

Pollen with Multiple Effects – Groundbreaking News for Allergology

Pollen is more than just an allergen carrier – it can pave its way for the development of an allergic reaction itself by releasing fatty acids. This important discovery was made recently by the Clinical Cooperation Group “Environmental Dermatology and Allergology” of the GSF, headed by Prof. Dr. Heidrun Behrendt.

As has long been known – pollen is one of the most important allergenic substances in outside air. So far the doctrine has been that the allergic inflammatory reaction is triggered, when proteins released from the pollen, the allergens, enter the human body through the skin or mucous membrane and cause a specific allergic immune reaction there. But there is little knowledge as to why these proteins cause an “abnormal” immune reaction with the production of immunoglobulin E antibodies. Scientists from the Clinical Cooperation Group “Environmental Dermatology and Allergology” (KKG UDA) at the Center for Aller-

gies and the Environment at the Clinic for Dermatology and Allergology of the Technical University of Munich, headed by Prof. Heidrun Behrendt, made an important discovery which might mean a big step forward for allergology: in their studies on allergen release Dr. Claudia Traidl-Hoffmann and her working group discovered a completely new biological property of pollen: apart from proteins it also releases a number of unsaturated fatty acids. “Continuing our studies we were surprised to find,” says Dr. Claudia Traidl-Hoffmann, head of the working group of the KKG UDA, “that these fatty acids have a direct immunostimulatory and immuno-

Clinical Cooperation Group

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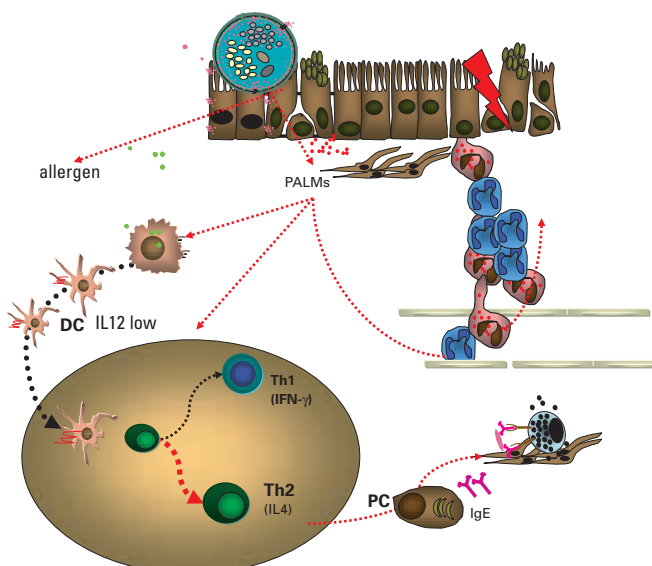
modulatory effect on the human organism.” The substances which are therefore called pollen-associated lipid mediators, or PALMs, are capable of directly attracting and activating human inflammatory cells, such as neutrophilic and eosinophilic granulocytes. Apart from that they modulate dendritic cells – central cells of the human immune system – so that they stimulate an allergenic immune response. This means that pollen is more than just an allergen carrier. It can pave its own way for the development of an allergic reaction by releasing PALMs.

PALMs – Key to Many Questions?

But this was not to be the only surprise for the members of the Clinical Cooperation Group: “The effects observed were not only found in allergic patients, but also in people with no allergies,” says Traidl-Hoffmann.

This opens up completely new approaches for the scientists. In the past the focus was on sensitized patients with the question why an allergy develops. In the future the question will also be investigated which mechanisms prevent an allergy from developing in people who have no allergies. Thus, PALMs might provide answers to the question why at times of high pollen concentrations non-allergic reactions of the upper respiratory tract also occur more frequently.

Yet another question might be answered in the near future by the discovery of the PALMs: epidemiological studies have shown that in areas with greater pollution more people suffer from allergies. PALMs might also have something to do with this – since: the Clinical Cooperation Group could also show that pollen grains release more PALMs from pollutant exposed trees compared to rural trees.



Newly discovered bioactive substances: apart from their specific effect, the pollen-associated lipid mediators (PALMs) released by pollen on the mucous membrane cause an unspecific activation and modulation of the immune system, thereby paving their way for the development of an allergic reaction. (DC = dendritic cell, Th1/Th2 = T-helper cells of the immune system, IgE = immunoglobulin E antibodies)

The Clinical Cooperation Group Environmental Dermatology and Allergology studies the influence of environmental factors on allergic diseases and develops new approaches to the diagnosis and therapy of allergic diseases.

The four working groups are established both in the clinical area and at the GSF.



The newly discovered PALMs might be partly responsible for the fact that in areas with greater air pollution, e.g. along busy roads, more people suffer from allergies: the Clinical Cooperation Group could show that pollen grains loaded with air pollutants release more PALMs.



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