

Press release

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Corona antibody tests from Reutlingen

Research: The NMI Reutlingen is currently tackling a major problem associated with antibody tests for the detection of COVID-19: false positive test results.

In order to detect the spread of the pandemic and improve the control of prevention measures, rapid tests for diagnosis as well as antibody tests that can be used to detect previous infections are required. The NMI Natural and Medical Sciences Institute in Reutlingen is currently working intensively and with its own resources on these tests. Available antibody tests sometimes lead to false positive results. Seasonal viruses from the corona family have been circulating in the population for a long time and usually cause harmless cold symptoms. Many currently available Covid-19 antibody tests are reacting positive to other viruses of the corona family. They are one reason why the Covid-19 infection cannot be accurately assessed.

NMI researchers are now working in cooperation with the Helmholtz Centre for Infection Research to develop an antibody test that enables the reliable analysis of existing antibodies against both Covid-19 and seasonal corona viruses and thus offers greater safety, reports Prof. Dr. Katja Schenke-Layland, director of the NMI. In addition, the antibody test should only require the smallest amounts of antigen - around one fiftieth of the amount required by conventional test methods - thus avoiding production bottlenecks in the tests.

During the development, the research team has leveraged its more than ten years of experience in serology. "We have already developed differential test systems in the past, for example for testing for hepatitis A or B infection. We have also developed serological tests for antibodies against other viruses and bacteria such as *Helicobacter pylori* and *Mycobacterium tuberculosis*. We were now able to use this expertise for the development of the new antibody test and produce antigens specifically for SARS-CoV-2 tests," said Dr. Nicole Schneiderhan-Marra, group leader and Biochemistry at the NMI Reutlingen.

With the new method, the researchers hope to tackle the problem of cross-reactions. Dr. Thomas Joos, deputy director of the NMI, explains: "Many people have or have had contact with common corona rhinitis viruses at some point in time. After all, they account for up to 15 percent of all common cold viruses. It is correspondingly likely that antibodies against their viral proteins can be found in the blood. Since corona viruses are very similar to each other, tests for SARS-CoV-2 antibodies can also lead to cross-reactions and thus to false positive test results. We want to rule these out with our second line test. Initial tests with the serum of former COVID-19 patients have already been successful.

With the development of these tests, the NMI is involved in joint projects. The institute started the first projects with its own resources at the beginning of February. In the meantime, the work is funded by the state and the EU. "We work closely with the Helmholtz Centre for Infection Research HZI in Braunschweig and are in intensive exchange with the epidemiologist Prof. Dr. Gérard Krause. In an EU project, the HZI is also leading studies on basic immunity in the population, in which we are involved," reports Dr. Schneiderhan-Marra.

Since it is foreseeable that more and more tests will be required, the NMI has purchased a new pipetting robot specifically for this purpose. This was made possible through a 210,000 euro state grant from the Ministry of Economic Affairs. "We are currently working with 96-well plates, but can then move on to the next format with 384-well plates. After subtracting the experimental control wells, we can test 360 samples with one of these plates and we can then manage 4 runs per day, and even two more with evening shifts," says Schneiderhan-Marra happily. The NMI plans to make the method available to other laboratories in the future. "We will pass on our development to interested laboratories," said Dr. Schneiderhan-Marra.

About the NMI

The NMI Natural and Medical Sciences Institute at the University of Tübingen conducts application-oriented research at the interface of biological and material sciences. It has a unique, interdisciplinary spectrum of competence for R&D and services for regional and international companies. The NMI addresses both the health care industry and industrial sectors such as vehicle-, machine- and tool construction.

The NMI is divided into three business areas, which are connected by a common mission statement: The search for technical solutions is always conducted according to the highest scientific standards. In the pharmaceutical and biotech business area, the NMI supports the development of new drugs using biochemical, molecular and cell biological methods. The Biomedicine and Materials Sciences division researches and develops future technologies such as personalised medicine and micromedicine for new diagnostic and therapeutic approaches. The focus of the services offered to customers is the structuring and functionalisation of materials and their surfaces. The Analytics and Electron Microscopy business unit provides answers to analytical questions.

The NMI is known beyond the borders of Germany for its incubator concept for start-up companies with a background in bio- and material sciences.

www.nmi.de

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Württemberg Innovation Alliance, an association of 13 non-university and industry-related research institutes.

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Prof. Dr. Katja Schenke-Layland, Director of the NMI in Reutlingen: "We are working intensively on the development of a reliable antibody test that enables the clear differentiation of a patient's immune response to pandemic SARS-CoV-2 from seasonal corona viruses." Photo: NMI (archive photo)

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