IN THE NEWS

Soya scare?

Levels of the sex-hormone mimic genistein that are found in soya-based infant formula can impair immune function, according to a new study in mice. Although food-safety groups maintain that it is still safe to feed babies with the formula, concerns were raised in the media. After all, as *HealthScout* news pointed out, ~750,000 babies in the United States alone drink soya-based formula.

The paper published by Paul Cooke and colleagues at the University of Illinois, in the 28-May edition of the *Proceedings of the National Academy of Sciences*, shows that the thymus of mice that are fed or injected with amounts of genistein that are similar to those that are found in soya formula are shrunken and contain 80% fewer T cells.

Paul Cooke, taking a moderate position, told *BBC* news, "although there is nothing definitive, there is enough concern in this area that you would tend to shy away from it if you were a parent".

However, food-safety groups and food-industry bodies were quick to reassure parents. "If you look in the scientific literature for evidence of hormonal effects when human infants consume soya formula you don't find them," claimed Mardi Mountford of the International Formula Council (*HealthScout*).

Heather Payne of the Infant and Dietetic Food Association (UK) argued that because soya milk has been used for decades, any detrimental effects on human immune systems should have come to light by now.

Jennifer Bell

THYMIC DEVELOPMENT

Going back to our roots

Thymocytes require interactions with many types of epithelial cell in the thymus for their maturation and selection. However, the lineage relationships between these functionally and phenotypically distinct thymic epithelial cells (TECs) have remained unclear. Papers in *Immunity* and *Nature Immunology* now provide evidence for a common progenitor cell from which all TECs derive.

The thymic microenvironment is organized into distinct cortical and medullary areas, which are characterized by the presence of thymocyte precursors at defined stages of maturation, mesenchymal cells and several types of specialized epithelial cell. There has been much debate about the origin of TECs, but the lack of cell-specific cell-surface markers has prevented the isolation of putative thymic epithelial stem cells.

Bennett *et al.* carried out an extensive phenotypic characterization of

the cellular composition of the embryonic day (E) 12.5 mouse thymus. Using monoclonal antibodies that are specific for keratin 5, keratin 8, MTS20 and MTS24 (markers that have been shown previously to be expressed by subsets of TECs), and for the differentiation antigens 4F1 and MTS10, several distinct epithelial subsets were identified. The lineage potential of these thymic subsets was assessed directly using a reaggregate fetal thymic organ culture (FTOC) model. Purified MTS20⁺MTS24⁺ or MTS20⁺MTS24⁻ cells were reaggregated, with or without mouse embryonic fibroblasts, for 24–48 hours and then either analysed directly or grafted under the kidney capsule of *nude* mice, which lack a thymus. MTS20⁺MTS24⁺ cells could differentiate into all known types of thymic epithelial cell, attract lymphoid progenitors and support T-cell development in *nude* mice. The MTS20⁺MTS24⁻ cells could perform none of these functions. Bennett and colleagues conclude that the MTS20⁺MTS24⁺ population has full thymic epithelial progenitor potential and is sufficient to establish a functional thymus *in vivo*.

Gill *et al.* also investigated the role of MTS24⁺ TECs in thymocyte development. E15.5 FTOCs that were depleted of lymphoid cells were treated with purified MTS24-specific monoclonal antibodies before being reconstituted with haematopoietic precursors. Antibody-treated cultures developed 88% fewer thymocytes than control cultures and thymocyte development was blocked at an early stage. In addition, the ability of E15.5 MTS24⁺ cells to generate functional thymic microenvironments was investigated by assessing the development of ectopic thymi after transplantation of these cells under the kidney capsule of recipient mice. Thymi that had a normal distribution of thymocyte subsets and normal architectural organization developed in mice that received MTS24⁺CD45⁻ MHC class-II⁺ cells, whereas no thymi developed in mice that received MTS24⁺CD45⁻ MHC class-II⁻ cells. The authors conclude, in agreement with the findings of Bennett *et al.*, that the MTS24⁺ thymic subset is sufficient to establish and maintain a complete thymic epithelial microenvironment and that these cells have full thymic epithelial progenitor potential.

HIV

Silencing HIV-1

RNA interference (RNAi) is a mechanism of post-transcriptional gene silencing that has been described both in animal and in plant cells. Short double-stranded RNA (dsRNA) duplexes lead to specific deletion of RNAs containing the same sequence. In plants, RNAi is an important defence against dsRNA-containing viruses and transposons, but whether this process can be used as a tool in human antiviral responses is unclear. A recent paper in *Nature Medicine* describes how RNAi can be targeted to inhibit HIV-infection in human cells, so possibly forming the basis of new antiviral therapies.

To assess the effects of RNAi on HIV-1 infection, Novina and colleagues targeted both cellular and viral RNAs. The HeLa-derived cell line Magi-CCR5 (which expresses human CD4, and the chemokine receptors CCR5 and CXCR4) was transfected with

short interfering RNA (siRNA) specific for the gene of interest and then infected with HIV-1. Cells transfected with siRNA specific for CD4 (the principle receptor for HIV-1) expressed CD4 mRNA at a level eight times lower than control cells, which led to a