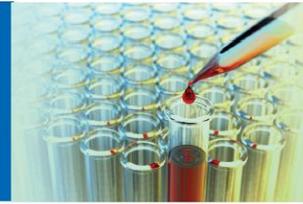


# 9



## Human Leucocyte Antigen (HLA) and Their Clinical Significance



### Chapter summary

- The human leucocyte antigens play a pivotal role in the induction and regulation of immune responses as the main function of HLA molecules is the presentation of peptides derived from foreign molecules to T lymphocytes.
- A key feature of the HLA system is its extensive polymorphism which is advantageous to humans in enabling responses to a wide variety of pathogens, but presents a barrier to transplantation and some transfusions.
- The immunological complications of transplantation and transfusion such as allograft rejection, graft versus host disease, and platelet refractoriness can be limited by HLA matching. A higher degree of HLA matching is required for T cell-mediated complications such as GvHD in HSCT, compared with antibody-mediated complications such as immunological platelet refractoriness.
- The current technology used for the definition of HLA polymorphism is DNA-based molecular techniques, allowing the discrimination between different HLA alleles for HSCT or antigens for solid organ transplantation or platelet transfusion. The availability of purified single HLA molecules has revolutionized antibody detection and definition such that complex antibody reactivity can be defined in a single Luminex-based test.
- Advances in allele, antigen, and antibody definition are associated with challenges in determining the clinical relevance of this increased sensitivity.
- Immunosuppression is highly effective, but is a 'broad-brush' approach to downregulate the immune response. Side effects include increased incidence of cancer and infection.
- Xenotransplantation has taught us valuable lessons as to the interactions of grafts with all arms of the immune response from innate (e.g. inappropriate complement deactivation) to humoral and cellular responses.