

Abstract 26

## HLA Analysis of the Australian Cord Blood Banks: How Diverse Are Donors?

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**Introduction:** The network of public cord blood banks (CBB) in Australia, known as AusCord, is comprised of CBB located in Brisbane, Sydney, and Melbourne. The network stores almost 37,000 cord blood units (CBU) and has released more than 1,300 for transplantation.

**Objective:** The objectives of this study were (1) to determine the relative diversity of HLA allele subtypes, tissue types, and haplotypes at each of the banks and between the banks and (2) to identify common tissue types and haplotypes that could be utilized for clinical research and development of third party cell therapy products.

**Methods:** HLA data was obtained for 36,782 CBU stored in the AusCord inventory. To standardize data format, high-resolution typing was converted to 2-digit typing. HLA allele subtypes were ranked from most to least common. A subset of Indigenous Australian and Pacific Islander HLA allele subtypes was interrogated to determine whether increased frequency correlated with declared ethnicity. Tissue types were separated into CBU that had HLA-A, HLA-B, HLA-C, and HLA-DRB1 typing (21,815 total) and CBU that did not have HLA-C typing (36,782 total). CBU tissue types were interrogated in 3

separate groups: searchable, searched, and released inventory. Haplotypes were confirmed where maternal typing was available (3,105 CBU).

**Results:** Ethnicity screening for donors and strategic location of collection sites servicing ethnic minority communities resulted in banking of Indigenous Australian and Pacific Islander HLA. At a bank and network level, there was a similar frequency of specific HLA subtypes; however, when considering the tissue types, there was vast diversity (~75% unique with 8 allele typing). Whilst there is diversity, there was also a fraction of the inventory that exhibited repetitive tissue types that could be utilized for clinical research.

**Discussion:** The study demonstrates that cord blood collections are able to boost storage of diverse tissue types in, and unique to, a multicultural population such as Australia. This finding can guide policy development and funding, as well as operational decisions at the CBB. Furthermore, CBB are well positioned to support research and development activity aimed at discovery of new applications for cord blood units through supply of GMP grade cryopreserved products exhibiting common tissue types and haplotypes.