Asian Transplantation Week 2023

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Session Title : -

Current progress of transplant genetics

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Transplantation is often the only available treatment for patients with significant congenital disease and/or end-stage disease failure. Advances in surgical techniques, drugs and patient management have yielded gains in short- and long-term transplant outcomes over the last few decades, yet the 5-year allograft survival rates are still ~50-90% depending on allograft-type. This is due to an interplay of immune-related and non-immune co-morbidities including increased risks of renal insufficiency, and complications in cardio-metabolic, infections and malignancies. Acute rejection is most likely to occur in the first 12 months post- transplant, increasing the risk of additional acute and downstream graft damage, and greatly impacts allograft survival. Rejection pathogeneses are complex and affected by many established factors such as number of HLA mismatches, IST regimens, and donor/recipient (D/R) age.

The International Genetics & Translational Research in Transplantation Network (iGeneTRAiN) was instigated to address this very need by generating and aggregating large numbers of well characterized D-R or 'recipient-only' genome-wide genotyping and other omics datasets, to accrue sufficient numbers of phenotypes/ outcomes. Our initial aims were to harmonize genome-wide genotyping and phenotypic datasets across trans-ethnic heart, kidney, liver and lung transplant studies, and integrating analyses and risk models to increase statistical power to detect transplant-related outcomes. iGeneTRAiN has now aggregated GWAS and phenotypic datasets from >56,000 DNAs from transplant subjects and controls (with >12,600 D-R pairs), collected from 1989 to present. These cohorts offer significant value for a number of studies including: enriched elucidation of additional primary disease loci (underpinning end-stage diseases in renal- liver- heart- and lung patients), multiomic resources for minimally invasive prognostic and diagnostic biomarker studies, and the opportunity to perform drug repositioning studies using large numbers of transplant outcomes.