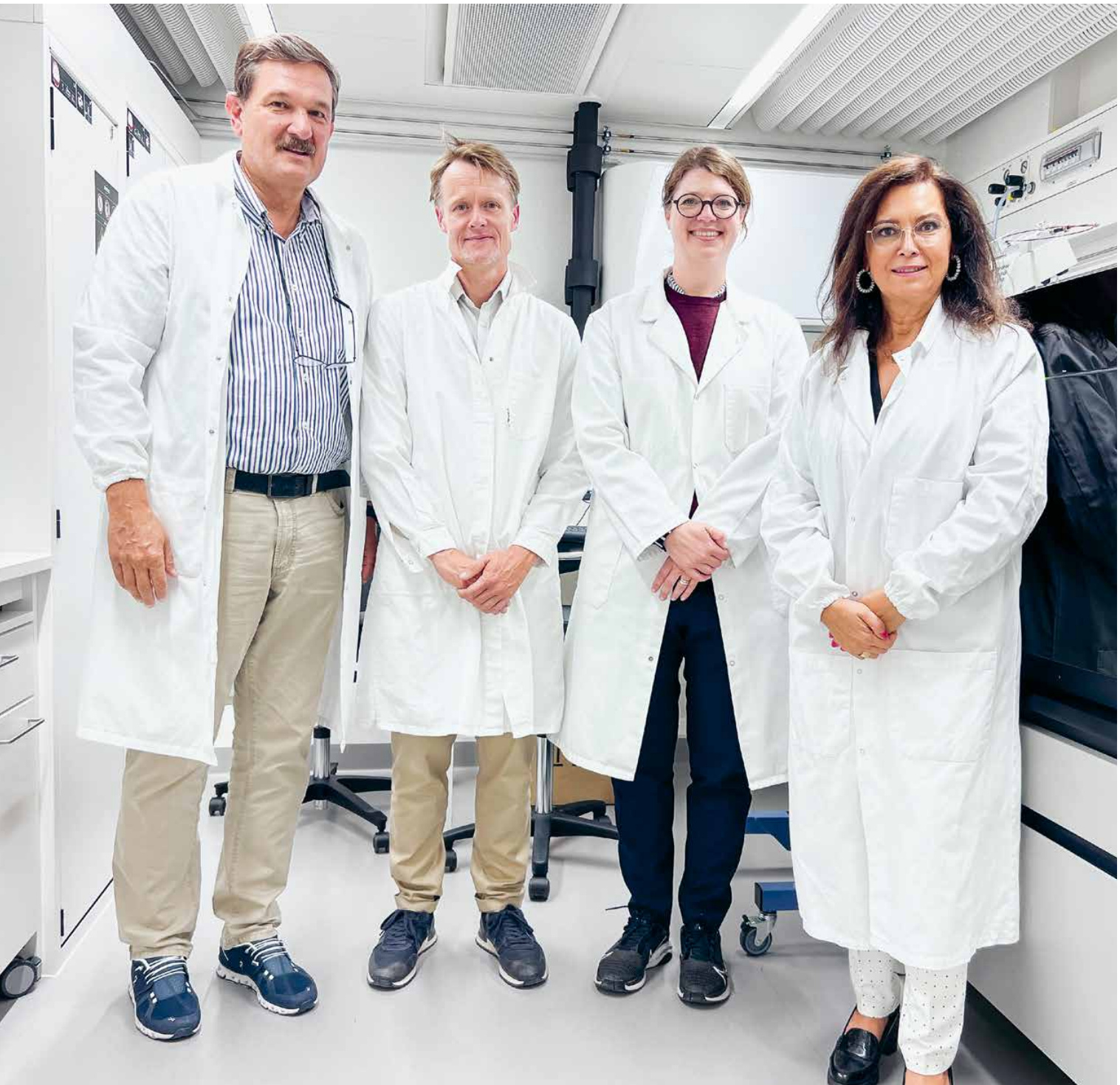
Cezmi A. Akdis, Director of the Swiss Institute of Allergy and Asthma Research, Davos, full Professor at the University of Zurich, and editor-in-chief of *Allergy*.

Taking an immunological perspective on future challenges



«Laboratory medicine will play a very mature role in bringing early diagnosis to the level of personalized diagnosis.»

Interview **Prof. Dr. Dr. Michael Nagler, editor-in-chief «pipette»**

Where does immunology stand today and how can it help to meet our future challenges? In the following interview, we explored these questions.

MN: Professor Akdis, you are one of the most prominent immunologists in Switzerland. In view of the takeaways from the COVID-19 pandemic, how do you see the role of laboratory medicine?

CA: The role of laboratory medicine is becoming immense, and it will be even more. Treatments are becoming more targeted and personalized. Personalized medicine will apply to every area, it's not just cancer anymore. A high level of personalized health care will be achieved through the joint discovery of biomarkers and the use of biologics in the future. Laboratory medicine will play a very mature role in bringing early diagnosis to the level of personalized diagnosis. It already started with the PSA prostate-specific 30 years ago, now this idea is ruling everywere. Also in the discipline of allergy and asthma, six biologicals are already available for patients. The question is which one to use? This will be the job of the laboratory medicine.

MN: Many opportunities for laboratory medicine...

CA: The other important area is healthy living, healthy aging, and again prediction of diseases. People are aging and they want to know how healthy they are. A significant change in medicine is happening nowadays, and the most affected part will maybe be laboratory medicine. We will do lab tests for early diagnosis of cancer just as we do regular colonoscopies. This demand will increase the work and responsibility of laboratory medicine.

MN: Going back to the COVID-19 pandemic, what are your immunology takeaways?

CA: Over 8 billion people live in the world, and with this size of population, we will almost certainly see more pandemics as airways and people are interconnected and there are migrations everywhere. Vaccines must be ready, and vaccine ethics, vaccine trials, and vaccine education must be available to the entire world. We also learned that there is a very strong misinformation flow in social media, including the [former] American president as well as many important people around the world. Initially, we were only able to separate humans by giving masks, but this also didn't help since masks weren't available everywhere. As a result, many mutations occurred in the virus. The more we let the virus divide, the more mutations we have. In addition, our measures won't make a difference if our neighbors don't protect themselves or if people that fly into Switzerland don't protect themselves. In a pandemic, the platform to fight is the whole world.

MN: How did you get involved, personally?

CA: We were in an interesting situation because on the January 10, 2020, an assistant professor from my lab asked me: "Do you know what is going on in Wuhan? People are dying on the streets." As a respiratory physician, he went back to Wuhan and told me: "I am in intensive care, we are full. There are no beds in the hospital. The whole hospital is reserved for patients." So we started to talk about the patients on a daily basis. One of the first things I told him was to give them cortisone—the simplest thing for sepsis-like syndromes. We had the first paper with Chinese data on the February 18, 2020.

The paper was the first one showing human to human infection and mentioned lymphopenia, elderly, diabetes and cancer chemotherapy as risk factors. I think we learned a lot of immunology from the pandemic. We used single-cell sequencing, mass cytometry, proteomic profiling, and other advanced techniques. As an example, biomarker discovery using the Olink technique was very efficient.

MN: I want to change to your other interests. I have noticed that you are decidedly interested in the various aspects of the impact of climate change and global health, and you were one of the driving forces behind a call to action for the United Nations.

CA: Our work on epithelial barriers started in 1998; since then we published a lot. I'm going to outline this in five different problems. First climate change and global warming. Secondly, since 1960 we have been exposed to 350,000 new chemical molecules from textiles, detergents, and food. Since no health concerns have been raised, health effects have not been tested. For example, we eat grams of food additives every day, but we can't eat milligrams of drugs without doing studies for 10-15 years. Without any control, these substances entered our lives. That causes the global health crisis. In the 1960s, there were about 20-30 Million chronic non-communicable diseases. Currently, there are about 2 billion.

MN: ...and that is not because we measure more appropriately?

CA: No, the main increase is after the 1980s and our major diagnostic criteria didn't change. At the same time, food allergy became a major public health concern. The third problem appears with the leak of the epithelial and endothelial barriers: drug hypersensitivity. We are now allergic to biologicals; we are allergic to small chemicals. In the old times there was penicillin allergy and sulfonamide allergy but it wasn't a public health issue because it was rare. Now, every drug can become allergenic and every small molecule delivered as food additive can become harmful to health. There is sometimes an IgG response, but a T-cell response to almost all of them. The fourth concern are COVID-Ebola-like infectious agents and antibiotic resistance. This is a major issue for laboratory medicine. And the fifth concern is ignorance. Many people who don't worry about climate change and don't worry about substantially increasing numbers of sickness of the individuals.

MN: There is one remaining question on my list: I noticed that you are a very successful editor. I am interested in your secret tip, how to make a journal successful.

CA: The secret tip is to see the journal as a whole enterprise aiming to heal the world. Then, you have to think about the journals educational aspects, communication, timing, quality and finances. You need to take care of all these aspects. In terms of education, the best paper does not have any value if you don't reach out to the readers. It needs graphics and good covers to be attractive. You can get things done with the big perspective.

MN: Big perspective?

CA: Yes, the big vision is enough to be successful if you are a hard worker. And you need to have good quality. Good quality only depends on having good editors and good writers. Our journal only grew by teaching our community how to write abstracts, how to review papers, how to write point-by-point reply, rebuttal lettes. Now people check our site when writing cover letters for high impact journals.

Another important point is to be sensitive. Sensitive for the patients, for the speciality, and for the future of the world. So if you publish something about microbiome and climate change – people read it. One important thing is to expand the readership. You can also organize conferences. If you would like to boil this down, you will end up with the two following secred words: embrace and engage. Our journal always tries to embrace the young scientists, developing junior group leaders. The interview was held on September 9, 2022. ●

«Another important point is to be sensitive. Sensitive for the patients, for the speciality, and for the future of the world.»


Seehorn