

ACCURACY OF HLA-B27 TYPING IN THE UNITED KINGDOM AND REPUBLIC OF IRELAND - 1996-2001



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Introduction

UK National External Quality Assessment Schemes for Histocompatibility and Immunogenetics (UK NEQAS for H&I) have provided an HLA-B27 phenotyping scheme (Scheme 1A) since 1990.

Here we present a prospect of the accuracy of HLA-B27 assignments in the UK and the Republic of Ireland over the six-year period from 1996 to 2001.

Participating laboratories

The number of laboratories participating in Scheme 1B increased steadily from 37 in 1996 to 55 in 2001. A total of 28 laboratories reported for the whole six-year period.

Typing methodology

HLA-B27 typing techniques slowly changed over the period with 54% of laboratories using a complement dependent cytotoxicity technique in 1996 compared to 22% in 2001.

Conversely, flow cytometry and the use of DNA-based methods (primarily PCR-SSP) increased from 16% and 35%, respectively in 1996 to 38% and 44%, in 2001.

Blood sample distribution

A total of 72 selected blood donor samples were distributed over the six-year period.

HLA-B27/B2708 (B*27) positive samples ranged from 4 to 7/year (total of 34, including one B2708).

HLA-B7+, B27- samples were distributed each year (2-5/year), while other potentially 'challenging' donor samples included those possessing HLA-B47 or B13 with or without B7. Blood samples from donors who were homozygous for HLA-B7 were also distributed.

HLA-B27 accuracy index

For each year of the six-year period a B27 accuracy index (AI) was calculated as: % of correct assignments over those reported.

The yearly AI changed little over the period (range 96.0% to 98.4%, mean of 97.4%).

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On behalf of the UK National External Quality Assessment Schemes for Histocompatibility and Immunogenetics Steering Committee

The lowest AI value (96.0%) was caused by an HLA-B2708 (found B27 negative by 6 laboratories using the complement dependent cytotoxicity technique and B27 negative by 9 laboratories using flow cytometry). If B2708 was excluded from that year's data the AI was 98.5%.

HLA-B27/B2708 assignment errors over the six-year period

Over the six years there were 3,493 B27/B2708 assignments and 94 assignment errors.

This gives an overall B27/B2708 assignment error rate of 2.7%.

Association of assignment errors with typing method

The use of the PCR-SSP method accounted for 4 errors (2 false positives and 2 false negatives) while the use of the complement dependent cytotoxicity (CDC) technique was associated with 5 false positives and 12 false negatives (6 associated with B2708). However, flow cytometry-based (FC) typing resulted in 47 false B27 positives and 26 false B27 negatives (9 with B2708) (Figure 1). 80.9% of flow cytometry false positives were associated with HLA-B7 positive samples ($n=18$), $p < 0.0001$.

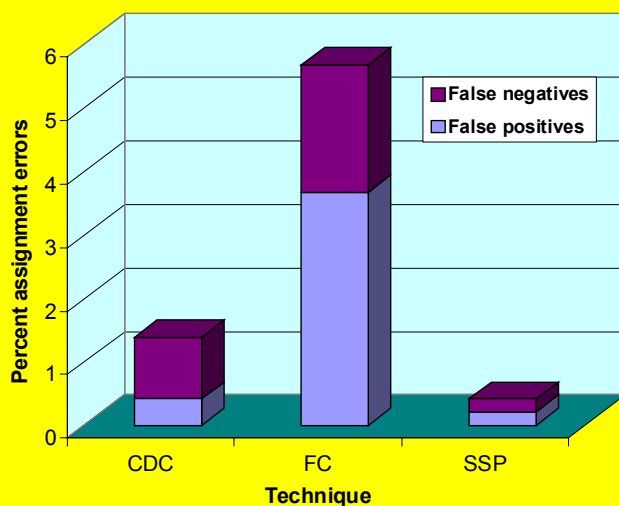


Figure 1. Erroneous HLA-B27 assignments

Comment

The data indicates that there are 2 to 3 HLA-B27/B2708 misassignments for every 100 samples typed in the UK and the Republic of Ireland.

A substantial proportion of these are made using flow cytometry-based methods.

False positive HLA-B27/B2708 assignments made using flow cytometry are most likely in HLA-B27/B2708 negative patients who are HLA-B7 positive.