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## Development of a comprehensive high-coverage, cost effective HLA typing assay

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The human leukocyte antigen (HLA) is responsible for regulation of the immune system in humans. HLA typing has important clinical significance for tissue transplantation matching, autoimmune disease-association studies and drug hypersensitivity research. However, the highly polymorphic essence of the HLA genes makes it a challenging task. Conventional methods like SSO and SSP only provide lower resolution typing results and cannot identify new alleles. High-resolution techniques like SBT required other methods for confirmation of phasing and it is time consuming. Single Molecule Real Time (SMRT) sequencing is a parallelized single molecule DNA sequencing by synthesis technology developed by Pacific Biosciences. It has long read lengths which enable unambiguous phasing of the entire HLA genes. However, the cost of the SMRT sequencing is still too high for clinical routine use. To develop clinically implementable HLA typing assay by using SMRT sequencing technology, we designed two sets of multiplex PCR primers for the HLA genes. The first assay we developed enables the HLA typing of A, B, C, DRB1, DQB1, DQA1, DPA1 and DPB1 genes for one patient by using one SMRT cell. The second assay we developed enables the typing of HLA-A genes for up to 50 patients by using one SMRT cell. Our assays provided choice of both coverage and cost-effectiveness.

## **Biography**

Qu Zhengzhong James has completed his PhD from the Chinese University of Hong Kong, Department of Chemical Pathology. He is the laboratory Manager of the POLARIS (Personalized OMIC Lattice for Advanced Research and Improving Stratification), a strategic program to pilot the application of clinical genomics in the treatment and diagnosis of medical diseases in Singapore and the region. His job responsibility is to make sure all the testing procedures in the lab will meet the requirements from Singapore Ministry of Health and also meet the guidelines from the College of American Pathologists.

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