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MNF Report

Improved quality of life to food allergic consumers

The EuroPrevall project

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For the food allergic consumer their condition can have a profound effect on their quality of life. At present, one of the difficulties faced is that the knowledge of health professionals and dieticians regarding the best practice for diagnosis and treatment of food allergy is often inadequate. The *in vitro* diagnostic tools currently available do not have sufficient predictive and prognostic power to allow clinicians to rely solely on the results of food specific IgE-determinations for a positive diagnosis of food allergy. It is the objective of an EU-funded integrated project, EuroPrevall (www.europrevall.org), to deliver an improved quality of life to food allergic consumers by obtaining information we currently lack and developing the tools (including those for diagnosing food allergies) necessary to manage food allergies more effectively. The EuroPrevall partnership includes over 56 organisations from 21 different countries (18 from Europe, one from Africa [Ghana], India and China), with additional collaborating centres and partners from the USA, Australia and New Zealand.

A major part of the project activities is to develop effective cohorts to determine the patterns and prevalence of food allergies across Europe, as well as providing the project with a cohort of individuals with well characterised food allergies necessary for developing and validating new diagnostic tools. The cohorts are being developed in different age groups, drawing on different cultural and climatic regions of Europe, including maritime, alpine, Nordic, Mediterranean and central European climates. They include a birth cohort set up in eight centres covering infants from birth to the age of two years, community surveys in nine centres in unselected populations of adults and children, and an out-patient clinic study in twelve different centres. Food allergies are being diagnosed using a combination of clinical history, serological and skin testing, backed up in selected patients with standardised double blind placebo controlled food challenges (DBPCFC). The foods represent almost all those currently included on Annex IIIa of the food labelling directive and have been split into two categories as follows:

Priority 1	Hen's egg Cow's milk Fish Shrimp Peanut Tree nuts (hazelnut) Apple Peach Celery
Priority 2	Kiwi Mustard Sesame Soy Walnut Wheat

The DBPCFC will employ standard matrices, utilised by all centres, given in titrated doses which will allow us to obtain information on "no observed effect levels" and "lowest observed effect levels" for major allergenic foods. From these cohorts a serum bank (the EuroPrevall Serum Bank, EPSB) has been set up to collate serum samples for IgE testing in the outpatient clinic cross-sectional survey. This forms an important platform to characterise the components in foods, known as allergens, responsible for triggering allergic reactions.

To facilitate the development of novel diagnostic methods an allergen library is being prepared, representing all

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Abbreviation: DBPCFC, double blind placebo controlled food challenges

known allergens from all priority foods identified in the project. The library is almost complete for the priority 1 foods and has been assembled using protocols and common authentication criteria with regards their identity (sequence information), folding and, where appropriate, their biological activity. Using this platform of allergens and working closely with the clinical researchers in the project, the concept of component resolved diagnosis will be explored. Specifically we will assess whether patterns of sensitisation to individual allergens offers additional diagnostic power with regards to food allergies than is currently possible with serological analysis using food extracts. Two types of format are being assessed, (i) the well-accepted CAP technology of Phadia and (ii) the novel allergen chip technology of VBC Genomics, which utilises small serum samples and may offer the opportunity to interrogate the serum samples from all the EuroPrevall cohorts. In addition, cellular methods able to assess the biological activity of serum IgE are being evaluated, including a high throughput histamine release assay using stripped basophils, currently being developed and applied by SME partner Reflab.

In order to set the EuroPrevall work in the context of current practice and the research outputs from others outside the project, the partnership is developing a series of "State-of-the-art" papers in important areas of food allergy. The paper of Asero *et al.* [1] in this issue deals with the important aspects of diagnosis. It provides the context within which the results of the EuroPrevall work to develop novel diagnostics will be developed and assessed with regards their efficacy.

[1] Asero, R., Ballmer-Weber, B. K., Beyer, K., Conti, A. *et al*., *Mol. Nutr. Food Res.* 2007, *51*, 135 – 147.

