

## **Progress in vaccination against vespid venom**

Neuherberg, 24. August 2016. **Especially in late summer, apprehension about wasp stings increases amongst allergy sufferers. So-called hyposensibilisation therapy can help, but it is linked to a heavy burden on patients and health insurers. Researchers at the Helmholtz Zentrum München and the Technical University Munich have now presented a method in the journal, 'Allergy', which facilitates a personalised procedure.**

In late summer enjoying a piece of cake outdoors can soon become a risky venture – it only takes a few moments before the first wasps are buzzing around. These animals change their diet in late summer and are particularly attracted to sugary products. Those who are incautious or react inappropriately run the risk of wasp stings. This is sometimes a perilous situation for allergy sufferers.

Hyposensibilisation is a common therapy against allergies. Here, the patient receives an inoculation with the allergens at periodic intervals in an increasing concentration. In this way the body slowly becomes accustomed to the allergen, in this case the insect venom. The process can take up to five years. "For success it is important that the patients are treated with exactly the substance which induces the allergy," explains Dr. Simon Blank, leader of the working group at the Institute for Allergy Research (IAF) at the Helmholtz Zentrum München. However, there are numerous different variants of vespid venom. "Until now it was almost impossible to diagnostically differentiate the venoms of different wasp species," adds Blank. "Consequently, it is correspondingly difficult to offer patients the best treatment. This often leads to them being treated unnecessarily against many venoms, which is a burden for patients and the health insurers."

### **Improved diagnostics due to new test method**

Blank and his colleagues led by the IAF Director Prof. Carsten Schmidt-Weber were able to overcome this problem with a new test. First, the scientists specifically produced the allergen components of the venoms from a total of seven different insect species in modified insect cells.\* Then, they examined them on 63 patient blood samples for their interaction with the antibodies triggering the allergy. "A succession of several test methods enabled us to determine from the samples exactly the venom causing the allergic reaction in the patients," says lead author and doctoral student, Maximilian Schiener. "This could allow doctors to offer the most efficient vaccine." However, according to the scientists, a hyposensibilisation therapy is not yet available against all venoms and further work is still to be done.

The results are coming just at the right time, because climate changes appear to be bringing new species of wasp to Germany which in turn produce their own venoms. "Recently our colleagues in Aachen reported that they had sighted a paper wasp which is well-known in the Mediterranean region," explains Blank. "If these neighbours propagate widely here, it would of course be an advantage if we were able to introduce the appropriate countermeasures directly – the vaccine is already available. A test such as ours could unambiguously identify the triggering venom in advance."

## Further information

\* In fact the allergen involved here is the one known as antigen 5 from vespid venom.

### Background:

The method had already been tried out by the scientists to be able to differentiate the venoms from bees and wasps. "The continually improving technical possibilities now enable us in the next step to find differences within vespid venoms," says principal investigator Blank.

Molecular diagnostics have also led to substantial improvements in other fields of allergology. Described scientifically, these advances are also being published currently in the [Molecular Allergology User's Guide](#) from the European Academy of Allergy and Clinical Immunology (EAACI). Dr. Simon Blank from the Helmholtz Zentrum München is amongst its authors who number more than fifty from 15 countries.

### Original Publication:

Schiener, M. et al. (2016): [Application of recombinant antigen 5 allergens from 7 allergy-relevant Hymenoptera species in diagnostics](#). Allergy, DOI: 10.1111/all.13000

### Related Review:

Ollert, M. & Blank, S. (2015): [Anaphylaxis to insect venom allergens: role of molecular diagnostics](#). Current Allergy and Asthma Reports, DOI: 10.1007/s11882-015-0527-z

The [Helmholtz Zentrum München](#), the German Research Center for Environmental Health, pursues the goal of developing personalized medical approaches for the prevention and therapy of major common diseases such as diabetes and lung diseases. To achieve this, it investigates the interaction of genetics, environmental factors and lifestyle. The Helmholtz Zentrum München is headquartered in Neuherberg in the north of Munich and has about 2,300 staff members. It is a member of the Helmholtz Association, a community of 18 scientific-technical and medical-biological research centers with a total of about 37,000 staff members. [www.helmholtz-muenchen.de/en](http://www.helmholtz-muenchen.de/en)

The [Institute of Allergy Research](#) (IAF) investigates the molecular mechanisms behind the development of allergies, which are on the rise around the world. Through intensive cooperation among scientists and clinicians on individual approaches to prevention, the IAF is working to halt this epidemiological spread. In the therapeutic area, the institute's scientists want to develop new approaches specifically targeted at the patients. The IAF works with the Technische Universität München in the joint Center of Allergy & Environment (ZAUM) facility. The IAF is also a member of the Munich Allergy Research Center (MARC) and the German Center for Lung Research (DZL). [www.helmholtz-muenchen.de/en/iaf](http://www.helmholtz-muenchen.de/en/iaf)

The [Center of Allergy & Environment](#) (ZAUM) in Munich is a joint undertaking by the Helmholtz Zentrum München and the Technical University of Munich (TUM). This cooperation, which is the only one of its kind in the German research landscape, is dedicated to interdisciplinary basic research and forms a link between clinicians at the hospital and clinical research staff at the university. Thanks to this approach, findings about the mechanisms that lie behind allergies are translated into preventive and therapeutic measures. The development of effective, individually tailored treatments enables better care to be provided for allergy-sufferers. [www.zaum-online.de](http://www.zaum-online.de)

[Technical University of Munich](#) (TUM) is one of Europe's leading research universities, with more than 500 professors, around 10,000 academic and non-academic staff, and 39,000 students. Its focus areas are the engineering sciences, natural sciences, life sciences and medicine, reinforced by schools of management and education. TUM acts as an entrepreneurial university that promotes talents and creates value for society. In that it profits from having strong partners in science and industry. It is represented worldwide with a campus in Singapore as well as offices in Beijing, Brussels, Cairo, Mumbai, San Francisco, and São Paulo. Nobel Prize winners and inventors such as Rudolf Diesel, Carl von Linde, and Rudolf Mößbauer have done research at TUM. In 2006 and 2012 it won recognition as a German "Excellence University." In international rankings, TUM regularly places among the best universities in Germany. [www.tum.de/en/homepage](http://www.tum.de/en/homepage)

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