

Transplant Immunology I

Using molecular HLA matching to avoid sensitization

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Donor-specific antibody (DSA) development is a major complication in transplantation. DSAs are associated with immune mediated injuries, inferior graft survival, impaired quality of life, and increased healthcare costs. DSA develop upon recognition of non-self-human leukocyte antigens (HLA) by kidney transplant recipients' immune system. Polymorphic amino acid sequences on surface of donor HLA molecules are believed to induce anti-HLA antibodies. Avoidance of immunogenic polymorphic residues that are present in the donor but absent in the recipient, may be an appealing strategy to minimize risk for immune injury and optimize transplant outcomes. Assessing molecular compatibility could decrease misclassification of post-transplant immunological risk by improving specificity when pre-formed antibodies are confirmed to be directed against donor HLA. Assessing molecular compatibility may also increase the sensitivity with which immunological risk is estimated when identifying molecular mismatches that could induce new, not previously detected, donor-specific antibodies post-transplant in patients without evident memory response. We will review strategies to assess molecular HLA compatibility and outline a roadmap for its integration into organ allocation schemes to minimize sensitization.