

# Cross match

## Virtual cross match (vXM)

In a vXM, profiles of reactivity from stored recipient samples, plus remote HLA typing of a deceased donor, are used to predict reactivity in advance of donor cells becoming available. Enables transplant to go ahead with certainty and shorter cold ischaemic times. Only suitable for low-risk recipients on the vXM list.

- Potential recipient checked against vXM list.
- Decision to proceed with vXM alone must be confirmed with on call H&I scientist.

## Prospective cross match

For all other recipients, a full CDC crossmatch\* must be performed using donor lymphocytes with recipient serum. Recipient serum usually must be fresh; occasionally a recent stored sample may be useful but later confirmation will then usually be required.

- Send spleen and lymph nodes to SNBTS H&I staff for an urgent lymphocytotoxic (CDC) crossmatch. Please ensure that a completed SNBTS histocompatibility /platelet immuno-haematology form is sent with the tissue.
- Results will be reported to the renal recipient coordinator. In addition a direct conversation should be had between consultant surgeon on call and H&I consultant.

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## About crossmatching and methods to detect anti-donor antibodies (DSA)

### T cell (CDC) crossmatch

CDC = complement-dependent cytotoxicity. Fresh donor lymphocytes (from blood or lymph nodes) are mixed with recipient serum in the presence of complement, to identify pre-formed cytotoxic antibodies to the donor. This is the classic

crossmatching technique for organ transplantation. A positive result usually precludes transplantation because of the risk of early severe antibody-mediated, 'hyperacute' rejection.

### **Other donor-specific antibodies (DSA)**

DSA detected by these methods correlate with risk of rejection and medium to long term outcomes, but to varying degrees depending on target and titre. They are implicated in antibody-mediated rejection, and used to select suitable donors and risk of rejection, and therefore intensity of immunosuppression.

- **Flow cytometry - 'B cell crossmatch'** - fresh donor B cells are mixed with recipient serum and analysed by FACS to detect recipient antibody binding. More sensitive than a CDC, and no test of cell lysis. Not associated with hyperacute rejection.
- **Solid phase assay** (e.g. Luminex) - recipient's serum is tested against a panel of purified HLA molecules to detect number and precise targets of any anti-HLA antibodies. This assay is conducted without knowledge of potential donors, in advance of transplantation, or for monitoring post-transplant. Having uniformly low titres of DSA to donor antigens without a history of previous exposure to foreign HLA antigens makes a positive CDC crossmatch very unlikely - this is the basis of the Virtual Crossmatch (vXM).

Interpretation of the significance of results of tests for DSA, and reconciliation with crossmatch results, often requires expert input.