

Immune mechanisms involved in the induction of oral tolerance to peanuts in children

Maes o ddiddordeb ymchwil: [Food hypersensitivity](#)

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Background

Peanut allergy affects up to 1 in 50 children in the UK. There is currently scientific uncertainty about whether children should avoid peanuts to escape sensitisation or instead should eat peanuts to induce early oral tolerance and thus prevent peanut allergy. It is thought that there is a critical window of time during early infant life when the immune system is developing which may be a key time for the development of allergies, but it is not clear how the route, timing and dose of exposure to food allergens during this period might influence whether the child develops an allergy or not.

One theory that has emerged recently is that high levels of consumption of food allergens at an early age may in fact prevent the development of food allergy by inducing tolerance, but there is a need to gain more definitive evidence to be able to support or reject this theory. To achieve this, a major clinical intervention study is being funded by the US National Institute of Health, called the Learning Early About Peanuts study - www.leapstudy.com - in which young children at high risk of developing peanut allergy are being recruited and randomised to either eat peanut at high levels from an early age or to exclude peanut from their diet. A series of diagnostic tests will be done over 5 years to monitor whether the children develop peanut allergy or not.

Research Approach

This project is aiming to characterise the processes involved in the developing immune system that lead to the development of oral tolerance (as opposed to allergy) to peanuts. This will be achieved by measuring differences in specific immunological markers in blood samples collected from LEAP study participants, at different time-points, from birth to 5 years of age.

These studies should enable us to understand the processes in the developing immune system that lead to the development of peanut allergy or to oral tolerance to peanut (i.e. no peanut allergy). It is hoped that the project will give us the scientific evidence on which to base our dietary advice on how best to avoid the development of peanut allergy, especially when combined with the results of other randomly controlled trials on the timing of introduction of allergenic foods into the infant diet and allergy risk, of which there are several ongoing worldwide (including the Agency funded project FS231063 – the EAT study). In particular, Public Health England is currently undertaking a major review of the evidence underpinning UK Government recommendations regarding complementary and young child feeding. The immunological results generated by this project when coupled with the findings of the LEAP clinical trial itself are likely to be informative to that review.

Published Papers

1. Turcanu, V., Stephens, A. C., Chan, S. M. H., Rancé, F. and Lack G. (2010) IgE-mediated facilitated antigen presentation underlies higher immune responses in peanut allergy. *Allergy*. 65 (10) 1274-81.