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Research in Graubünden

The amazing world of proteins

– And their importance for personalized medicine

Anyone crossing the Wolfgang Pass on their way to Davos may have wondered what lies behind the facade of the modern building on the right-hand side of the road. Opened in 2019, the Davos Medical Campus is home to the Swiss Institute of Allergy and Asthma Research (SIAF), headed by Professor Cezmi Akdis. Around forty scientists from all over the world conduct research in the laboratories, which are equipped with the latest technology. Since the summer of 2022, Christoph Messner, a native of Tyrol, has also been conducting research at SIAF. He is a professor at the University of Zurich and heads the new Center for Precision Proteomics at SIAF. After several years of research at the University of Cambridge and the Francis Crick Institute in London, the molecular biologist was drawn back to the Alps.

Christoph Messner at work on a mass spectrometer. Image: SIAF

The canton of Graubünden is supporting the project to establish the center over a period of six years with a total contribution of around CHF 3.49 million. Messner explains what lies behind the enigmatic naming 'Precision Proteomics': "Proteomics is a branch of molecular biology that deals with the analysis of proteins. Proteins are the fundamental building blocks of cells and organisms and are involved in almost all biochemical processes. Therefore, this research approach is applied in many research areas of biochemistry and biomedicine. Proteomics is also of great importance for drug development, since most drugs bind to proteins. In recent decades, proteomics has made significant progress through the use of mass spectrometry. With this analytical technique, thousands of proteins can be measured in different types of samples, such as saliva, blood or skin cells. For example, hundreds of proteins can be analyzed in one drop of blood and the health status can be recorded very precisely. However, the data we get from such measurements are very complex and require state-of-the-art analytical techniques to interpret them."

The term 'precision' in the name refers to personalized medicine, as Messner explains: "For example, I am involved in a clinical trial that focuses on patients with pancreatic cancer. These patients are being treated with a combination of immunotherapy and chemotherapy, to which

some of them respond positively. We are investigating whether we can use blood samples to measure certain proteins that distinguish these individuals from others. We found that there are indeed certain proteins that distinguish the different groups of patients. That way, therapy can be tailored to the individual." Those who are now curious can meet Christoph Messner in person at Academia Raetica's Researchers Beer at Kulturplatz Davos on Tuesday, June 6, at 6:30 pm. He will give an insight into proteomics and reveal why it sometimes smells like a bakery in the lab.

Christoph Messner and Daniela Heinen

Christoph Messner. Image provided.

More information
Research at SIAF (www.siaf.uzh.ch) focuses on the immunological mechanisms of allergic and asthmatic diseases. SIAF is affiliated with the University of Zurich and a member of the Life Science Zurich Graduate School.