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CLINICAL UTILITY OF URINE CULTURE-DERIVED CELLS FROM KIDNEY TRANSPLANTED RECIPIENTS

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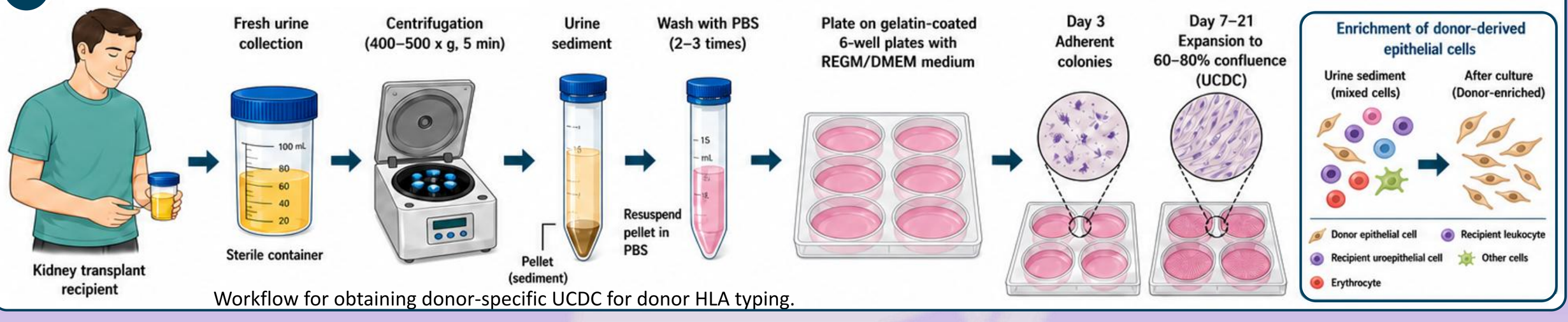
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Donor HLA typing is critical for diagnosing donor-specific antibodies (DSA) in kidney transplant recipients. Yet, many patients transplanted outside Hong Kong lack complete donor HLA information. This study assessed a culture-based enrichment method using recipient urine to recover donor HLA data and facilitate DSA diagnosis.

Urine-derived culture cells (UCDC) were established from fresh urine samples of recipients with incomplete donor typing. Donor cell enrichment was verified by short tandem repeat (STR) analysis. HLA typing from UCDC was then applied to DSA evaluation.

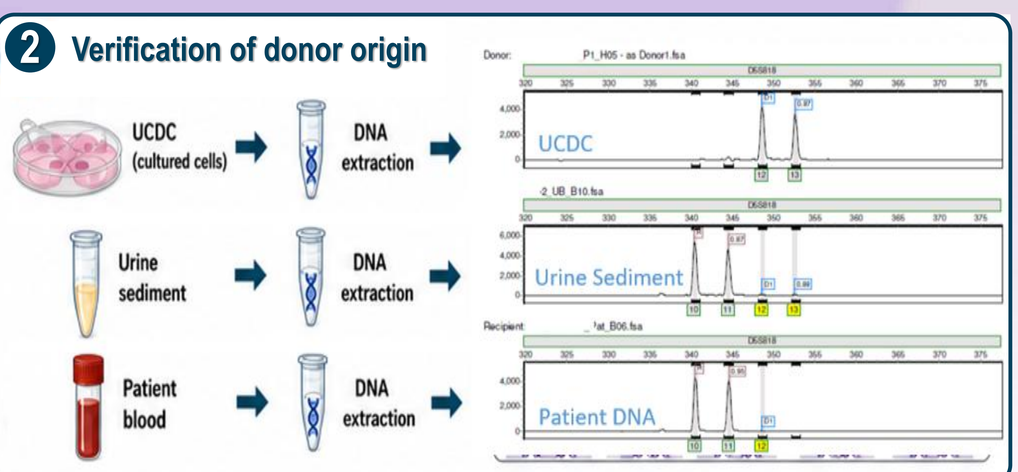
Between 2024–2026, 100 recipients with unknown (n=96) or incomplete (n=4) donor typing were enrolled. Mean urine volume was 257 mL (range: 90 - 391 mL), collected at a mean of 3,945 days post-transplant. UCDC were harvested after 14 days, yielding high-quality DNA (47.1± 29.6ng/µL; OD 260/280 ratio 1.79). STR confirmed enrichment from 17.4±19.8% (sediment) to 98.8±2.5% (UCDC)).

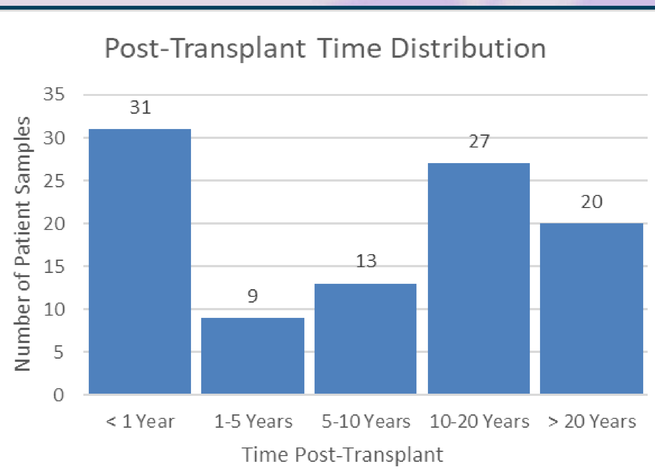
1 Urine collection and UCDC enrichment

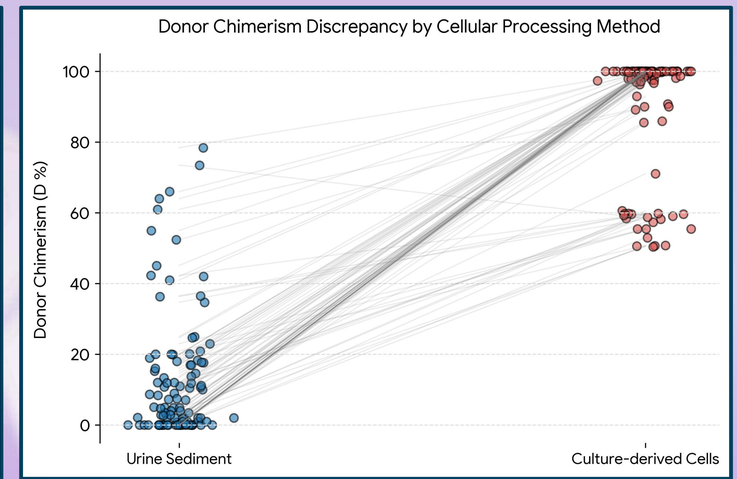


Workflow for obtaining donor-specific UCDC for donor HLA typing.

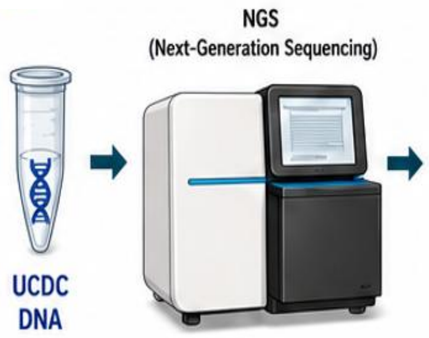
2 Verification of donor origin



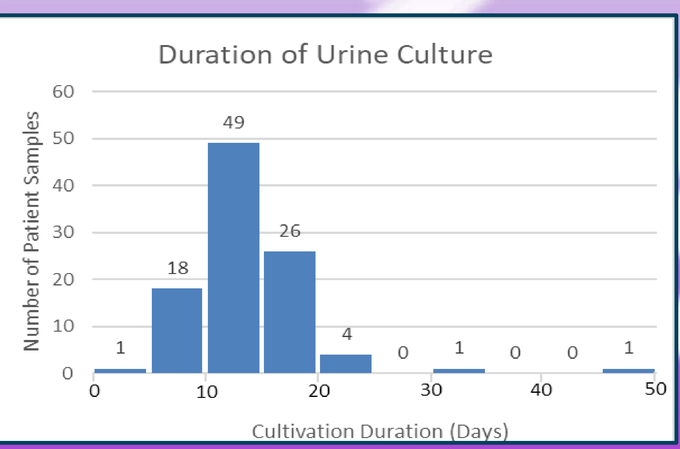


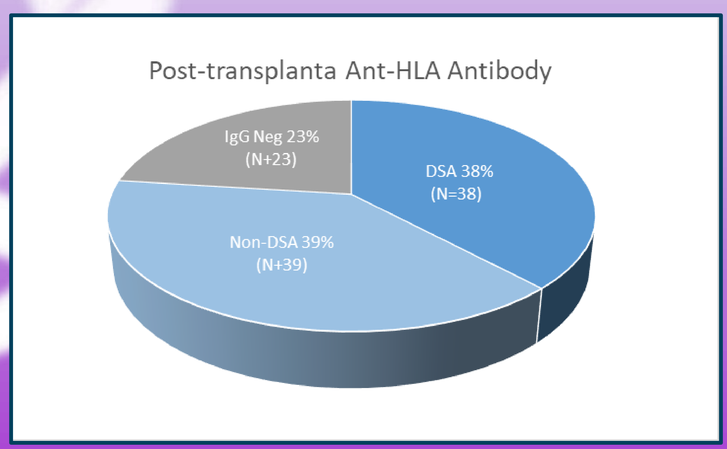


3 Donor HLA typing (NGS) and interpretation



HLA typing by UCDC NGS		
HLA-A	A*02:03 (A203)	A*11:01 (A11)
HLA-B	B*38:02 (B38)	B*40:02 (B61)
HLA-C	C*07:02	C*15:02
HLA-DRB1	DRB1*04:03 (DR4)	DRB1*14:54 (DR14)
HLA-DRB3/4/5	DRB345*4*01:01P (DR53)	DRB345*3*02:02P (DR52)
HLA-DQB1	DQB1*03:02 (DQ8)	DQB1*05:02 (DQ5)
HLA-DQA1	DQA1*01:04	DQA1*03:01
HLA-DPB1	DPB1*05:01	DPA1*02:02





UCDC provides a reliable, non-invasive method for retrieving donor HLA typings when original donor data is incomplete. This approach facilitates precise donor-specific antibody (DSA) assessment, ultimately improving post-transplant clinical outcomes. Consequently, it has emerged as the preferred strategy among patients, clinicians, and laboratory technologists for recovering essential donor genetic profiles