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Correspondence

Sequence similarity between a major allergen from the dermatophyte *Trichophyton tonsurans* and exo 1,3-β-glucanase

Sirs, The potential clinical importance of immediate hypersensitivity reactions to dermatophytes such as *Trichophyton tonsurans* and *T. rubrum* has been reported in the literature, and the available data reviewed in a recent editorial published in this journal [1]. However, the physicochemical characteristics of individual allergens derived from these fungi are limited and, in an attempt to redress this situation, Deuell and colleagues have begun the characterization of dermatophyte allergens. In this regard, they have isolated a 30 kD allergen, designated *Tri t* I, which was shown to be important in cases of immediate, but not delayed, type hypersensitivity [2]. The availability of this and further dermatophyte allergens should prove useful in helping to dissect the relevance of various aspects of the immune response to these fungi in infected patients [2].

The *Tri t* I allergen has been characterized and both its apparent molecular weight and N-terminal sequence were determined, although its relationship to any previously sequenced protein was not reported. In this regard, I recently had recourse to examine the sequences of a number of allergens, including *Tri t* I, for homology using the FASTP searching algorithm [3]. These studies showed that *Tri t* I demonstrated limited homology with a number of proteins but the 46 per cent identity, over a 28 residue overlap, with the N-terminal sequence of a 29 kD exo β-1,3-glucanase from the yeast, *Saccharomyces cerevisiae* (Fig. 1) [4] may be of particular significance.

The exo-glucanases are a group of enzymes common in fungi and are thought to be involved in the remodelling of cell wall 1,3-linked glucans during the morphogenic changes which occur during growth and sporulation [5]. The enzymes may either be secreted into their surroundings or found tightly bound to structural components. In their bound form, such enzymes are difficult to remove unless specific procedures are employed and this observation could account not only for the low yield of *Tri t* I obtained during isolation but also raises the possibility that other fungal exo-glucanases may be allergenic since immunohistochemical studies have shown that allergens from fungi such as *Aspergillus* spp. are located primarily in association with the cell wall [6].

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                                  10          20          30
Exo β-1,3-glucanase               IGELAFNLGVKNNDGTCKSTSDYETELQAL
                                  ..:.:::::. ::. :   :.: .. ::
Tri t I                           -NNMAFSLGVKGPDGSVKQLVDFEQDFVAL
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Fig. 1. The amino acid sequence homology between exo β-1,3-glucanase from yeast [4] and *Tri t* I [2]. Amino acid residue identity is indicated by ':' whereas amino acid residue similarity is indicated by '.'. The dash represents a gap introduced to maximize homology.

The similarity observed between the dermatophyte allergen and the yeast enzyme is consistent with other data in the literature. For example, the 40 and 47 kD allergens from *Candida albicans* have been shown to correspond to yeast alcohol dehydrogenase and enolase respectively [7,8]. In this regard, Deuell and colleagues reported that *Candida albicans* contained a *Tri t* I crossreacting component [2], and exo β-1,3-glucanases are known to be present in this species also [5]. These data, together with the above similarities, suggest that a study of the putative enzymatic properties of both the dermatophyte allergen and other fungal allergens may be warranted.

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International Consensus Report on Diagnosis and Management of Asthma

Sirs, May I use the good offices of your journal to draw attention to the International Consensus Report on Diagnosis and Management of Asthma published as a supplement to Volume 22 of *Clinical and Experimental Allergy*.

It is both surprising and disappointing that this consensus report showed an almost complete neglect of the important role of the psychological factors in the course and treatment of asthma. This particularly applies to children, but also to adults. The report does make reference that depression may increase the risk of mortality in asthma and also discusses the fact that mortality from asthma has been associated with other psychosocial problems. One or two other small points are made. However, there is no reference whatsoever to the very wide literature on the effectiveness of psychosocial interventions on improving the course of asthma. Nor is there any reference to why, when and how patients might be referred for psychological treatments.

In summary, in a 71 page report, there is one paragraph on psychosocial factors! Yet *Clinical and Experimental Allergy* published a paper in 1991 entitled 'Psychological Treatments of Asthma' [1]. This paper summarized the wide range of psychological treatments available for asthma and reviewed their effectiveness. The Consensus Report also failed to make mention of psychological factors in the section entitled 'Directions of Research'.

It would be interesting to hear of an explanation for their neglect of these matters from the authors of this report.

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Reference

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Reply

Sirs, The International Consensus Report on Diagnosis and Management of Asthma is intended to present general guidelines on a wide range of topics important in asthma management. It was not possible to elaborate upon every aspect of care. However, the report emphasizes that patient stress and fear, significant psychological factors to consider in asthma management, can be minimized by adequate patient education for children as well as adults. The report describes the critical elements of such patient education: informing patients and families about the disease, actively involving patients and families in making decisions about treatment, and teaching patients necessary management skills, and providing opportunities to discuss fears and concerns. The report further alerts physicians that more serious psychological problems such as depression, family dysfunction, and low self-esteem may seriously complicate management of asthma and often require referral for counselling. Evaluations of psychological treatments applied to asthma management are limited, and few clinical trials on specific psychological techniques have been conducted. Consideration of psychosocial factors may well be a significant adjuvant to the medical management outlined in the six part management programme presented in the International Report. Clearly, this is an area in need of further research.

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