

## Research into the Origins of the Thymus Reveals Secrets of the Immune System

Posted on Friday 23rd June 2006

Researchers at the University of Birmingham have become the first to identify a new type of cell, which is crucial in the development of the thymus, the organ, which plays a key role in the development of the immune system.

The research, which is published in Nature (22nd June) opens the way for the development of techniques to regenerate the thymus, as a treatment for patients with a compromised immune system.

The thymus plays a crucial role in the development of the immune system by providing an environment for T Cells to develop and mature. Mature T Cells form the basis of our immune response to viruses and bacteria. The organ is split into two sections, the medulla and the cortex, which play different roles in the development of T Cells.

The team from the University's MRC Centre for Immune Regulation showed for the first time that the two areas of the thymus, can be generated from the same original cell.

They took a single cell, marked with a fluorescent yellow protein from a thymus at the early stage of its development. This cell was inserted in a foster thymus to allow it to develop. The thymus was then transplanted into a mouse, where it was allowed to grow normally.

The team found that the marked cells were present in both areas of the thymus. This indicates that both areas of the organ are generated from the same progenitor.

Professor Graham Anderson, who led the research commented: 'The presence of marked cells in both areas of the thymus is extremely significant because it demonstrates that the cells in both areas have a common origin. There has long been controversy about how the two areas of the thymus are generated, because they perform different roles. Finding a single cell type that generates the organ opens up the possibility of generating viable thymic tissue for therapeutic means.'

Professor Eric Jenkinson added: 'Identifying a single cell type that is responsible for the generation of epithelial cells in both areas of the thymus, opens up greater possibilities for therapeutic cell treatment for patients who have significant problems with their immune systems. Because of the ability of the thymus to generate T-Cells it could be an effective way of boosting the immune systems of patients with diseases that affect the immune system like HIV or for patients after transplant surgery.'

### ENDS

For further information or to request a copy of the paper contact Ben Hill 0121 4145134 or mobile 07789 921 163, Professor Graham Anderson is available for interview.

### Notes to Editors

The Paper: 'Clonal analysis reveals a common progenitor for thymic cortical and medullary epithelium' is published in Nature.

### Research Methods

The research team created a starting population of intrinsically marked cells using the yellow protein Eyfp (enhanced yellow fluorescent protein). Individual cells were then picked from this population using a micropipette and microinjected into a foster thymus, which was grafted under the kidney capsule of a mouse to develop. The grafts were analysed after four weeks to attempt to identify the Eyfp protein marker. The Eyfp marked cells were found to present in both the cortical and medullary epithelium. The cells were also analysed for markers that are present in either medullary or cortical cells.