

AN ANALYSIS OF UNIQUE HLA PHENOTYPES IN THE WELSH BONE MARROW DONOR REGISTRY

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Introduction

In considering future HLA typing and donor recruitment strategies for the Welsh Bone Marrow Donor Registry (WBMDR) we examined the extent to which unique HLA-A,B,DR,DQ phenotypes were added to the WBMDR's donor panel.

New donor phenotypes are added to the panel on a daily basis and after 10 years and 10 months the WBMDR's panel consisted of 24,412 HLA-A,B,DR and DQ typed donors (to end of November 1999).

Unique HLA phenotypes

Examination of 23,421 HLA-A,B,DR,DQ phenotypes (95.94% of the total panel) delineated to the same resolution (essentially split specificity level) showed that:

- ☒ 55.12% (12,909) of the phenotypes occurred once only, i.e., they were unique.
- ☒ The number of unique phenotypes dropped to 50.25% (11,768) when HLA-A,B and DR only were considered.

Influence of panel size

The number of unique HLA-A,B,DR,DQ and HLA-A,B,DR phenotypes present in the panel was calculated on a monthly basis for each of the 130 months of the panel's existence. Similarly, the number of unique phenotypes contributed to the whole panel each month was calculated as a percentage of the total new donor phenotypes added during that month.

As expected, these proportions fell with increasing panel size. For example, when the total panel was only 480 donors, 92.3% of the HLA-A, B, DR phenotypes were unique. This dropped to 66.7% with 5,034 donors, 60.1% with 10,114 donors and 55.2% with 15,185 subjects (Figure 1).

A logarithmic and exponential trend analysis of this information indicated that even when the panel contains 50,000 donors, i.e. just over twice its current size, at least 30% of new donors added would each have a unique HLA-A, B, DR phenotype delineated at the split specificity level (Figure 2).

Comment

This study was performed on HLA phenotypes assigned to the split specificity level. Since most transplant units are now requiring allele level recipient/donor matching (at least for HLA-DRB1) and HLA-C matching, these data supports the expansion of the Welsh Bone Marrow Donor Registry's donor panel for the foreseeable future.

Figure 1. Frequency of unique HLA-A, B, DR/DQ phenotypes with increasing panel size

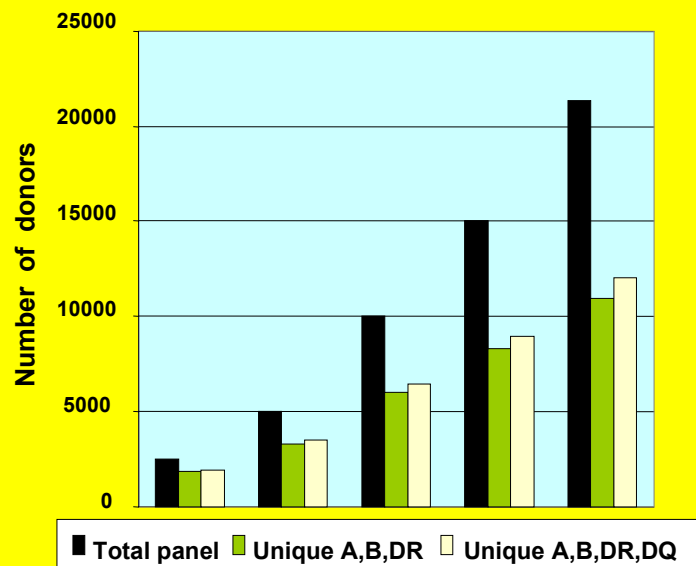


Figure 2. Extrapolation of unique HLA-A, B, DR phenotypes (% of monthly increment of new donors added to an expanding donor panel)

