

Platelet Epitopes

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Will cover...

- Standard Antigen Matching
- Epitope Matching
- Case study

Standard Antigen Matching

Platelet Refractoriness

Corrected Count Increment (CCI) of less than between 3,000 – 5,500 per μL per m^2 per 10^{11} platelets 1 hour post transfusion.

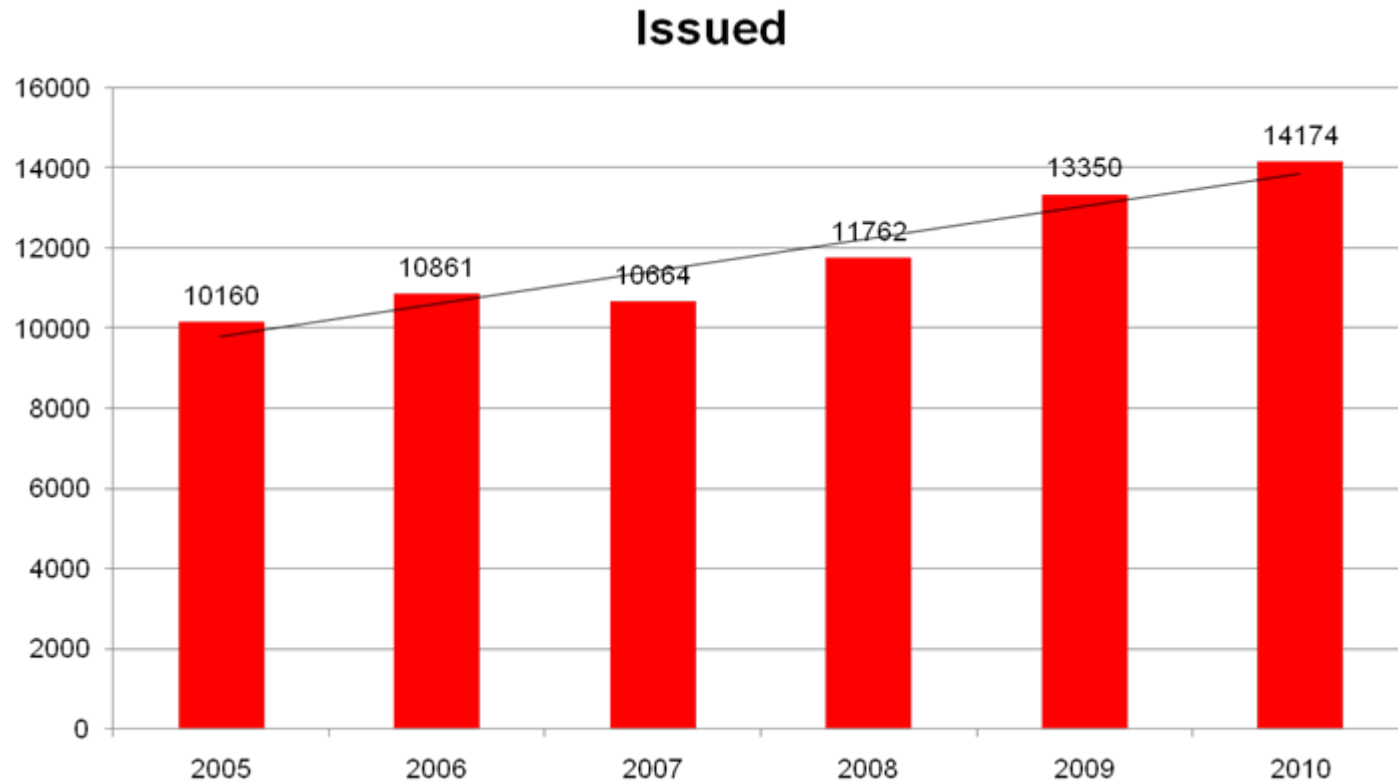
$$\frac{\text{Platelet Count Increment } (/ \mu\text{L}) \times \text{Body Surface Area } (\text{m}^2)}{\text{Platelets Transfused } (\times 10^{11})}$$

Bishop JF, Matthews JP, Yuen K, McGrath K, Wolf MM, Szer J. The definition of refractoriness to platelet transfusions. *Transfus Med* 1992; 2: 35-41

Practical Definition

Increase in patient's platelet count of $<10 \times 10^9/l$ between 1 and 24 hours after the transfusion of an adult dose of ABO compatible apheresis platelets on two separate occasions.

Number of HLA Selected Platelets Issued



Selected Platelets

- Receive request
- Assess request
- Tissue type and HLA antibody screen patient
- Panels searched to select donor
- Issue platelets
- Obtain increment data
- Weekly review meetings

Match Grades

- Platelets are matched at the HLA-A and B Loci
- 'A' match = complete match (30%)
- 'B1'- 'B4' match = mismatched for between 1 and 4 HLA antigens (70%)

Match grade 'A' examples

donor	A1, A2	:	B8, B44
Patient	A1, A2	:	B8, B44
donor*	A1, X	:	B8, X
Patient	A1, A2	:	B8, B44

*homozygous donor

Match grade 'B' match examples

B1 match

donor: A1, A2 ; B8, B27
patient: A1, A68 ; B8, B27

B2 match

donor: A1, A66 ; B7, B27
patient: A1, A68 ; B8, B27

Epitope Matching

HLA Matchmaker

HLAMatchmaker is based on two principles

1. An HLA antigen can be treated as a set of epitopes with each epitope potentially capable of being recognised by antibodies
2. A person cannot make antibodies against one of their own epitopes. A donor who shares those epitopes should therefore be compatible even if the shared epitopes are not at the same HLA antigen

Duquesnoy RJ. HLAMatchmaker: a molecularly based algorithm for histocompatibility determination. I. Description of the algorithm. *Hum Immunol* 2002; 63:339–352.

Traditional vs. Molecular Matching

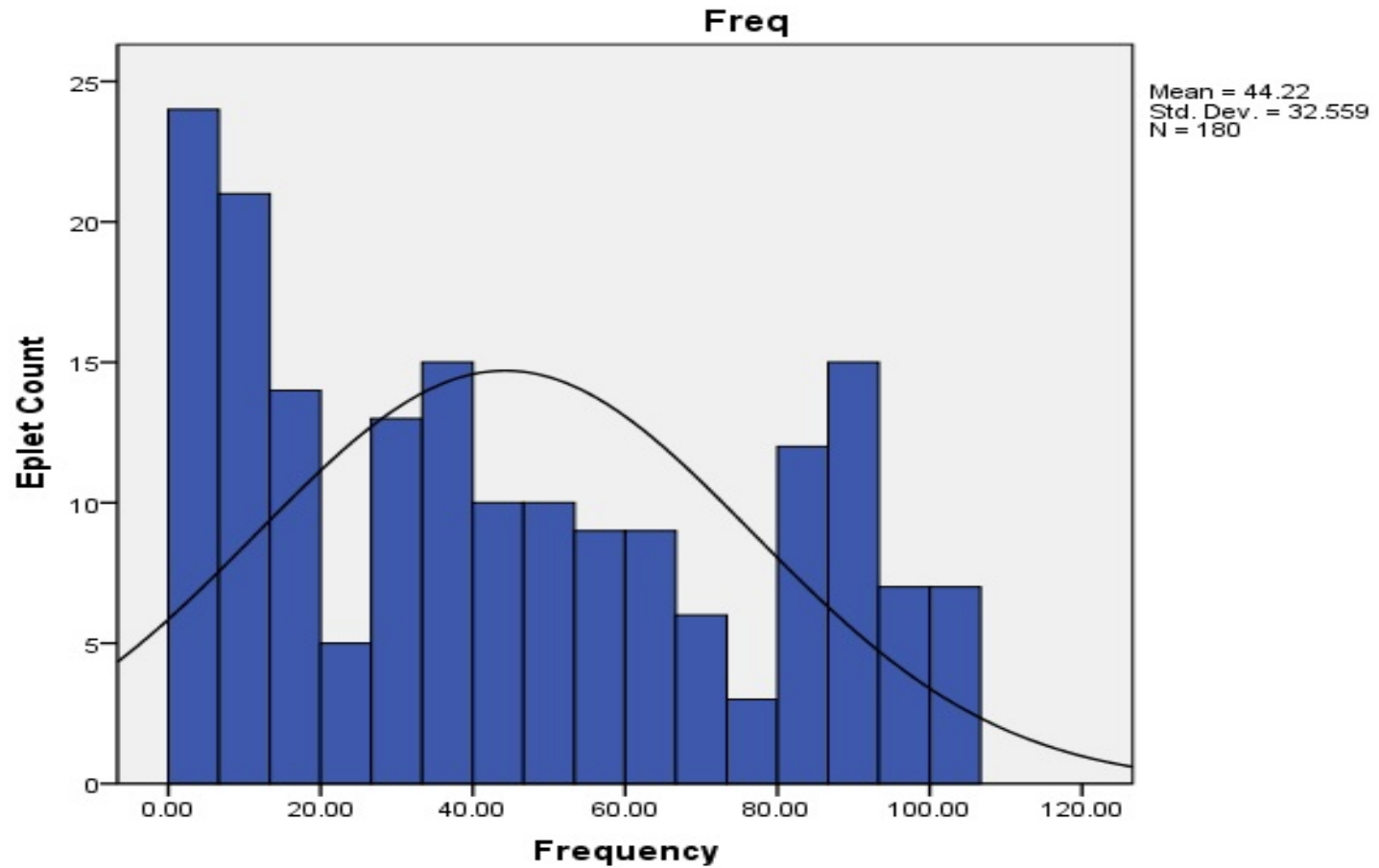
Consider a platelet patient with HLA type A2, 30; B42, 53 and two potential donors D1 and D2 with types as listed

	TYPE	MM	Epitopes
Patient	A2, 30; B42, 53		
D1	A2, 29; B7, 53	B2	8
D2	A30, 69; B8, 35	B3	1

Platelet Donor Ethnicities

Ethnicity	N (%)
Caucasoid	11,073 (98.10%)
Asian	94 (0.83%)
Black	74 (0.66%)
Other	46 (0.41%)

Epitope Frequencies



Low, Intermediate and High Frequency Eplets

Type	Eplet	Freq.	Antigens
Low Frequency Eplets (LFE)	149TAH	8.46%	A25, A26, A34, A43, A66
	113HN + 116Y + 151RE	9.13%	B51, A52, A78
	65GKA	17.63%	A23, A24
Intermediate Frequency Eplets (IFE)	76ERI + 82ALR	44.09%	Bw4
	62RN + 180E	50.98%	B7, B8, B42 , B81
	144TKH / 142MT	54.85%	A2, A68, A69
High Frequency Eplets (HFE)	90D	81.27%	A1, 80, B73, Cw4, 6, 7, 18
	149AAH	84.69%	A2, 3, 11, 24, 68, 69
	73TS + 76ERN + 82LRG	86.10%	Bw6

Case Study

Case Study

- Patient BM, F, MDS
- HLA Type A*03, A*30; B*13, B*37
- Luminex SAB – Pos with:
 - A*01:01 MFI=1790
 - A*02:03 MFI=1221
 - A*02:01 MFI=1217
 - B*08:01 MFI=1131
 - A*02:06 MFI=1087

Case Study Cont.

- HLAMatchmaker analysis shows antibodies to the following Eplets:
 - 163RG
 - 63GEK
 - 66QIF156DA
- These Epitopes are shared by:
 - B*44:06
 - B*51:08
- Patient issued B44 or B51 plts for 6/31 Tfns

Future

- Epitope matched platelet study lead by Cristina Navarrete and Judith Marsh
- Randomised crossover trial of standard platelets and Epitope matched platelets in AA and low risk MDS patients
- Due to start recruiting soon

Thank you