



ORAL PRESENTATION

Open Access

LTP cross-reactivity - primary sensitization to mugwort pollen LTP Art v 3, facilitates subsequent sensitisation to peach LTP Pru p 3 in mice

Andrea Wangorsch^{1*}, Stefan Schülke¹, Gabriele Gadermaier², Melanie Albrecht¹, Michael Wallner², Stefanie Rando¹, Sonja Wolfheimer¹, Jonas Lidholm³, Iris Lauer¹, Fatima Ferreira², Masako Toda^{4,4}, Stefan Vieths¹, Gerald Reese¹, Stephan Scheurer¹

From 5th International Symposium on Molecular Allergology (ISMA 2013)
Vienna, Austria. 6-7 December 2013

Non-specific lipid transfer proteins (nsLTPs) are important pollen and food allergens in the Mediterranean area. Peach LTP Pru p 3 is considered as primary sensitizer inducing LTP cross-reactive IgE antibodies. Despite the evidence on the importance of Pru p 3, it is unclear whether reactivity to multiple LTPs is due to antibody cross-reactivity or to independent sensitization events. Aim of the study was (1) to compare antigenicity of LTPs from pollen and food, and (2) to investigate whether primary sensitization to LTPs promotes secondary sensitization to LTPs from unrelated sources. IgE sensitization to peach LTP was compared in different mouse strains (C3H/HeJ, BALB/c, CBA/J). IgE high responder mice (CBA/J) were used to compare the antigenicity and IgE cross-reactivity of LTPs from pollen (mugwort/Art v 3, plane tree/Pla a 3, ragweed/Amb a 6) and foods (peach/Pru p 3, cherry/Pru av 3, hazelnut/Cor a 8). To investigate whether an established Th2 immune response to LTPs facilitates a secondary immune response and cross-reactivity to unrelated LTPs, CBA/J mice were immunized with (1) Pru p 3 followed by Art v 3, (2) Art v 3 followed by Pru p 3, and (3) a mixture of Pru p 3 and Art v 3. Induction of Pru p 3 and Art v 3 specific IgE and IgG titers, and cross-reactivity between the two LTPs were determined by ELISA. CBA and C3H mice showed strong IgE-responses to Pru p 3, whereas BALB/c mice did not. Remarkably, a species-specific immune response lacking any IgE- and IgG-cross-reactivity was observed for all tested LTPs except for Pru p 3 and Pru av 3. Although LTPs show high structural similarity, Pru p 3 and Art v 3 displayed

different antigenicity. In comparison to Art v 3, Pru p 3 showed much lower IgE-sensitizing capacity. In contrast, IgE response to Pru p 3 was promoted in mice previously sensitized to Art v 3, which was even the case upon concurrent administration of both LTPs. Neither sequential immunization nor immunization with the mixture induced IgE antibodies to unrelated LTPs, e.g. Cor a 8. In summary, the immune response to LTPs in mice varied strongly between strains. The LTPs studied, displayed different immunogenic properties and did not induce cross-reactive IgE antibodies. Primary sensitization to the pollen LTP Art v 3 conditioned the animals for subsequent sensitization to the food LTP Pru p 3. The extent to which the findings are applicable to the manifestation of clinical cross-reactivity to LTPs in humans needs to be investigated.

Authors' details

¹Paul-Ehrlich-Institut, Division of Allergology, Langen, Germany. ²University of Salzburg, Department of Molecular Biology, Salzburg, Austria. ³Thermo Fisher Scientific, Research and Development, Uppsala, Sweden. ⁴Paul-Ehrlich-Institut, Junior Research Group 1 Experimental Allergology, Langen, Germany.

Published: 17 March 2014

doi:10.1186/2045-7022-4-S2-O14

Cite this article as: Wangorsch et al.: LTP cross-reactivity - primary sensitization to mugwort pollen LTP Art v 3, facilitates subsequent sensitisation to peach LTP Pru p 3 in mice. *Clinical and Translational Allergy* 2014 **4**(Suppl 2):O14.

¹Paul-Ehrlich-Institut, Division of Allergology, Langen, Germany
Full list of author information is available at the end of the article