



Validating residues determining epitopes and its possible application in Clinical Histocompatibility Testing



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Table 1: Serologically identical two different proteins

Antigen	SAB1	SAB2	R ²	Residue position
A-0201	A*02:01	A*02:06	0.98	9
A11	A*11:01	A*11:02	0.84	19
A-6801	A*68:01	A*68:02	0.93	11,97,105,114,116
B13	B*13:02	B*13:01	0.93	94,95,97
B44	B*44:02	B*44:03	0.90	156
B-4002	B*40:02	B*40:06	0.97	95,97
B57	B*57:01	B*57:03	0.98	114,116
DR-0101	DRB1*01:01	DRB1*01:02	0.98	85,86
DR3	DRB1*03:01	DRB1*03:02	0.97	25,27,47,86
DR-0401	DRB1*04:01	DRB1*04:04	0.96	71,86
	DRB1*04:01	DRB1*04:05	0.96	57,71
	DRB1*04:04	DRB1*04:05	0.93	57,86
DR-1101	DRB1*11:01	DRB1*11:04	0.98	86
DR-1401	DRB1*14:01	DRB1*14:54	0.98	112
DR-1501	DRB1*15:01	DRB1*15:02	0.97	86
	DRB1*15:01	DRB1*15:03	0.97	30
	DRB1*15:02	DRB1*15:03	0.98	30,86
DR53	DRB4*01:01	DRB4*01:03	0.99	135
DQ2	DQA1*02:01,DQB1*02:01	DQA1*02:01,DQB1*02:02	0.98	135
DQ4	DQA1*02:01,DQB1*04:01	DQA1*02:01,DQB1*04:02	0.96	23
DQ7	DQA1*05:03,DQB1*03:01	DQA1*05:05,DQB1*03:19	0.99	DQB1: 184
DQA-05				DQA1: 160
DQA-01	DQA1*01:01,DQB1*06:02	DQA1*01:02,DQB1*06:02	0.98	DQA1: 34
DQ8/DQ9	DQA1*02:01,DQB1*03:02	DQA1*02:01,DQB1*03:03	0.96	57
	DQA1*03:01,DQB1*03:02	DQA1*03:01,DQB1*03:03	0.96	
	DQA1*03:02,DQB1*03:02	DQA1*03:02,DQB1*03:03	0.97	
DPA-01	DPA1*01:03,DPB1*03:01	DPA1*01:05,DPB1*03:01	0.96	83
	DPA1*01:03,DPB1*28:01	DPA1*01:05,DPB1*28:01	0.95	83
	DPA1*01:04,DPB1*18:01	DPA1*01:05,DPB1*18:01	0.94	28
DPA-02	DPA1*02:01,DPB1*13:01	DPA1*02:02,DPB1*13:01	0.95	11
	DPA1*02:01,DPB1*05:01	DPA1*02:02,DPB1*05:01#	0.91	11
DP-03	DPA1*02:01,DPB1*03:01	DPA1*02:01,DPB1*14:01#	0.95	9
DP-03	DPA1*01:05,DPB1*03:01	DPA1*03:01,DPB1*20:01	0.96	DPB1:76
DPA-01				DPA1: 11,66,83
DP-06	DPA1*02:01,DPB1*06:01	DPA1*02:01,DPB1*09:01	0.96	9,65,76
	DPA1*02:01,DPB1*09:01	DPA1*02:01,DPB1*17:01	0.95	76
	DPA1*02:01,DPB1*06:01	DPA1*02:01,DPB1*17:01	0.95	9,65
DP-0401	DPA1*01:03,DPB1*04:01	DPA1*01:03,DPB1*23:01	0.93	36

Table 3: Confirmed distinctive serological reactivity with supplemental SABs

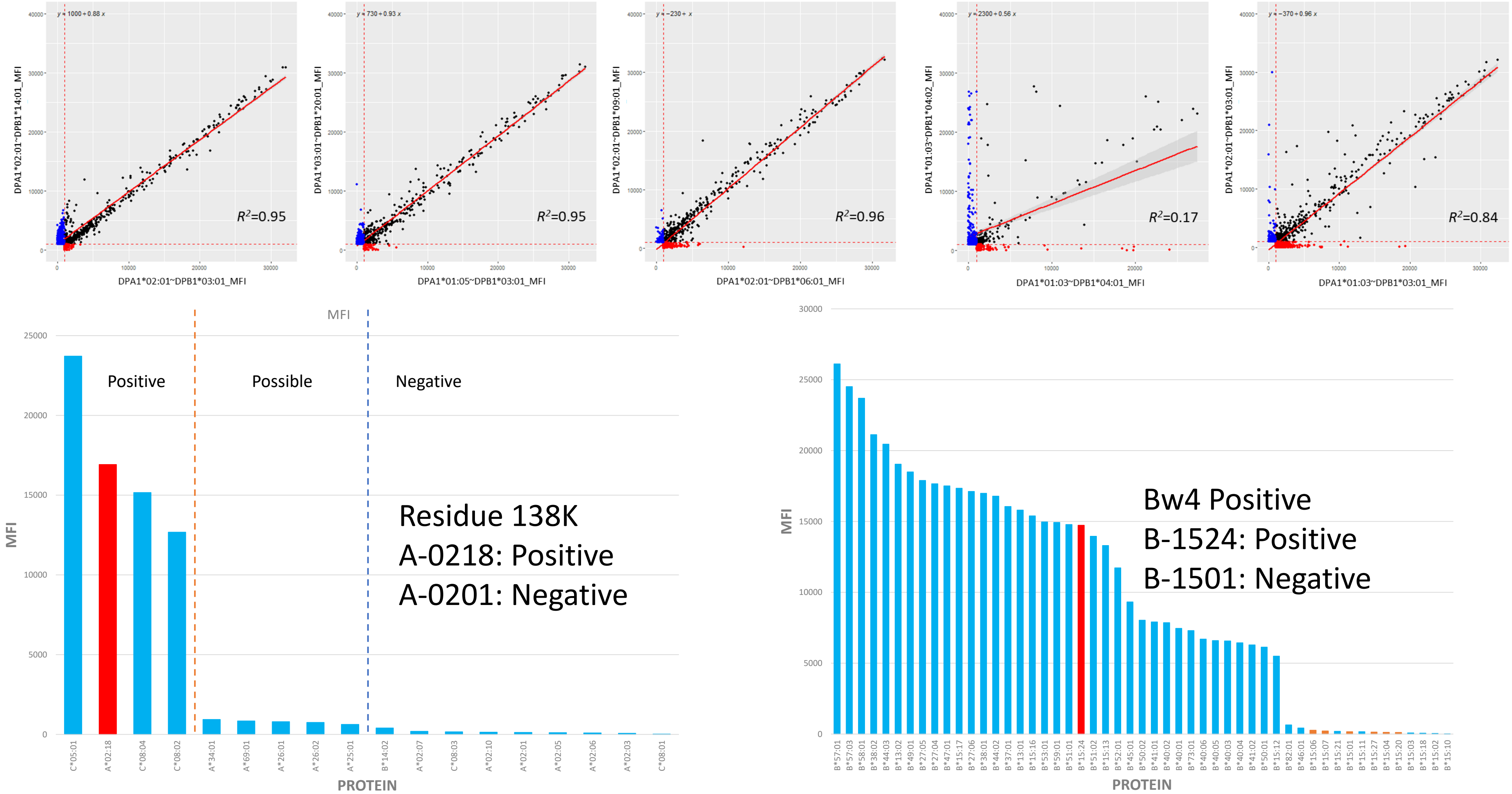
Antigen	Associated antigen	SAB1	SAB2	Residue position
A2	A-0201, A-0202	A*02:01	A*02:05	9,43
A2	A-0201, A-0218	A*02:01	A*02:18	138
B62	B-1501, B-1524	B*15:01	B*15:24	77,80,81,82,83
Cw8	C-0801, C-0802	C*08:01	C*08:02/C*08:04	138,152,156
	C-1601, C-16:02	C*16:01	C*16:02	77,80



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Reference: A new strategy for systematically classifying HLA alleles into serological specificities: update and refinement
Osoegawa, K., Yim, K., Jeracki, M., Nguyen, T.-N., Wang, L., Cho, A., David, R., Son, J., Mankey, A., Marsh, S.G.E, Gendzekhadze, K., Murphey, C., Fernández Viña, M.A. HLA. In Press

Table 2: Confirmed distinctive serological reactivity between closely related proposed antigens.

Antigen	Split/Associated antigen	SAB1	SAB2	R ²	Residue position
A1, A36		A*01:01	A*36:01	0.70	163,166,167
A9	A-2301, A-2402	A*23:01	A*24:02	0.77	144,151,156
A24	A-2402, A2403	A*24:02	A*24:03	0.89	166,167
A26, A43	A-2601, A43	A*26:01	A*43:01	0.61	62,63
A10	A-3401, A-6601	A*34:01	A*66:01	0.64	66,163
DR1	DR-0101, DR103	DRB1*01:01	DRB1*01:03	0.55	67,70,71
		DRB1*01:02	DRB1*01:03	0.59	67,70,71,85,86
DQ3	DQ7, DQ8	DQA1*02:01	DQA1*02:01	0.66	13,26,45,57,167185
		DQB1*03:01	DQB1*03:02		
		DQA1*03:01	DQA1*03:01	0.66	
		DQB1*03:01	DQB1*03:02		
A29	A-2901, A-2902	A*29:01	A*29:02	0.94	102
A30	A-3001, A-3002	A*30:01	A*30:02	0.80	70,76,77
A33	A-3301, A-3303	A*33:01	A*33:03	0.83	171
A34	A-3401, A-3402	A*34:01	A*34:02	0.67	66,97,105,114,156
A66	A-6601, A-6602	A*66:01	A*66:02	0.44	90,163
B75	B-1502, B-1511	B*15:02	B*15:11	0.79	67,94,95,113,156
DR4	DR-0401, DR-0402	DRB1*04:01	DRB1*04:02	0.76	67,70,71
	DR-0401, DR-0403	DRB1*04:01	DRB1*04:03	0.91	71,74
	DR-0402, DR-0403	DRB1*04:02	DRB1*04:03	0.76	67,70,71,74
DR12	DR-1201, DR-1202	DRB1*12:01	DRB1*12:02	0.91	67
DR13	DR-1301, DR-1303	DRB1*13:01	DRB1*13:03	0.88	31,37,47,57,71,86
DR14	DR-1401, DR-1402	DRB1*14:01	DRB1*14:02	0.64	28,37,57,60,70,74,86
DR16	DR-1601, DR-1602	DRB1*16:01	DRB1*16:02	0.96	67
DR52	DR-5201, DR-5202	DRB3*01:01	DRB3*02:02	0.45	11,26,28,30,37,38,51,57,60
	DR-5201, DR-5203	DRB3*01:01	DRB3*03:01	0.83	11,26,28,38,74
	DR-5202, DR-5203	DRB3*02:02	DRB3*03:01	0.50	30,37,38,51,57,60
DR51	DR-5101, DR-5102	DRB5*01:01	DRB5*02:02	0.72	6,30,37,38,67,70,71,85,86
	DQA-02, DQA-03	DQA1*02:01 DQB1*03:03	DQA1*03:02 DQB1*03:03	0.75	25,26,47,52,54,56,161,187
	DQA-02, DQA-04	DQA1*02:01 DQB1*04:02	DQA1*04:01 DQB1*04:02	0.48	25,34,40,47,50,51,52,53,54,69,215
	DQA-02, DQA-05	DQA1*02:01 DQB1*02:01	DQA1*05:01 DQB1*02:01	0.36	25,34,40,47,50,51,52,53,,54,75,107,156,161,163,175,215
	DQA-02, DQA-06	DQA1*02:01 DQB1*03:01	DQA1*06:01 DQB1*03:01	0.57	34,40,47,50, 51,52,53,54,69,215
	DQA-03, DQA-04	DQA1*03:03 DQB1*04:01	DQA1*04:01 DQB1*04:02	0.42	26,34,40,47,50,51,53,56,69,76,160,187,215
	DQA-03, DQA-05	DQA1*03:01 DQB1*03:01	DQA1*05:03 DQB1*03:01	0.46	26,34,40,47,50,51,53,56,75,76,107,156,160,161,163,175,187,215
	DQA-03, DQA-06	DQA1*03:01 DQB1*03:01	DQA1*06:01 DQB1*03:01	0.45	25,26,34,40,47,50,51,53,56,69,76,187,215
	DQA-04, DQA-05	DQA1*04:01 DQB1*02:01	DQA1*05:01 DQB1*02:01	0.69	69,75,107,156,161,163,175
	DQA-05, DQA-06	DQA1*05:05 DQB1*03:19	DQA1*06:01 DQB1*03:01	0.95	25,69,75,107,156,161,163,175
	DP-0401,DP-0402	DPA1*01:03 DPB1*04:01	DPA1*01:03 DPB1*04:02	0.17	36,55,56,178
	DPA-01,DPA-02	DPA1*01:03 DPB1*03:01	DPA1*02:01 DPB1*03:01	0.84	31,50,83,111,127,160,228

AA Pos.	10	20	30	40	50	60	70	80	90	100
DPB1*01:01	RATPENYYVQ	GRQEYAFNG	TQRFLEERYIY	NREEYARFDS	DVGEFRAVTE	LGRPAAEYWN	SQKDILEEKR	AVPDRVCRHN	YELDEAVTLQ	RRVQPKVNVS
DPB1*03:01	-----L-----	-----L-----	-----FV-----	-----DED-----	-----L-----	-----M-----	-----GGPM-----	-----R-----	-----R-----	-----R-----
DPB1*04:01	-----LF-----	-----LF-----	-----F-----	-----FV-----	-----DE-----	-----M-----	-----GGPM-----	-----R-----	-----R-----	-----R-----
DPB1*04:02	-----LF-----	-----LF-----	-----FV-----	-----DED-----	-----L-----	-----M-----	-----M-----	-----M-----	-----M-----	-----M-----
DPB1*20:01	-----L-----	-----L-----	-----FV-----	-----DED-----	-----L-----	-----M-----	-----M-----	-----M-----	-----M-----	-----M-----
AA Pos.	110	120	130	140	150	160	170	180	190	200
A*01:01	CDVGPDGRLFL	RGYRQDAYDYG	KDYIALNEDL	RSWTAADMAA	QITKRKWEAV	HAAEQRRVYL	EGRCVDGLRR	YLENGKETLQ	RTDPKPTHMT	HHPISDHEAT
A*02:01	---S-W---	---H-Y---	---K---	---T-H---	---A-V---	---L-A---	---T-EW---	---A-----	---A-----	---AV-----
A*02:18	---S-W---	---H-Y---	---K---	---K---	---T-H---	---A-V---	---L-A---	---T-EW---	---A-----	---AV-----
C*01:02	CDLGPDGRLLL	RGYDQYAYDG	KDYIALNEDL	RSWTAADTAA	QITQRKWEAA	REAEQRRAYL	EGTCVWLRR	YLENGKETLQ	RAEHPKTHVT	HHPSVDHEAT
C*05:01	-----N-F-----	-----N-F-----	-----K-----	-----K-----	-----T-----	-----L-----	-----K-----	-----K-----	-----K-----	-----K-----
C*08:01	-----N-F-----	-----N-F-----	-----K-----	-----K-----	-----T-----	-----L-----	-----K-----	-----K-----	-----K-----	-----K-----
C*08:02	-----N-F-----	-----N-F-----	-----K-----	-----K-----	-----T-----	-----L-----	-----K-----	-----K-----	-----K-----	-----K-----
C*08:03	-----N-F-----	-----N-F-----	-----K-----	-----K-----	-----T-----	-----L-----	-----K-----	-----K-----	-----K-----	-----K-----
C*08:04	-----N-F-----	-----N-F-----	-----K-----	-----K-----	-----T-----	-----L-----	-----K-----	-----K-----	-----K-----	-----K-----

The results strongly supported the correlations between residues defining epitope (DEP) and serological specificity.