ImmunoTools IT-Box-139 Award 2013

Richard Battle

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The development of immuno-proteomic approaches for the assessment of tissue compatibility for transplantation

Renal transplantation is the treatment of choice for patients with end stage renal failure. However access to this treatment is limited due to the number of patients in need of a transplant, which by far exceeds the number of donor organs available. Currently in the UK there are more than 7,500 patients awaiting an organ transplant. The majority of these patients (approximately 85%) are waiting for a kidney. This situation is compounded by a number of factors: failure of transplanted kidneys (renal allografts) due to immunological mechanisms, damage caused by the patient's primary disease and the toxicity associated with immunosuppressive drugs. This Results in many patients requiring subsequent transplants after their primary transplant has failed.

Currently Histocompatibility and Immunogenetics (H+I) laboratories characterise donor and recipients prior to transplants by crossmatching to detect donor specific antibodies, and by comparison of tissue types, the tissue type referring to the Human Leucocyte Antigen (HLA) types of the potential transplant recipients and donors. Evidence shows the closer matched the HLA types are, the better long term survival of the transplanted kidney. HLA antigens present exogenous and endogenous derived peptides to $CD4^+$ and $CD8^+$ T lymphocytes, which are then capable of initiating an immune response.

This project is pursuing further characterisation of donor and recipient HLA types by examining the effect which different peptides bound within the groove of the HLA antigens have upon the immune response. The hope is better understanding of this process will enable an increase in renal allograft survival, providing a better outcome for patients as well as reducing the burden upon the pool of available donor organs.

The ImmunoTools will be useful tool to measure the immune response of Peripheral Blood Mononuclear Cells (PBMCs) stimulated by different peptides loaded onto specific HLA antigens. The ImmunoTools *IT-Box-139* provides an array of antibodies to analyse T-cells populations (CD3, CD4, CD8, CD45RA, CD45RO, CD45RB, CD62L) allowing differentiation of T helper and cytotoxic response components, as well as B-cells (CD19, CD20, CD38, CD27), and NK-cells (CD16, CD56) responses, thus providing a comprehensive assessment tool capable of extensive insight into the alloresponse.

ImmunoTools *IT-Box-139.3* for **Richard Battle** includes 100 antibodies

FITC - conjugated anti-human CD1a, CD2, CD3, CD4, CD5, CD6, CD7, CD8, CD9, CD11a, CD11b, CD14, CD15, CD16, CD18, CD19, CD21, CD25, CD29, CD36, CD41a, CD43, CD45, CD45RA, CD46, CD52, CD53, CD54, CD58, CD62p, CD63, CD69, CD71, CD80, CD86, CD95, CD235a, HLA-ABC, HLA-DR, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

PE - conjugated anti-human CD2, CD3, CD4, CD8, CD11b, CD14, CD15, CD18, CD19, CD20, CD21, CD22, CD27, CD33, CD34, CD37, CD38, CD40, CD42b, CD45, CD45RB, CD50, CD72, CD95, CD105, CD147, CD177, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

PE/Dy647 -tandem conjugated anti-human CD45

APC -conjugated anti-human CD3, CD4, CD7, CD8, CD10, CD11c, CD14, CD16, CD19, CD27, CD37, CD40, CD44, CD56, CD59, CD61, CD62L, CD62P, CD69, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V DETAILS

plus CD56 FITC, HLA-ABC PE, CD3 PE/Dy647