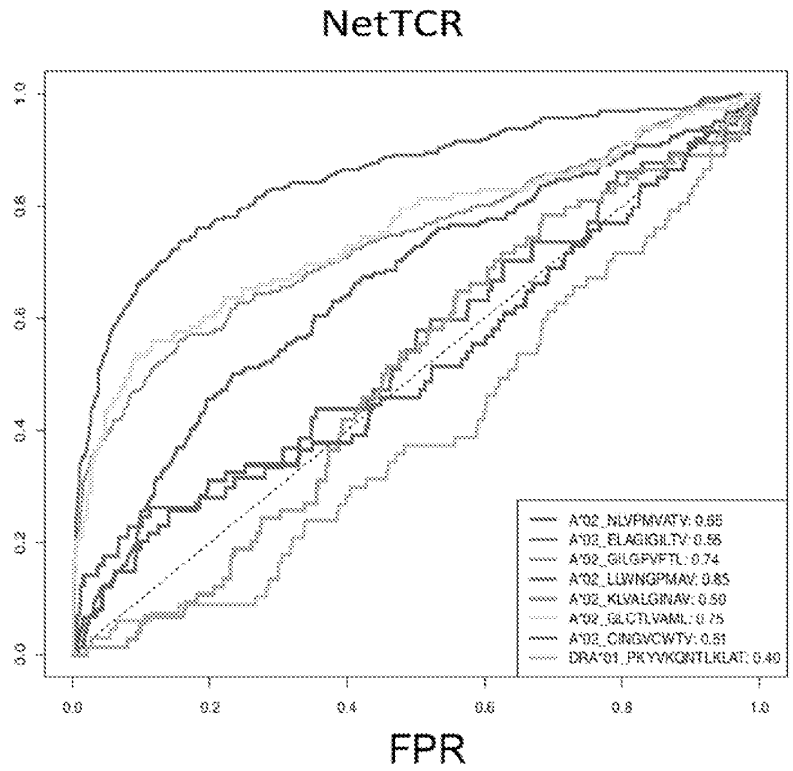
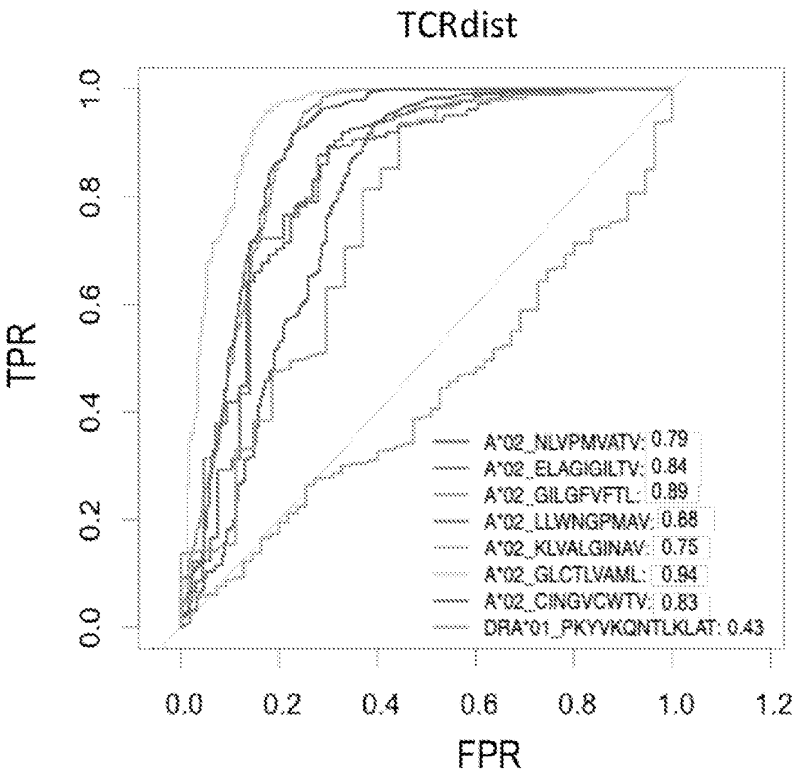


FIG. 32A
(CONTINUED)

DeepTCR(B)

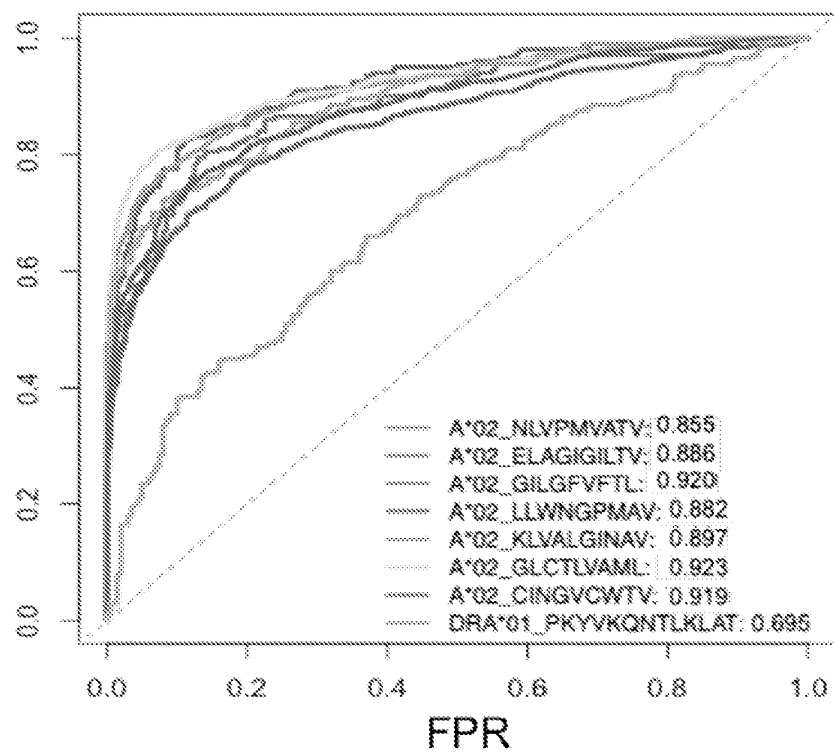


FIG. 32B

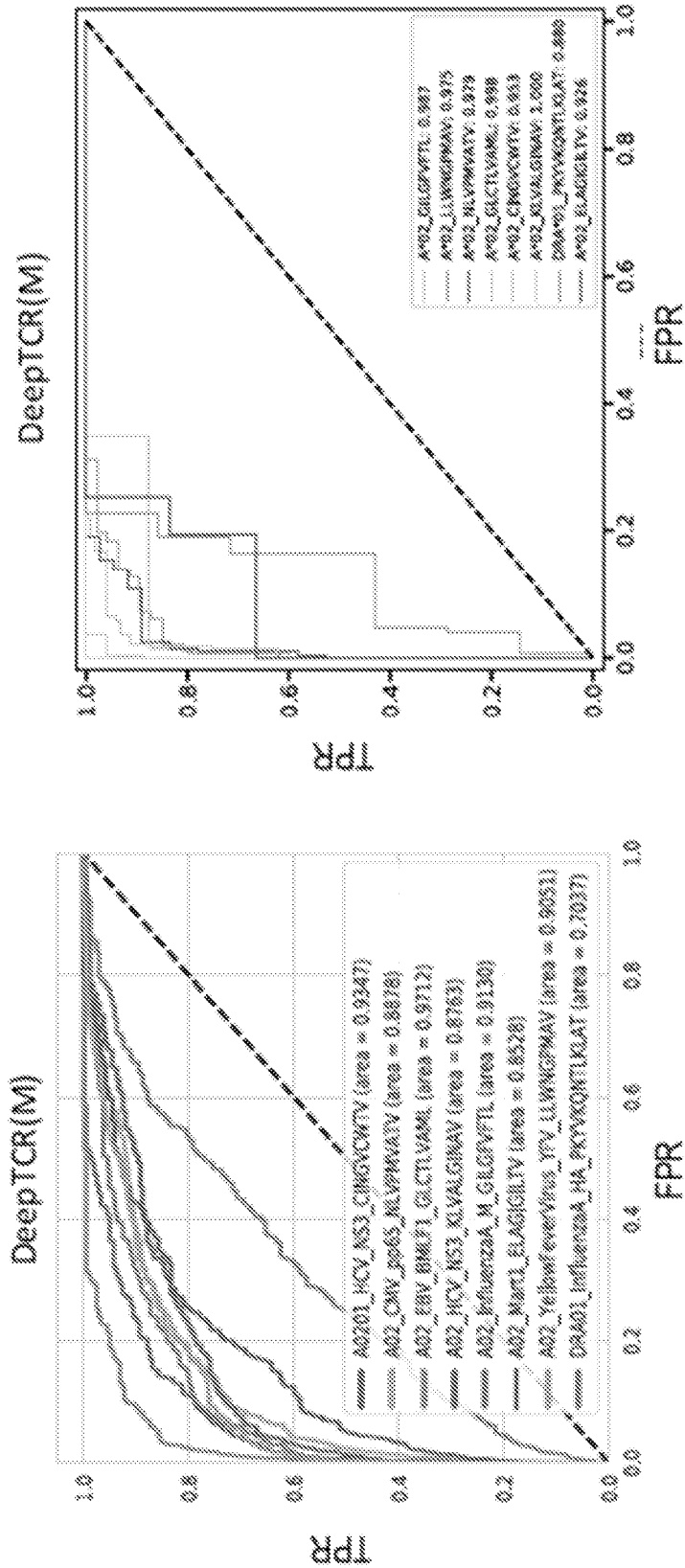
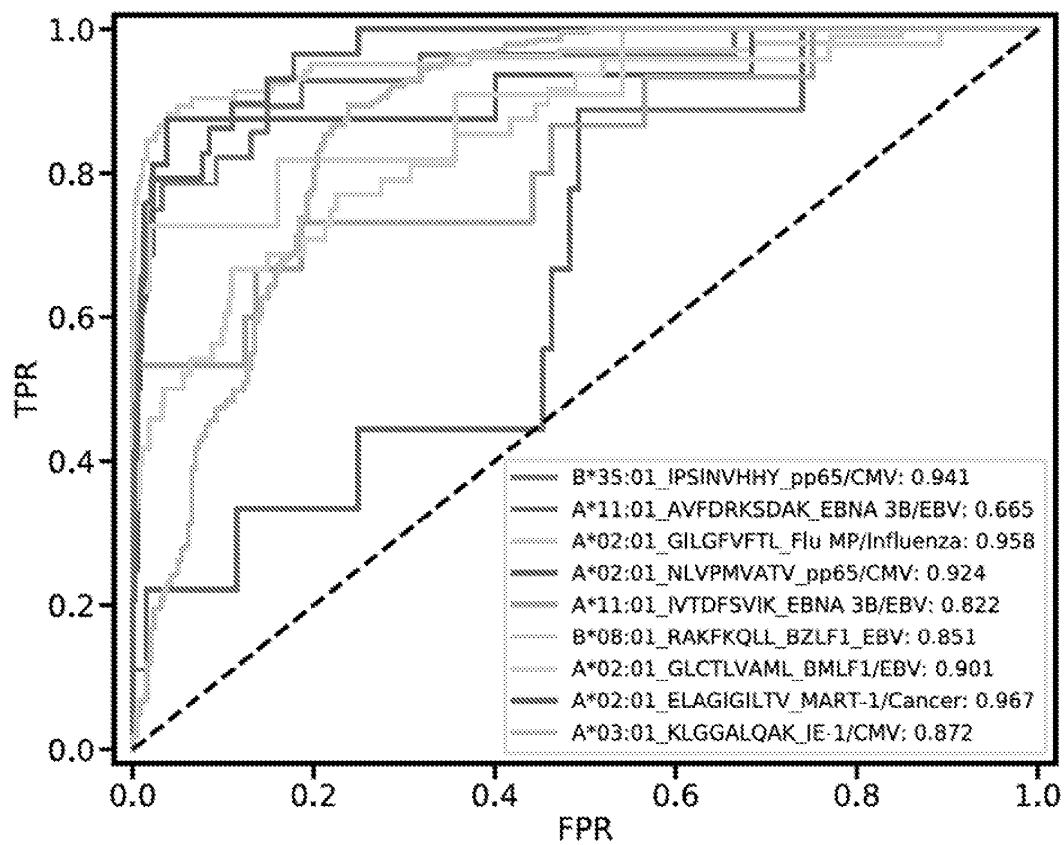


FIG. 32C



pMHC	GLIPH2		NetTCR		TCRdist		DeepTCR		TCRAI	
	SENSITIVITY	SPECIFICITY	SENSITIVITY	SPECIFICITY	SENSITIVITY	SPECIFICITY	SENSITIVITY	SPECIFICITY	SENSITIVITY	SPECIFICITY
A*02_NLVPMVATV	0.246	0.997	0.500	0.767	0.937	0.606	0.885	0.697	0.889	0.988
A*02_ELAGIGILTV	0.000	1.000	0.263	0.888	0.878	0.721	0.870	0.795	0.833	0.912
A*02_GILGFVFTL	0.867	0.988	0.562	0.845	0.955	0.751	0.928	0.763	0.902	0.947
A*02_LLWNGPMAV	0.119	1.000	0.738	0.843	0.920	0.770	0.874	0.757	0.936	0.951
A*02_KLVALGINAV	0.000	1.000	0.784	0.316	0.935	0.556	0.920	0.720	0.857	0.873
A*02_GLCTLVAML	0.646	0.999	0.559	0.885	0.957	0.830	0.928	0.806	1.000	0.947
A*02_CINGVCWTV	0.191	1.000	0.257	0.860	0.895	0.701	0.890	0.825	0.875	0.922
DRA*01_PKYVKQNTLKLAT	0.000	1.000	1.000	0.006	0.048	1.000	0.630	0.660	1.000	0.831
Average of HLA-A*02 binders	0.296	0.998	0.523	0.772	0.925	0.705	0.899	0.766	0.899	0.934
Average of all binders	0.259	0.998	0.583	0.676	0.816	0.742	0.866	0.753	0.912	0.922

FIG. 33

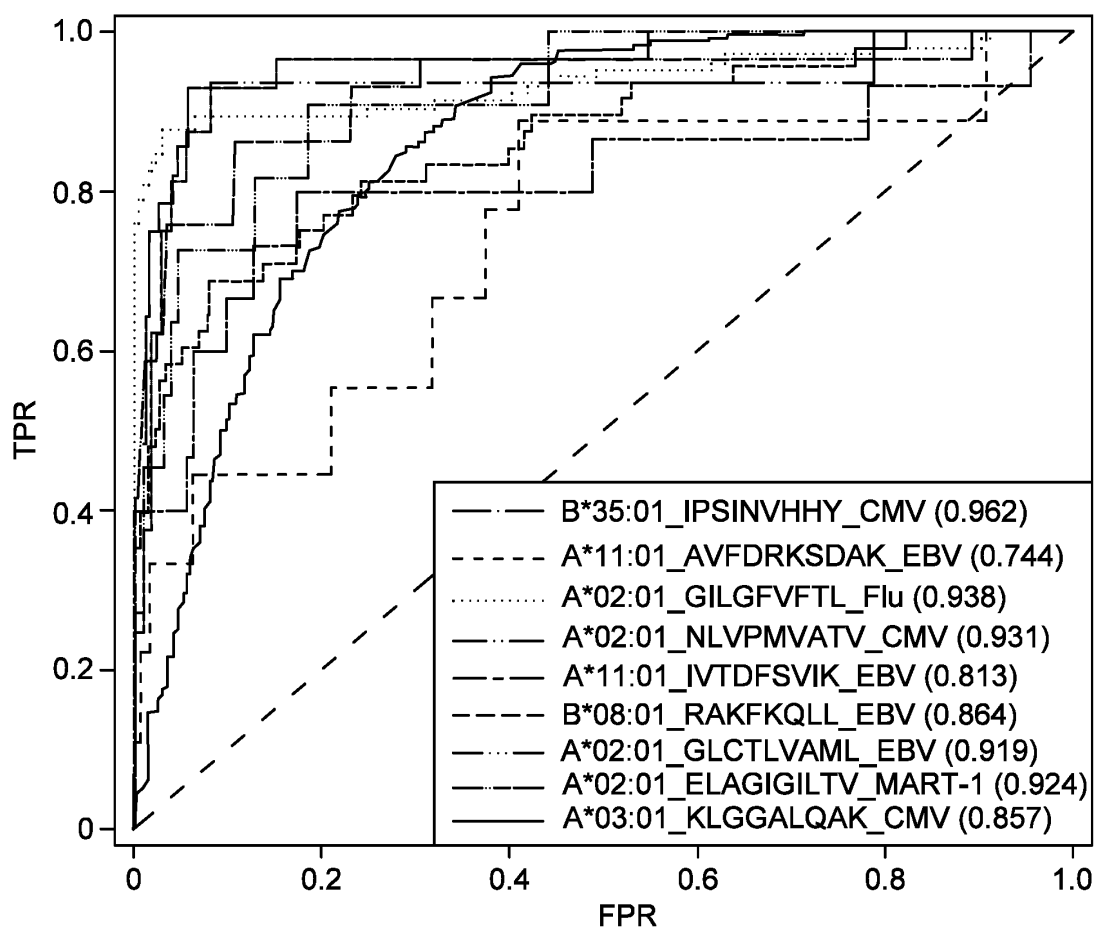


FIG. 34A

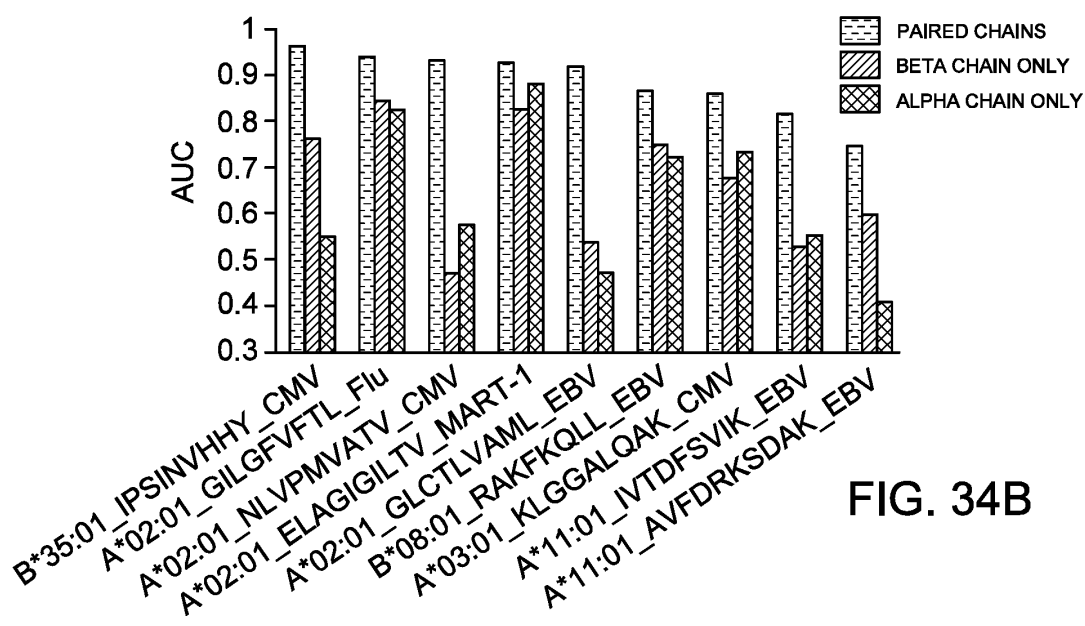


FIG. 34B

FIG. 34C

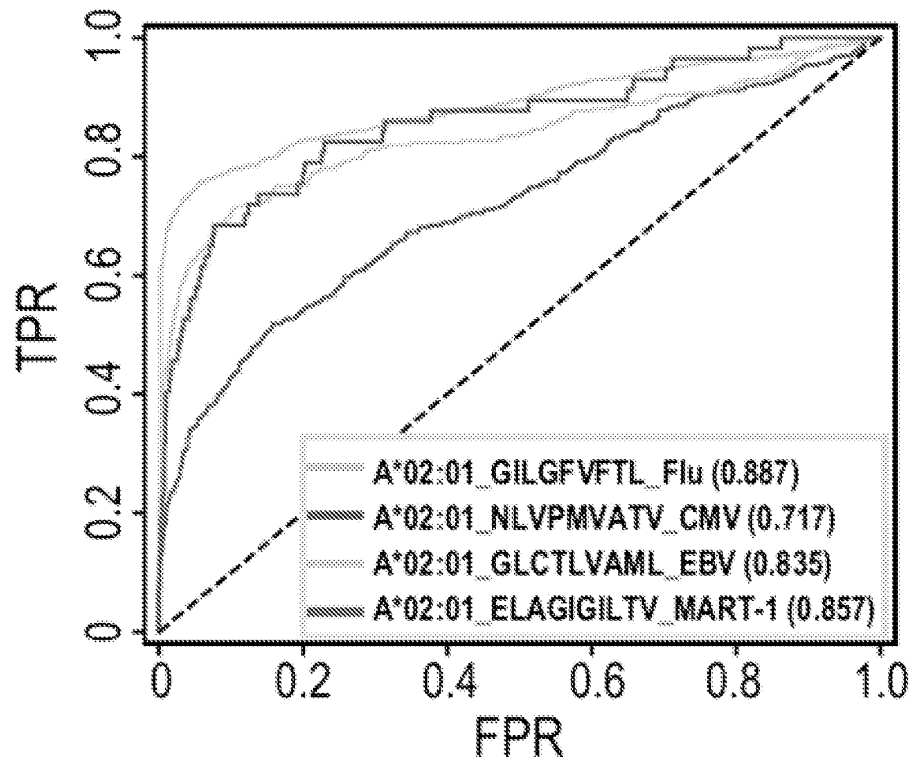


FIG. 34D

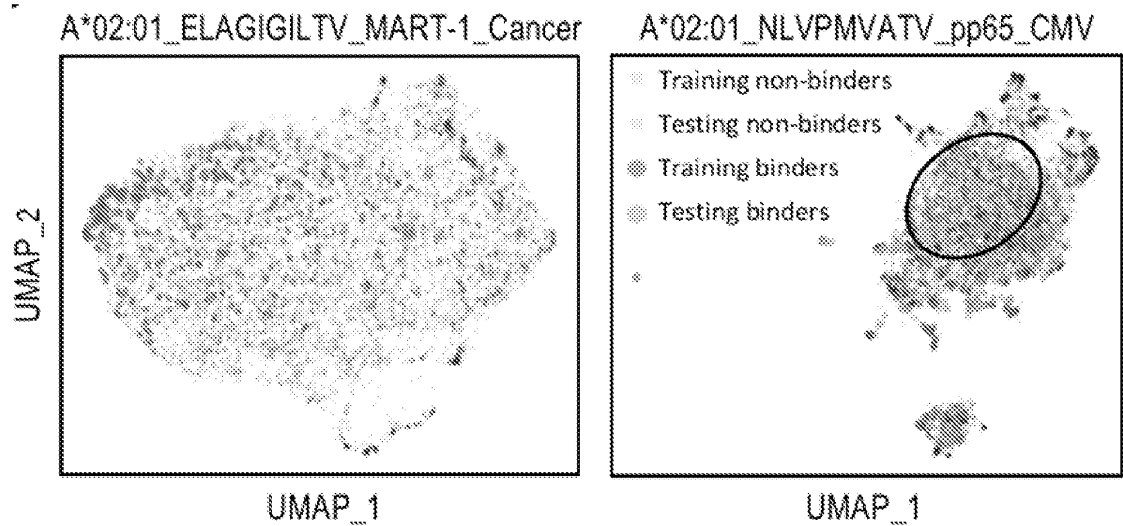


FIG. 35

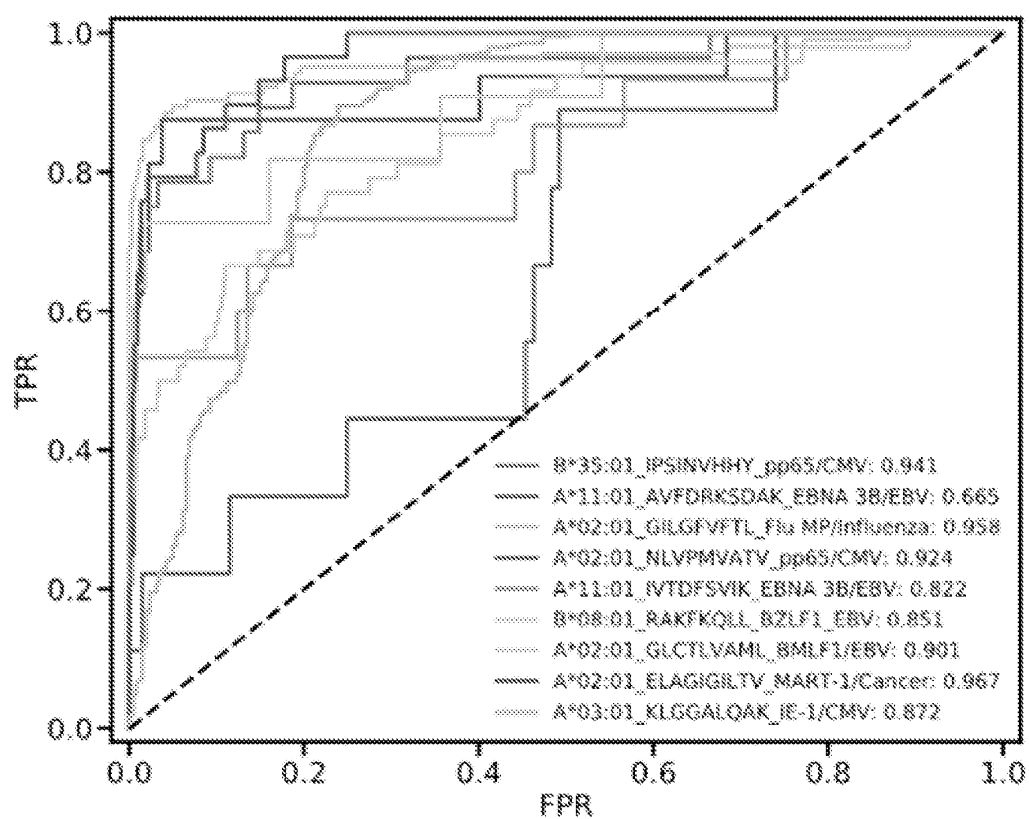


FIG. 36A

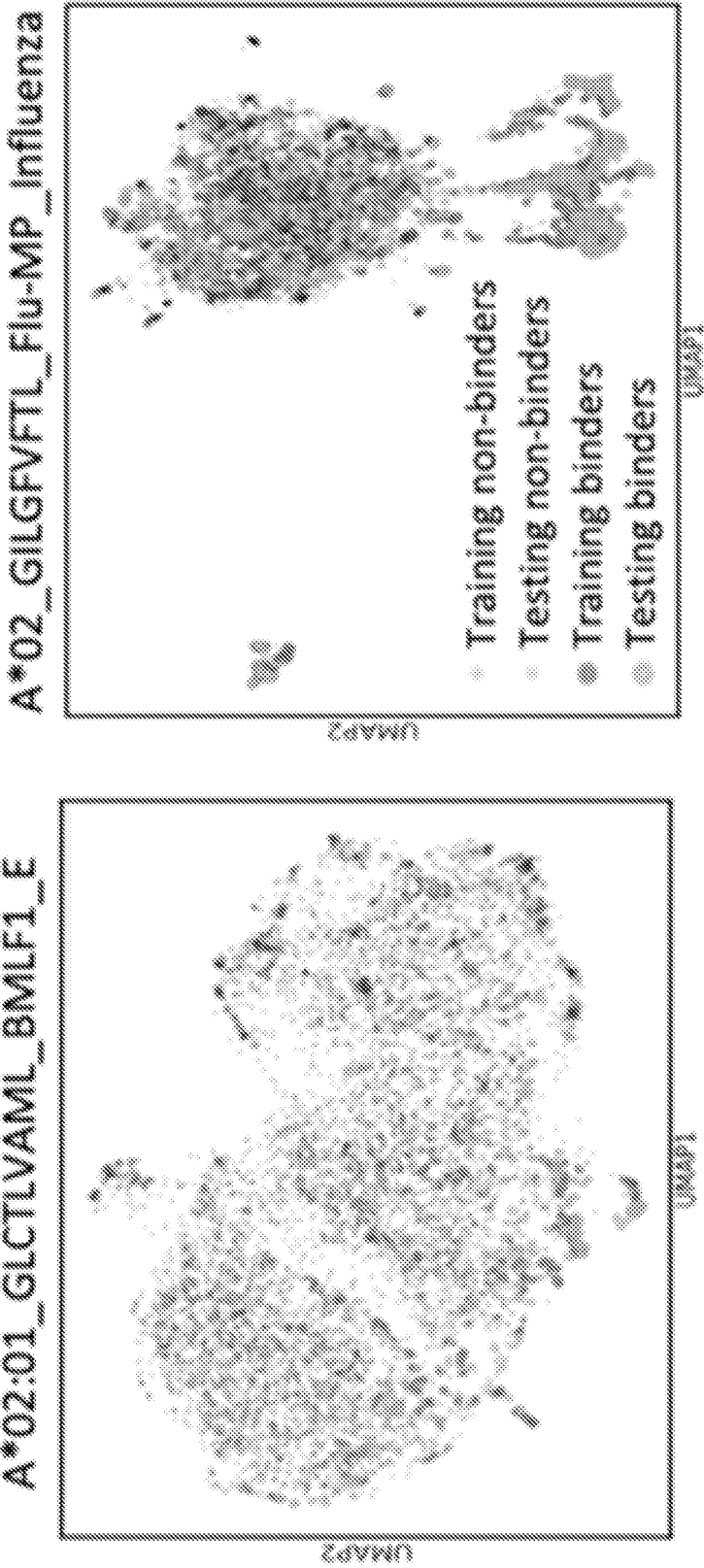
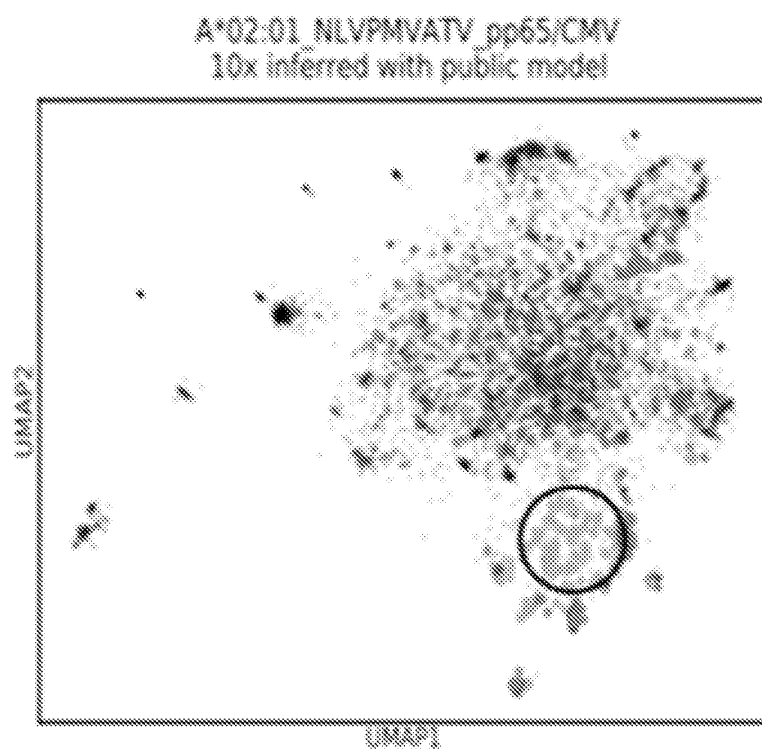


FIG. 36B



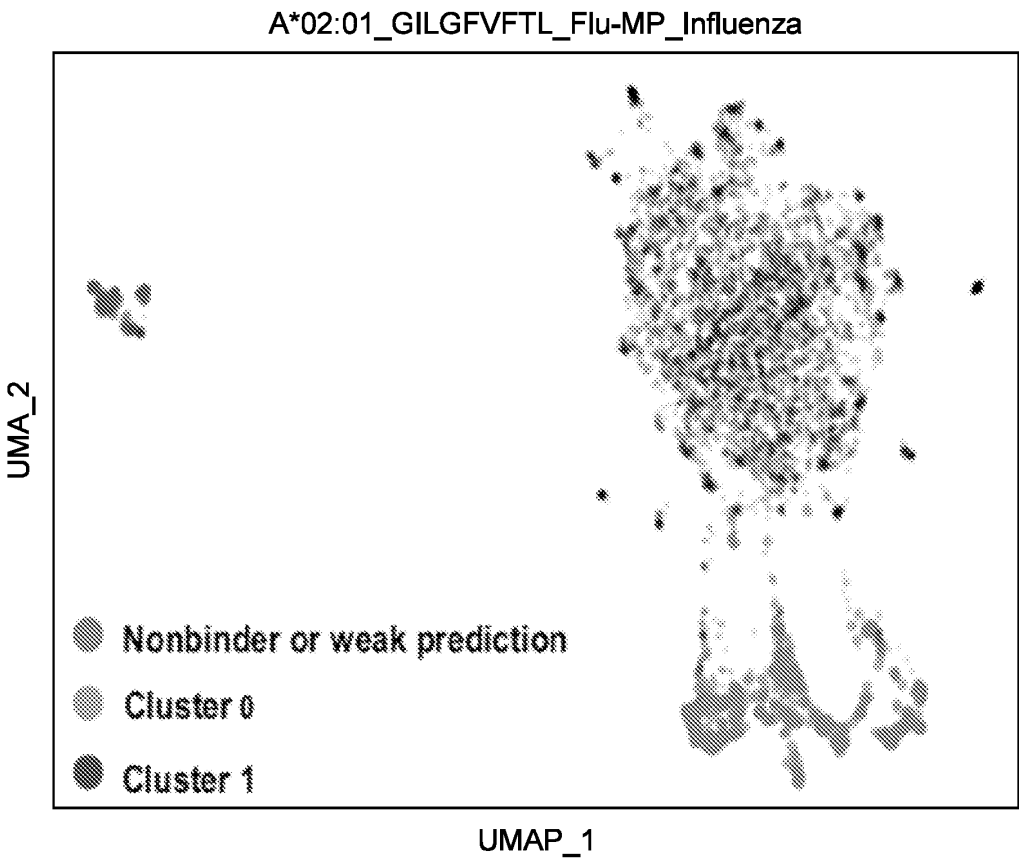


FIG. 37A

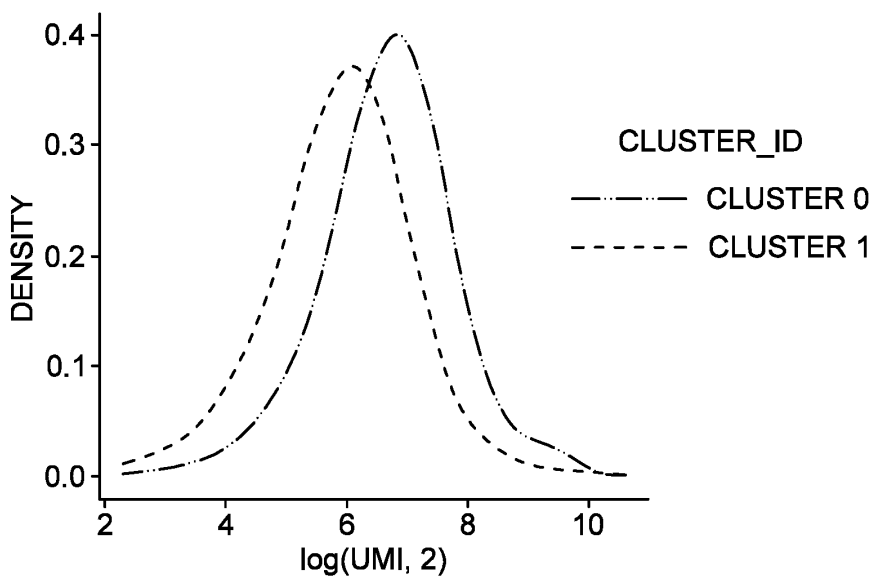


FIG. 37B

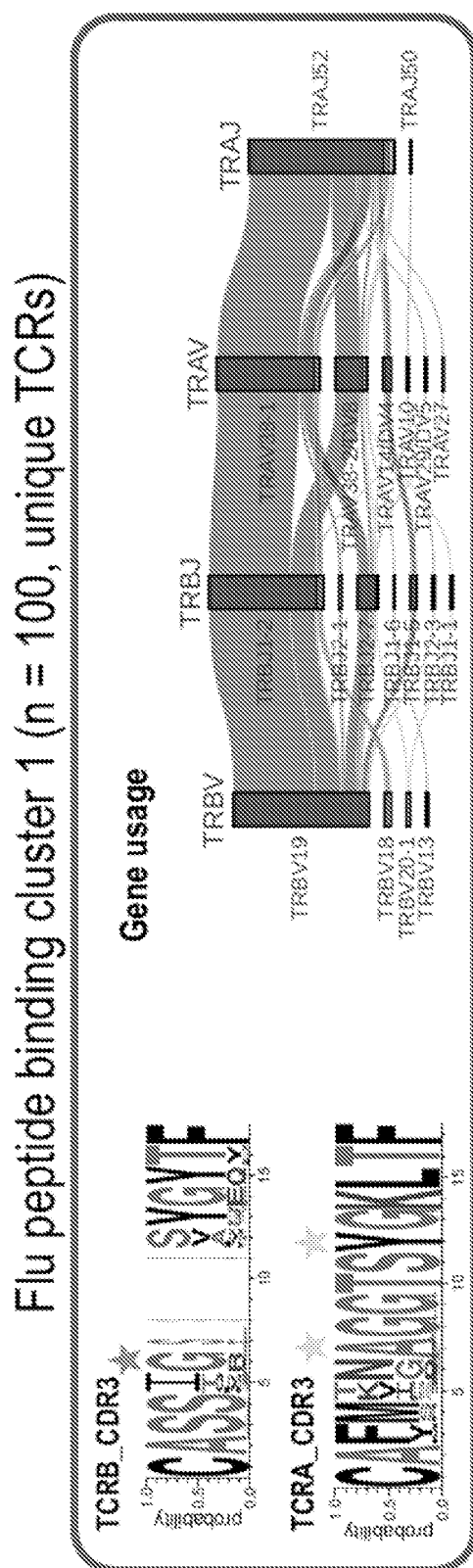
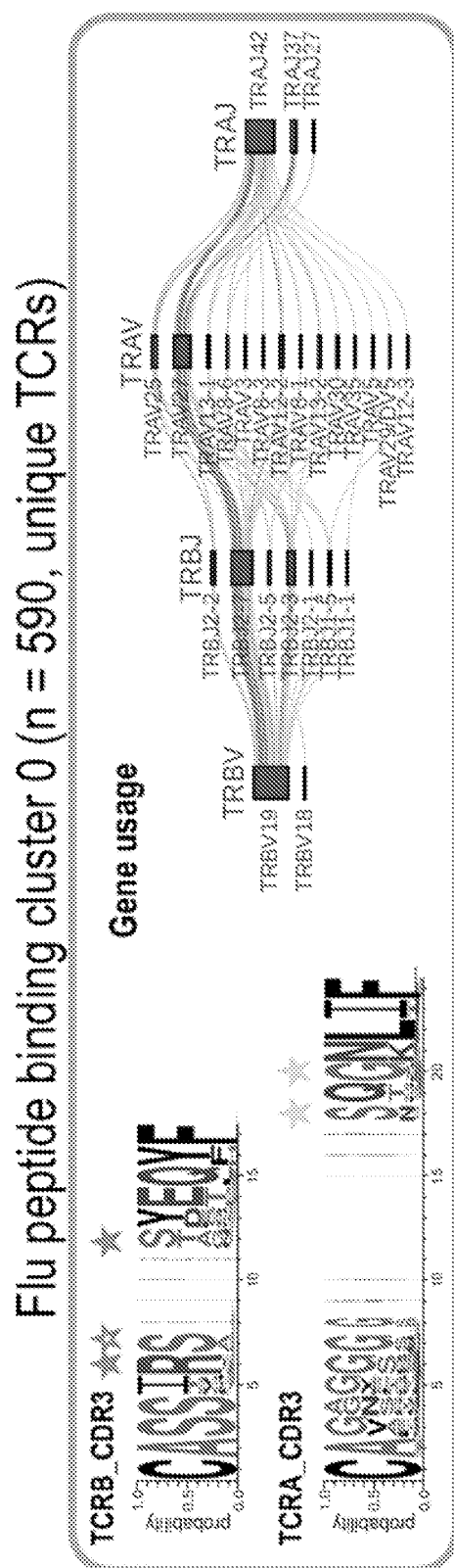


FIG. 37C

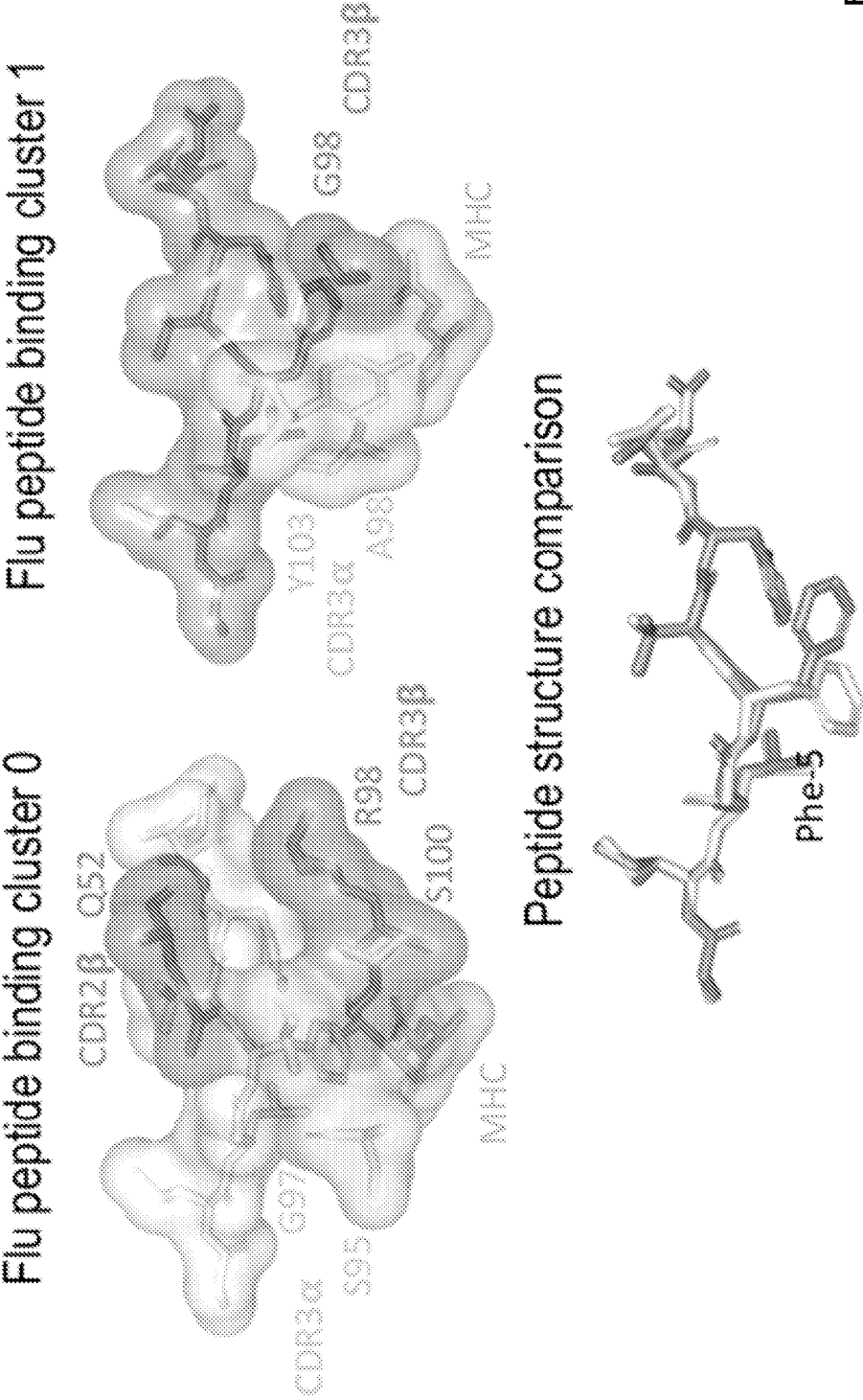


FIG. 37D

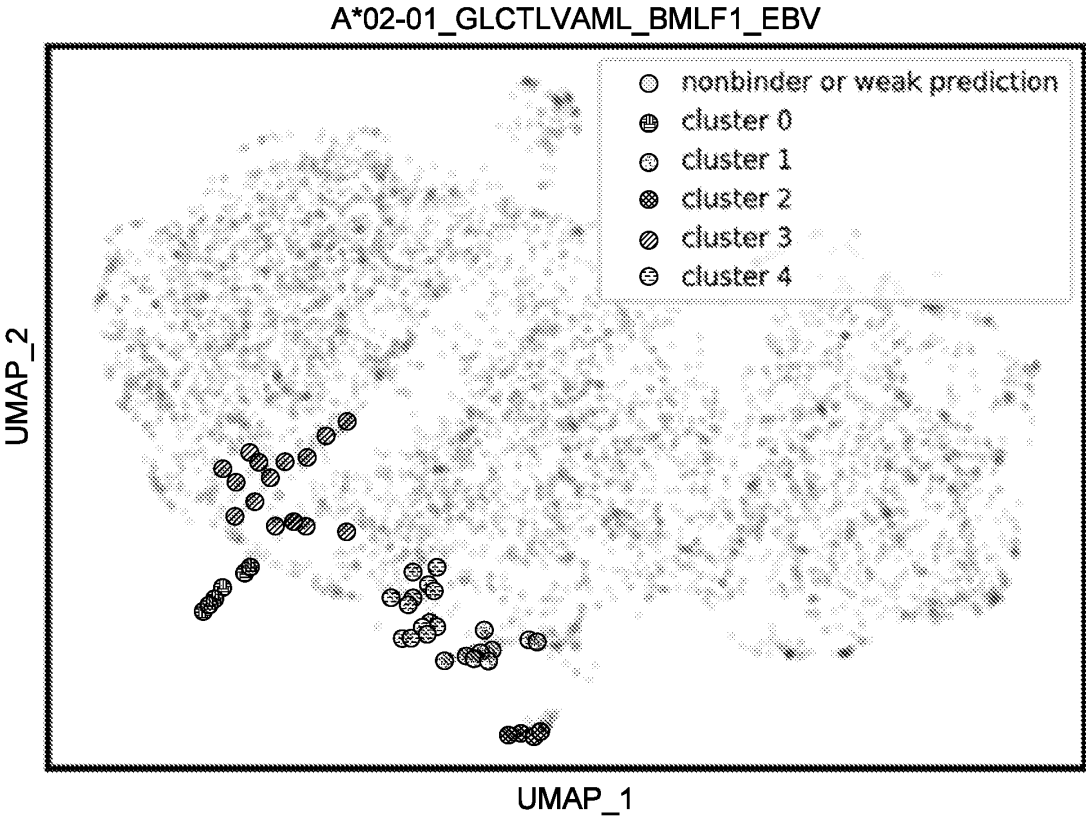


FIG. 37E

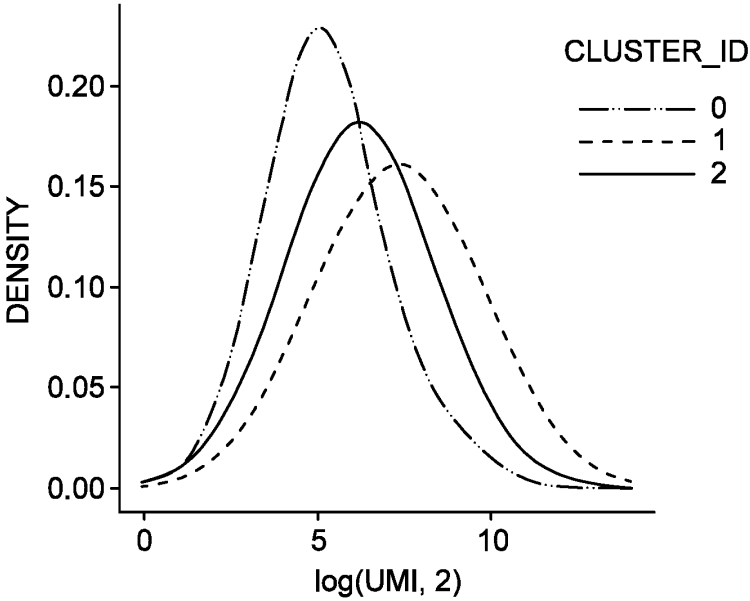
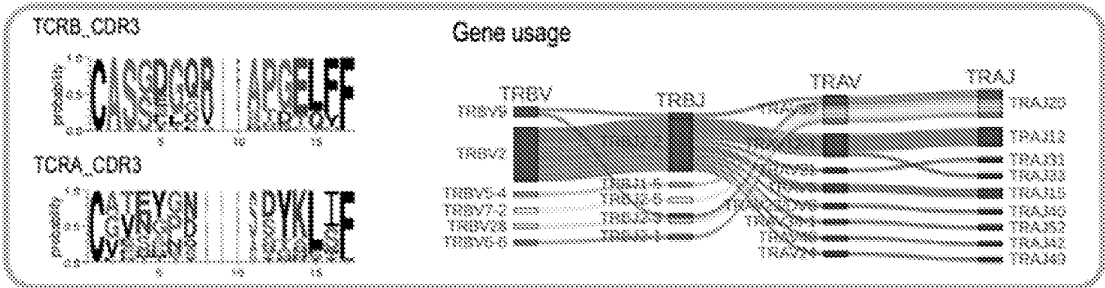


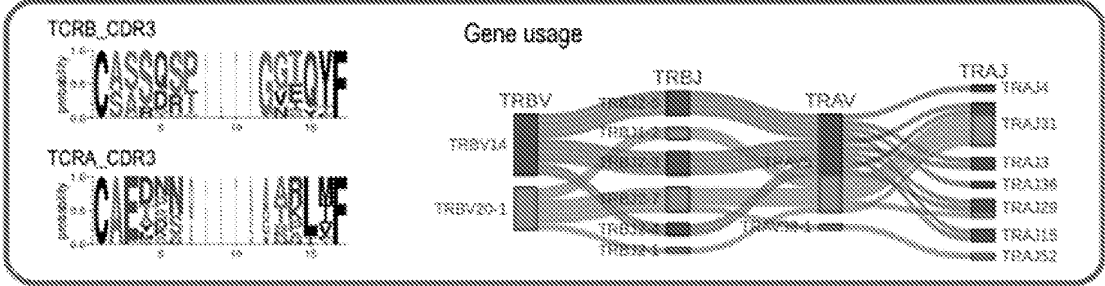
FIG. 37F

FIG. 37G

EBV peptide binding Cluster 0 (n = 18, unique TCRs)



EBV peptide binding Cluster 1 (n = 17, unique TCRs)



EBV peptide binding Cluster 2 (n = 16, unique TCRs)

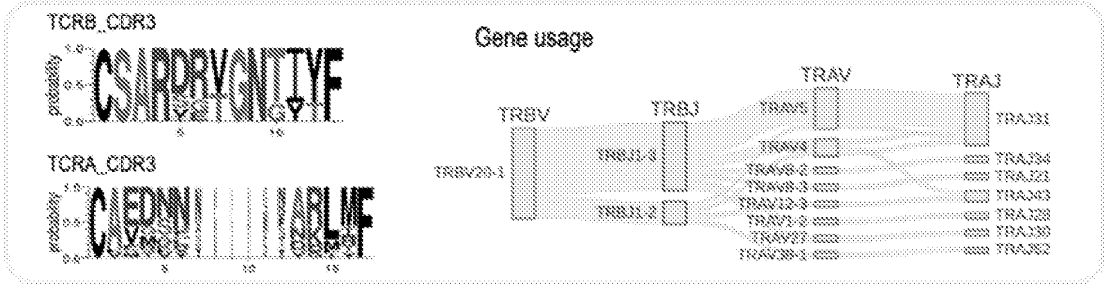
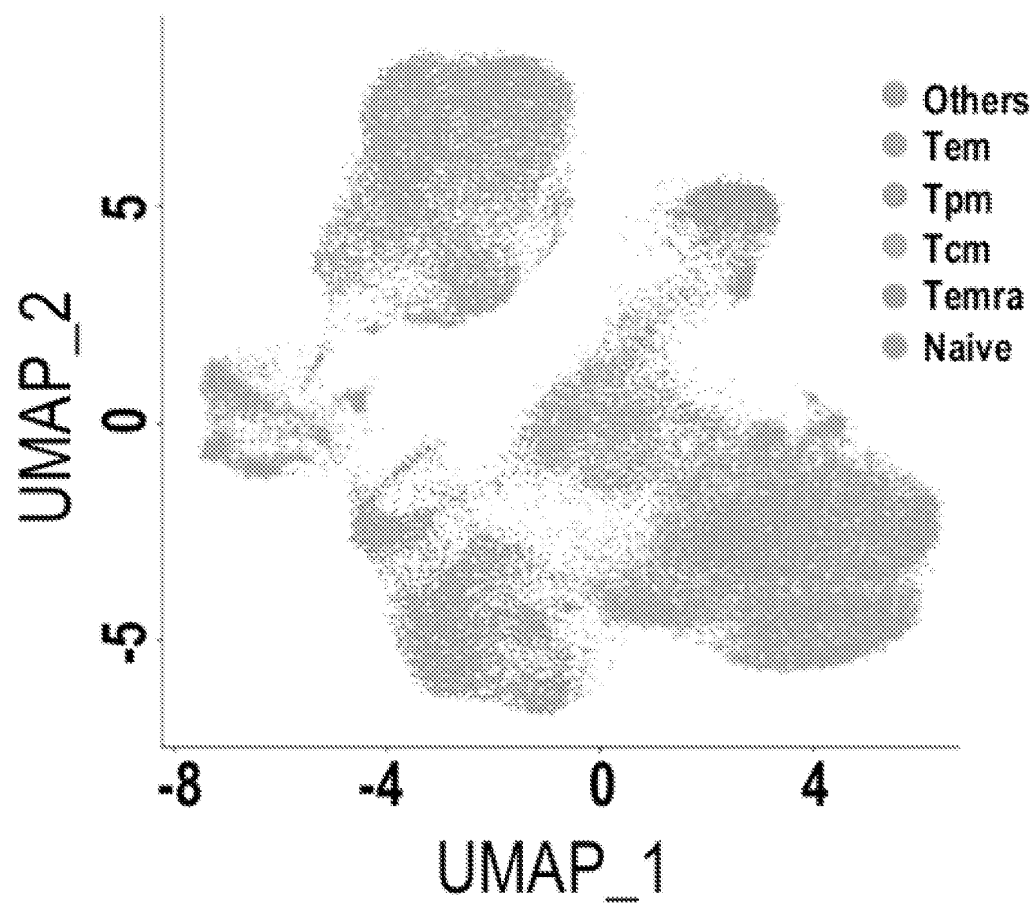


FIG. 38A



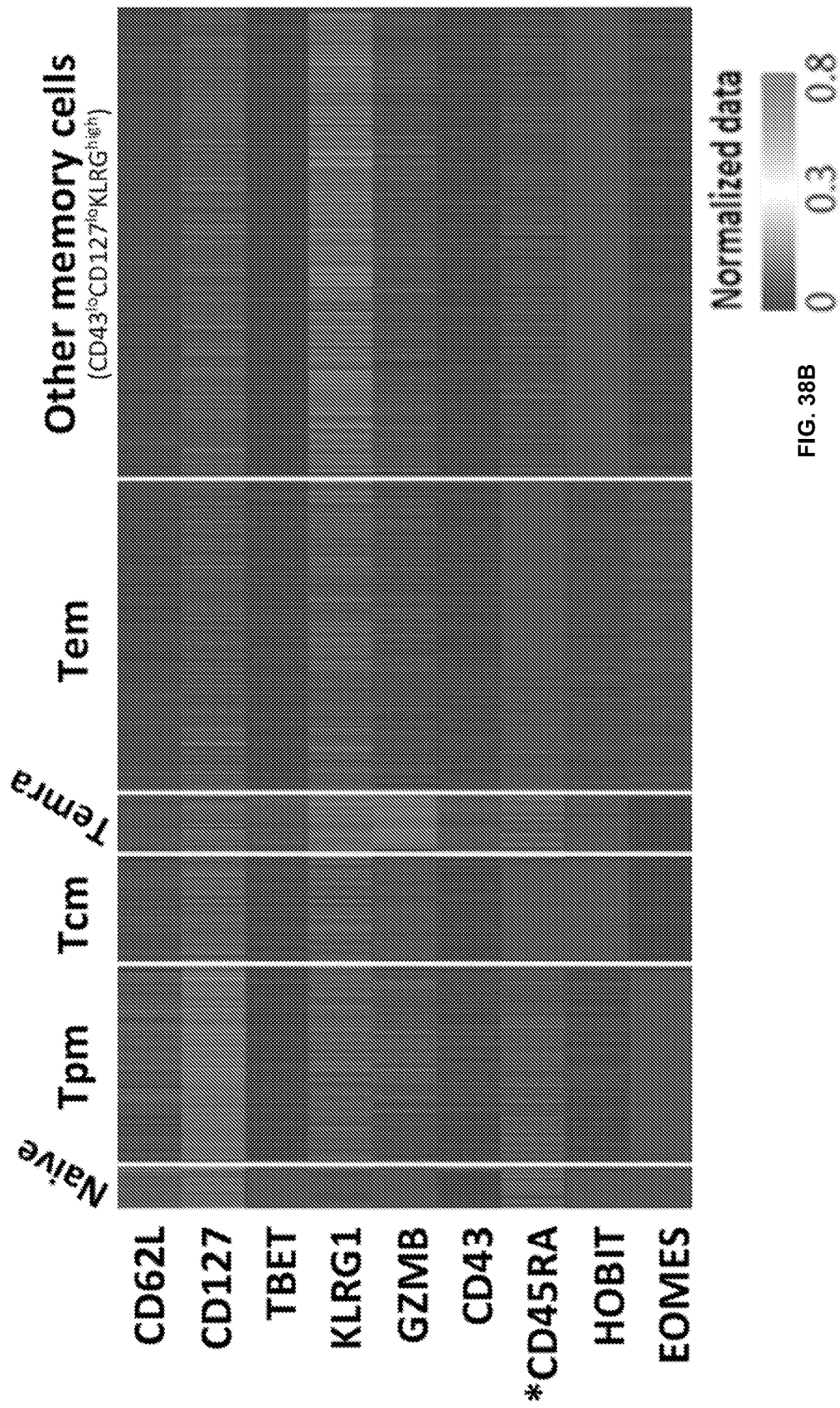
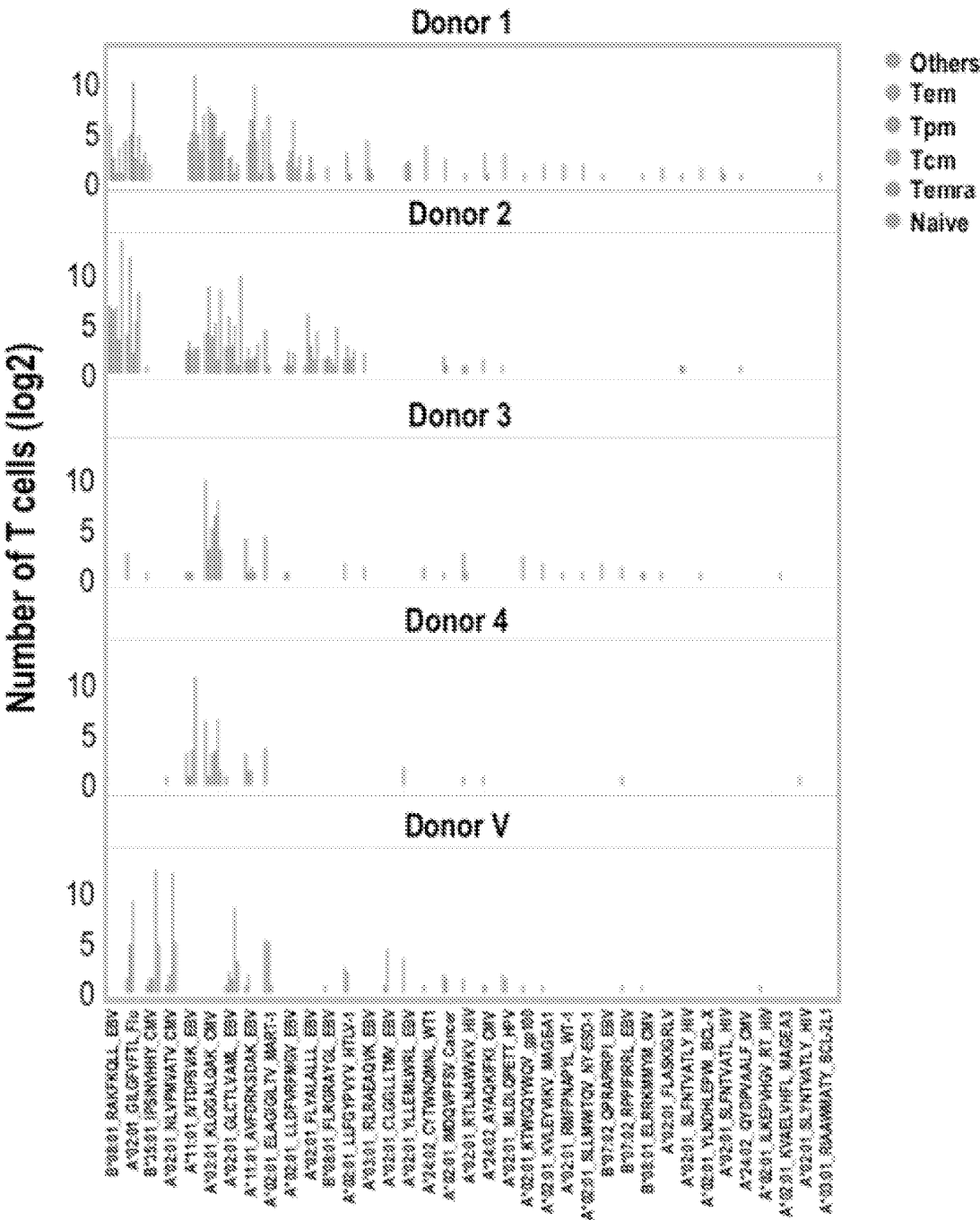


FIG. 38B

FIG. 38C



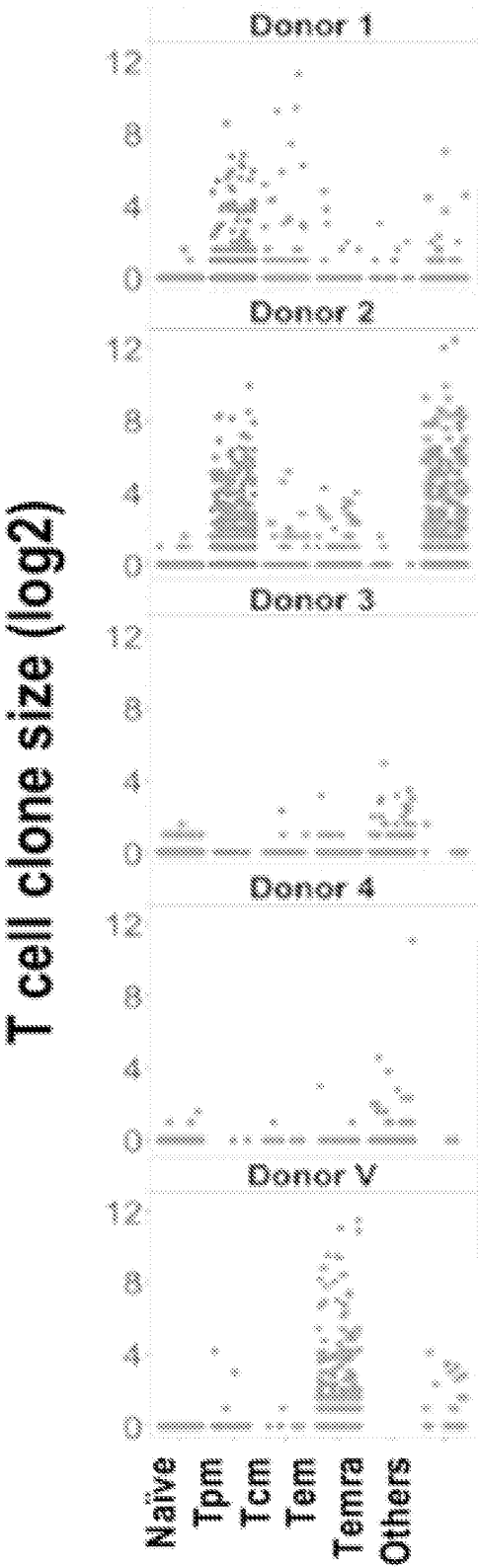


FIG. 38D

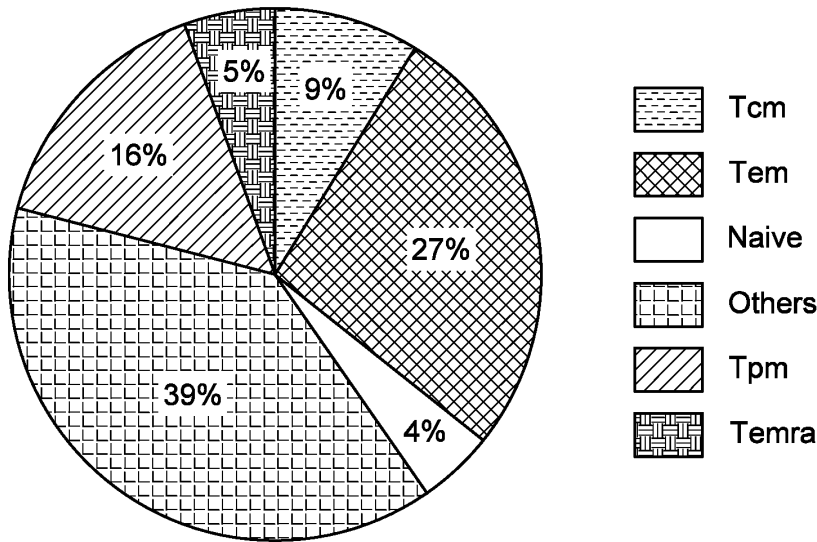


FIG. 38F

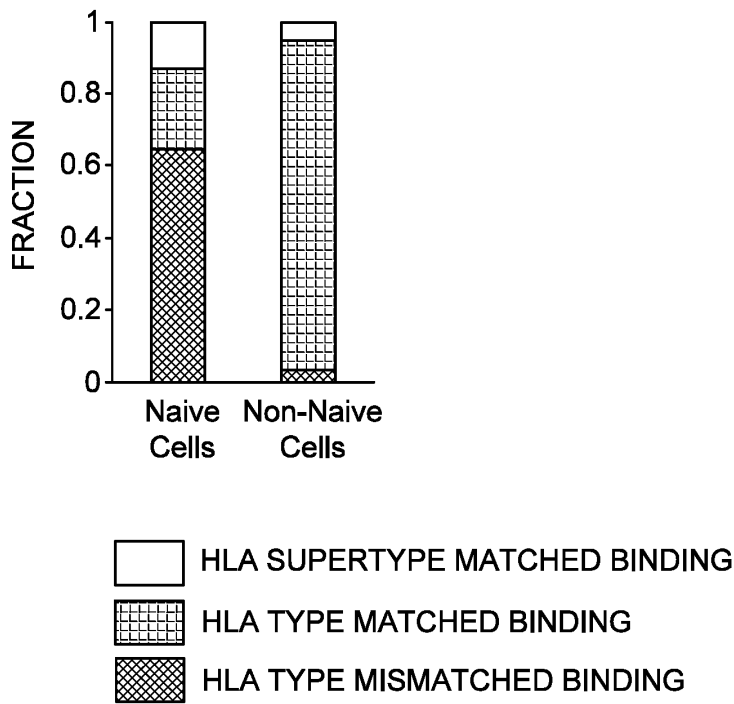


FIG. 38E

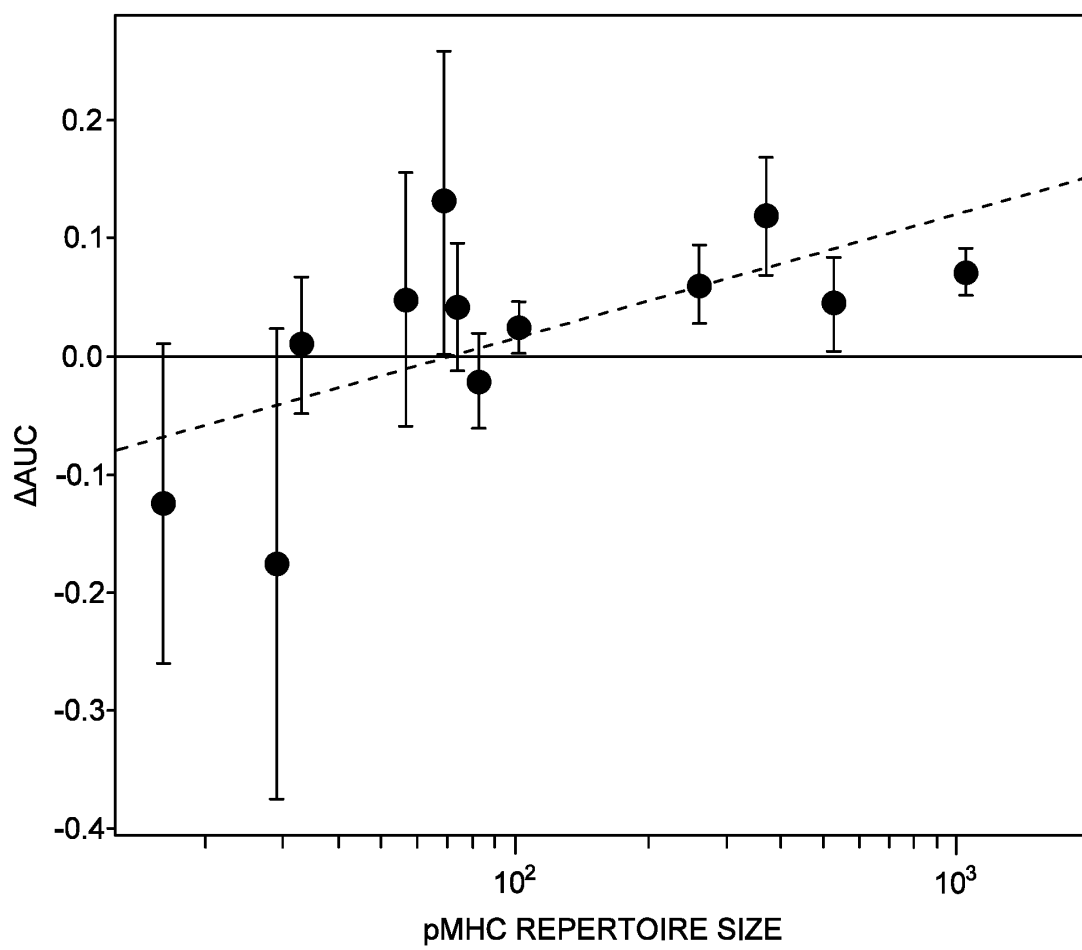


FIG. 39

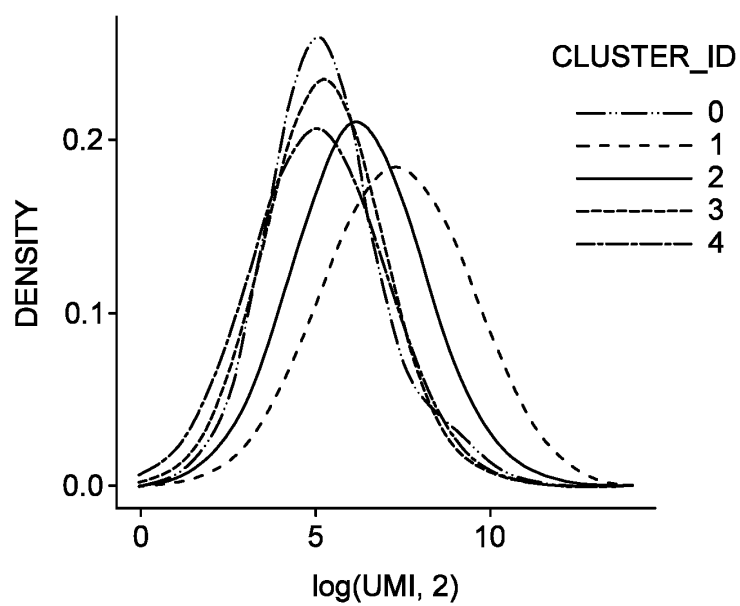
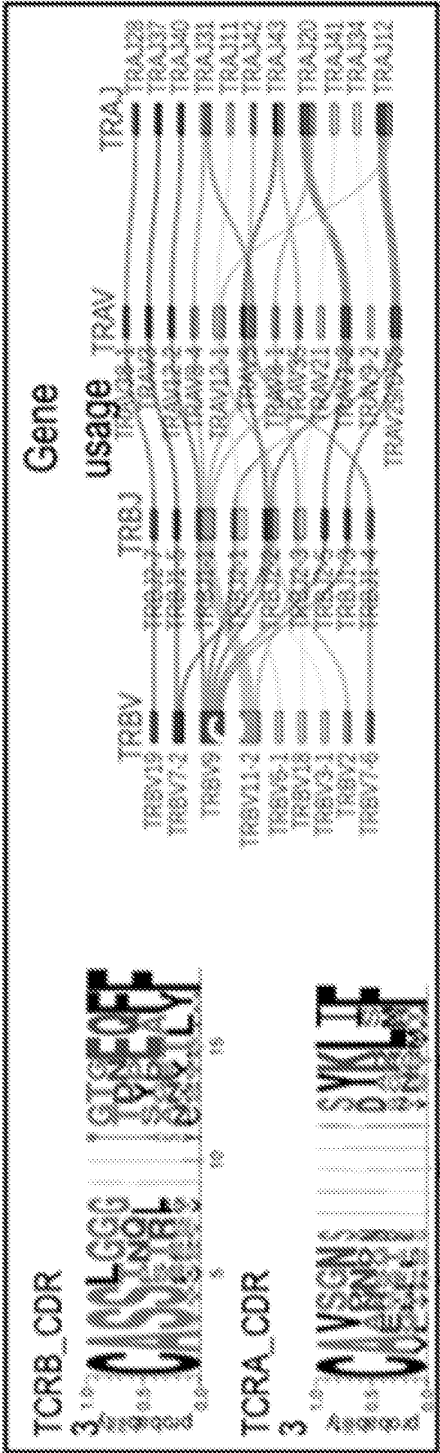
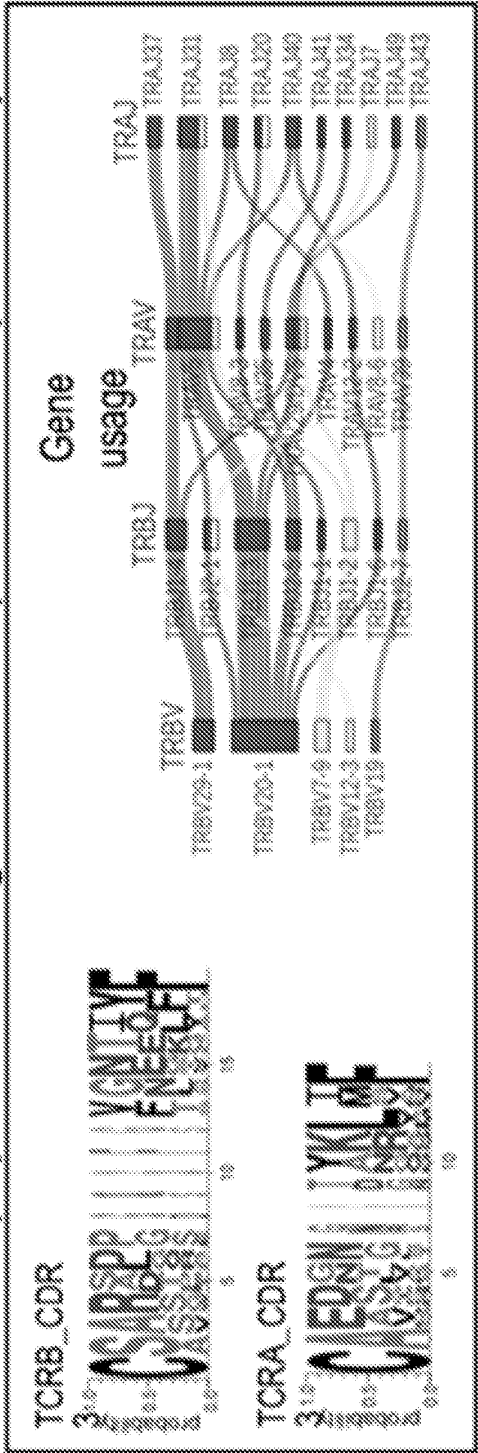


FIG. 40A

EBV peptide binding Cluster 3 (n = 17, unique TCRs)



EBV peptide binding Cluster 4 (n = 17, unique TCRs)



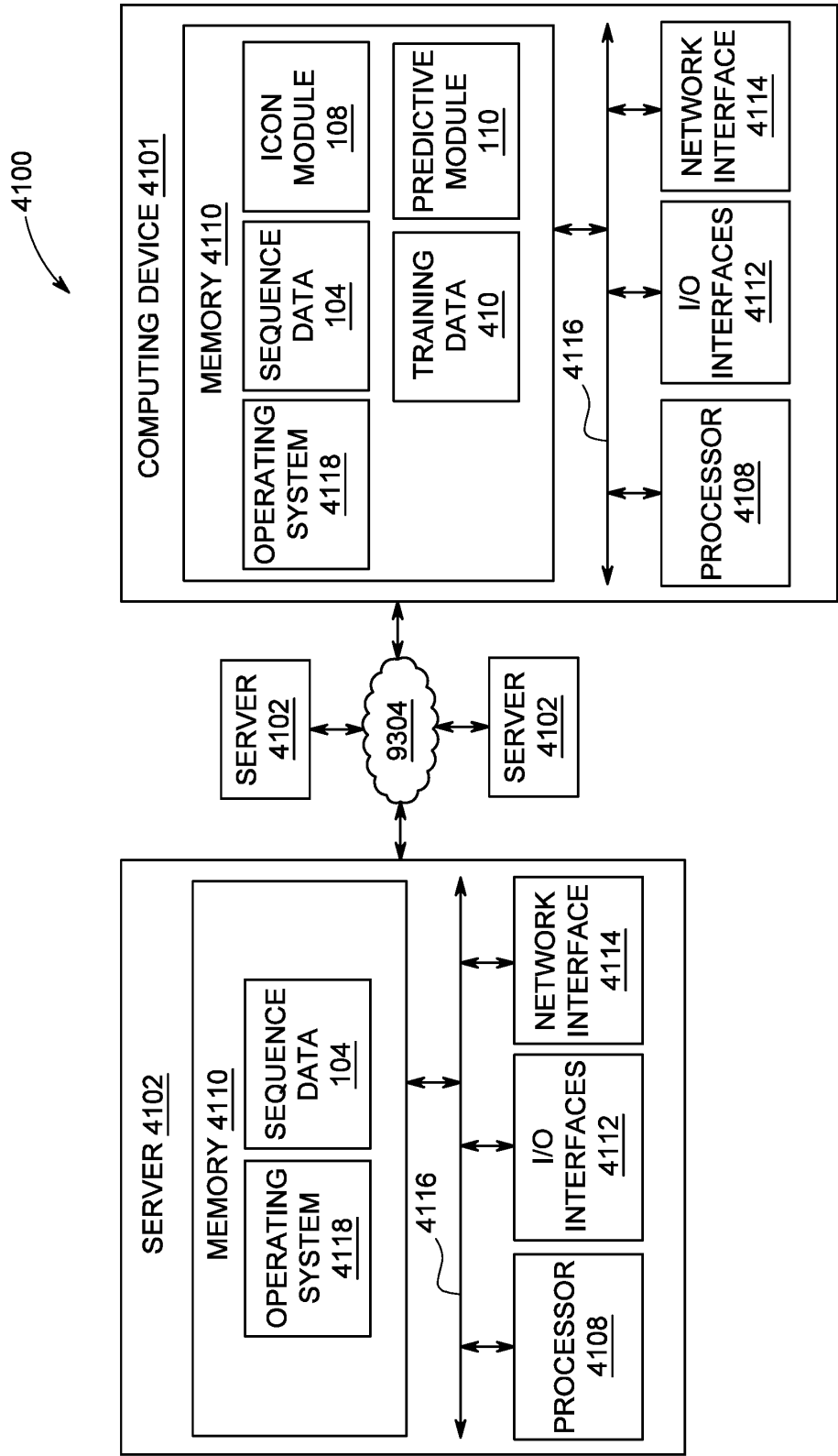


FIG. 41

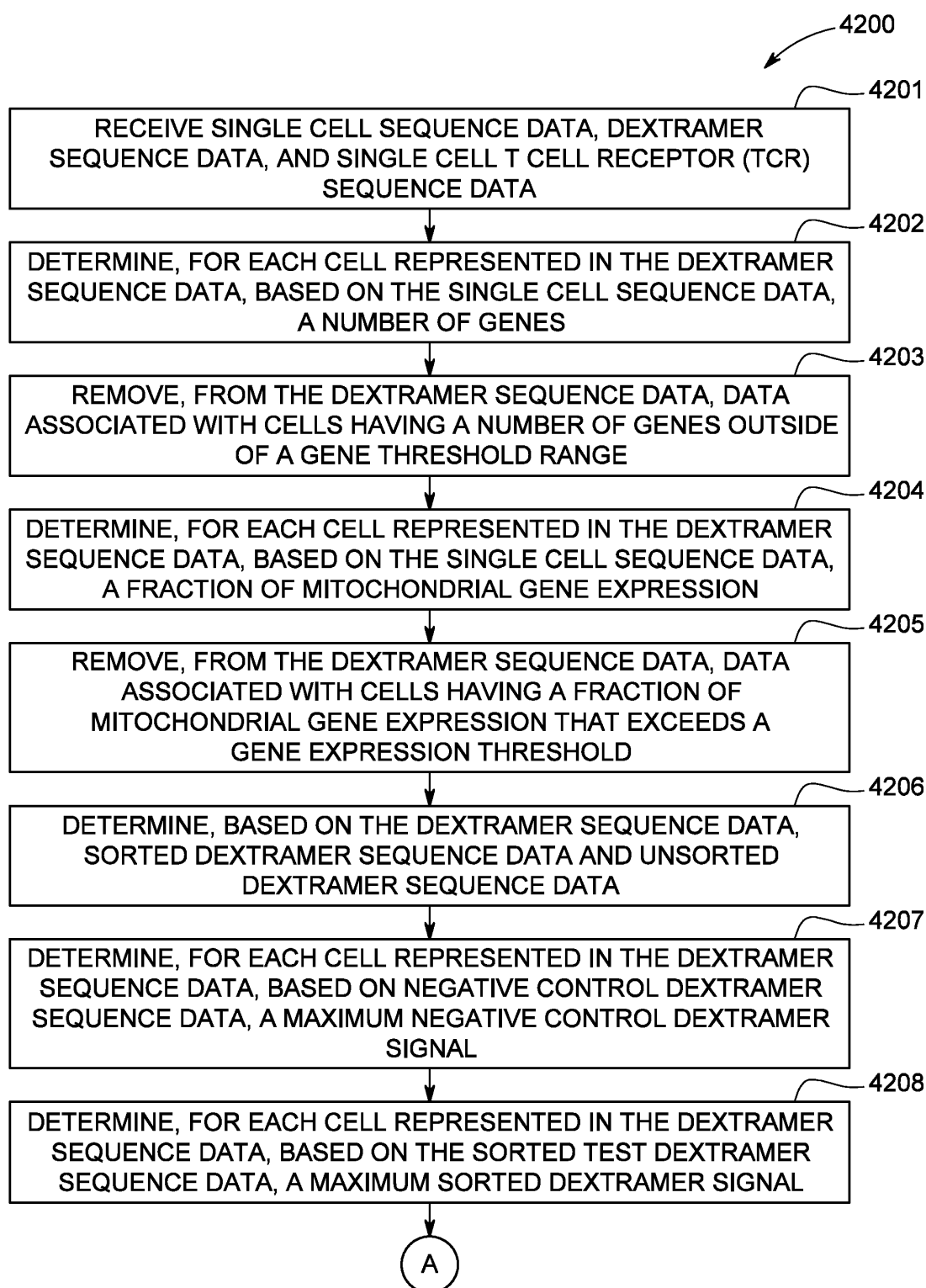


FIG. 42

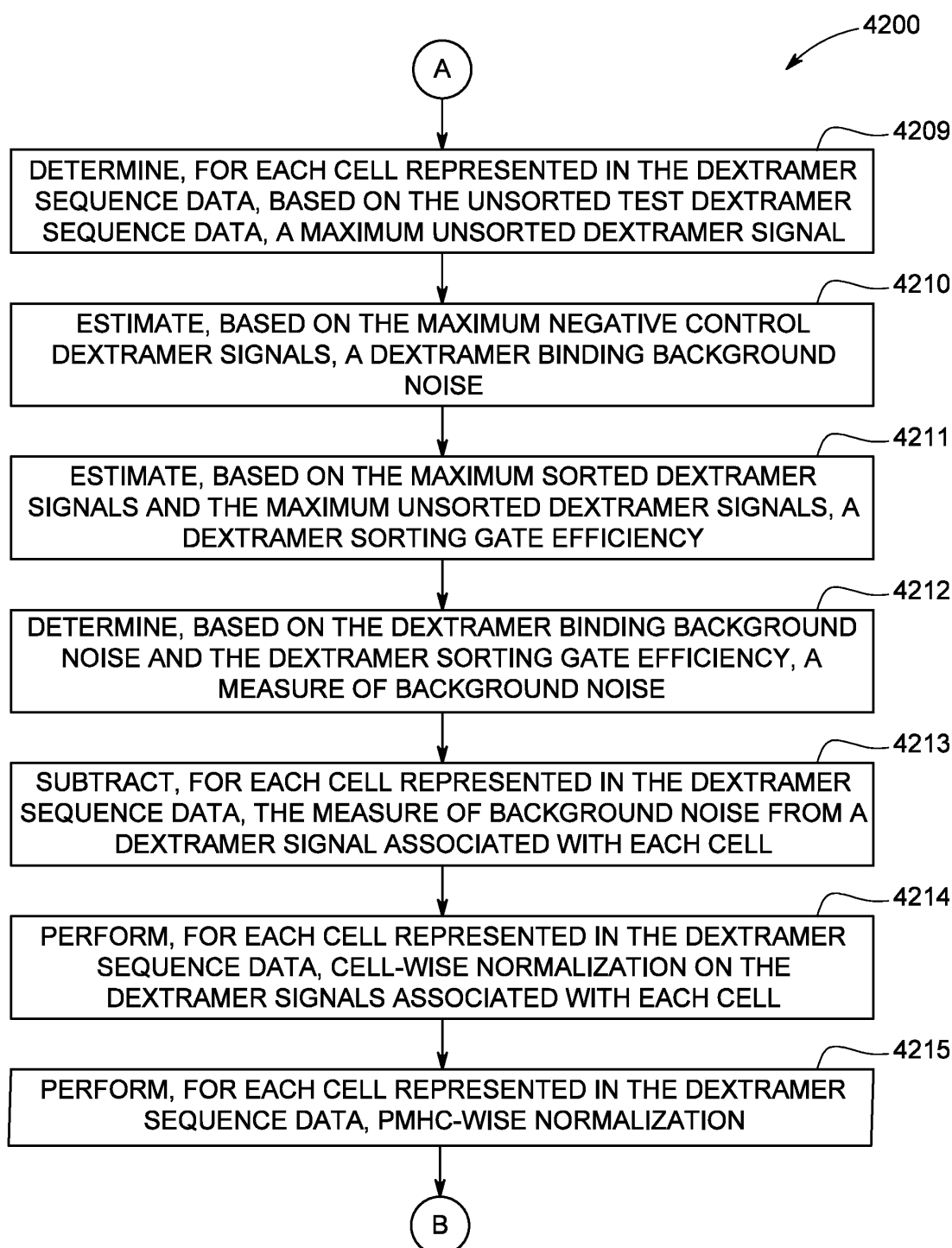


FIG. 42 (CONT'D)

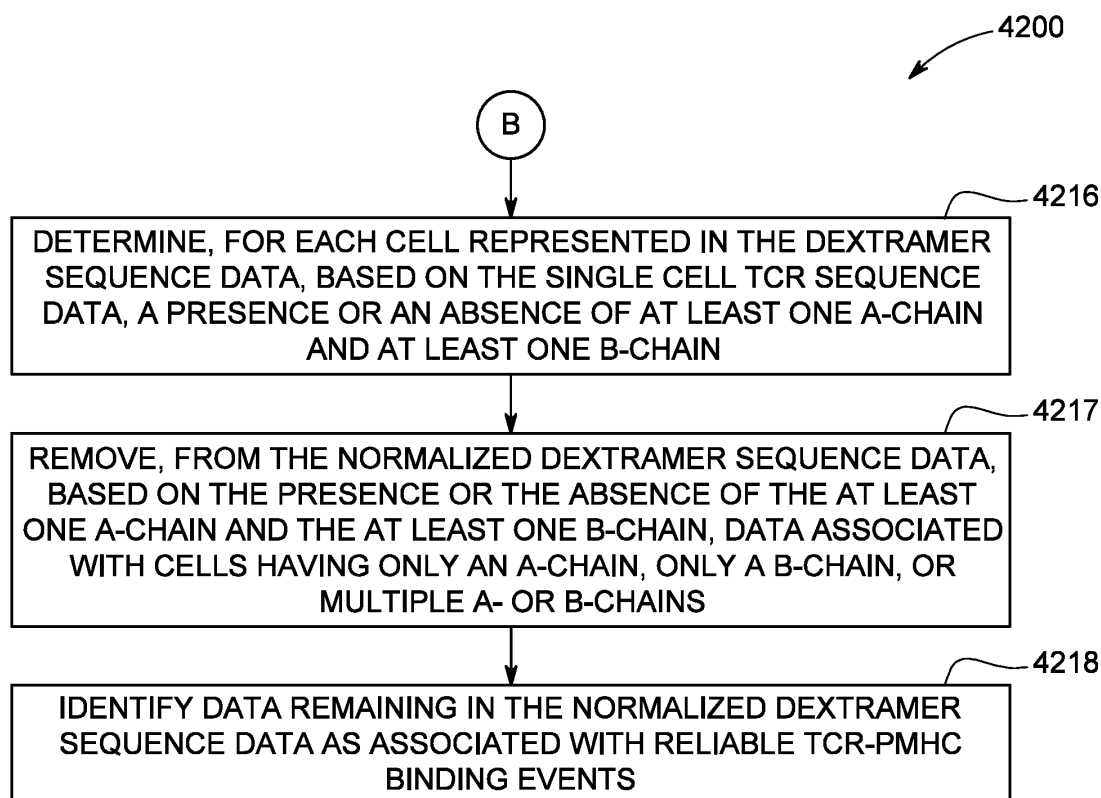


FIG. 42 (CONT'D)

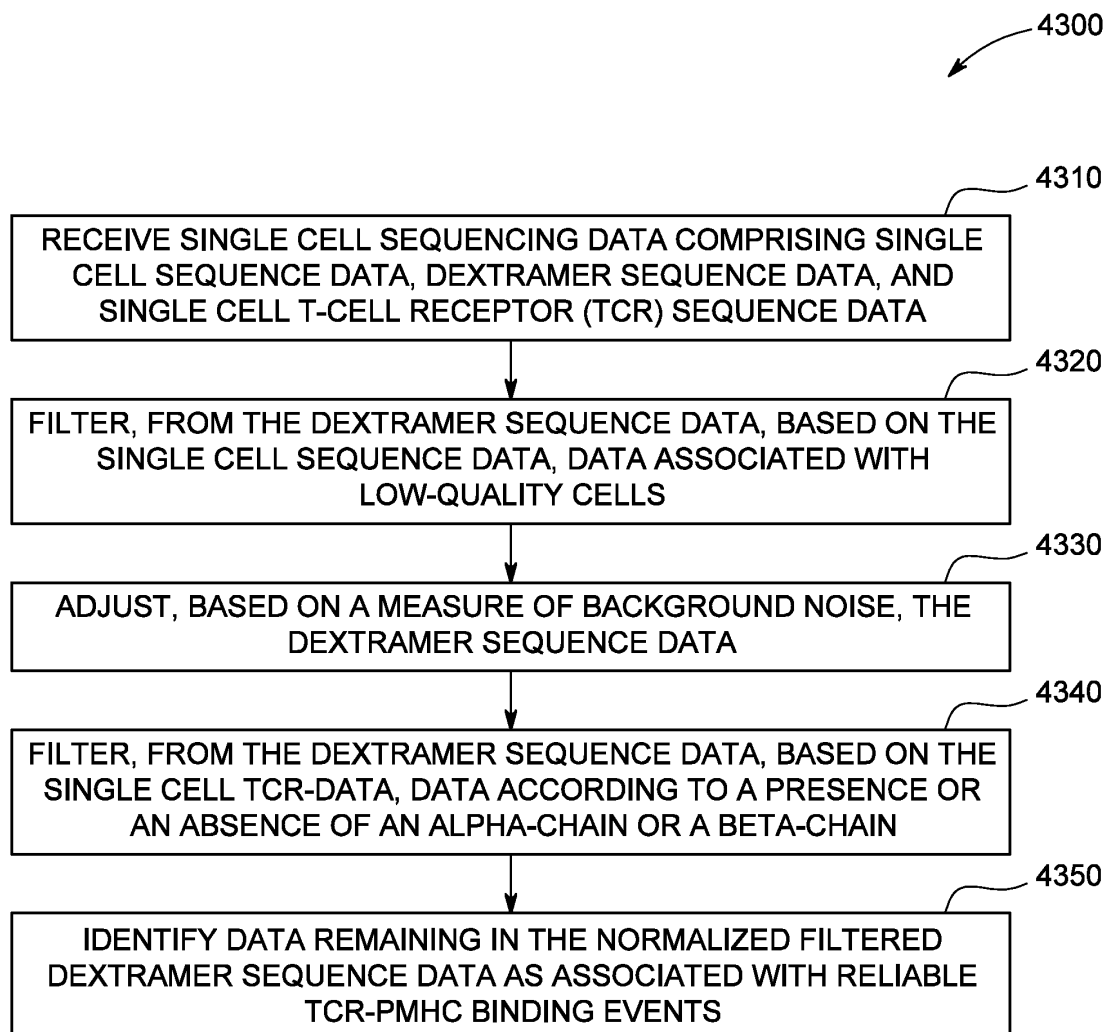


FIG. 43

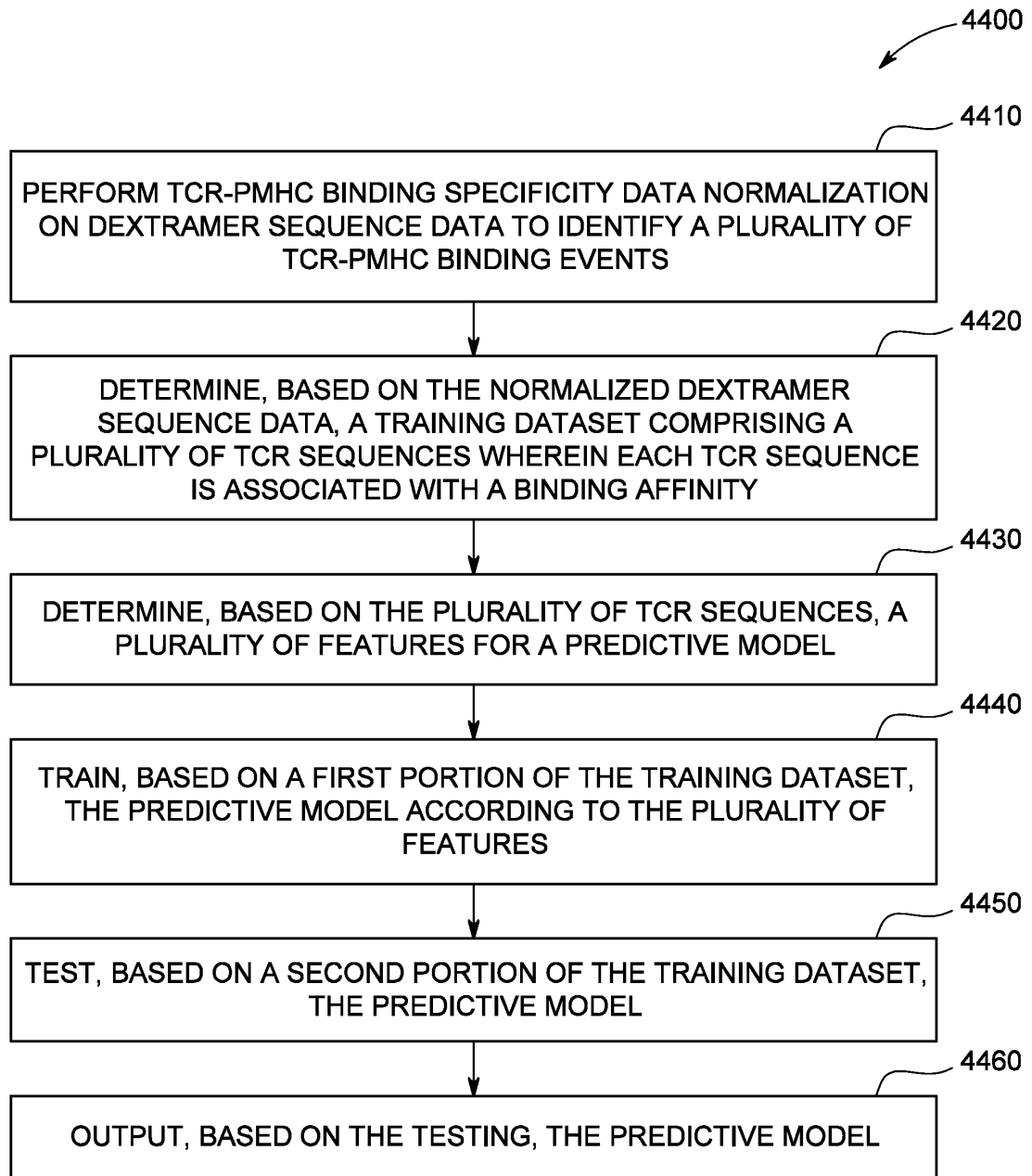


FIG. 44

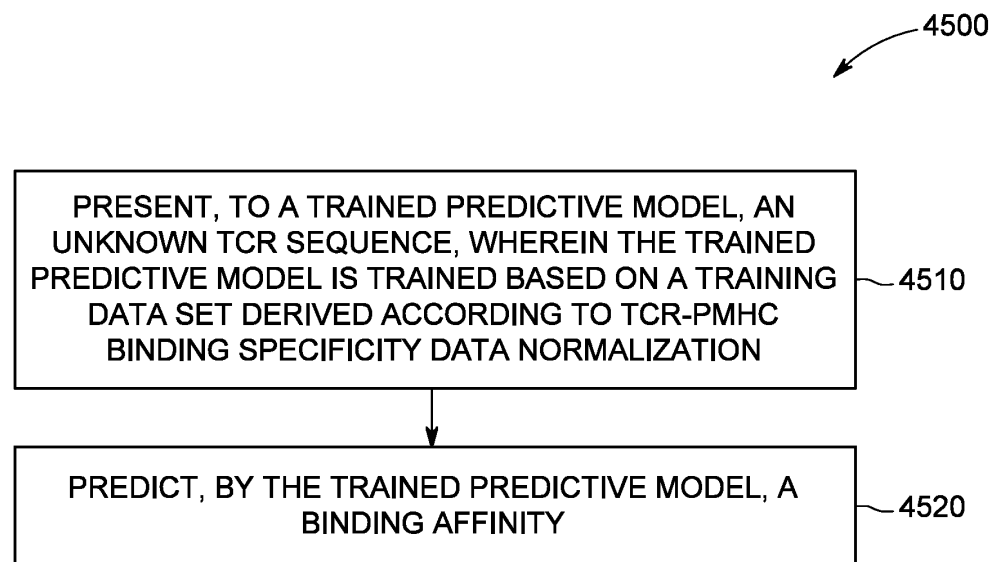


FIG. 45

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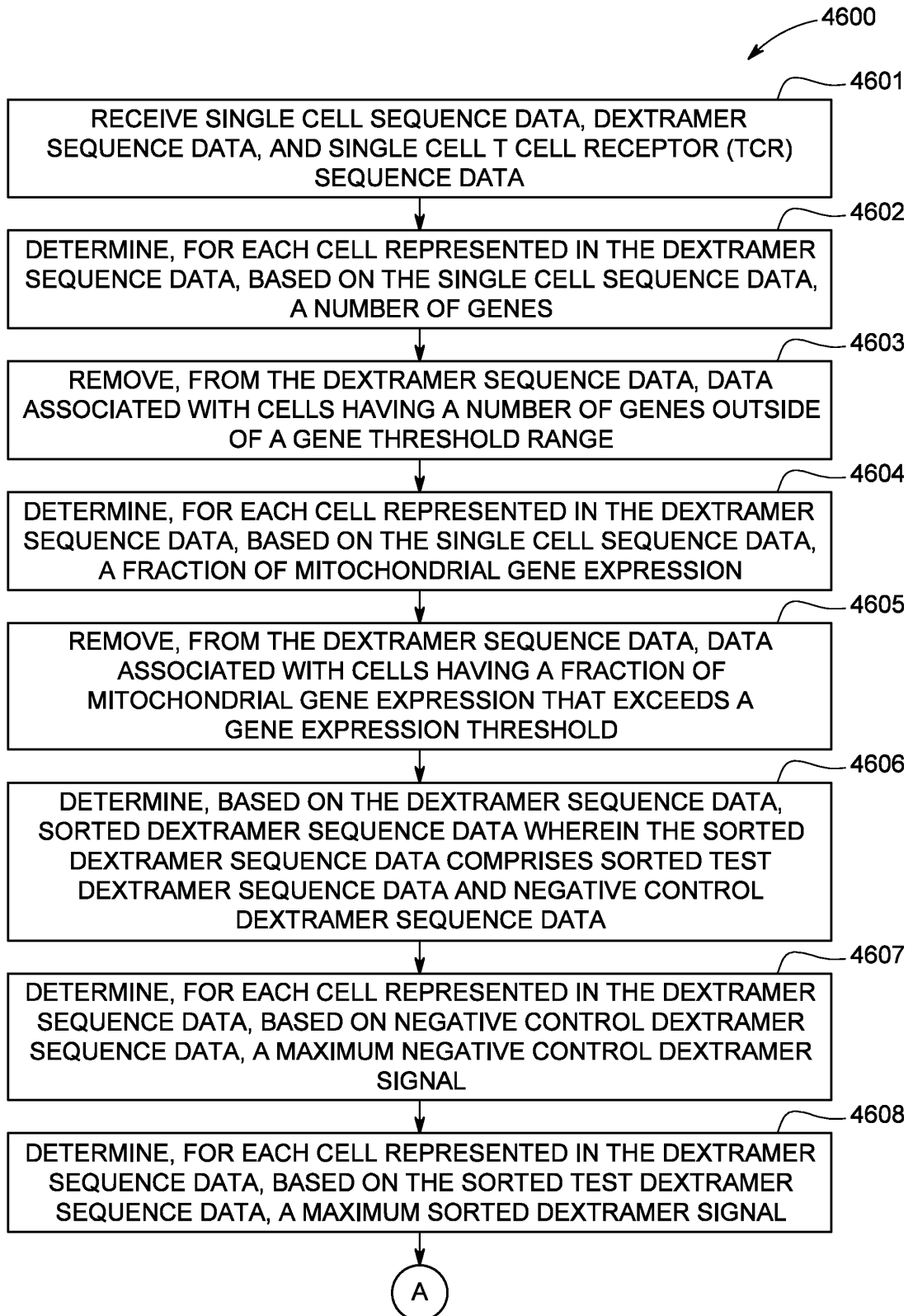
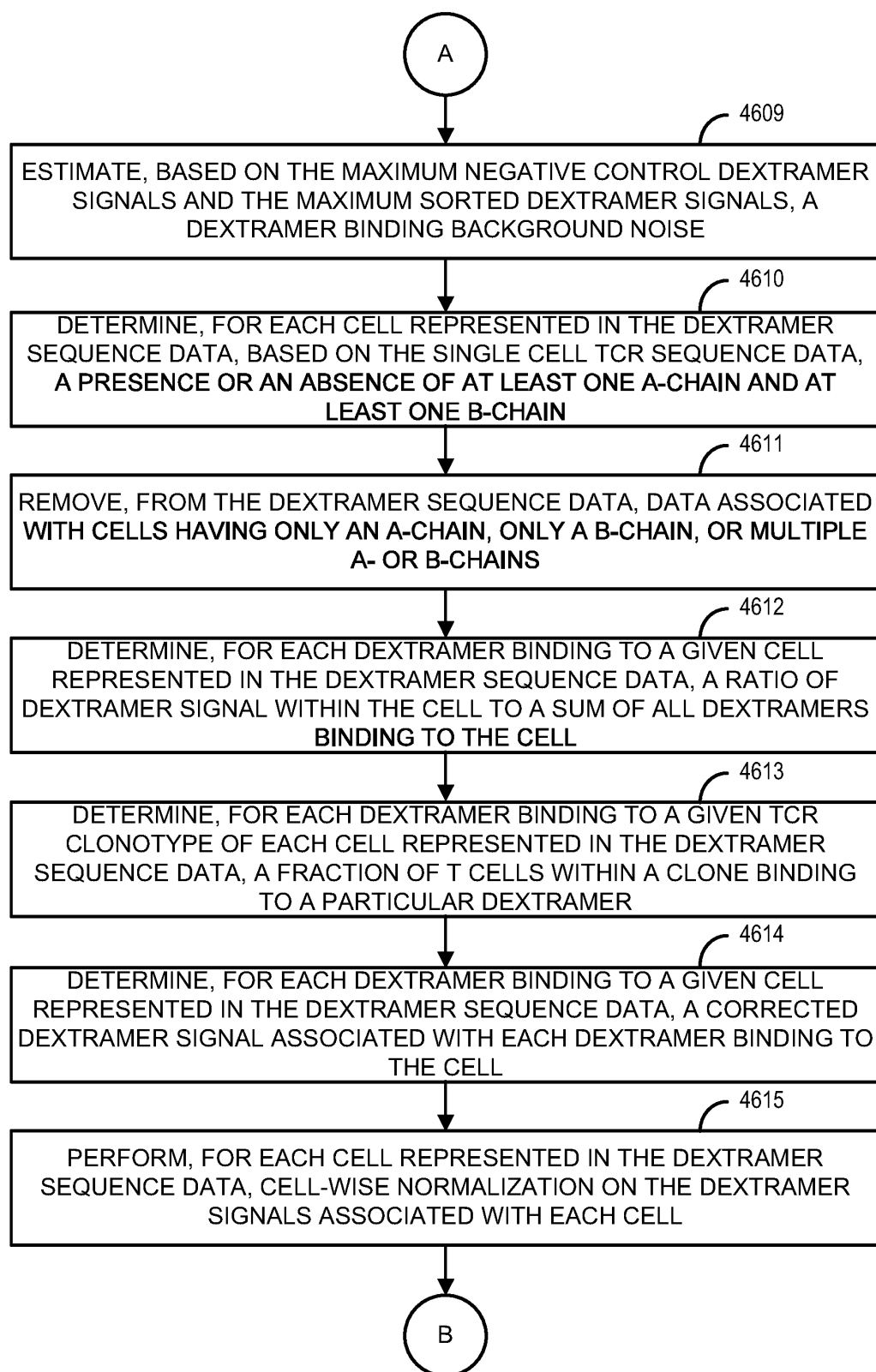


FIG. 46

SUBSTITUTE SHEET (RULE 26)

4600

FIG. 46 (CONT'D)



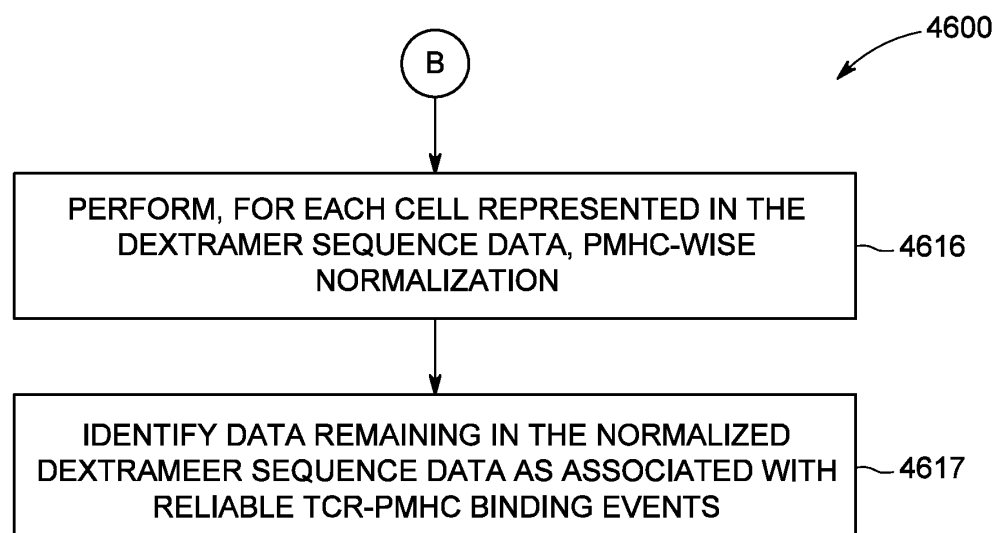


FIG. 46 (CONT'D)