

Immunotherapy Group

The main interest of the Immunotherapy Group (ITG) is translational research to promote the scale up of cellular products to complement the development of the Anthony Nolan Cord Blood Bank. Its aims are the study of regeneration and tolerance, specifically involving the allogeneic approach, and graft-versus-leukaemia/graft-versus-infection effects. ITG scientists work on two physical sites: London (cell oriented) and Nottingham (product oriented). These sites are developing projects in both clinical and basic research. The project has a pre-clinical biological phase, which is product orientated, and a clinical phase, which is patient orientated.

Cell-driven research and development

Main subjects being developed are:

- artificial APC (immunoliposomes): triggering immune-reactions through a) antigen presentation *ex vivo* or *in vivo* and b) focussed delivery of immuno-mediators
- Treg: assessment of the suppressor ability of CD25+FOXP3+ cells comparing the geno-phenotypical and functional characteristics between adult and cord blood
- T effector: developing effector T cells as a therapeutic product against cancer cells or infection.
- NK: analysing the capacity of NK precursors and NK cells from cord blood to develop anti-tumoural responses through NK alloreactivity.
- Stem Cells: studying of the different progenitor cells contained in cord blood (multipotent stem cells, haematopoietic stem cells and endothelial progenitor cells).

Product-driven research and development:

- the **CORDBANK** project: The Anthony Nolan trust is in the process of setting up the UK's first charitable cord blood bank to increase the access to haematopoietic stem cell transplantation for many patients in need. A state-of-the art programme aiming to collect high quality and diverse cord blood units using ethically approved and safe collection strategies are being validated. The ANT is establishing new procedures and implementing new quality control techniques to minimise the risk for donor and patients from this new medical application.

the **CORDPHARM** project : Using the ethically donated cord blood units, not currently suitable for clinical transplantation,, for translational research. The main goal is to analyse the different cellular subsets in whole cord blood to be used as allogeneic sources for universal cell therapy approaches, both as an immune or stem cell source. Subsequently, one major area of interest is evolving the concept of using pooled natural produced stem and immunological cells for clinical protocols, without the need for *ex vivo* procedures.

Target products are:

- CD133+ cells single or pooled
- CD25+ cells single or pooled

- CD3+CD25- na ve effector T cells

- CD3- as NK-precursor source

The main work at the core facility at NTU is to generated these cell sets, and produce them under GMP rules before freezing.