HIGHLIGHTS

IN THE NEWS

Success in cancer therapy

Metastatic melanoma might have met its match, according to a study from the National Institute of Cancer Research in the United States published this month in *Science*. In this trial, led by Steven A. Rosenberg, patients with advanced melanoma were treated with their own tumour-infiltrating lymphocytes (TILs) after they had been amplified *in vitro*.

Ten of the 13 patients are still alive, four are “virtually cancer free” and two others have experienced “substantial” shrinkage of their tumours (*The Associated Press*). The patients included a teenager who had a “volleyball-sized tumour” in his pelvic cavity. “I would guess his life expectancy was a couple of months. The patient, two years later, is completely disease-free”, Rosenberg told a seminar sponsored by the American Medical Association (*Reuters*).

Similar strategies have been used previously, but with disappointing results. “What’s new here is putting all the pieces together to get a more successful outcome”, said Richard Childs from the National Heart, Lung and Blood Institute (*The Washington Post*). TILs were obtained from the patient, clonally expanded *in vitro*, and then reinfused into the patient. Before the adoptive transfer, patients underwent non-myeloablative chemotherapy to make ‘room’ for the TILs, and they received high-dose interleukin-2 injections to encourage the TILs to proliferate *in vivo*.

Although, as Lesley Walker from Cancer Research UK told the BBC, “There is probably a genuine step forward here”, Rosenberg warns that this treatment is highly experimental and will not be available for several years (*Reuters*). In addition, the treatment did not work for all patients, and autoimmune side effects (melanocyte destruction) were noted.

Jenny Buckland

ALLERGY

Worms and allergy — whats going on?

The incidence of allergic diseases and asthma has rocketed in recent years in Western countries, and the explanation for this has been the subject of much debate. Children are born with a T helper 2 (T_H2)-biased immune system, but this bias normally diminishes during the first two years of life in non-allergic individuals. The hygiene hypothesis argues that early childhood infections provide a T_H1 stimulus for the T_H2 -skewed immune system of humans. The theory is that in Western countries, the reduction in the number of childhood infections means that the immune system lacks this T_H1 stimulus and continues to maintain a T_H2 bias, which results in an increased risk of developing allergy and asthma. However, the hygiene hypothesis cannot account for the fact that there is a very low incidence of allergy in developing countries where helminth infection — which also results in a T_H2 -biased immune response — is endemic. Recently, it has been proposed that helminth infection can protect against the development of allergy by the production of regulatory cytokines, such as interleukin-10 (IL-10), and it is this idea that has been tested by Nagler-Anderson’s group in this study.

Nagler-Anderson and colleagues assessed the effect of T_H2 responses induced by intestinal helminth infection on the development of an allergic response to the food allergen peanut antigen (PN). When PN alone was given to helminth-infected mice, PN-specific

immunoglobulin E was not detected, which indicates the absence of an allergic response. Gastric administration of PN plus the T_H2 -inducing mucosal adjuvant cholera toxin (CT) to helminth-infected mice resulted in a T_H2 response, and the production of PN-specific IgE and systemic anaphylaxis, but these responses were greatly diminished in comparison with the responses of non-infected mice. Compared with non-infected mice, a reduction in the number of antigen-specific T cells producing IL-13 was also observed in the helminth-infected mice given PN plus CT. The administration of neutralizing antibody specific for IL-10 to helminth-infected mice stimulated with PN plus CT resulted in the development of allergic symptoms that were similar in magnitude to those observed in non-infected mice.

This study shows, for the first time in a mouse model, that helminth infection protects against the development of allergy and that this protection is mediated, at least in part, by the immunoregulatory cytokine IL-10.

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References and links

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FURTHER READING Wills-Karp, M., Santeliz, J. & Karp, C. L. The germless theory of allergic disease: revisiting the hygiene hypothesis. *Nature Rev. Immunol.* **1**, 69–75 (2001) | van den Biggelaar, A. H. *et al.* Decreased atopy in children with *Schistosoma haematobium*: a role for parasite-induced IL-10. *Lancet* **356**, 1723–1727 (2000)