

Poster 220: Demonstrating the Feasibility of Eplet-Matching in a Canadian Organ Allocation Simulation Model

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Introduction:

- Prospective eplet (epitope) matching is an innovative, biologically-relevant method for achieving donor-recipient compatibility to improve transplant outcomes
- We have demonstrated the population frequencies of antibody-determined (n=150) and non-Ab-determined epitopes (n=x) across class I and class II gene loci for donors and recipients within the Canadian population
- By computer simulation of this data, we define the minimum required waiting list sizes for matching at all and critical HLA loci and confirm the feasibility of prospective epitope matching in Canadian provincial and national renal transplant programs



Methods

- Next-generation sequencing at the 11 HLA genes was performed in 1,262 kidney patients and donors from British Columbia, Canada
- HLA genotypes were converted into antibody-verified eplets using HLAMatchmaker v2
- Computer simulations of deceased donor organ allocation were performed with and without eplet-matching (i.e. baseline) in R.
- Canadian provincial waitlist sizes and donor rates were used for analysis.

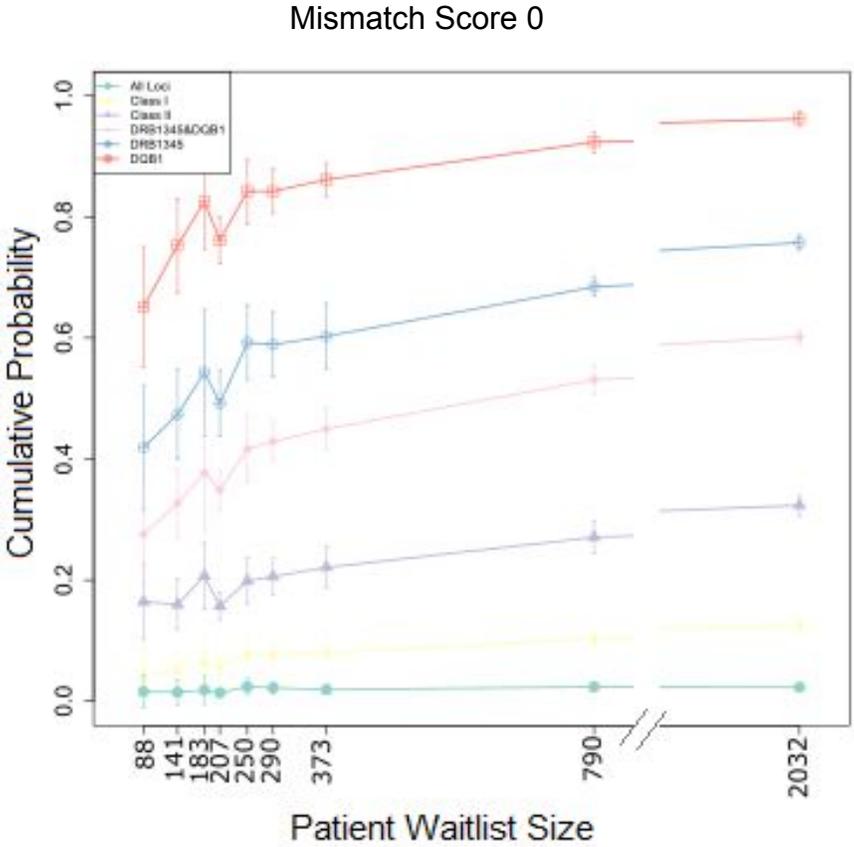
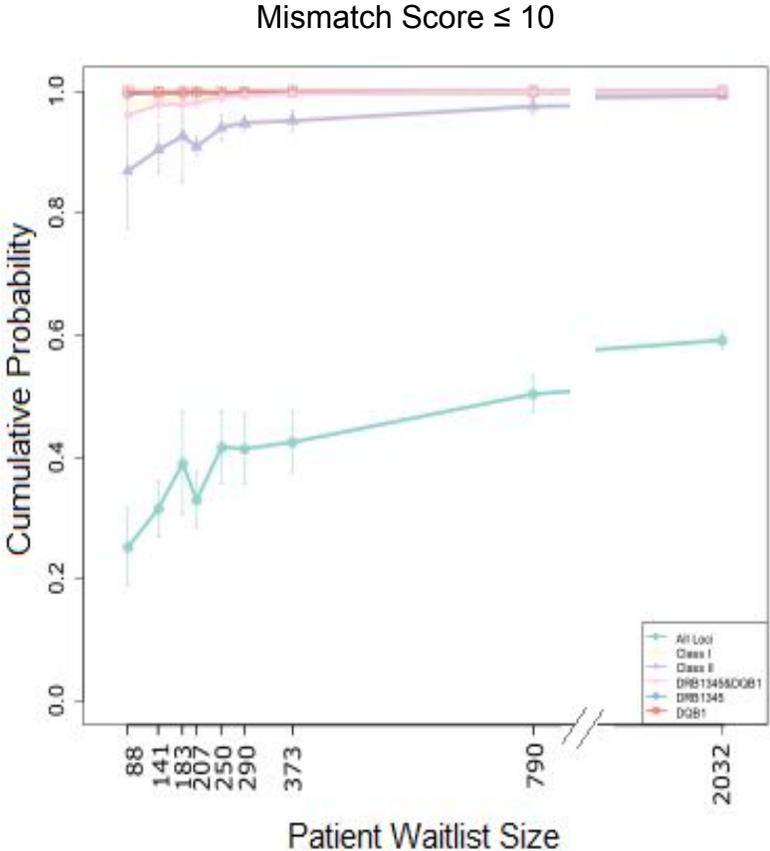
Table 1. Comparison of eplet mismatches (antibody-verified) between baseline simulations versus simulations that including eplet-matching

HLA Genes	Median and Range of Eplet Mismatches Across All Matched Recipient-Donor Pairs	
	Baseline	Eplet-Matching
All 11 HLA genes	27.35 (0 - 62)	9.3 (0 - 22)
Class I (A, B, C)	10.2 (0 - 27)	3 (0 - 11)
Class II (DR, DQ, DP)	16.8 (0 - 45)	1 (0 - 13)
DRB1/3/4/5	6 (0 - 20)	0 (0 - 4)
DQB1	6 (0 - 21)	0 (0 - 5)
DRB1/3/4/5 + DQB1	12.3 (0 - 39)	0 (0 - 10)



Results and conclusions

The effect of patient waitlist size and donor rates on mismatch score



- A high degree of compatibility appears achievable with most waitlist sizes tested and perfect identity at DQB1 can be obtained with a waitlist of 250 patients or more
- Eplet-matching appears feasible in most Canadian transplant programs, avoiding the necessity for a national sharing program to enable this strategy.

