

“We Need to Do Something Now”

Prof. Dr. Sinz from Martin Luther University Halle-Wittenberg is working on combating the pandemic, developing new test methods and pushing ahead with research

Pharmaceutical chemists at Martin Luther University Halle-Wittenberg (MLU) have succeeded in using mass spectrometry to identify minute amounts of the coronavirus SARS-CoV-2 in gargle solutions from COVID-19 patients. The idea behind this came from Prof. Dr. Andrea Sinz at the Institute of Pharmacy. The distinguished protein researcher is also one of the founding members of the COVID-19 Mass Spectrometry Coalition, an international network that is sharing methodological expertise and new data on the respiratory disease.

Research can be a good antidote to shock. When Germany went into lockdown in mid-March, Prof. Dr. Andrea Sinz felt uneasy. “I felt I needed to do something,” said the Professor of Pharmaceutical Chemistry at the MLU. She recalls how she looked into empty rooms and thought: “I want to do something and make use of all our modern equipment.” She shook off her initial feelings of shock and decided that her motto would be: “Let’s try something.” No sooner said than done. Normally the researchers in the “Sinz Lab”, the Department of Pharmaceutical Chemistry and Bioanalytics, use mass spectrometry to investigate the structures of proteins and the interactions between them in order to improve the molecular understanding of diseases such as cancer and diabetes. In April, they began using the process to measure the mass of atoms and molecules so that they could try out a spontaneous idea. Together with Prof. Dr. Stefan Hüttelmaier from the University Hospital in Halle an der Saale, Prof. Dr. Andrea Sinz came up with the idea of analyzing samples from COVID-19 patients. Prof. Hüttelmaier supplied the gargle solutions and highly diluted samples were analyzed in the Sinz Lab.

Identifying virus proteins in gargle solutions

In record time the working group developed a method of identifying the components of SARS-CoV-2 viruses in the samples. “We actually found components of the virus proteins in the solutions,” says Prof. Dr. Andrea Sinz. “We didn’t know whether it would work, so it was quite a surprise.” There is currently one reliable test method used to determine whether people are acutely infected with COVID-19: the polymerase chain reaction or PCR. The test developed in Halle an der Saale could be a new addition to this. As Prof. Dr. Andrea Sinz explains, “it is highly specific to the virus, because the proteins in question only occur with this disease.” Another benefit is that it has already been possible to carry out tests during the early phase when many viruses are present in the mouth and throat. Even the tiniest amounts of the coronavirus SARS-CoV-2 have been identified in only around 15 minutes.

“We have a major responsibility.”

The researchers from Saxony-Anhalt are currently working on reducing the analysis times, while at the same time looking for partners from industry and investigating the use of other mass spectrometry methods that are comparable with biotyping. “This would make it possible to carry out the measurements in a matter of seconds,” said Sinz. The investigations are under way, but Sinz does not like to talk about the team being under pressure. “It’s true that we are all working very quickly, but we have a major responsibility,” she comments. To fulfill this responsibility in a variety of different ways, Sinz, who has been working and researching at the MLU since 2007, is taking new international approaches.

She is among the founding members of the COVID-19 Mass Spectrometry Coalition, an international initiative set up to share methodological expertise and new data relating to COVID-19. “Mass spectrometry is a highly promising method of carrying out research into the coronavirus. It is fast, sensitive and reliable,” explains Sinz. If anyone should know this, it is Prof. Dr. Andrea Sinz, because she is chair of the German Society for Mass Spectrometry.

Knowledge transfer on an international level

This ensured that she was quickly taken seriously by the coalition. “We simply have an obligation to give something back to society,” she says. Together with colleagues from the UK, Spain and Italy, among other countries, she has laid the foundations for the establishment of the alliance. At the first video conference, she asked: “Which direction are we going in?”. Her question was soon answered. Reports on mass spectrometry processes are being shared, details are being passed on and knowledge is being exchanged. “We are not competing with one another. Quite the opposite – we are partners who can benefit from each other’s knowledge,” she says. The news from other countries where politicians have failed to combat the virus and health systems are collapsing as a result of the pandemic fills her with horror. Once again she is pleased “to be able to live and work in such a good environment.” She includes in this her place of work in Halle an der Saale.

The coronavirus pandemic: Pooling specialist knowledge on an international level

Sinz, who was born in the German state of Baden-Württemberg, can look back on an impressive career. She has carried out research at the National Institutes of Health in Bethesda, Maryland, USA and at the Universities of Leipzig and Tübingen in Germany. For several years, she has been the chair of the Saxony-Anhalt group of the German Pharmaceutical Society. In 2016 The Analytic Scientist magazine included her in its list of the 50 most influential women worldwide in the field of analytical science, and in 2019 she was awarded the Fresenius Prize by the German Chemical Society.

She has contacts in many countries and is part of a large network of prominent researchers. She receives job offers from other research institutions, but always turns them down. “My working conditions here are very good. I have a lot of freedom and all the latest equipment,” says Prof. Dr. Andrea Sinz. In addition, she has access to a pool of highly qualified people in the region and is supported by international colleagues. She is also very good at taking the initiative and bringing external partners on board. “That’s the right mix for me,” she says. “I want to develop methods for solving medical problems that are actually used. That is just what we are doing here in Halle.” She calls this the “mainspring” of her research.

She is currently planning to continue this by developing new diagnostic methods using mass spectrometry. Prof. Dr. Andrea Sinz hopes that these will be in use in just a few months and that other new findings will help to give a better understanding of COVID-19. Her motto remains: “We need to do something now.” This is why she is constantly sharing information with colleagues all over the world. As she explains: “If we pool our knowledge, we can make a contribution in several areas, including tests, treatments and vaccines.”

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