

Antikor Tayininde Mikroboncuk Temelli Testler

GÜLHANE EĞİTİM ARAŞTIRMA HASTANESİ
DOKU TİPLEME LABORATUVARI

Dr. SAİT YEŞİLLİK
GÜLHANE EAH DTL SORUMLUSU

Tarihçe

- **İlk başarılı deneysel böbrek nakli:**

- 1902 yılında Viyana'da yapıldı
- Macar asıllı Emerich Ullmann (1861-1937)
- Bir köpekten alınan böbrek başka bir köpeğe takıldı
- Graft 5. güne kadar fonksiyoneldi

- **İnsana yapılan ilk deneysel böbrek nakli:**

- 1905 de Bordeaux (Fransa)da yapıldı,
- M Princeteau tarafından Bir tavşandan alınan böbrek bir çocuğa takıldı
- Graft 1 saat kadar fonksiyoneldi
- Çocuk 2 hafta sonra öldü.

Tarihçe

- 1906 İlk başarılı organ nakli- kornea
- 1933 İnsandan insana böbrek böbrek nakli Y. Yuriyevich Voronoy, **başarısız**
- 1954 Tek yumurta ikizleri arasında ilk böbrek nakli(J. Murray)
- 1967 İlk karaciğer nakli (T. Starzl)
İlk kalp nakli (C.Bernard)
- 1968 Kemik iliği nakli (D. Thomas)
- 1975 İlk böbrek nakli Prof. Dr. M. Haberal
- 1978 karaciğer nakli Prof. Dr. M.Haberal
- 1978 ilk allojenik kemik iliği nakli
- 1984 ilk otolog kemik iliği nakli *
- 1992 ilk periferik kök hücre nakli
- 1995 allojenik kordon kanı nakli

ORGAN NAKLİ ÖNCESİ VE SONRASI YAPILAN TESTLER

Rejeksiyon riskinin değerlendirilmesi:

ABO antijenlerinin uyumu

HLA uyumu

Duyarlılığın tespiti
(PRA, CM testleri)

Nakil öncesi

İmmünolojik izlem:

Duyarlılığın tespiti
Bx., PRA, DSA, XM testleri, hücresel immünite

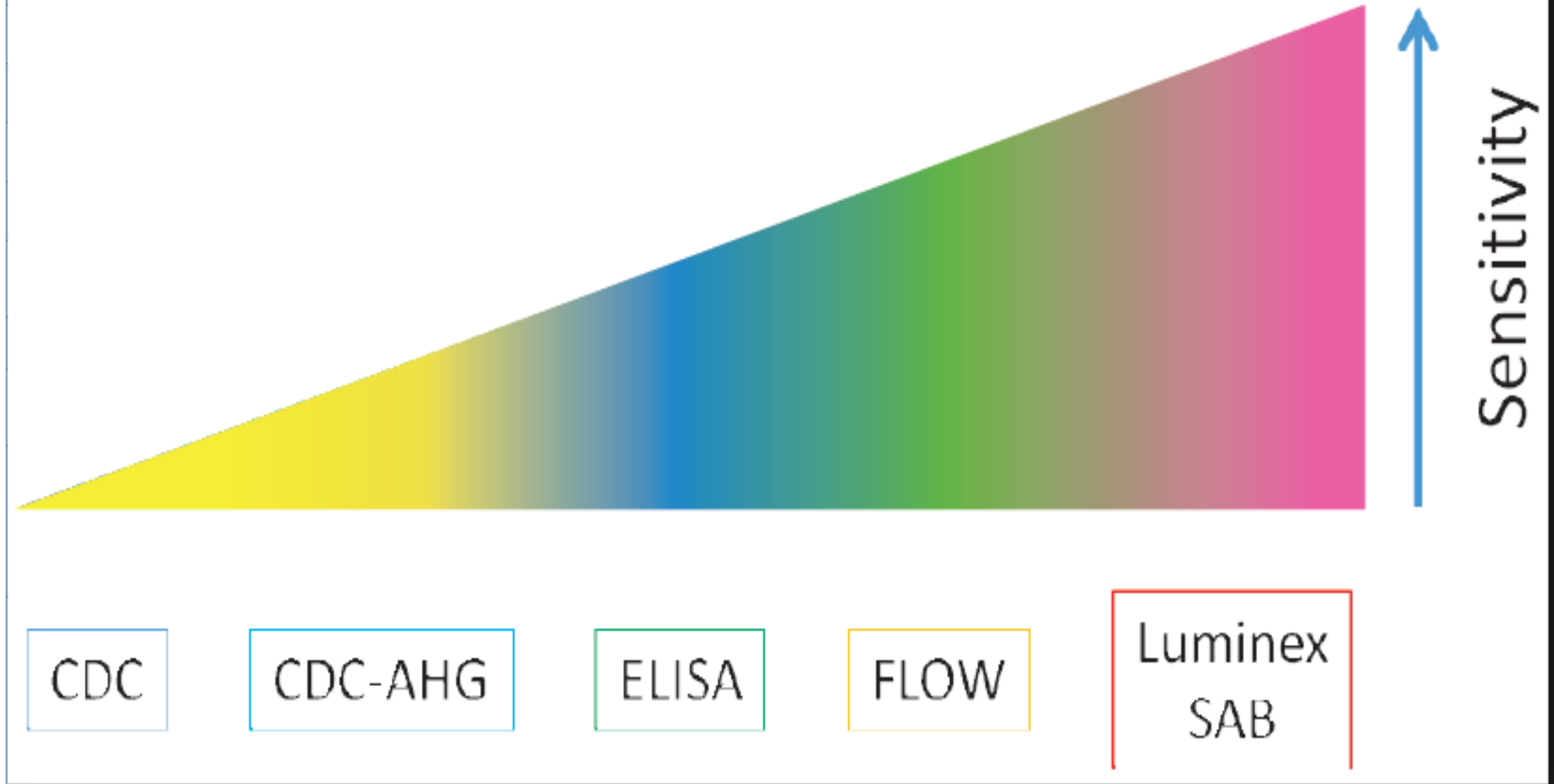
Nakil sonrası

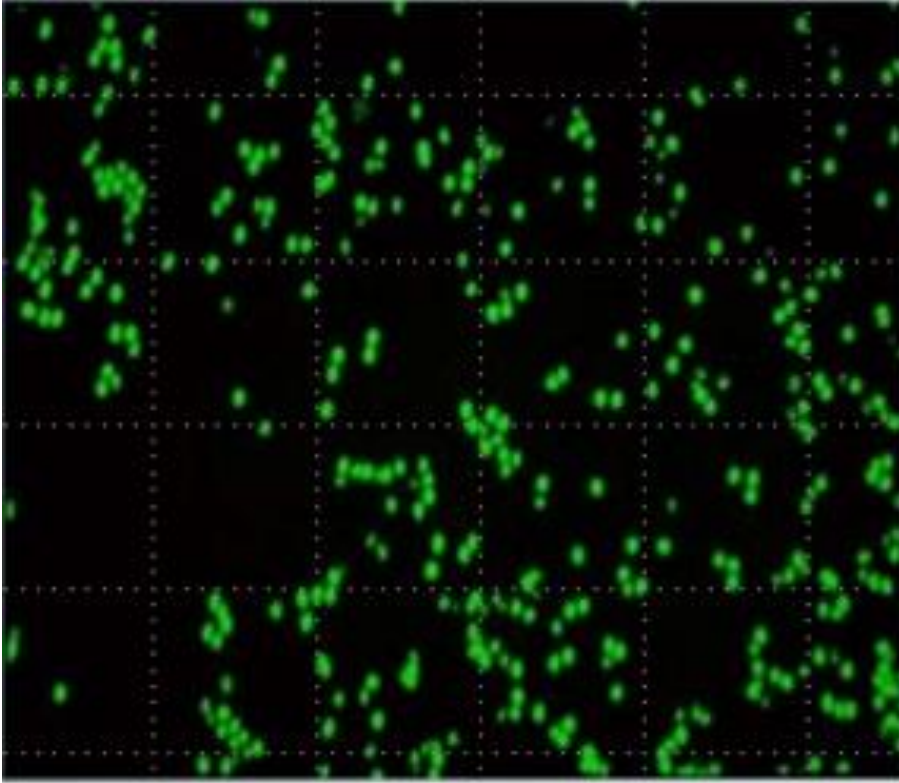
İmmün-düzenleyici tedavi:

Nakil öncesi duyarlı hastalarda Desensitizasyon Prot. uygulama

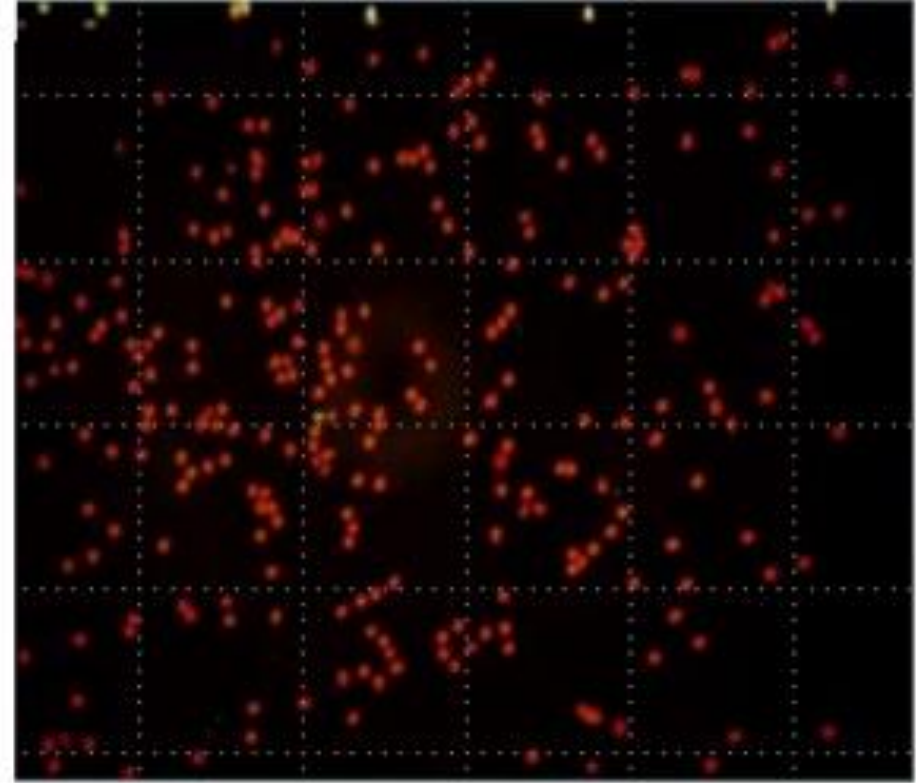
Nakil sonrası duyarlı olmayan hastalarda konvansiyonel immünsupresyon uygulama

Sensitivity of Antibody Detection Methods





Canlı Hücreler



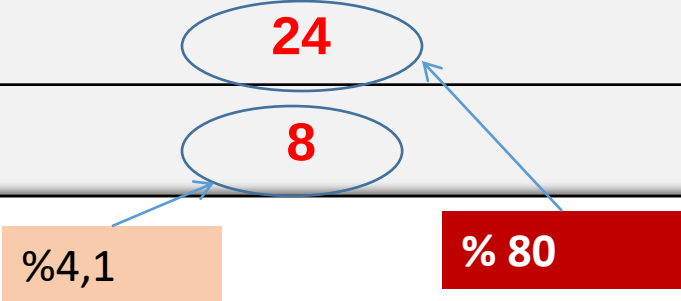
Ölü Hücreler

Sitotoksikite Lenfosit Cross Match testi terasaki plağı canlı ve ölü hücreler

CDC CROSSMATCH / BÖBREK NAKLİ

Patel R., Terasaki P.I. : N.Engl. J. Med. 1969; 280: 735

	Rejeksiyon ($\geq 48h$)	Rejeksiyon yok
Positive crossmatch	24	6
Negative crossmatch	8	187



%4,1

% 80

- ✓ **Pozitif crossmatch:** Akut greft kaybı için yüksek risk (80%)
- ✓ **Crossmatch pozitif ise transplantasyon önerilmez.**
- ✓ Bazı antikorlar (anti-HLA dışındakiler) direkt donör lenfositlerine karşı olmakla birlikte klinik olarak ilişkisiz.

Bize nasıl bir test lazım?



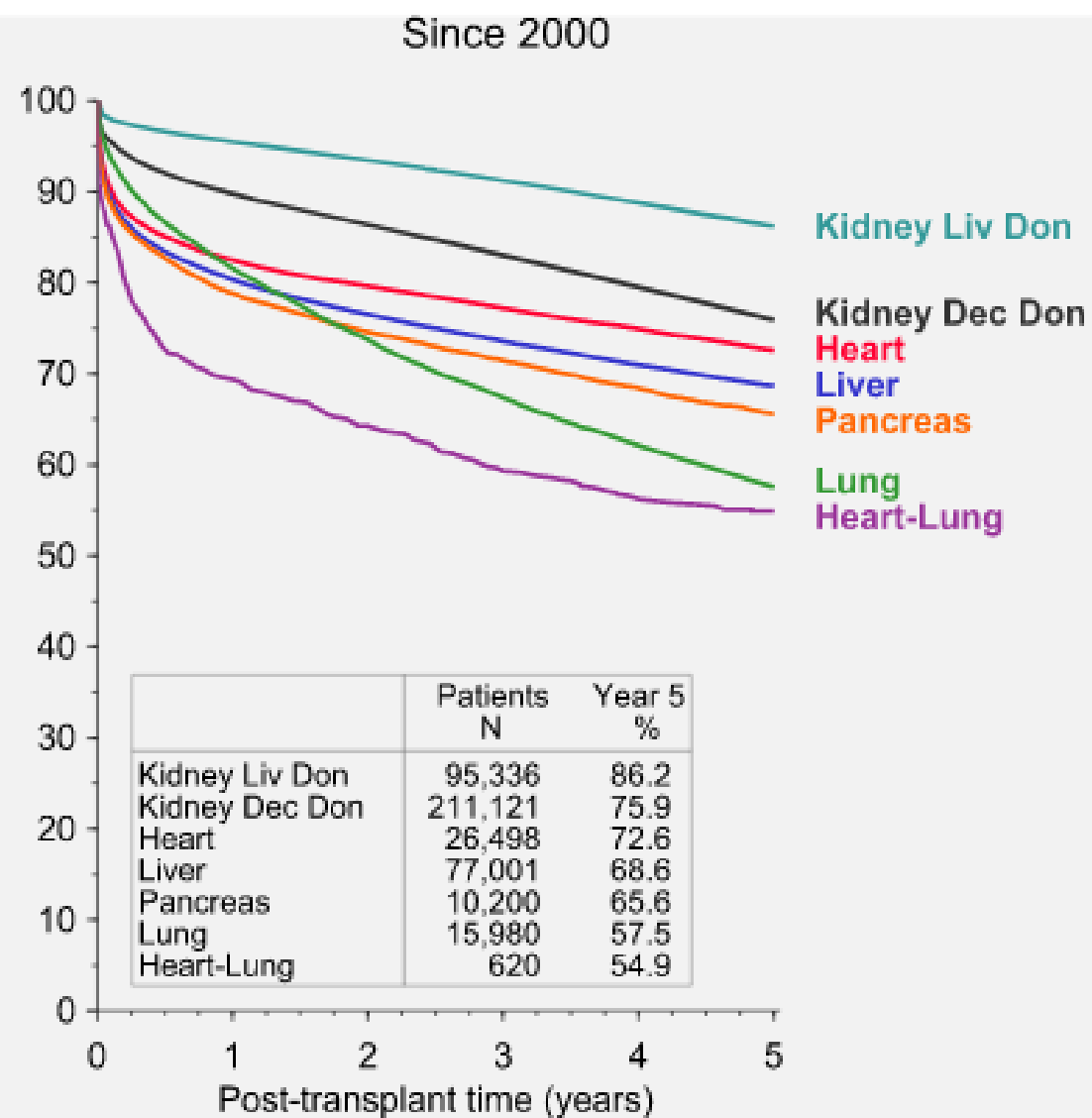
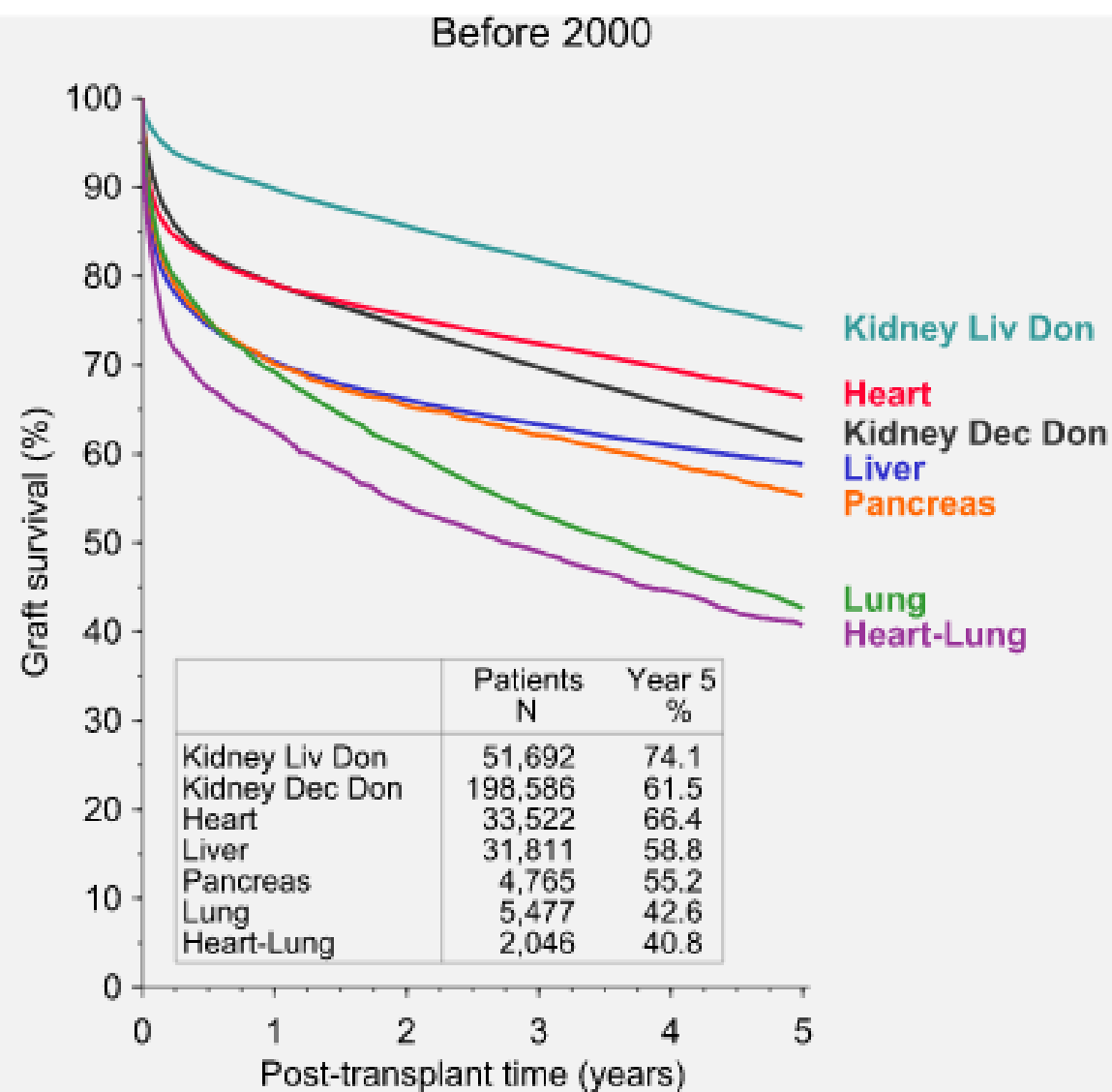
1992
Barcelona

Şimdi İstatistik zamanı

	Hastalık var	Hastalık yok	Toplam
Test pozitif	<u>A</u> <u>GP</u>	C YP	A+C
Test negatif	B YN	<u>D</u> <u>GN</u>	B+D
	A+B	C+D	A+B+CD

Sensitivite : $A/A+B$ Hastalar içindeki gerçek hastaları ayırır

Spesifite: $D/C+D$ Gerçek sağlamlar içindeki sağlamları ayırır



TEST DUYARLILIKLARI ANTİKOR TAYİNİNİ NASIL ETKİLİYOR?

Role and Value of Luminex®-Detected HLA Antibodies before and after Kidney Transplantation

Caner Süsal^a Gerhard Opelz^a Christian Morath^b

^a Department of Transplant Immunology,

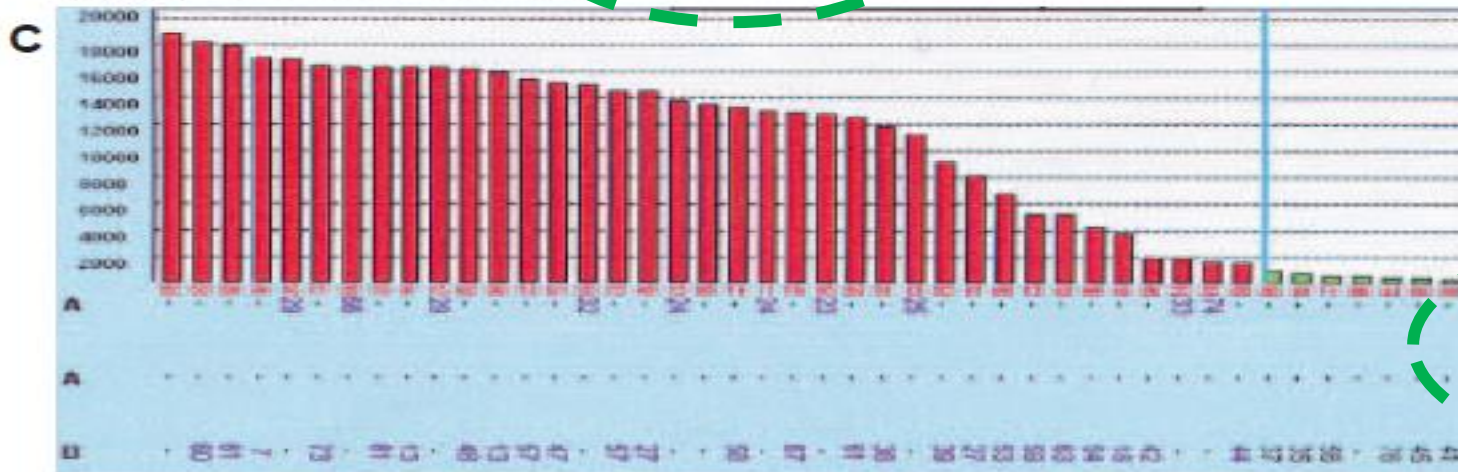
^b Department of Nephrology, University of Heidelberg, Heidelberg, Germany

B+	3	1	3	69	79	61	2	2	11	33
B+	3	1	28	29	18	55	3	12	11	11
B+	3	1	1	3	39	59	6	-	9	10
F+	4	1	2	24	57	58	6	7	9	13
E+	4	444	24	-	52	-	12	-	14	54
D+	4	1	1	2	49	57	6	7	9	11
C+	4	1	2	69	8	56	1	7	13	13
B+	4	1	2	32	33	48	4	16	1	17
B+	4	1	2	15	48	76	8	-	9	12
A+	5	1	24	32	41	44	16	17	9	13
B+	5	444	24	31	44	40	2	3	1	4
C+	5	1	2	31	51	39	12	15	8	15
D+	5	444	1	-	57	63	4	7	9	13
B+	5	1	25	29	59	18	7	12	15	17
F+	5	1	2	26	59	57	6	-	7	7
F+	6	1	1	-	37	57	6	-	7	11
E+	6	1	1	33	62	65	3	8	1	8
D+	6	888	2	32	27	44	2	5	1	4
C+	6	1	1	-	8	50	7	-	9	17
B+	6	1	1	24	8	38	7	12	14	15
A+	6	1	1	-	52	57	4	-	7	10
A+	7	1	2	26	7	62	3	7	13	15
B+	7	1	1	31	8	60	3	7	3	4
C+	7	1	68	68	60	41	3	17	12	13
D+	7	1	3	32	7	61	2	7	9	11
B+	7	1	2	24	44	61	2	5	1	15
F+	7	1	11	-	39	53	12	14	1	11
F+	8	1	3	86	19	41	4	17	13	13
E+	8	444	2	-	59	62	3	6	4	14
D+	8	1	2	25	7	18	7	12	15	17
C+	8	1	21	68	27	60	2	6	7	11
B+	8	1	3	31	51	35	4	16	11	16
A+	8	888	1	1	24	7	2	7	9	11
A+	9	1	2	26	38	18	3	12	13	13
B+	9	1	53	69	49	51	4	16	13	16
C+	9	1	38	32	38	51	5	7	11	13
D+	9	1	2	69	42	53	4	7	12	13
E+	9	1	1	24	8	38	7	12	14	15
F+	9	1	23	29	18	32	2	12	1	15
F+	10	1	2	68	39	57	6	7	8	11
B+	10	1	2	23	17	49	4	7	13	17
D+	10	1	3	32	16	62	3	4	13	19
C+	10	1	29	32	8	51	7	16	7	17
B+	10	888	-	+	-	+	-	+	-	+
A+	10	888	-	+	+	+	-	+	-	+

CDC-PRA:
B27+Extras

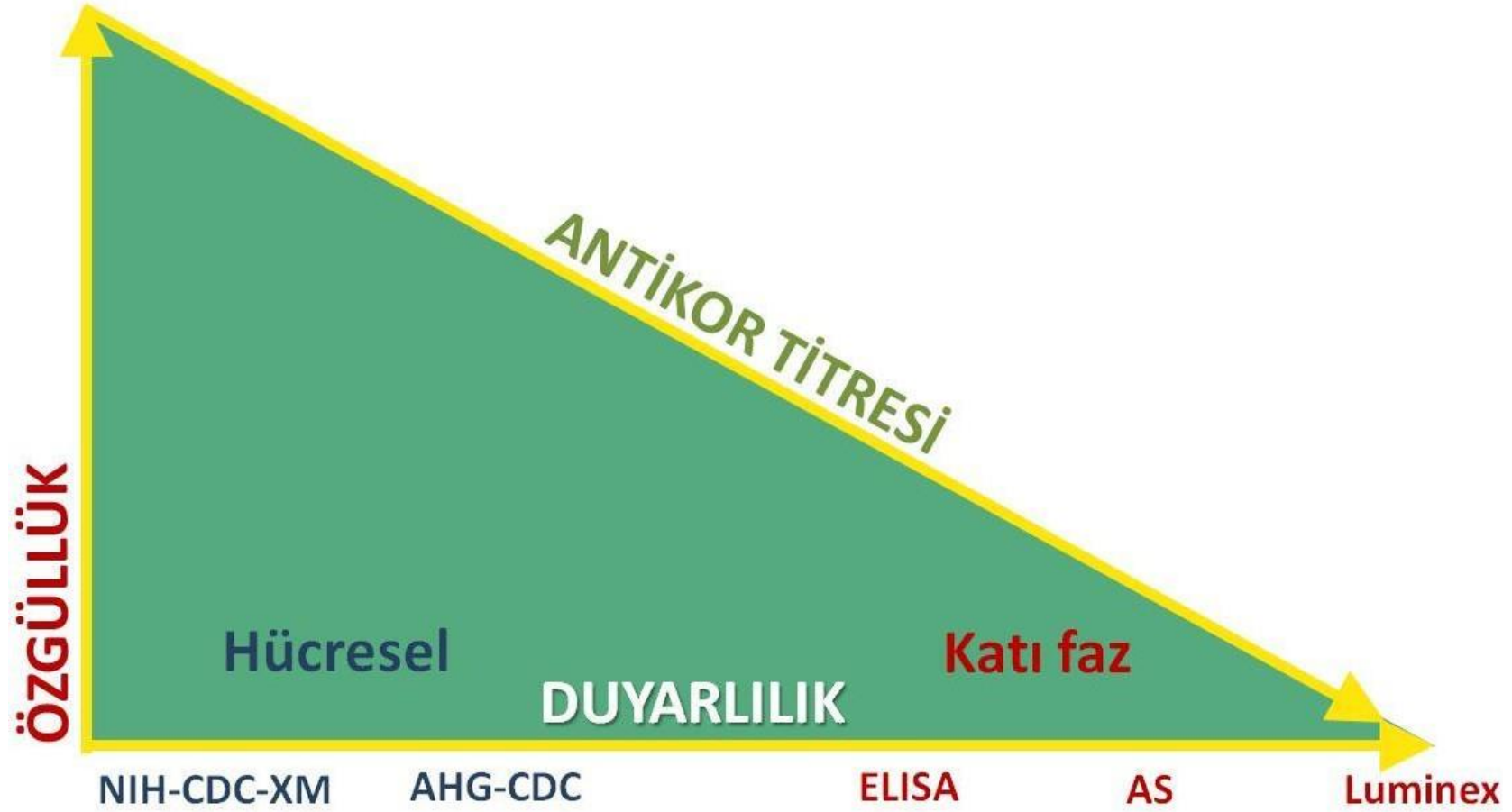
E9	1CH467	-0.066	=	(0.276)	-(0.282)	A29	A68	B49	B71	C83	C87	W84	W86
A10	LER788	-0.031	=	(0.236)	-(0.267)	A31	A32	B88	B39	C87	C12	W-	W86
D8	52LB	-0.036	=	(0.220)	-(0.256)	A38	A88	B18	B78	C82	C16	W-	W86
D10	L8364	-0.048	=	(0.219)	-(0.259)	A25	A33	B55	B58	C83	C86	W84	W86
G7	158CFW	-0.046	=	(0.252)	-(0.298)	A26	A36	B38	B49	C87	C12	W84	W-
F9	YUT652	-0.047	=	(0.214)	-(0.261)	A82	A11	B55	B67	C83	C87	W-	W86
F8	380FW	-0.068	=	(0.173)	-(0.241)	A82	A83	B37	B58	C86	---	W84	W86
A4	740FW	-0.078	=	(0.196)	-(0.266)	A87	---	B18	B44	C86	C87	W84	W86
A7	166DFW	-0.073	=	(0.217)	-(0.298)	A81	A83	B56	B62	C81	C83	W-	W86
B7	155CBC	-0.081	=	(0.215)	-(0.296)	A82	---	B38	B51	C81	C12	W84	W-
F7	186DFW	-0.083	=	(0.172)	-(0.255)	A26	A68	B44	B56	C81	C87	W84	W86
G11	J4118	-0.102	=	(0.208)	-(0.318)	A33	A74	B53	B72	C82	C84	W84	W86
G9	HAT517	-0.102	=	(0.158)	-(0.261)	A11	---	B54	B75	C81	C88	W-	W86
D9	HZ498	-0.105	=	(0.155)	-(0.268)	A33	A34	B35	B53	C84	---	W84	W86
I8	L8831	-0.118	=	(0.182)	-(0.292)	A38	A36	B58	B65	C86	C88	W84	W86
G10	TCH877	-0.125	=	(0.162)	-(0.287)	A81	A82	B37	B76	C84	C86	W84	W86
H9	L8671	-0.133	=	(0.198)	-(0.333)	A38	A68	B42	B63	C14	C17	W84	W86
C10	L8648	-0.139	=	(0.198)	-(0.337)	A25	A31	B52	B62	C81	C15	W84	W86
E10	L8286	-0.173	=	(0.178)	-(0.351)	A83	A74	B88	B45	C87	C16	---	W86
H11	HC189	-0.186	=	(0.154)	-(0.248)	A31	A33	B35	B46	C81	C84	---	W86
E9	=NAW	-0.297	=	(0.068)	-(0.357)	X-	X-	X-	X-	X-	X-	X-	X-

ELISA-PRA:
A23,A24
B7,B27,B60,B61+Extras

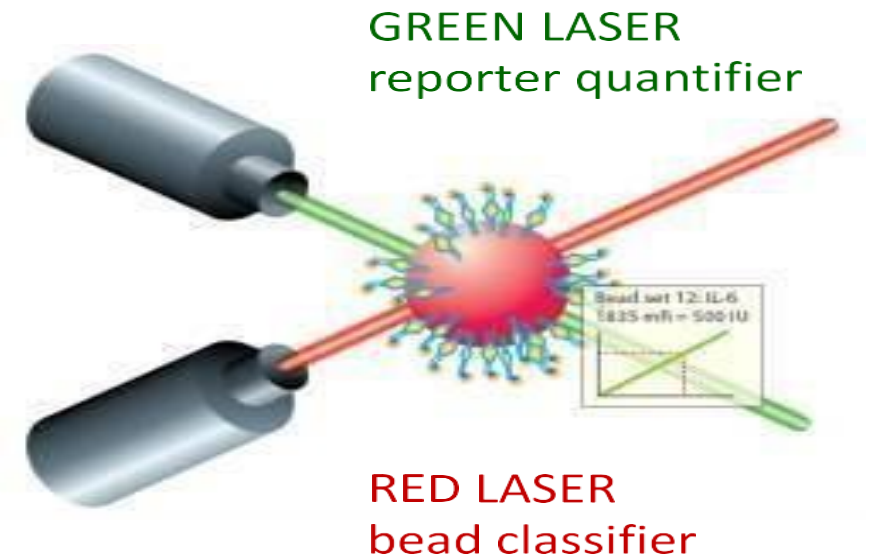
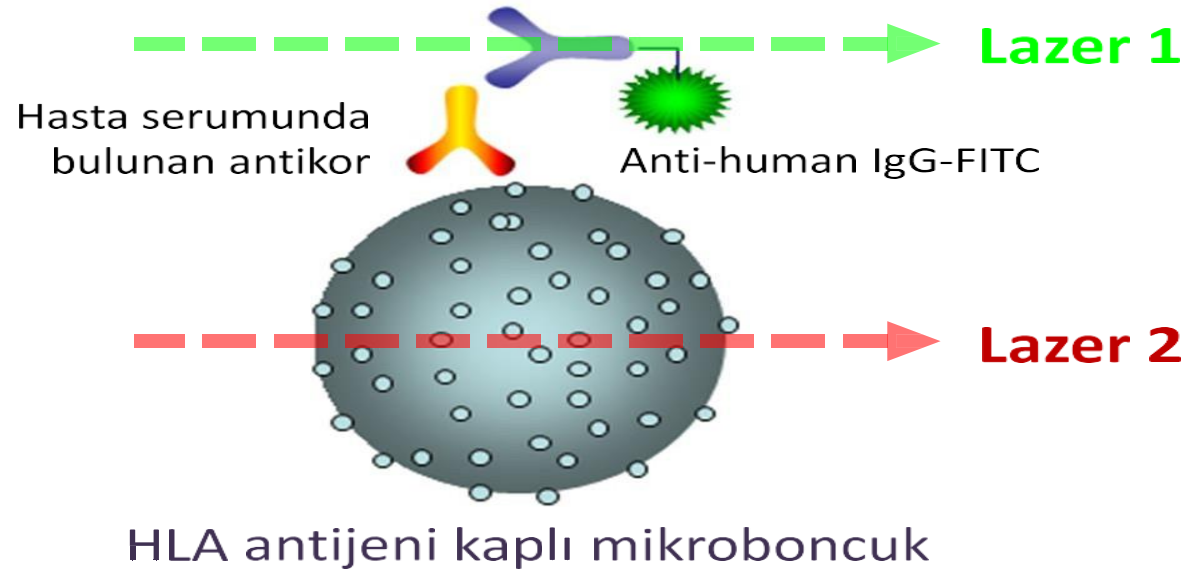


L-SAB:

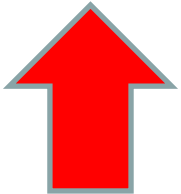
A23,A24,A25,A29,A32,A33,A66,A74
B7,B13,B18,B27,B35,B37,B38,B39,B42,
B44,B47,B48,B53,B54,56,B57,B58,B59,
B60,B61,B63,B67,B73,B76,B81



MİKROBONCUK TEKNOLOJİSİ

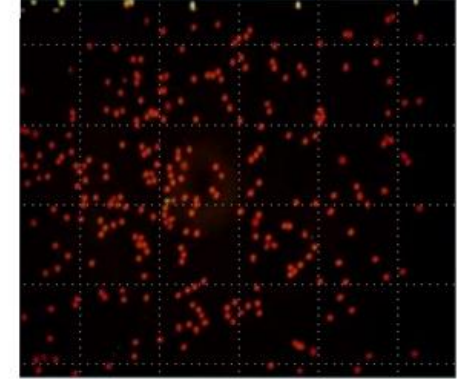
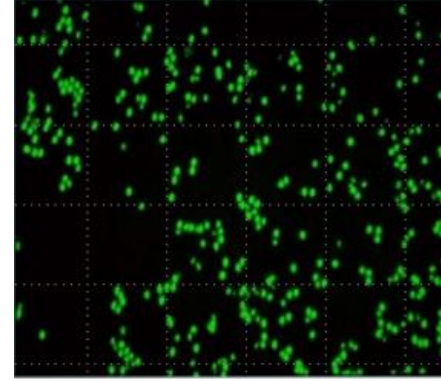


Çapraz uyum testleri

- CDC XM: transplant öncesi dönore karşı Ab
- HLA ve non HLA Ab : HAR ve AAAR riski 
- Ab tanımlayamaz
- AHÖ ve Lumineks

CDC-XM

- HLA ve Non HLA Ab
- HAR ve AAAR riski
- Duyarlılığı düşük
- Daha duyarlı katı fazlı AS ve Luminex PRA



Luminex

Böbrek nakli konsultasyon örneği

4/6 doku uygunluğu

UYGUNLUĞU SAPTANMIŞ OLUP, HASTANIN CDC VE FCM-CM TESTLERİNDE REAKTİVİTE %52'İN ALTINDADIR. PRA CLASS 1 TANIMLAMA TESTİ (HLA CLASS I ANTİJENLERİNE SPESİFİK IGG TİPİ PANEL REAKTİF ANTİKOR TESTİ) %32 ORANINDA POZİTİF TESPİT EDİLMİŞTİR. PRA CLASS 2 TANIMLAMA TESTİ (HLA CLASS II ANTİJENLERİNE SPESİFİK IGG TİPİ PANEL REAKTİF ANTİKOR TESTİ) %13 ORANINDA POZİTİF TESPİT EDİLMİŞTİR. LSA SINGLE ANTİJEN CLASS I (HLA CLASS I ANTİJENLERİNE SPESİFİK SINGLE ANTİJEN) TESTİ %0 NEGATİF TESPİT EDİLMİŞTİR. LSA SINGLE ANTİJEN CLASS II (HLA CLASS II ANTİJENLERİNE SPESİFİK SINGLE ANTİJEN) TESTİ %19 POZİTİF TESPİT EDİLMİŞTİR. POZİTİF ANTİKORLAR: HLA DQB1 03:02, HLA DQB1 04:01, HLA DQB1 04:02, HLA DQB1 05:03, HLA DQB1 06:01, HLA DQB1 03:03 (ONTEN: LUMINEX SCREENING ASSAY) HASTANIN KAN GRUBU O Rh(+), DONÖR ADAYININ KAN GRUBU O Rh(+) OLARAK BİLDİRİLMİŞTİR. BU NETİCELERE GÖRE DONÖR ADAYINDAN PLANLANAN BÖBREK NAKLİ İMMÜNOLOJİK ÖNDEN UYGUNDUR. ARZ EDERİM.

CDC-XM

Tetkik Adı	Sonuç	Durum	Birim	Referans Aralığı /Karar Sınırı	Önceki Sonuçlar
HLA-B (SSO)moleküler Düşük çözünürlük	Çalışıldı.			(-)	() / ()
HLA-DR (SSO) moleküler düşük çözünürlük	Çalışıldı.			(-)	() / ()
T ve B Lenfosit çapraz karşılaştırma,	ÇALIŞILDI			(-)	() / ()
HLA-A(SSO)moleküler düşük çözünürlük	Çalışıldı.			(-)	() / ()

Not: KOMPLEMANA BAĞLI SİTOTOKSİSİTE LENFOSİT CROSS MATCH (CDC-LCM)

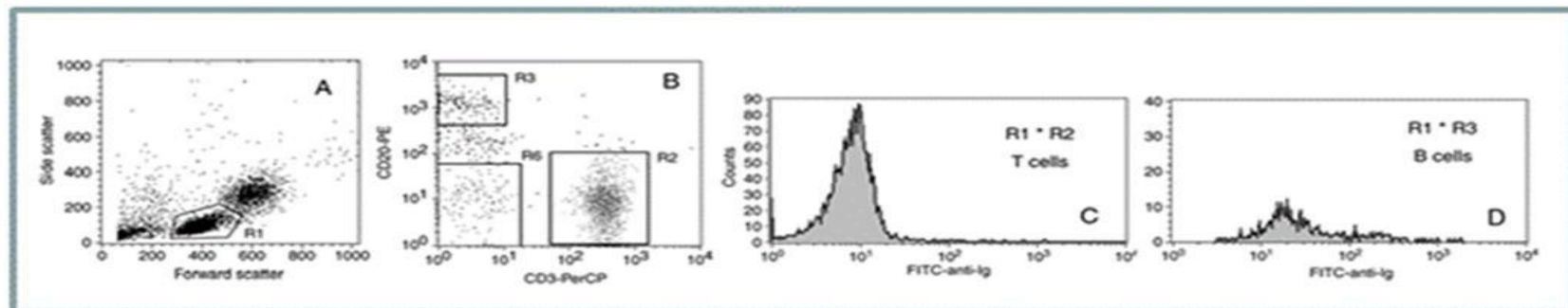
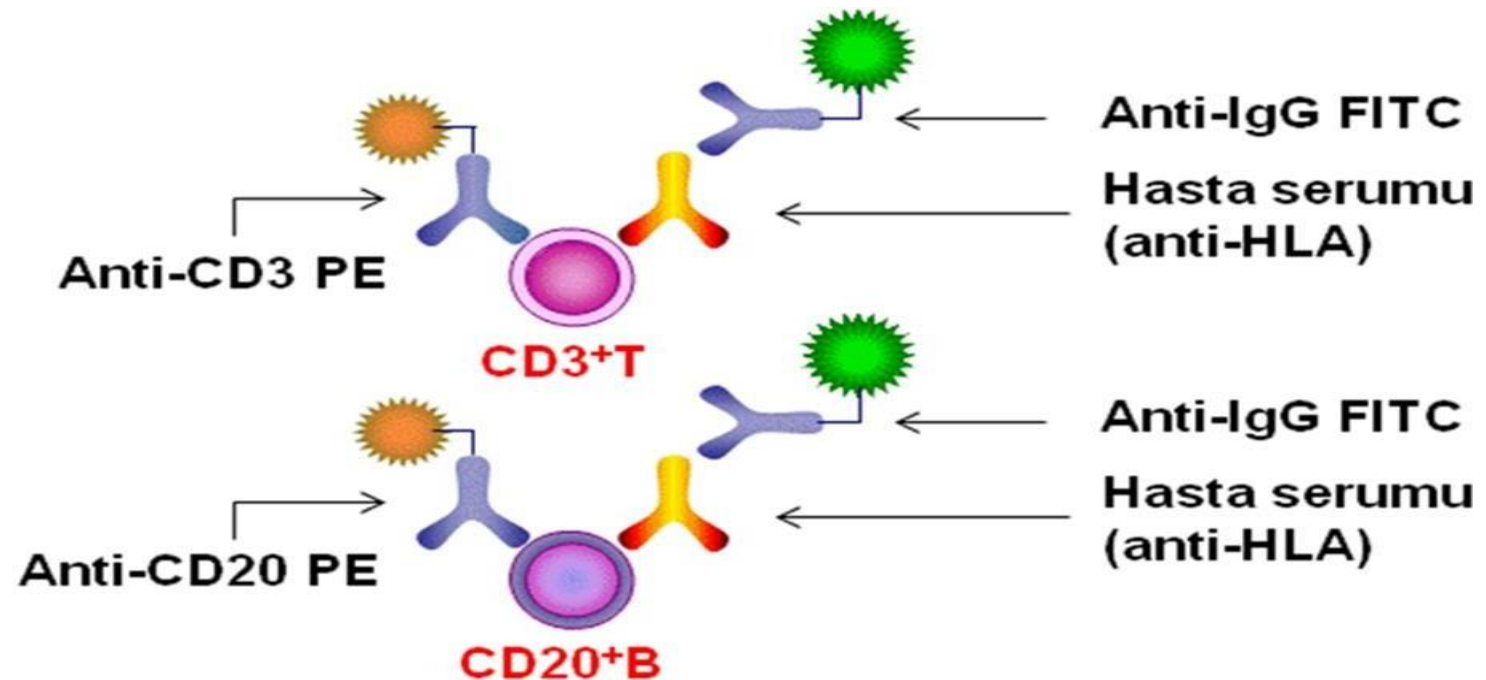
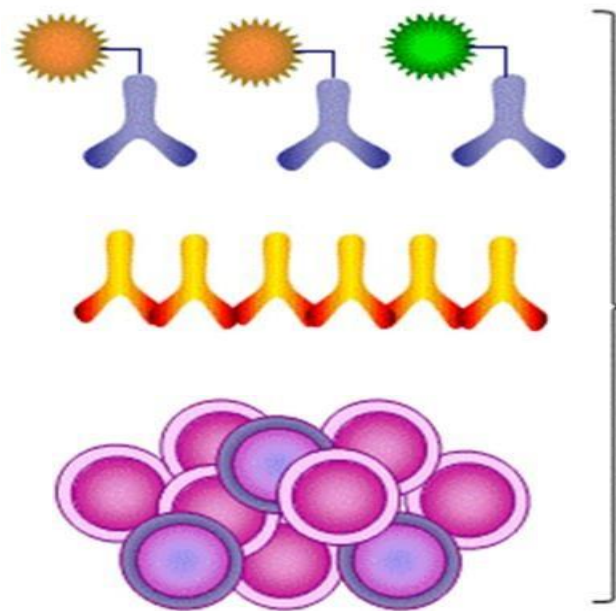
TESTLER	SONUÇ	REFERANS ARALIK
B Lenfosit Cross Match Non Dilüe: %2 DEN AZ		(0 - 10)
B Lenfosit Cross Match 1/2 Dilüe: %3 DEN AZ		(0 - 15)
T Lenfosit Cross Match Non Dilüe: %1 DEN AZ		(0 - 5)
T Lenfosit Cross Match 1/2 Dilüe: %3 DEN AZ		(0 - 5)
B Lenfosit Negatif Kontrol: %4 DEN AZ		
B Lenfosit Pozitif Kontrol: %99,0		
T Lenfosit Negatif Kontrol: %3 DEN AZ		
T Lenfosit Pozitif Kontrol: %97,0		
Alıcı Serum x Alıcı T Lenfosit: % 5 DEN AZ		
Alıcı Serum x Alıcı B Lenfosit: % 5 DEN AZ		

AHÖ-XM

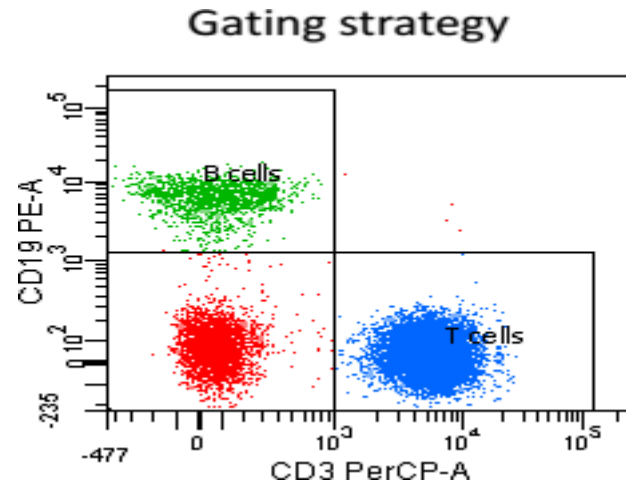
- Güvenli ve daha duyarlı
- Düşük seviyede Ab titre
- Kompleman bağlayan Ab
- Canlı hücre gerektirir, standartizasyon zor
- Sensitize, 1. sonrası nakil , transfüzyonlar
- Çocuktan veya eşten anneye nakillerde

CDC + AHÖ-XM ile birlikte

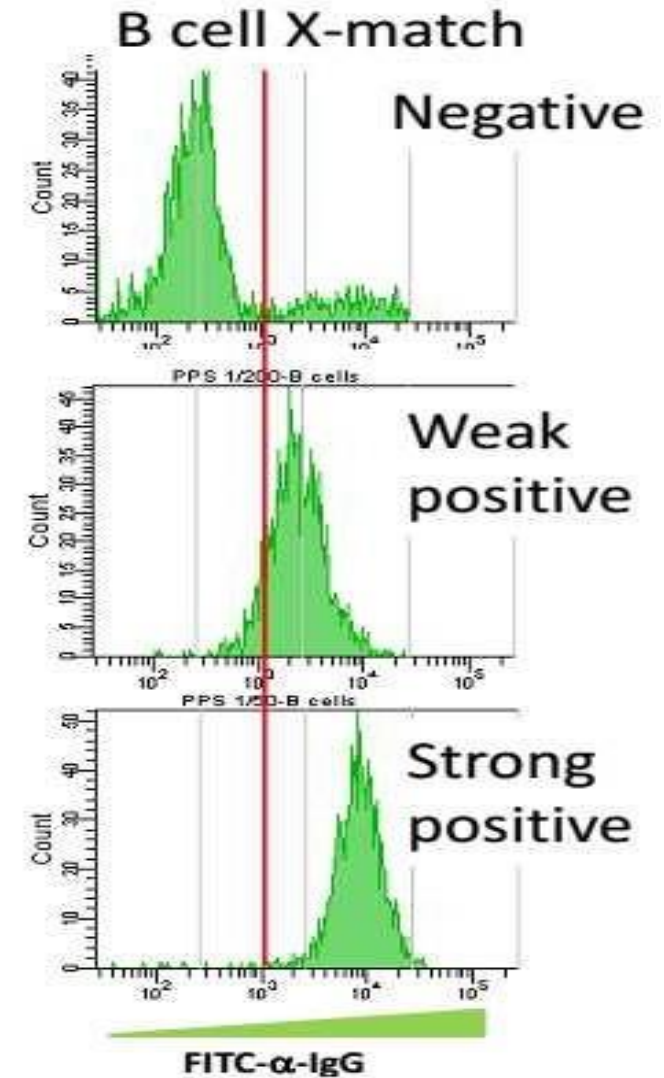
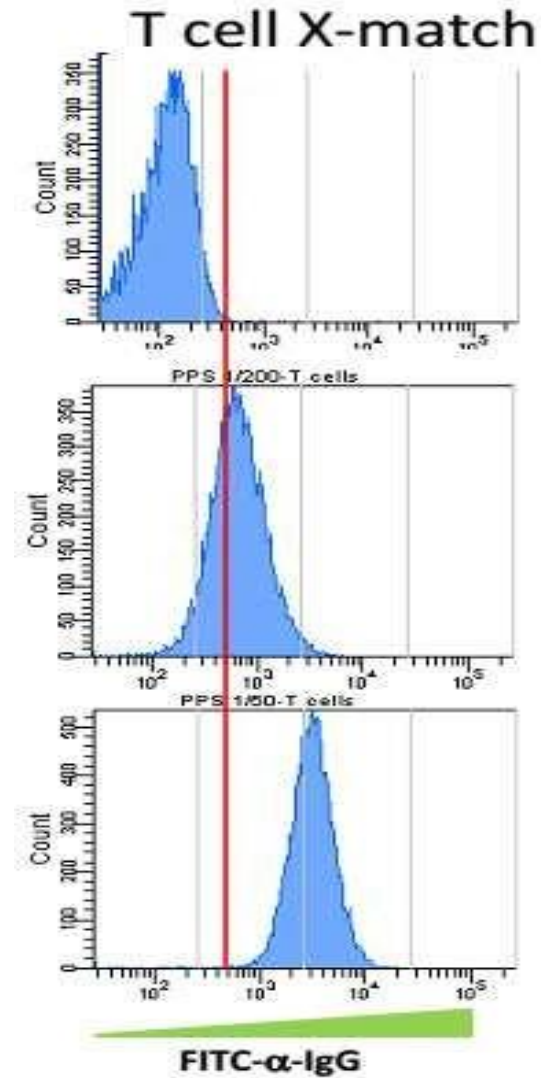
AHÖ- XM



AHÖ- XM



T FCXM < 200 MCS $\cong$ 7000 MFI
 B FCXM < 200 MCS $\cong$ 5000 MFI

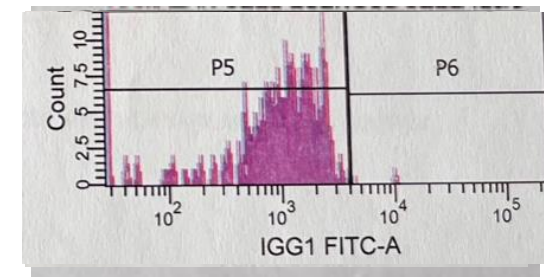
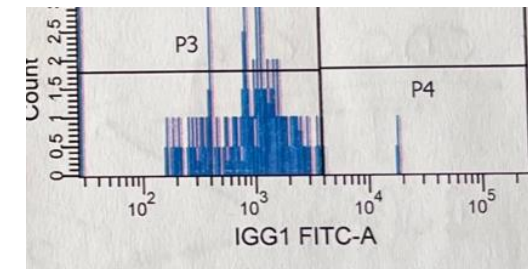
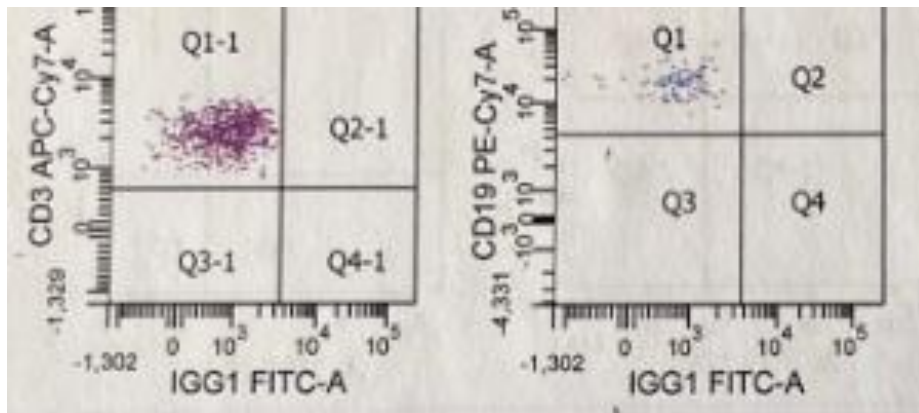
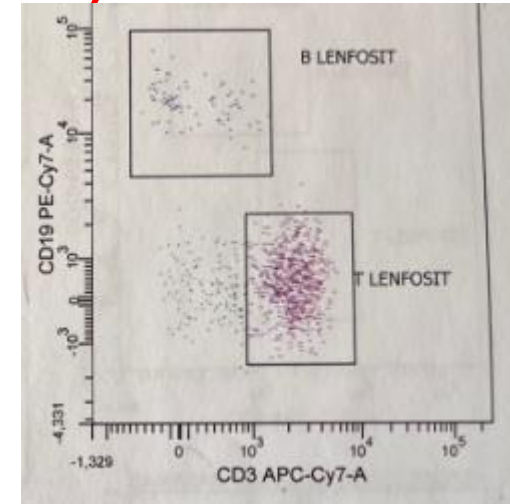
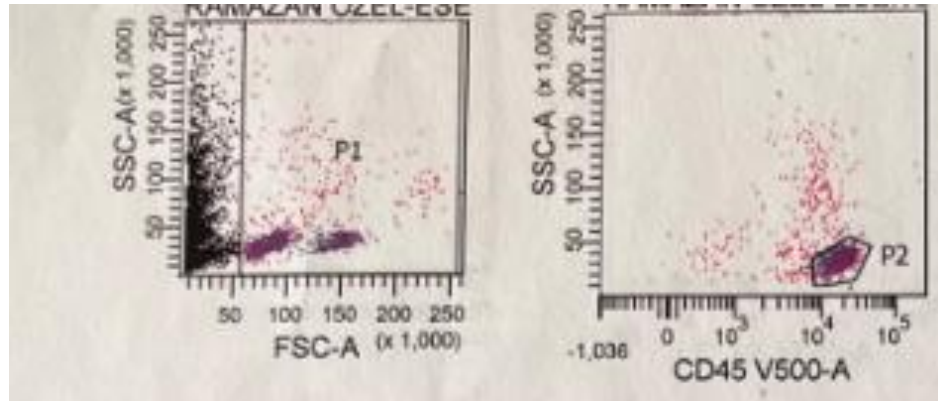


Dr. Robert Liwski, MD, PhD, FRCPC
 Optimization of flow cytometric crossmatch assay to
 expedite pre-transplant immunologic risk assessment

AHÖ-XM

TESTLER	SONUÇ	REFERANS ARALIK
B Lenfosit Cross Match Non Dilüe: % 0,1		(0 - 10)
B Lenfosit Cross Match 1/2 Dilüe: % 0,3		(0 - 15)
T Lenfosit Cross Match Non Dilüe: % 0,3		(0 - 5)
T Lenfosit Cross Match 1/2 Dilüe: % 0,2		(0 - 5)
B Lenfosit Negatif Kontrol: % 0,0		
B Lenfosit Pozitif Kontrol: % 100		
T Lenfosit Negatif Kontrol: % 0,0		
T Lenfosit Pozitif Kontrol: % 100		
Alıcı Serumı x Alıcı T Lenfosit: % 0,5		
Alıcı Serumı x Alıcı B Lenfosit: % 1,5		

AHÖ – XM (kontrol)



AHÖ- PRA

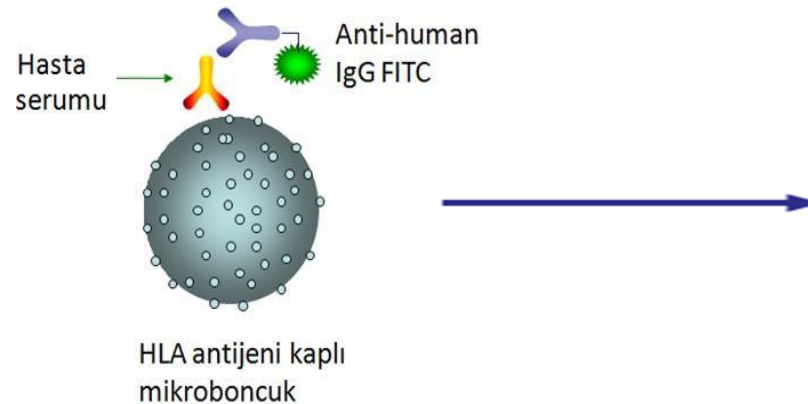
- **Toplumda sık rastlanan** polistren boncuklara bağlanmış HLA
- Ig G1-4, Ig M, Kompleman bağlayan – bağlamayan Ab
- Daha duyarlı
- Floresan kanal üzerinde yer değiştiren mikroboncuk oranı **% PRA**
- Tarama , tanımlama, tek antijen saptama kitleri mevcut
- Canlı hücre istemez
- Standartizasyon: cihaz, reaktif, teknisyen vb.. zor



AHÖ- PRA tarama

- HLA sınıf 1 ve/veya 2 antijenleri için hazırlanmış mikroboncuk panelleri (her sınıf için 30 farklı fenotip)
- Serum ile pozitif reaksiyon veren boncuk oranları % PRA

- Hızlı ve ucuz



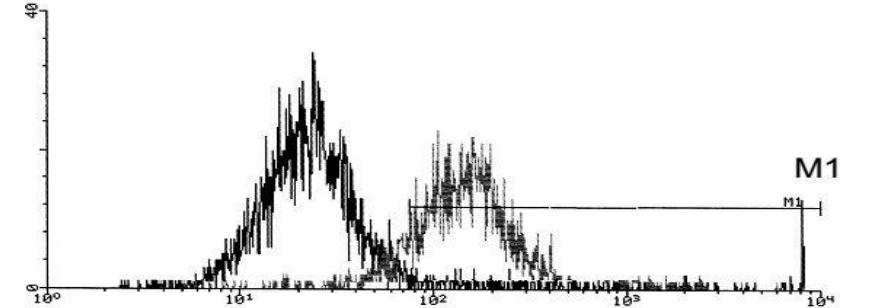
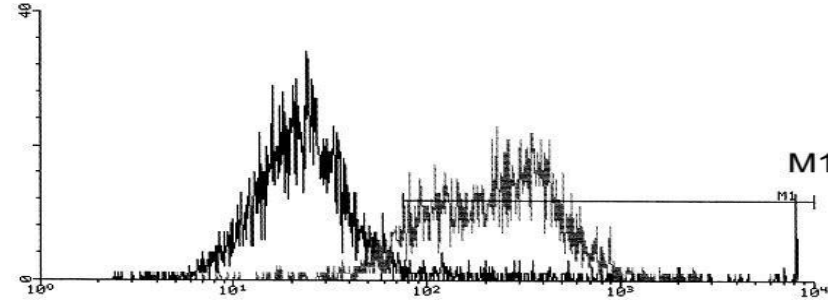
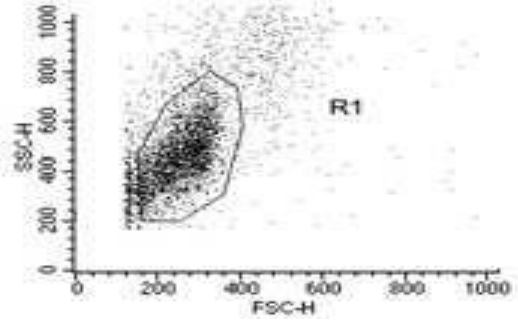
AHÖ – PRA tarama

Sınıf-I PRA

Sınıf-I mikroböncükler

(-) kontrol %90 (+) kontrol

(-) kontrol %95 (+) HS

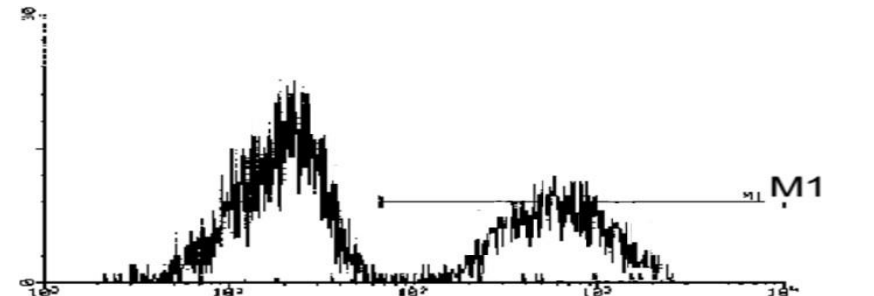
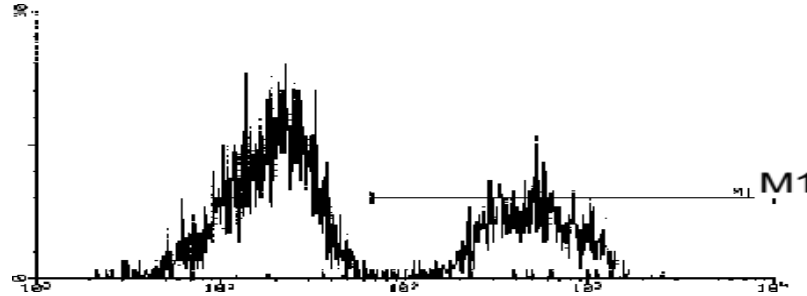
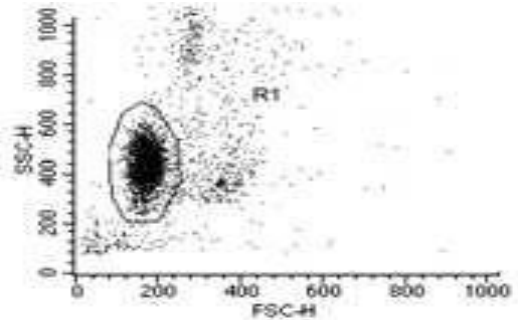


Sınıf-II PRA

Sınıf-II mikroböncükler

(-) kontrol %98 (+) kontrol

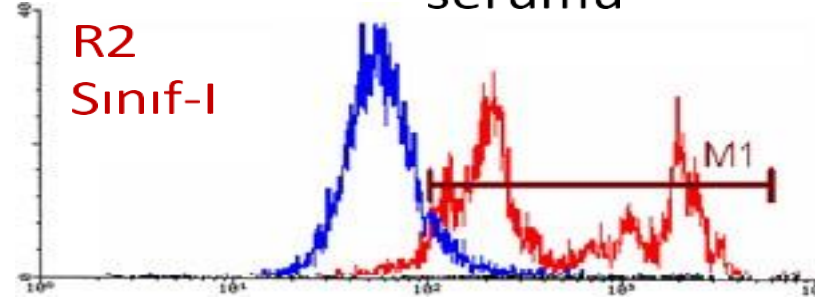
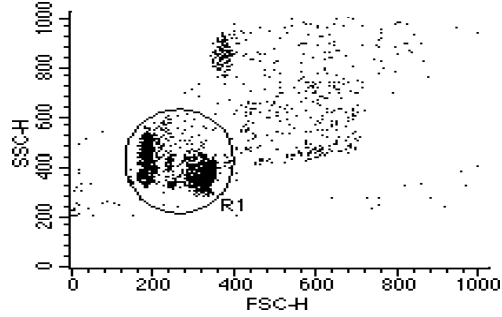
(-) kontrol %100 (+) HS



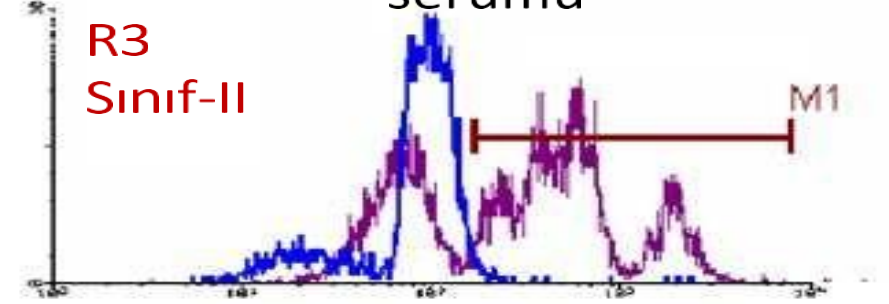
AHÖ – PRA tarama

Sınıf-I PRA ve II kombine PRA

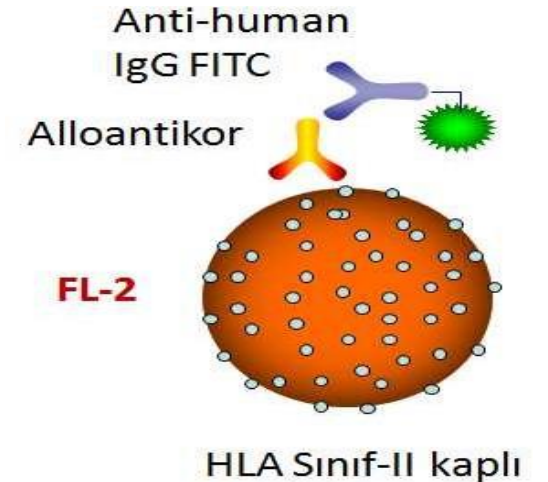
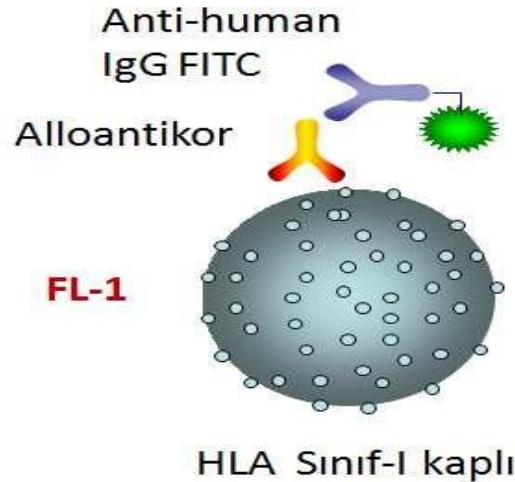
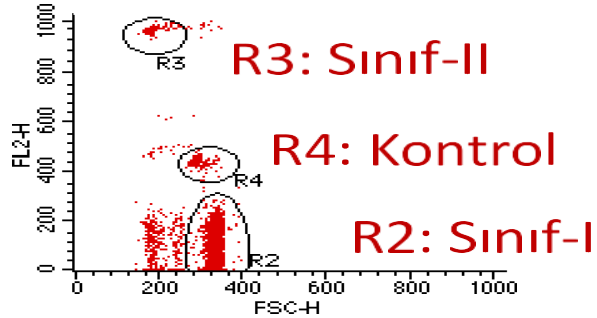
Sınıf-I ve II mikroböncükler (-) kontrol %99 (+) hasta serumu



(-) kontrol %65 (+) hasta serumu



Sınıf-I ve II mikroböncükler



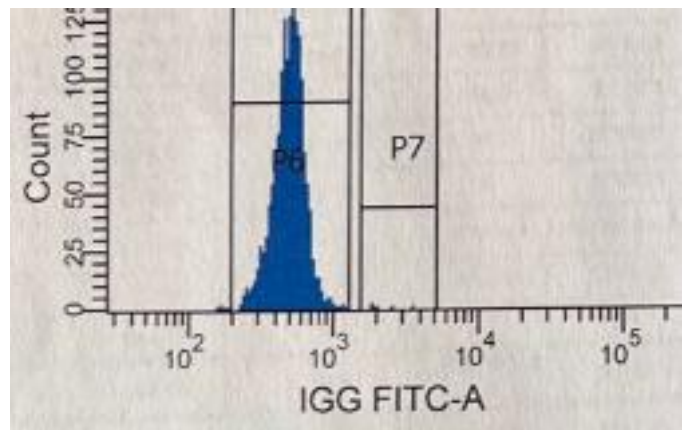
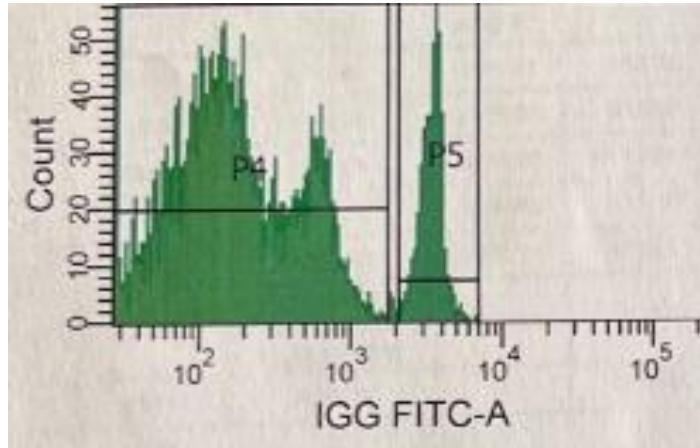
AHÖ-PRA tarama

TEST	SONUÇ	BİYİRİ	REFERANS DEĞER	ÖNCEKİ SONUÇLAR	
				16.12.15	14.12.15
Panel reaktif antikor (PRA) class II antijen					
Panel reaktif antikor (PRA) class II tarama	NEGATİF				NEGATİ
Panel reaktif antikor (PRA) class I antij	POZİTİF			POZİTİF	
<u>PRA SİNE I ANTİJENE SPESİFİK : %31</u>	POZİTİF				
AKIM SİTOMETRİK YÖNTEMLE ÇALIŞILMIŞTIR.					
Panel reaktif antikor (PRA) class I tara	POZİTİF			POZİTİF	
HLA-A,B,C (moleküler düşük çözünürlükte)				ÇALIŞIL	
HLA-DR,DP,DQ (moleküler düşük çözünü				ÇALIŞIL	
HLA-B5 (Moleküler Düşük Çözünürlükte,					
T ve B Lenfosit çapraz karşılaştırma, total,	ÇALIŞILDI				
KOMPLEMANA BAĞLI SİTOTOKSİSİTE LENFOSİT CROSS MATCH (CDC-LCM)					

TESTLER

B Lenfosit Cross Match Non Dilüe: %5'DEN AZ
B Lenfosit Cross Match 1/2 Dilüe: %5'DEN AZ
T Lenfosit Cross Match Non Dilüe: %5'DEN AZ
T Lenfosit Cross Match 1/2 Dilüe: %5'DEN AZ
B Lenfosit Negatif Kontrol: %5'DEN AZ
B Lenfosit Pozitif Kontrol: %90
T Lenfosit Negatif Kontrol: %5'DEN AZ
T Lenfosit Pozitif Kontrol: %90
Alıcı Serum x Alıcı T Lenfosit: %5'DEN AZ
Alıcı Serum x Alıcı B Lenfosit: %5'DEN AZ

AHÖ-PRA tarama



				IGG FITC-A
Population	#Events	%Parent	%Total	Geo Mean
All Events	10,000	####	100.0	####
P1	6,577	65.8	65.8	####
P2	3,469	52.7	34.7	####
P4	2,985	86.0	29.8	####
P5	473	13.6	4.7	3,321
P3	1,799	27.4	18.0	479
P6	1,788	99.4	17.9	478
P7	6	0.3	0.1	2,185

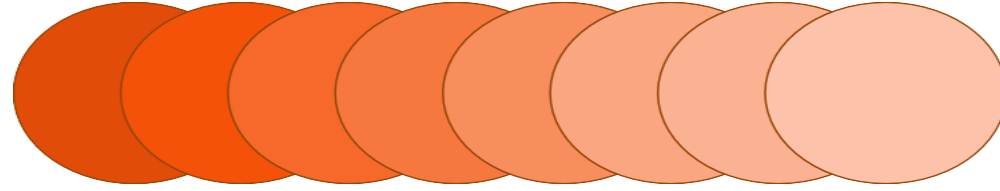
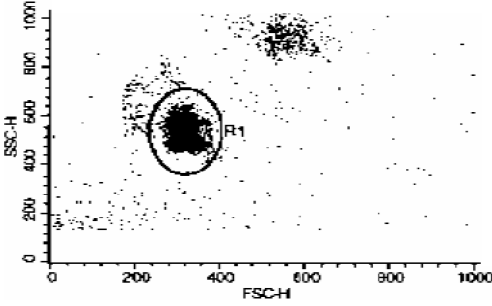
AHÖ – PRA tanımlama

- Pozitif tarama testi sonrası yapılır
- HLA sınıf 1 ve/veya 2 antijenleri için hazırlanmış mikroboncuk panelleri (4 grupX 8 renk kodu: 32 farklı fenotip)
- Serum ile pozitif reaksiyon veren boncuk oranları
(FL_1 üzerinde negatif kontrole göre yer değiştiren mikroboncuk %)
- *Yüksek PRA pozitifliği, spesifik Ab belirleyememesi*

AHÖ – PRA tanımlama

Sınıf-I veya II mikroboncuklar

Her biri farklı renk kodu taşıyan mikroboncuk paneli



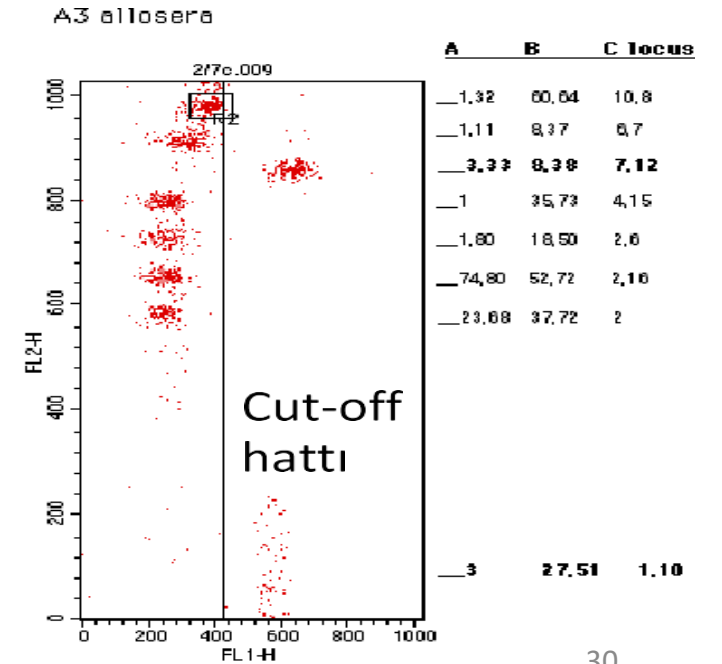
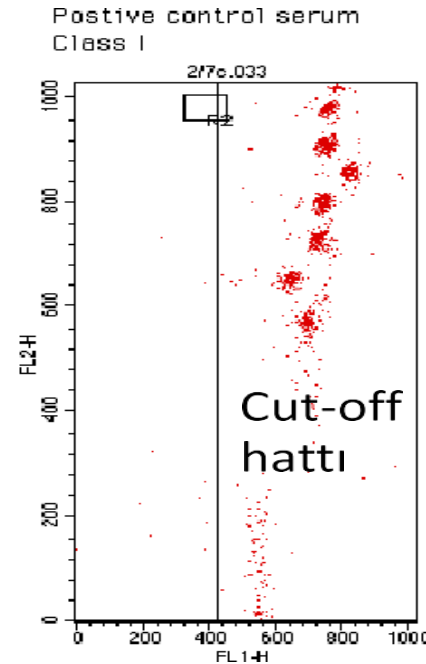
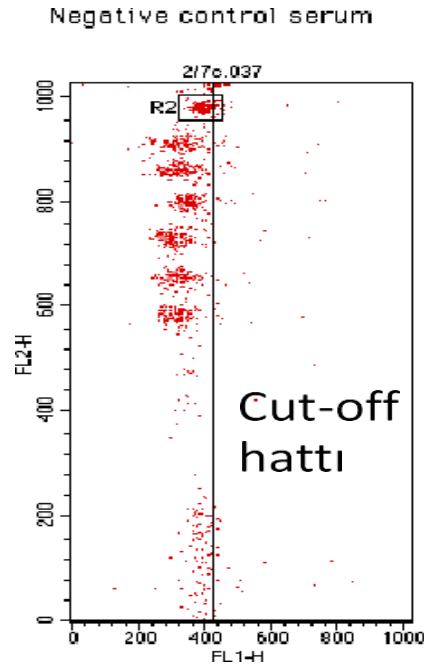
GRUP-1

FL2 üzerinde farklı mesafelerde görüntülenir

%	skor
1-10	1
11-20	2
21-50	4
51-80	6
81-100	8

GRUP-1

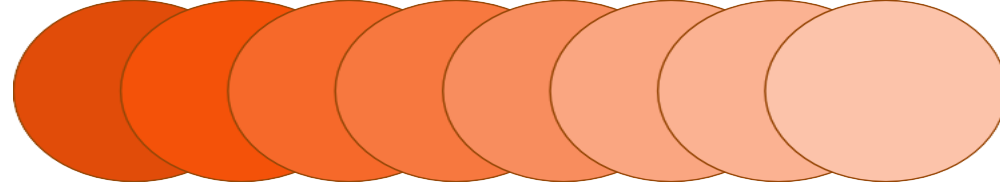
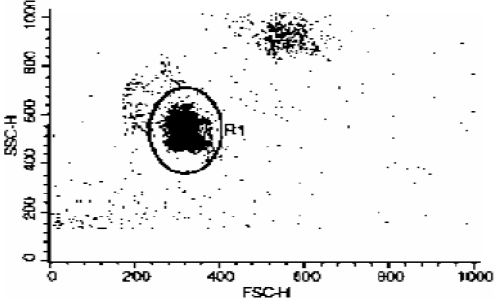
A3 antikoru
tespit edilen
alloserum



AHÖ – PRA tanımlama

Sınıf-I veya II mikrobuncuklar

Her biri farklı renk kodu taşıyan mikrobuncuk paneli



GRUP-3

FL2 üzerinde farklı mesafelerde görüntülenir

%	skor
1-10	1
11-20	2
21-50	4
51-80	6
81-100	8

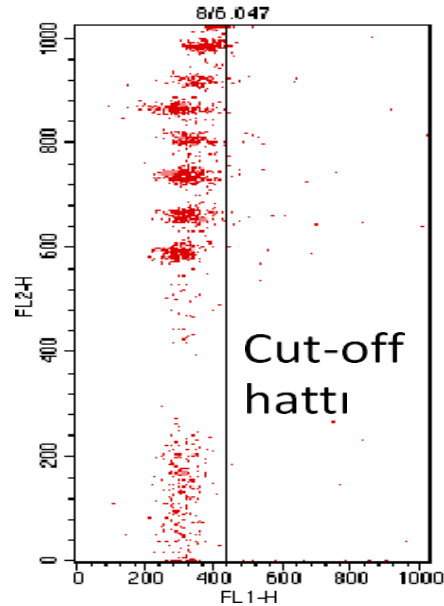
GRUP-3

DR8, DR12

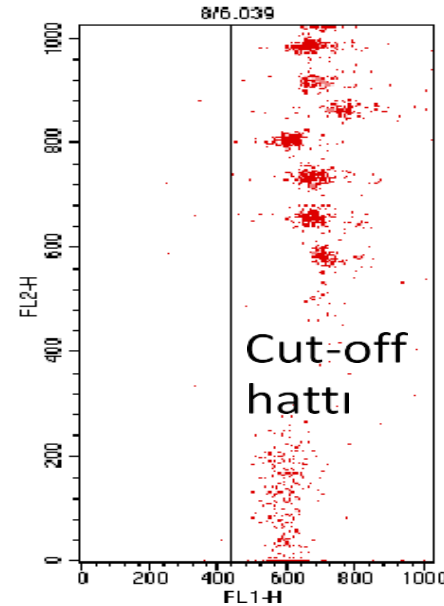
antikoru tespit
edilen alloserum



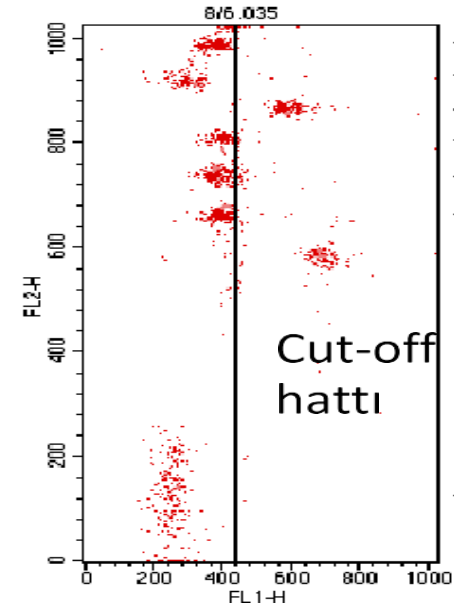
Negative control serum



Positive control serum
Class II



DR8,12 alloserum



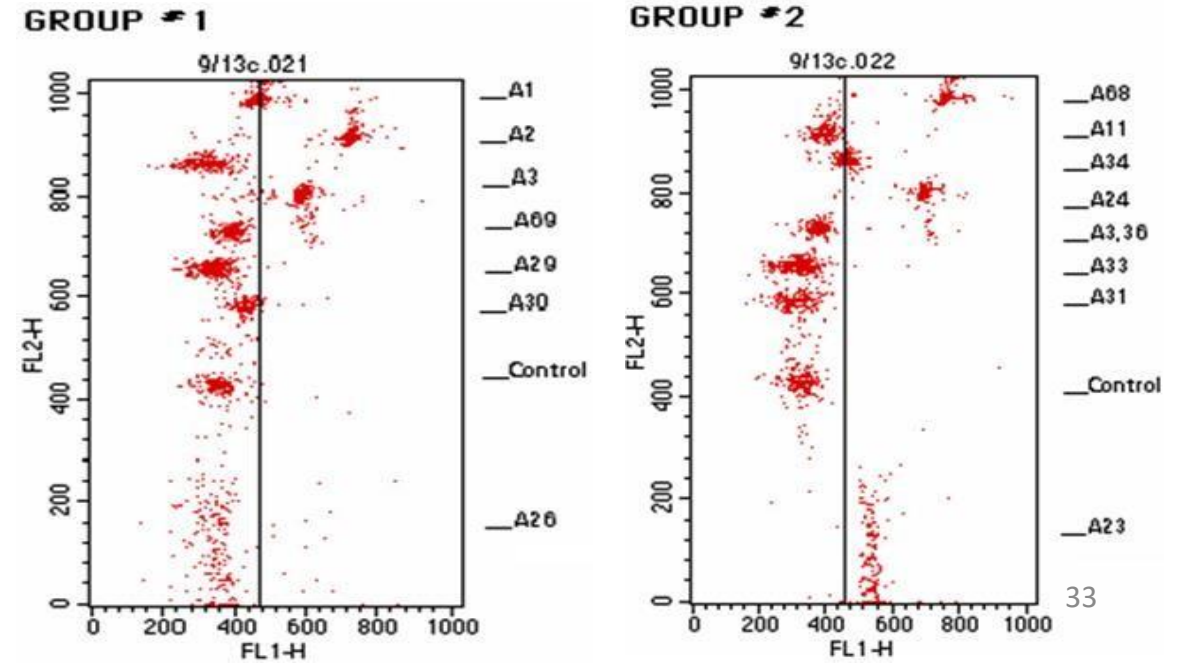
	DR	DQ locus
—1,11	52	5,6
—8,15	51,53	2,6
—8,11	52	7
—1,7	53	5,9
—14,16	51,52	7
—7,10	53	5,2
—8,14	52	5,9
—103,15	51	6,7

AHÖ-PRA tanımlama

Other Assignment:									
Test Configuration:						Excluded Antigen			
	Threshold	%PRA8	%PRA6	%PRA4	%PRA2	A2,A68,B35,B44			
Class I	X4	0	6	31	46				
Class II	-	-	-	-	-				
Epitope Analysis									
	Specificity	TP	FN	Mean (raw) of positives					
Class I	A23	2	1	6					
	A80	2	0	5					
	A1	3	2	4					
	A11	4	2	4					
	A24	4	0	4					
Tail Analysis									
	Specificity	Avg. Score	TP	FP	FN	TN	R value	% Inclusion	Str.Index
Class I	A24	4	4	6	0	22	0.56	100	0
	B18	4.67	3	3	0	22	0.66	100	0
	B42	4	1	2	0	22	0.55	100	0
	B46	4	1	2	0	22	0.55	100	0
	B71	4	1	2	0	22	0.55	100	0
	A23	6	1	0	1	21	0.69	66.67	0
	B41	6	1	0	1	21	0.69	50	0
Test Details									
Well	Rxn	Specificity	Allele Specificity						
1-9	6	A23,A80,B8,B18,Bw6,Cw2,Cw10	A*23:01,A*80:01,B*08:01,B*18:01,C*02:02,C*03:04						
2-7	6	A23,B7,B41,Bw6,Cw7,Cw8	A*23:01,B*07:02,B*41:01,C*07:02,C*08:02						
1-1	4	A1,A11,B46,B57,Bw6,Bw4,Cw6,Cw8	A*01:01,A*11:01,B*46:01,B*57:01,C*06:02,C*08:03						
1-2	4	A11,A29,B18,B38,Bw6,Bw4,Cw12	A*11:01,A*29:02,B*18:01,B*38:01,C*12:03						
1-5	4	A1,A30,B71,B42,Bw6,Cw10,Cw17	A*01:01,A*30:01,B*15:10,B*42:01,C*03:04,C*17:01						
1-7	4	A1,A80,B18,B50,Bw6,Cw2,Cw6	A*01:01,A*80:01,B*18:01,B*50:01,C*02:02,C*06:02						
2-2	4	A2,A24,B54,B67,Bw6,Cw1,Cw7	A*02:06,A*24:02,B*54:01,B*67:01,C*01:02,C*07:02						
2-3	4	A11,A24,B62,B35,Bw6,Cw9,Cw4	A*11:01,A*24:02,B*15:01/34,B*35:01,C*03:03,C*04:01						
			A*24:02/50/54/55/56/58 A*30:02 B*37:01 B*48:01,C*06:02,C*08:01						

AHÖ Tek antijen saptama

- Tanımlama ile bulunan Ab'ın tek antijen düzeyinde ayrımını yapar
- Yüksek duyarlı hastalarda nakil için kabul edilebilir Ab belirlenir
- Sanal XM yapılır
- Her HLA antijenleri için ayrı ayrı hazırlanmış mikroboncuk panelleri (4 grupX 8 renk kou: 32 farklı fenotip)
- Maskelenen Ab tespit eder.



Single antigen flow beads for identification of human leukocyte antigen antibody specificities in hypersensitized patients with chronic renal failure

MUSTAFA SOYÖZ^{1,2}, TÜLAY KILIÇASLAN-AYNA^{1,2}, ASLI ÖZKIZILCIK-KOÇYIĞIT^{1,2}, DERYA GÜLEÇ², İBRAHİM PIRIM^{1,2}

¹Department of Medical Biology and Genetics, Faculty of Medicine, İzmir Katip Çelebi University, İzmir, Turkey

²Tissue Typing Laboratory, İzmir Tepecik Education and Research Hospital, İzmir, Turkey

Single antigen flow beads for identification of human leukocyte antigen antibody specificities in hypersensitized patients with chronic renal failure

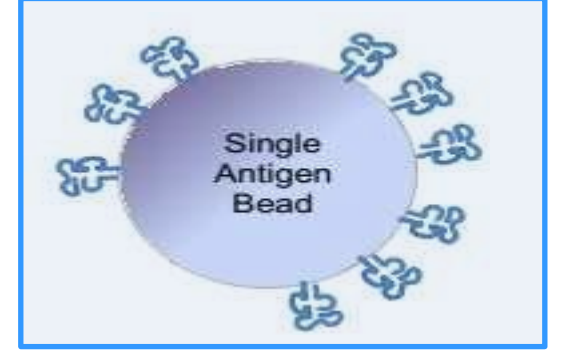
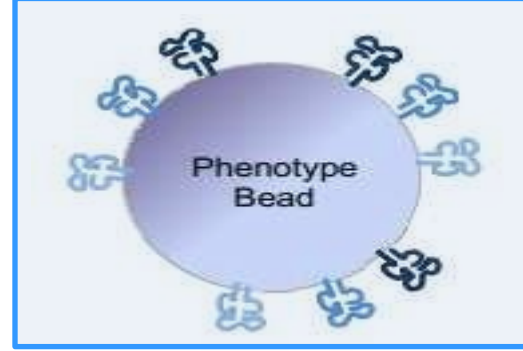
Table 2. Comparison of HLA types, PRA and SAB results of the patients

Patient No	HLA types of the patients	PRA %		SAB Results ^a
		CI	CII	
1	A*26, A*68, B*55, –, DRB1*13, –	94	100	A*01, A*03, A*29, A*30, A*26, A*68, A*11, A*34, A*33, B*40, B*07, B*55, DRB1*13, DRB1*12, DRB1*03
2	A*02, A*68, B*27, B*53, DRB1*11, –	100	100	A*02, A*68, A*24, B*51, B*13, B*44, B*38, B*57, B*53, DRB1*11, DRB1*08, DRB1*13, DRB1*15, DRB1*16, DRB1*03, DRB1*01, DRB1*04
3	A*21, A*02, B*37, –, DRB1*01, DRB1*10	100	100	A*01, A*02, B*37, DRB1*01, DRB1*01, DRB1*10
4	A23(19), A32(19), B52(5), B35, DRB1*15, DRB1*16	100	Neg	A*23, A*32, B*52, B*35, B*51, B*18, B*15, B*45, B*14
5	A*02, B*35, B*51, DRB1*09, DRB1*14	100	96.67	B*18, B*15, B*44, B*52, B*14, DRB1*09, DRB1*10, DRB1*14, DRB1*17, DRB1*03
6	A2, A24, B8, B61, DR03, DR15	94	Neg	A*02, A*24, B*08, B*40
7	A*24, A*29, B*35, –, DRB1*15, DRB1*16	Neg	96.67	DRB1*01, DRB1*10, DRB1*15, DRB1*16
8	A1, A3, B7, B60, DRB1*10, DRB1*12	100	100	A*01, A*03, B*07, B*40, DRB1*01, DRB1*07, DRB1*10, DRB1*12, DRB1*16, DRB1*09

Lumineks PRA

- Toplumda sık rastlanan mikrobuncuklara tanımlanmış HLA ag
- Ig G1-4 saptar
- MFI: serum ile pozitif reaksiyon veren mikrobuncukların yaydığı floresan yoğunluğu
- HLA Cw, HLA DQ, HLA DPA, HLA DPB, düşük yoğunluktaki Ab
- Canlı hücre istemez, çoklu örnek çalışılabilir.
- Kompleman bağlayan, bağlamayan Ab tespiti yapar.
- Denature HLA için MFI değerleri?
- Altın standart testtir. Klinik ve laboratuvar işbirliği ile hasta hakkında karar verilmelidir.

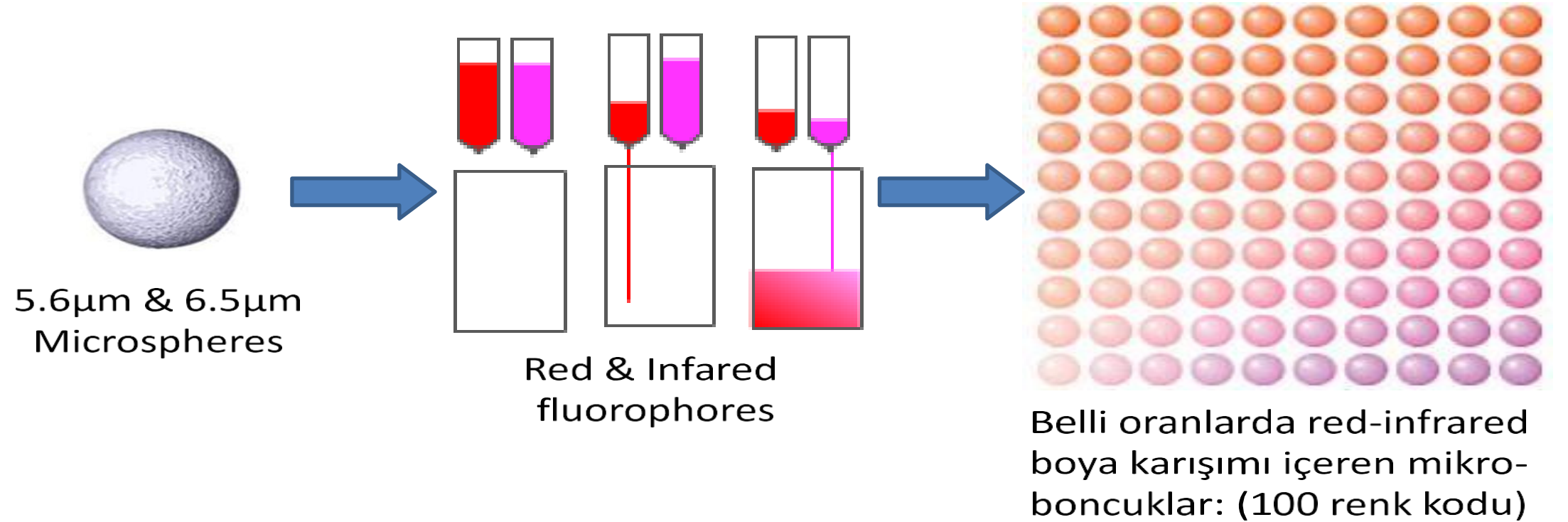
Lumineks- PRA



Uygulama	Tarama	Tanımlama	Tek antijen
Ag yoğunluğu	Düşük	Orta	Yüksek
Çözünürlük	-	*	***
Ag kaynağı	Trombosit EBV hücre hattı	EBV hücre hattı	Rekombinant
Her mikro-boncuktaki Ag kompozisyonu	3-5 ayrı kaynaktan elde edilen Sınıf-I ve/veya Sınıf-II Ag'ler: her lokus için 2'den fazla Ag ile kaplı	Tek kaynaktan elde edilen Sınıf-I ve/veya Sınıf-II Ag'ler: her lokus için 2 Ag ile kaplı	Sınıf-I ve/veya Sınıf-II'den Ther lokus için tek Ag

Lumineks- PRA

MAP = Multi-Analytes Profiling (Multiplexing)



MB panelleri 2 floresan boyanın farklı oranlarda MB'lara emdirilmesi ile elde edilir. Böylelikle 100 den fazla MB panelleri oluşturulur.

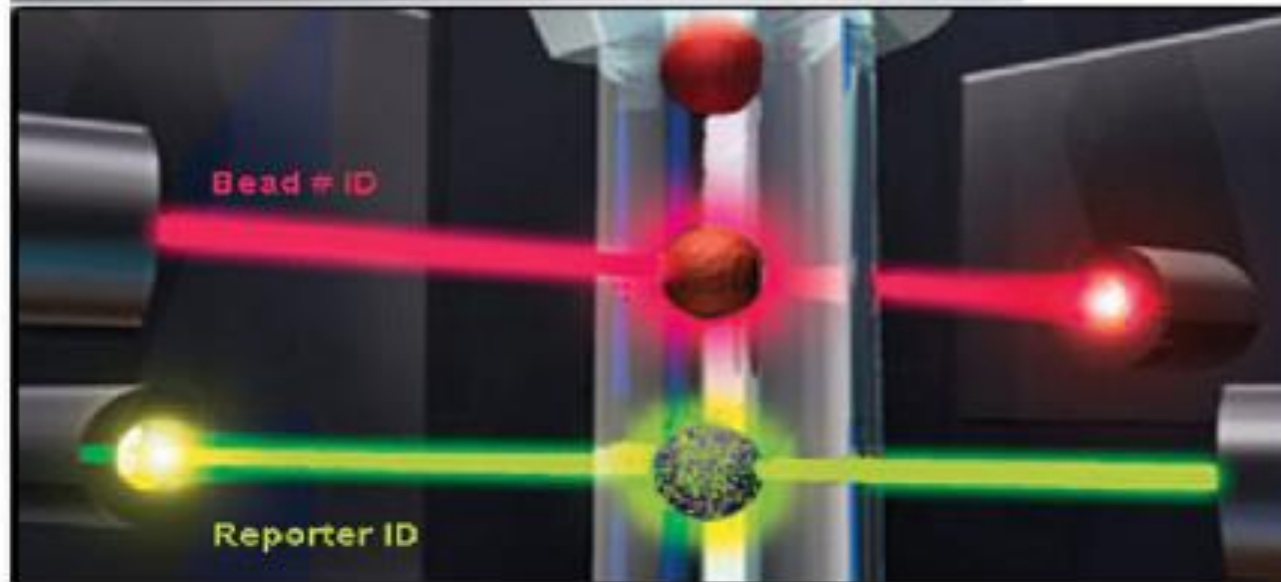
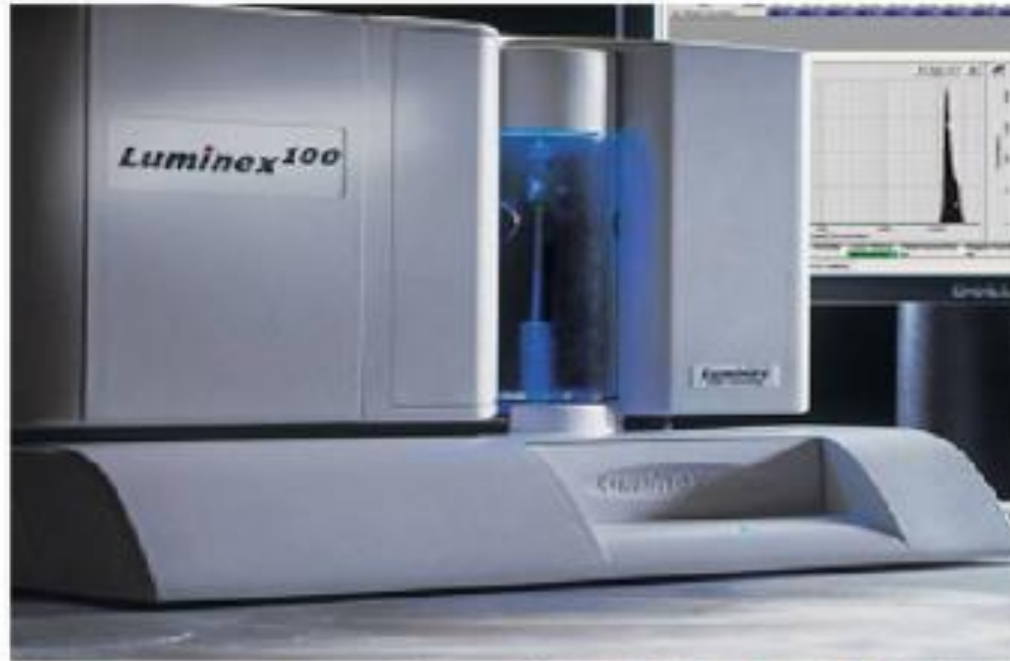
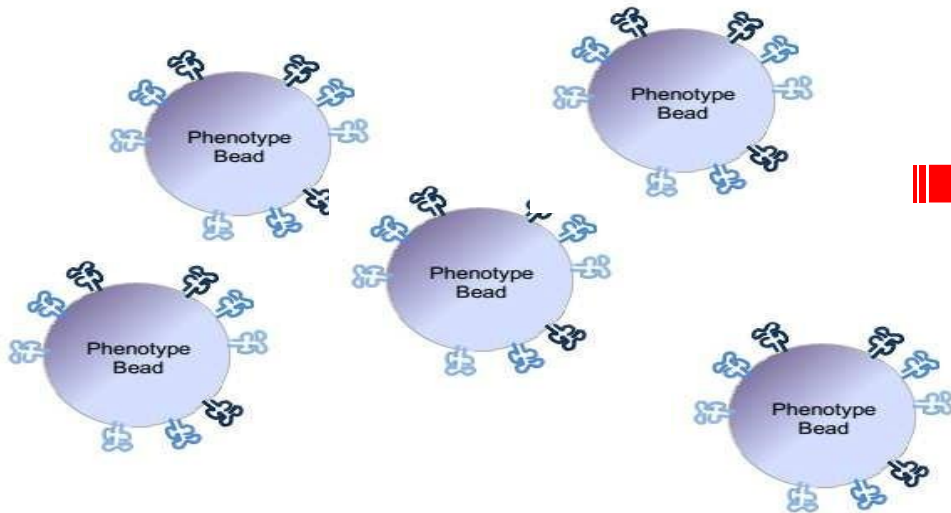


FIGURE 2 | 1
and then was
washes with |

temperature for 30 min
s followed by two further

Lumineks- PRA tarama

- Nakil öncesi ve sonrası için
- **HLA** sınıf **1** için 7, HLA sınıf **2** için 5 adet mikroboncuk ile **birlikte**
- MFI değerleri ile birlikte + veya - sonuç
- Ucuz ve pratik



PRA Taroma

Batch ID: 16012018-pra tarama

Supplemental Cutoff: 2,2

Supplemental Adjust: 0.00,0.00

CON 2: 39 - 731

CON 3: 45 - 2718

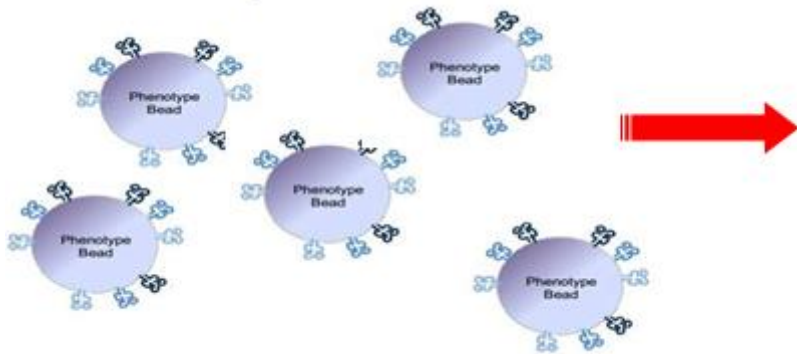
Positive

Luminex PRA tarama

Tetkiki İsteyen: Dr./Uzm.Dr. Adı Soyadı: YUSUF OĞUZ SBÜ Gülhane Eğitim ve Araştırma Hastanesi / Nefroloji Polikliniği-4 Numune Türü: Canlı Hücre		Tetkik İstem Zamanı : 03.12.2018 10:46:42 Numune Kabul Zamanı 03.12.2018 13:44:23 Numune Alma Zamanı 03.12.2018 11:09:55 Uzman Onay Zamanı 05.12.2018 10:14:42			
Tetkik Adı	Sonuç	Durum	Birim	Referans Aralığı /Karar Sınırı	Önceki Sonuçlar
PRA Class II tarama	Negatif			(-)	() / (
PRA Class I Tarama	Negatif			(-)	() / (

Lumineks- PRA tanımlama

- Tarama pozitif olan Ab tanımlanır.
- HLA sınıf 1 ve/veya HLA sınıf 2 için hazırlanan mikroboncuk ile panelleri
- Sonuç MFI deęerleri ile % PRA olarak
- Farklı panellerde ortak HLA Ag var



Lumineks- PRA tanımlama



HASTA (X): PRA (-)

Class I ID Results

Batch ID: 18072014-3 pra tanımlama 1

Patient Name: **Patient DOB:** **Draw Date:** **Donor Number:** **Expiration Date:** 15.05.2014
Sample ID: 18072014-3 **Lot ID:** 3000947 3000944-LM1 **Donor Center #:** **Accession #:**
Patient HLA Type: **Report By:** Lab Supervisor

Method Type: Standard Calculation

Positive MFI: 12,322 CON 1 MFI: 68 CON 2 MFI: 82 CON 3 MFI: 184 Cal CON MFI: 63 Adjust Cutoff Value: 0.0 Assignment Cutoff: 2 Tail Type: No Tail Done Tail Sort By: R-Value R-Value Cutoff: 0.00 % Positive Cutoff: 50 **% PRA: 0**

Bead	Raw	Adj 1	Adj 2	Adj 3	Assign	A1	A2	B1	B2	Bw4	Bw6	C1	C2	Epitope
147	184	-2.37	-3	-3.14	Negative	A23	A6602	B44	B7	Bw4	Bw6	Cw4	Cw7	
103	152	-3.32	-3.67	-3.81	Negative	A1	A6602	B52	B58	Bw4		Cw12	Cw7	
142	129	-2.62	-2.79	-2.74	Negative	A1	A31	B64	B8		Bw6	Cw7	Cw8	
129	126	-2.81	-2.72	-3.08	Negative	A33	A6601	B41	B65		Bw6	Cw7	Cw8	
163	123	-2.03	-2.02	-2.02	Negative	A2	A36	B7	B72		Bw6	Cw2	Cw7	
156	122	-3.89	-3.98	-3.6	Negative	A11		B54	B75		Bw6	Cw1	Cw8	
112	121	-2.15	-2.49	-2.63	Negative	A23	A80	B45	B81		Bw6	Cw16	Cw18	
165	120	-3.17	-3.28	-3.25	Negative	A2	A23	B63	B65	Bw4	Bw6	Cw16	Cw8	
154	118	-3.08	-3.34	-3	Negative	A1	A2	B37	B7	Bw4	Bw6	Cw6	Cw7	
125	112	-3.97	-3.77	-3.59	Negative	A11	A31	B39	B61		Bw6	Cw3	Cw7	
167	112	-3.34	-3.03	-3.31	Negative	A24	A68	B49	B82	Bw4	Bw6	Cw3	Cw7	
113	111	-2.54	-2.61	-2.79	Negative	A1	A69	B35	B8		Bw6	Cw12	Cw7	
124	111	-4.43	-4.38	-4.25	Negative	A24	A32	B38	B48	Bw4	Bw6	Cw12	Cw8	
118	107	-2.21	-2.13	-2.41	Negative	A25	A33	B55	B58	Bw4	Bw6	Cw3	Cw6	
104	98	-2.89	-2.73	-2.81	Negative	A24	A26	B60	B77	Bw4	Bw6	Cw7	Cw8	
148	97	-2.5	-2.33	-2.43	Negative	A2	A74	B53	B72	Bw4	Bw6	Cw2	Cw6	
130	96	-3.88	-3.86	-3.77	Negative	A33		B49	B58	Bw4		Cw7		
132	96	-3.05	-2.85	-2.96	Negative	A23	A6601	B39	B8		Bw6	Cw12	Cw7	
155	96	-2.68	-2.4	-2.69	Negative	A2	A30	B56	B7		Bw6	Cw1	Cw7	
140	94	-3.56	-3.6	-3.43	Negative	A2	A29	B13	B44	Bw4		Cw16	Cw6	
128	94	-2.82	-2.53	-2.69	Negative	A26	A30	B51	B62	Bw4	Bw6	Cw14	Cw3	
162	93	-2.75	-2.53	-2.8	Negative	A1	A33	B57	B7	Bw4	Bw6	Cw7		
127	92	-2.98	-3.03	-2.3	Negative	A30	A80	B18	B78		Bw6	Cw16	Cw2	
117	91	-2.96	-3.47	-2.96	Negative	A1	A3	B60	B7		Bw6	Cw7		

Lumineks- PRA tanımlama



HASTA (X): PRA (-)

Class I ID Results

Batch ID: 18072014-3 pra tanımlama 1

Patient Name:

Patient DOB:

Expiration Date: 15.05.2014

Sample ID: 18072014-3

Draw Date:

Donor Number:

Accession #:

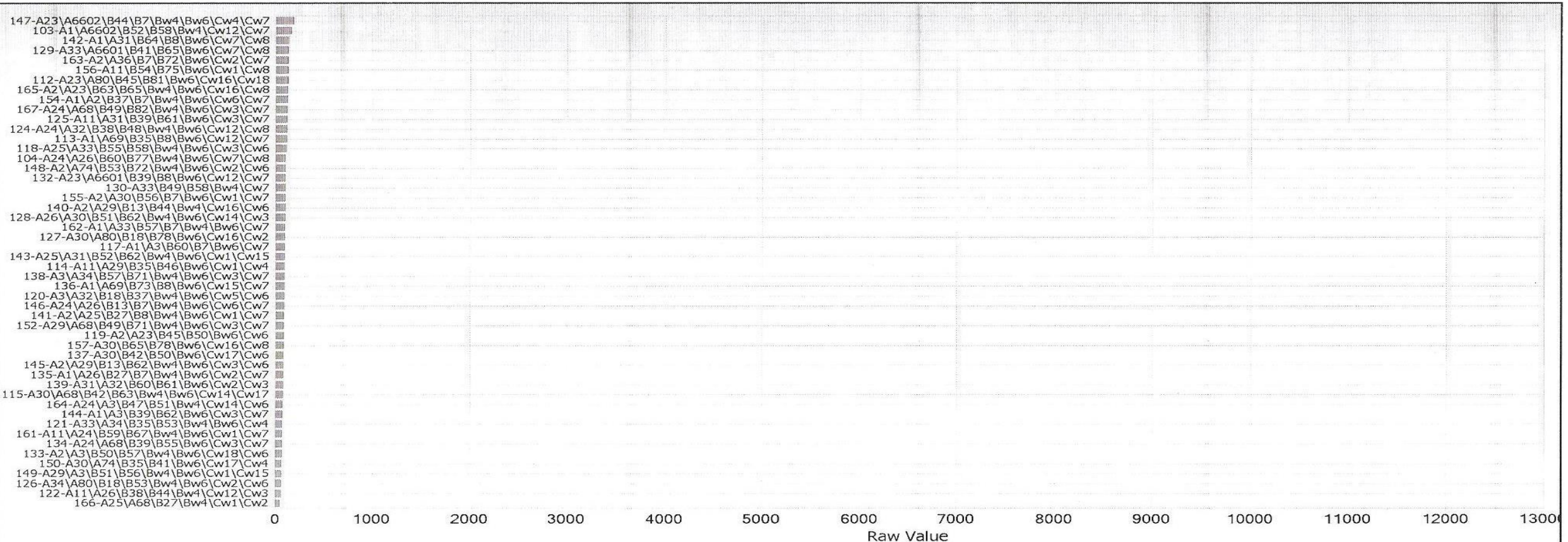
Lot ID: 3000947 3000944-L

Donor Center #:

Reported By: Lab Supervisor

% PRA: 0

Patient HLA Type:



Lumineks- PRA tanımlama

 **HASTA (X): PRA (+)**

Class II ID Results

Batch ID: 18072014 pra tanımlama2

Patient Name: Patient DOB: Patient Draw Date: Donor Number: Expiration Date: 15.06.2014
Sample ID: 18042014-4 Lot ID: 3001075 3001038-LM2Q Donor Center #: Accession #:
Patient HLA Type: Report By: Lab Supervisor

Method Type: Standard Calculation

Positive MFI:		CON 1 MFI:		CON 2 MFI:		CON 3 MFI:		Cal CON MFI:		Adjust Cutoff Value:		Assignment Cutoff:		Tail Type:		Tail Sort By:		R-Value Cutoff:		% Positive Cutoff:		% PRA:	
11,6/0		78		51		147		69		0.0		2		No Tail Done		R-Value		0.00		50		30	
Bead	Bead Count	Raw	Adj 1	Adj 2	Adj 3	Assign	DR1	DR2	DR5x1	DR5x2	DQB1	DQB2	DQA1	DQA2	DPB1	DPB2	Epitope						
154	88	1240	10.44	20.51	5.11	Positive					DQ9												
146	82	788	2.78	10.64	0.73	Positive					DQ8												
148	95	545	1.58	6.62	0.08	Positive					DQ7												
155	68	368	-0.59	3.21	-0.89	Positive					DQ4	DQ7											
162	73	330	-1.82	1.89	-1.74	Negative					DQ4	DQ9											
147	78	256	-1.97	1.46	-1.72	Negative					DQ5	DQ9											
161	75	247	-4.16	-0.92	-2.37	Negative					DQ2												
120	79	194	-4.41	-0.97	-3.21	Negative	DR12	DR4	DR52	DR53	DQ4	DQ7											
134	65	185	-2.66	0.11	-2.02	Negative	DR11	DR17	DR52		DQ2	DQ7											
104	100	171	-4.1	-0.94	-2.97	Negative	DR13	DR16	DR51	DR52	DQ5	DQ6											
122	74	171	-4.73	-1.64	-3.27	Negative	DR103	DR8			DQ4	DQ5											
138	84	155	-3.35	-0.52	-2.39	Negative	DR11	DR15	DR51	DR52	DQ6	DQ7											
118	60	150	-4.44	-1.78	-3.2	Negative	DR8				DQ6	DQ8											
130	77	147	-2.75	-0.87	-2	Negative	DR7		DR53		DQ2												
124	89	143	-3.58	-1.14	-2.38	Negative	DR11	DR13	DR52		DQ7												
119	69	137	-4.52	-1.72	-2.82	Negative	DR18		DR52		DQ4												
156	85	133	-4.99	-1.76	-3.24	Negative					DQ2												
149	78	130	-3.91	-1.35	-2.78	Negative	DR13	DR7	DR52	DR53	DQ2	DQ7											
129	75	130	-3.6	-0.99	-2.59	Negative	DR11	DR17	DR52		DQ2	DQ7											
114	85	126	-4.95	-2.1	-3.28	Negative	DR1	DR13	DR52		DQ5	DQ6											
166	70	126	-4.17	-1.22	-2.71	Negative					DQ6	DQ8											
142	78	126	-2.89	-0.73	-2.11	Negative	DR103				DQ5												
125	89	123	5.01	-2.02	-3.65	Negative	DR13	DR15	DR51	DR52	DQ6												
132	86	120	-3.45	-1.22	-2.4	Negative	DR4		DR53		DQ8						45						

Lumineks- PRA tanımlama

 **HASTA (X): PRA (+)**

Class II ID Results

Batch ID: 18072014 pra tanımlama2

Patient Name:

Sample ID: 18042014-4

Patient DOB:

Draw Date:

Lot ID: 3001075 3001038-L

Expiration Date: 15.06.2014

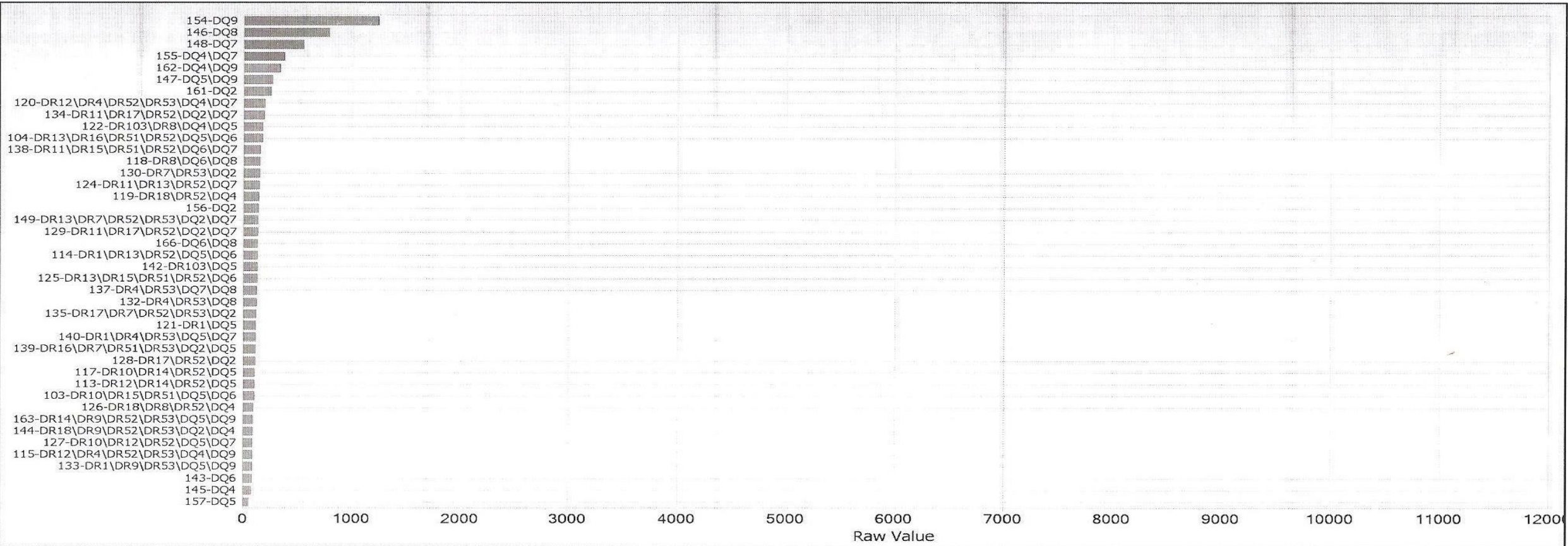
Donor Number:

Donor Center #:

Reported By: Lab Supervisor

% PRA: 30

Patient HLA Type:



Lumineks- PRA tanımlama

 **HASTA (Y): PRA (+)**

Patient Name:	Class I ID Results	Donor Number:
Sample ID: 13082014-7	Batch ID: 13082014 pra class1	Donor Center #:
Patient DOB:	Draw Date:	Reported By: Lab Supervisor
Accession #:	Lot ID: 3000947 3000	% PRA: 98
Patient HLA Type:	Expiration Date: 15.05.2014	

Report Parameters

Method Type: Standard Calculation

Positive MFI: 15,519	CON 1 MFI: 159	CON 2 MFI: 165	CON 3 MFI: 310	Cal CON MFI: 441	Adjust Value Cutoff Value: 0.0	Assignment Cutoff: 2
Tail Type: AUTOMATIC	Tail Sort By: R-Value	R-Value Cutoff: 0.00	% Positive Cutoff: 50			

Tail Antigens

Specificity	TP(++)	FP(+/-)	FN(-+)	TN(--)	N	Chi ²	R-Value	% Positive	Strength
Bw4	30	19	0	1	50	1.53	0.18	100	5689
Cw7	11	8	0	1	20	1.29	0.25	100	5212
A30	4	4	0	1	9	0.90	0.32	100	3528
Cw1	2	2	0	1	5	0.83	0.41	100	6787
A31	1	1	0	1	3	0.75	0.50	100	5820
Cw6	1	0	0	1	2	2.00	1.00	100	4517
Overall	49	0	0	1	50	50.00	1.00	100.00	-----

Antibody Assignments: A30,A31,Bw4,Cw1,Cw6,Cw7

Masked Antigens: A1, A11, A2, A24, A25, A26, A29, A3, A32, A33, A34, A36, A6601, A6602, A68, A69, A74, B13, B18, B27, B35, B37, B38, B39, B41, B42, B44, B46, B47, B48, B49, B50, B51, B52, B53, B54, B55, B56, B57, B58, B59, B60, B61, B62, B63, B64, B65, B67, B7, B71, B72, B73, B75, B77, B78, B8, B82, Cw12, Cw14, Cw15, Cw17, Cw2, Cw3, Cw4, Cw5, Cw8

Excluded Antigens: None

Lumineks- PRA tanımlama

 **HASTA (Y): PRA (+)**

Class I ID Results

Batch ID: 13082014 pra class1

Patient Name: | Patient DOB: | Draw Date: | Donor Number: | Expiration Date: 15.05.2014
 Sample ID: 13082014-7 | Lot ID: 3000947 3000944-LM1 | Donor Center #: | Accession #: |
 Patient HLA Type: | Report By: Lab Supervisor

Method Type: Standard Calculation

Positive MFI:		CON 1 MFI:		CON 2 MFI:		CON 3 MFI:		Cal CON MFI:		Adjust Cutoff Value:		Assignment Cutoff:		Tail Type:		Tail Sort By:		R-Value Cutoff:		% Positive Cutoff:		% PRA:	
15.519		159		165		310		441		0.0		2		AUTOMATIC		R-Value		0.00		50		98	
Bead	Raw	Adj 1	Adj 2	Adj 3	Assign	A1	A2	B1	B2	Bw4	Bw6	C1	C2	Epitope									
141	9862	58.1	56.34	28.96	Positive	A2	A25	B27	B8	Bw4	Bw6	Cw1	Cw7										
118	9604	56.62	54.95	28.04	Positive	A25	A33	B55	B58	Bw4	Bw6	Cw3	Cw6										
129	9406	54.5	52.93	26.63	Positive	A33	A6601	B41	B65		Bw6	Cw7	Cw8										
166	9101	52.92	51.37	26.13	Positive	A25	A68	B27		Bw4		Cw1	Cw2										
122	8602	50.06	48.38	24.79	Positive	A11	A26	B38	B44	Bw4		Cw12	Cw3										
143	8585	49.92	48.61	24.72	Positive	A25	A31	B52	B62	Bw4	Bw6	Cw1	Cw15										
149	8182	48.03	46.35	23.61	Positive	A29	A3	B51	B56	Bw4	Bw6	Cw1	Cw15										
132	7920	45.35	44.12	22.11	Positive	A23	A6601	B39	B8		Bw6	Cw12	Cw7										
128	7349	42.02	41	20.54	Positive	A26	A30	B51	B62	Bw4	Bw6	Cw14	Cw3										
152	7281	42.21	40.66	20.63	Positive	A29	A68	B49	B71	Bw4	Bw6	Cw3	Cw7										
114	7110	40.65	38.91	19.61	Positive	A11	A29	B35	B46		Bw6	Cw1	Cw4										
146	6712	37.82	36.63	18.35	Positive	A24	A26	B13	B7	Bw4	Bw6	Cw6	Cw7										
135	6446	36.07	34.55	17.13	Positive	A1	A26	B27	B7	Bw4	Bw6	Cw2	Cw7										
104	6246	34.95	34.04	16.84	Positive	A24	A26	B60	B77	Bw4	Bw6	Cw7	Cw8										
130	6241	33.96	32.91	15.87	Positive	A33		B49	B58	Bw4		Cw7											
121	6161	34.36	33.08	16.47	Positive	A33	A34	B35	B53	Bw4	Bw6	Cw4											
138	6142	34.47	33.19	16.58	Positive	A3	A34	B57	B71	Bw4	Bw6	Cw3	Cw7										
140	5842	31.79	30.76	14.93	Positive	A2	A29	B13	B44	Bw4		Cw16	Cw6										
142	5755	31.67	30.62	15.15	Positive	A1	A31	B64	B8		Bw6	Cw7	Cw8										
136	5678	30.64	29.56	14.45	Positive	A1	A69	B73	B8		Bw6	Cw15	Cw7										

Lumineks- PRA tanımlama

HASTA (Y): PRA (+)

Patient Name:

Sample ID: 13082014-7

Accession #:

Patient HLA Type:

Class I ID Results

Batch ID: 13082014 pra class1

Patient DOB:

Draw Date:

Lot ID: 3000947 3000944-L

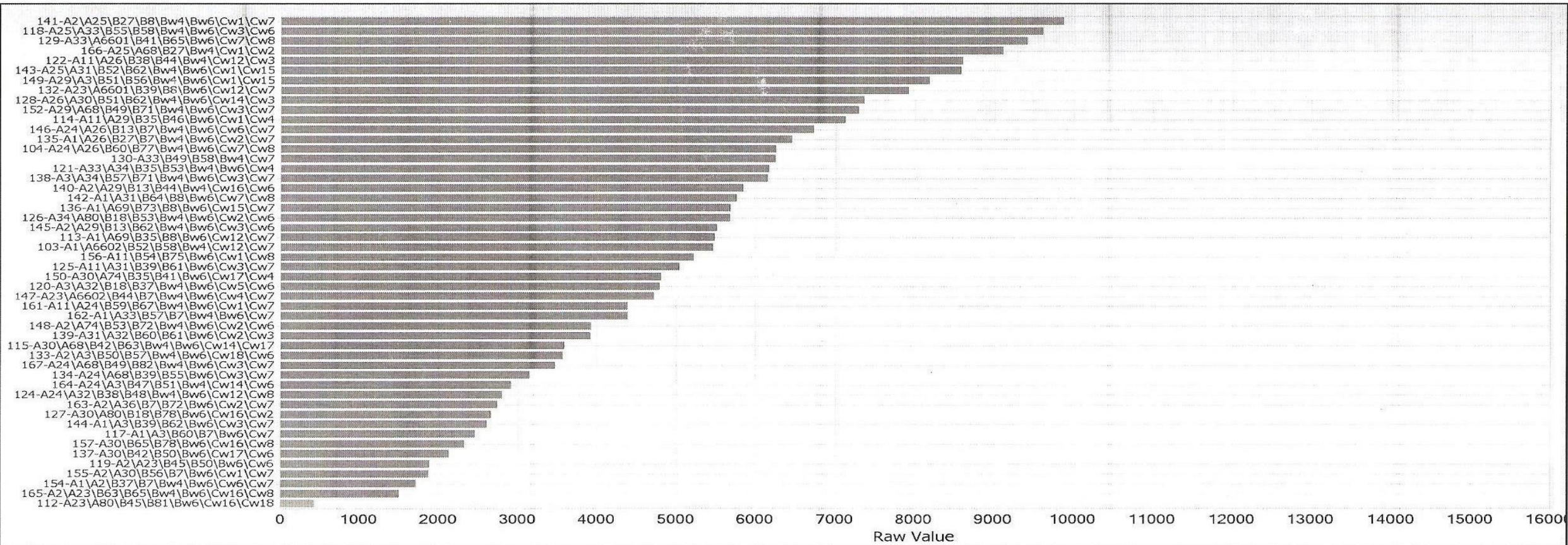
Expiration Date: 15.05.2014

Donor Number:

Donor Center #:

Reported By: Lab Supervisor

% PRA: 98



Lumineks- PRA tanımlama HASTA (Y): PRA (+)

Patient Name:	Class II ID Results	Donor Number:
Sample ID: 13082014-8	Batch ID: 13082014 pra class 2	Donor Center #:
Patient DOB:	Draw Date:	Reported By: Lab Supervisor
Accession #:	Lot ID: 3001075 3001	% PRA: 73
Patient HLA Type:	Expiration Date: 15.06.2014	

Report Parameters

Method Type: Standard Calculation

Positive MFI: 14,865	CON 1 MFI: 77	CON 2 MFI: 98	CON 3 MFI: 267	Cal CON MFI: 149	Adjust Value Cutoff Value: 0.0	Assignment Cutoff: 2
Tail Type: AUTOMATIC	Tail Sort By: R-Value	R-Value Cutoff: 0.00	% Positive Cutoff: 50			

Tail Antigens

Specificity	TP(++)	FP(+/-)	FN(-+)	TN(--)	N	Chi ²	R-Value	% Positive	Strength
DR53	11	12	1	18	42	9.24	0.47	92	1980
DQ9	3	9	0	18	30	5.00	0.41	100	1692
DQ8	2	7	0	18	27	4.32	0.40	100	2890
DQ4	2	5	0	18	25	5.59	0.47	100	1212
DR18	2	3	0	18	23	7.89	0.59	100	526
DQ6	1	2	0	18	21	6.30	0.55	100	681
Overall	21	2	1	18	42	30.88	0.86	95.45	-----

Antibody Assignments: DQ4,DQ6,DQ8,DQ9,DR18,DR53

Masked Antigens: DR4, DR9

Excluded Antigens: None

Luminex PRA tanımlama

Tail Antigens									
Specificity	TP(++)	FP(+ -)	FN(- +)	TN(--)	N	Chi ²	R-Value	% Positive	Strength
DR4	4	15	0	23	42	5.35	0.36	100	1994
DQ8	2	13	0	23	38	3.24	0.29	100	2249
DR10	3	10	1	22	36	2.95	0.29	75	1270
DQ6	1	9	0	22	32	2.27	0.27	100	1992
DQ9	2	7	1	21	31	2.28	0.27	67	1356
DR8	2	5	1	20	28	3.11	0.33	67	1220
DR17	2	3	2	18	25	2.68	0.33	50	1173
DR16	1	2	1	17	21	2.30	0.33	50	1264
DR1	1	1	2	15	19	1.97	0.32	33	1531
Overall	18	1	8	15	42	15.86	0.61	69.23	-----

Antibody Assignments: DQ6,DQ8,DQ9,DR1,DR10,DR16,DR17,DR4,DR8

Masked Antigens:

Excluded Antigens: None

Lumineks tek antijen saptama

- Tanımlama ile bulunan Ab'ın tek antijen düzeyinde ayrımını yapar
- Nakil için kabul edilemez Ab belirlenir
- Her HLA lokusunda farklı allerin karşılığı ayrı ayrı mikrobuncuklara bağlanan paneller. 94 sınıf 1, 57 sınıf 2 Ag
- Sanal XM
- *Tüm HLA tiplemesi yok, önemi belirsiz veya tespit edilemeyen Ab-Ag?*
- Lizat kullanılmaz
- *Pahalı bir yöntem.*

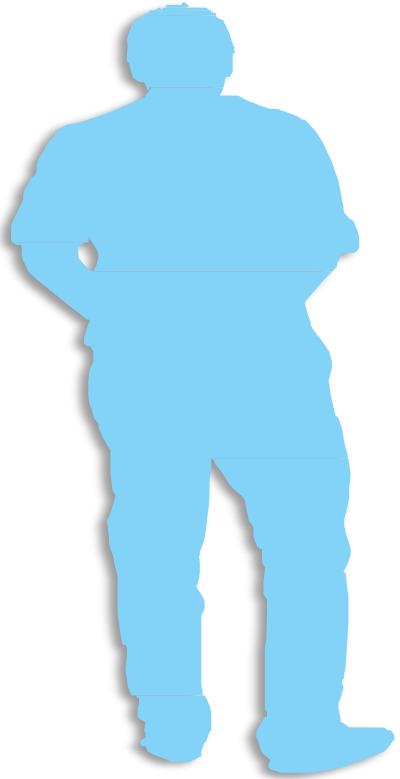
LSA

ff	Raw Value	MFI/LRA	Assignment	BG Adjusted	AD-MFI	AD-BG Adjusted	DR/DR5x	DQA	DQB
	1228	13.35	Positive	1064	1156	1002		DQA1*02:01	DQB1*02:01
	1131	12.29	Positive	946	1016	850		DQA1*03:02	DQB1*02:02
	1035	11.25	Positive	856	988	817		DQA1*02:01	DQB1*02:02
	986	10.71	Positive	787	968	773		DQA1*05:01	DQB1*02:02
	868	9.43	Positive	669	913	704		DQA1*05:01	DQB1*02:01
	584	6.87	Negative	405	515	357	DRB1*16:02		
	572	6.22	Negative	76	517	69		DQA1*01:02	DQB1*06:04
	507	5.51	Negative	61	522	63		DQA1*01:01	DQB1*05:01
	359	3.90	Negative	187	319	166		DQA1*01:02	DQB1*05:01
	313	3.68	Negative	141	287	129	DRB1*07:01		
					320	126		DQA1*04:01	DQB1*04:02

SANAL - XM

Hasta doku tiplemesi

Donör doku tiplemesi

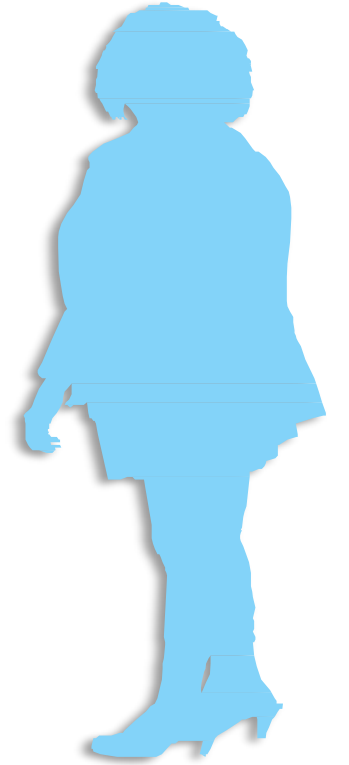


PRA
tarama

(-)

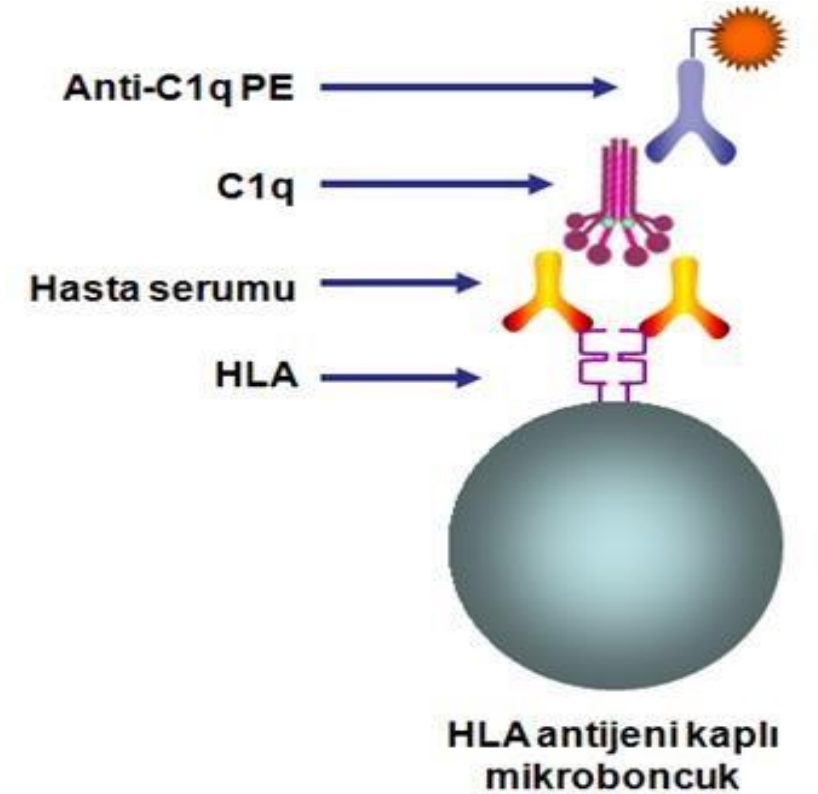
SANAL XM

(+) → SAB →
Kabul edilemez Ag tayini



Lumineks C1q

- Komplemanı bağlayan Ig G1,3, Ig M tespit eden daha duyarlı bir yöntem
- Özgüllük  AAAR risk değerlendirmesi
- İViG nedeni ile yanlış + için ideal



C1q-Fixing Human Leukocyte Antigen Assay in Immunized Renal Patients: Correlation Between Luminex SAB-C1q and SAB-IgG

S. Llorente, F. Boix, J. Eguia, M. López, A. Bosch, H. Martinez, M.J. Gonzalez, R. López-Hernández, G. Salgado, M.R. Moya-Quiles, J.A. Campillo, A.M. García-Alonso, A. Minguela, L. Jimeno, M.R. Álvarez-López, and M. Muro

Table 1. Selected Representative Examples of Antibody Models with Differences in Study Cohort

Patient	By IgG-SAB MFI _{max}	By IgG-SAB	By C1q-SAB MFI _{max}	By C1q-SAB
GLJP	1000	A25, 24, 23, 32, B57 , 63, 27, 45, 58, 44	2700	A23, 24, 25, 32, B57
CSD	3800	A1, 2, 25, 30, 31, 34, 68, 74, 80 , B7, 37, 42, 55, 67, 76 , 81, 82, 76	1000	A80, 74, 32, B76, A3, 24, 23, 32 (2)
VPMC	9500	A23, 24, 25, 32 , B27, 37, 38, 44, 47, 49 , 51, 52, 53, 57, 58, 63, 77	1700	A23, 24, 32, B49
NPA	3600	A1 , 11, 23, 24, 25, 26, 34, 36, 43, 66, 68 , B7, 8, 13, 27, 37, 38, 41, 42, 44, 49, 50, 52, 54, 55, 59, 60, 61, 62, 67, 72	4800	A1, 25, 26, 34, 36, 43, 66, 68, A3
GJA	6500	A66, 80, 1, B58, 51 , 81, 77, 27, 71, 44 , 48, 47, 62, 57, 7, 55, 72, 61 , 63, 76, 60, 52, 67 , 82, 54, 45, 8, 42, 39, 13, 53, 41, 59, CW17	1900	B62, 71, 72, 60, 41, 55, 27, 61, 67, 52, 45, 42, 50, 7, 13, 59, CW17, 53, 57, 51, 44, 39, 77
GMJ	1000	B45, 76, 82, 44	8000	B45, 76, 82, 44
BPMA	14500	A1 , 2, 24, 23, 3, 29, 11, 36, 80, 31, 68, 33, 30, 74, 34, 69, 66, 32, B57, 76, 45, 58 , 35, 75, 82 , 50, 44, 72 , 51, 49, 62, 71, 78 , 13, 52, 41, 53, 60, 61 , 56, 46, 63, 13, 77, 47, 55, 8, 54, 18, 37, 65, 59, 27	800	A1, 23, B61, 44, 58, 62, 71, 72, 78, 82

Bold letters note the shared specificities between IgG-SAB and C1q-SAB. MFI_{max} maximum median fluorescence intensity; SBA, Single Antigens Beads.

Transplantation Proceedings, 44, 2535–2537 (2012)

TABLE 1. Methods for antibody screening and cross-matching in solid organ transplantation

Method	Pretransplantation screening	Pretransplantation XM	Comment	Basic information pretransplantation	Posttransplantation	Comment
CDC/CDC modified	+++	+++	Prevention of HAR or early AMR	+	-/+	Donor cells required
FC/FC modified	+++	+++	Prevention of HAR or early AMR	+	+	Donor cells required
ELISA generic	+++	—	Detection of HLA antibodies	+	-/+	Useful only if patient nonsensitized
ELISA specific	+++	—	Specification of HLA antibodies	(Only if patient sensitized)	++	Low level of sensitivity
LUM generic	+++	—	Detection of HLA antibodies	+	-/+	Detection of antibody breadth and level
LUM phenotype	+++	—	Specification of HLA antibodies	+	++	Low level of sensitivity
LUM SAB	+++		Comprehensive specification HLA antibodies	+	+++	Comprehensive locus/allele specification

The assays are scored from not valuable (—) to very valuable (+++). The comparative sensitivities are LUM>ELISA/FC>CDC. Note there are no convincing data that demonstrate ELISA is more sensitive than FC.

AMR, antibody-mediated rejection; CDC, complement-dependent lymphocytotoxicity; ELISA, enzyme-linked immunosorbent assay; FC, flow cytometry; HAR, hyperacute rejection; HLA, human leukocyte antigen; LUM, Luminex-based immunoassays (generic, phenotype, and single-antigen beads [SAB]); XM, crossmatch.



Figure 2 - Facial edema in a 26-year-old man victim of multiple honeybee stings in Macapá, Amapá, Brazil (authors' archive)

Figure 1 - Pathophysiology of

Bee s
ee veno
into bloo



Figure 3 - Lower limb edema in a 26-year-old man victim of multiple honeybee stings in Macapá, Amapá, Brazil (authors' archive)

is
cute ki



Figure 4 - A 26-year-old man victim of multiple honeybee stings in Macapá, Amapá, Brazil, after intensive care support, at the time of hospital discharge, showing no facial or lower limb edema

review

nior¹,
João de
i², Elvino



**İntihar etmek için 4. kattan atladı... 1 kişinin
üstüne düşerek ağır yaralandı
İstemeye gittiği kızın abisini
vurdu**

.....

Dinlediğiniz İçin
Teşekkürler