ImmunoTools IT-Box-139 Award 2012

Michael McGrath

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The development of an in vitro model of spinal cord injury to study aligned neurite outgrowth

Spinal cord injury (SCI) is vastly complex and devastating condition. Severity and level of paralysis is directly correlated to the position along the spinal cord where the injury occurs due to loss of nerve process contact from the injury site to target muscles. Complexities arise with specifically targeting and identifying key factors in the pathological mechanism. Acute spinal injury is characterised not only by a primary response of initial traumatic tissue damage but a cellular response initiated by the secondary phase which leads to further nerve damage caused by inflammatory factors. Several factors contribute to the inability for repair including astrocytosis, inhibitory factors to neurite outgrowth and the immune response. My research aims to model spinal injury *in vitro* with a view to understand the role of astrocyte, endogenous neural cells as well as the immune response in the irreversible damage to the CNS. We have developed an in vitro system to study SCI. In particular we can models many of the features of SCI (Boomkamp al., 2012). In particular we have seen an increase in expression of chemokines/cytokines secreted from microglia present in the cultures. Since activated Microglia has been implicated in the injury site but their mode of action both pathological and beneficial is still unclear, we aim to study their role and other immune cells in our system, In particular we have identified human mesenchymal stem cells and marrow stromal cell which promote myelination. Since cell transplantation is a strategy for SCI repair we plan to add various human immune cells into our culture and study changes in their phenotype.

Thus the panel of antibodies supplied by ImmunoTools will be very beneficial for this work and provide a vast array in which we could detect changes in cell differentiation and provide novel transplantation cells which we can incorporate into our system. This would be a valuable insight into the pathogenesis of spinal cord injury and help towards providing clinical approaches to help overcome spinal cord injury.

ImmunoTools IT-Box-139 for Michael McGrath includes 100 antibodies

FITC - conjugated anti-human CD1a, CD3, CD4, CD5, CD6, CD7, CD8, CD14, CD15, CD16, CD19, CD21, CD25, CD29, CD35, CD36, CD41a, CD42b, CD45, CD45RA, CD45RB, CD45RO, CD49d, CD53, CD57, CD61, CD63, CD80, CD86, HLA-DR, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

PE - conjugated anti-human CD3, CD4, CD8, CD11b, CD15, CD14, CD18, CD19, CD20, CD21, CD22, CD31, CD33, CD38, CD40, CD45, CD45RB, CD50, CD52, CD56, CD58, CD62p, CD72, CD95, CD105, CD147, CD177, CD235a, HLA-ABC, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

PE/Dy647 -tandem conjugated anti-human CD3, CD4, CD8, CD14, CD19, CD20, CD25, CD54

APC -conjugated anti-human CD2, CD3, CD4, CD8, CD10, CD11a, CD11c, CD14, CD16, CD27, CD37, CD42b, CD44, CD45, CD59, CD62L, CD69, CD71, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

DETAILS