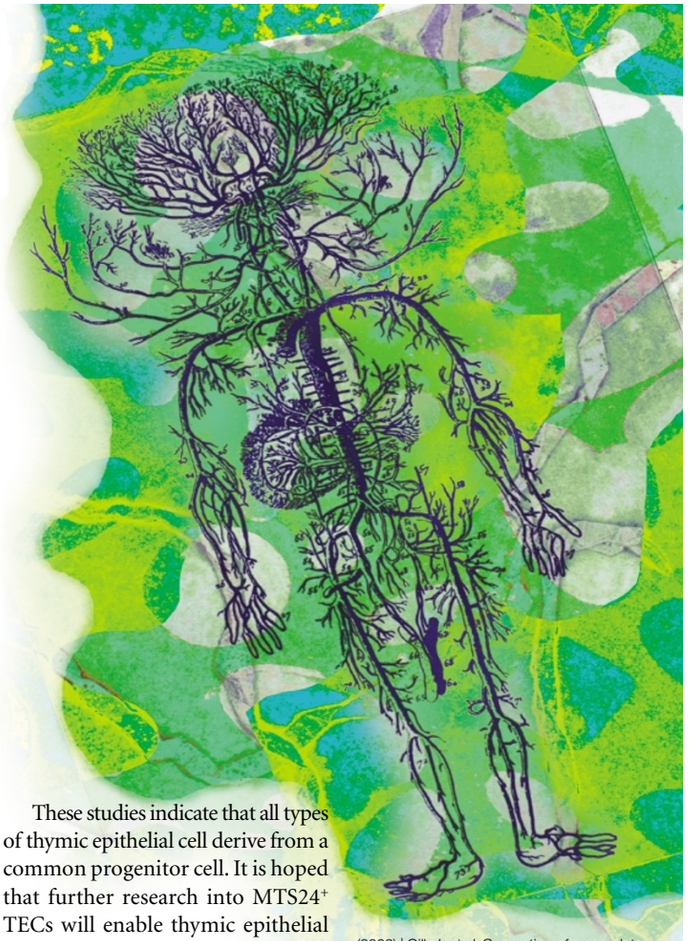

These studies indicate that all types of thymic epithelial cell derive from a common progenitor cell. It is hoped that further research into MTS24$^+$ TECs will enable thymic epithelial stem cells to be identified.

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References and links

ORIGINAL RESEARCH PAPER Bennett, A. R. *et al.* Identification and characterization of thymic epithelial progenitor cells. *Immunity* **16**, 803–814 (2002) | Gill, J. *et al*. Generation of a complete thymic microenvironment by MTS24$^+$ thymic epithelial cells. *Nature Immunol.* **3**, 635–642 (2000)

FURTHER READING Anderson, G. & Jenkinson, E. J. Lymphostromal interactions in thymic development and function. *Nature Rev. Immunol.* **1**, 31–40 (2002)

fourfold reduction in HIV-1 entry. Therefore, siRNA-directed silencing of CD4 specifically inhibited HIV entry and hence replication.

Next, the viral structural protein Gag was targeted by transfecting cells with siRNA specific for the p24 component of this polyprotein. p24-siRNA-transfected cells showed a fourfold decrease in viral protein compared with controls, implying that viral amplification was inhibited by this approach.

The authors also carried out transfection assays on human T cells, to assess the effect of RNAi on viral infectivity in a more physiological context. H9 cells were transfected with siRNA against green fluorescent protein (GFP) and were infected with an HIV-1 strain in which the *nef* gene had been replaced with GFP. Again, silencing of viral gene expression occurred, resulting in reduced GFP and HIV-1 protein expression.

But can siRNA-directed silencing reduce viral production in an established infection? Novina *et al.* tested the effect of p24-siRNA on previously infected Hela-CD4 cells and on a latently infected T-cell clone (ACH2) and again saw silencing of p24 expression. So, HIV-1 gene expression can be silenced by this approach even after viral integration has occurred in an established infection.

This study extends work by Lee and colleagues, published in *Nature Biotechnology*, who used a vector-based RNAi strategy to silence an HIV-1 gene, and establishes that siRNA technology can be used to suppress multiple steps of the HIV-1 life cycle.

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References and links

ORIGINAL RESEARCH PAPER Novina, C. D. *et al.* siRNA-directed inhibition of HIV-1 infection. *Nature Med.* 2002 June 3 (DOI:10.1038/nm725)

FURTHER READING Lee, N. S. *et al.* Expression of small interfering RNAs targeted against HIV-1 rev transcripts in human cells. *Nature Biotechnol.* **20**, 500–505 (2002)

IN BRIEF

HAEMATOPOIESIS

Essential and instructive roles of GATA factors in eosinophil development.

Hirasawa, R. *et al. J. Exp. Med.* **195**, 1379–1386 (2002)

Targeted deletion of a high-affinity GATA-binding site in the GATA-1 promoter leads to selective loss of the eosinophil lineage *in vivo*.

Yu, C. *et al. J. Exp. Med.* **195**, 1387–1395 (2002)

These papers show that the transcription factor GATA1 has a pivotal role in eosinophil development. Hirasawa *et al.* transduced human myeloid progenitors that were isolated from cord blood with GATA1 and found that they developed into eosinophils, even under culture conditions that favour the development of myeloid cells. Furthermore, they show that *Gata1*$^{-/-}$ mice lack eosinophil progenitors in the fetal liver. Yu *et al.* show that deletion of a positive regulatory element in the *Gata1* promoter blocks eosinophil development. Together, these results indicate that GATA1 has an essential role in the specification of the eosinophil lineage.

ALLERGY

Human epithelial cells trigger dendritic-cell-mediated allergic inflammation by producing TSLP.

Soumelis, V. *et al. Nature Immunol.* **3**, 673–680 (2002)

Allergic inflammation is associated with the dysregulated production of T helper 2 (T_H2) cytokines, such as IL-4, IL-5 and IL-13. The activation of dendritic cells (DCs) seems to be an important part of this process, but it is unknown what drives DCs to preferentially stimulate T_H2-cell development. This study shows that human epithelial cells produce an IL-7-like cytokine, known as thymic stromal lymphopoietin (TSLP), which activates DCs and causes them to polarize naive CD4$^+$ T cells for the production of T_H2-associated cytokines. So, TSLP is a key trigger for DC-mediated allergic inflammation and might represent a new target for blocking inflammation, particularly in allergic diseases.

T-CELL DEVELOPMENT

Dynamics of thymic–stromal-cell interactions visualized by two-photon microscopy.

Bousso, P. *et al. Science* **296**, 1876–1880 (2002)

Two-photon laser-scanning microscopy (TPLSM) allows immunologists to investigate the behaviour of immune cells in three dimensions in real-time analyses. Here, Bousso and colleagues use TPLSM to assess the interactions of thymocytes and stromal cells during positive selection in a reaggregated thymic organ culture system. Thymocyte–stromal-cell interactions were diverse, involving both dynamic and stable interactions, but the basis for this observed diversity is unclear. The next step will be to assess the signals that are received through the T-cell receptor of a single thymocyte during thymocyte development.