Press release

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Helmholtz makes important contributions to solve the Corona crisis.

The number of SARS-CoV-2 infections is increasing dramatically from day to day in Germany and worldwide. Researchers at the Helmholtz Centers are working on the development of new active substances, antibody therapies and testing procedures, the deciphering of infection mechanisms and epidemiological questions. In more than 20 research projects – mainly in the Research Field Health but also beyond – Helmholtz is addressing one of the greatest challenges of our time.

The SARS-CoV-2 pandemic poses immense challenges to our society and to each and every one of us. Helmholtz took steps early on – both to protect its own employees and to contain the spread of the virus and to research the novel corona virus. “The pandemic challenges us on several levels”, says Helmholtz President Otmar D. Wiestler. “As Germany’s largest research organization, Helmholtz is making important contributions to overcoming the corona crisis through top-level research. According to Wiestler, Helmholtz is doing everything in its power to continue to deliver important research results that will help fight the current pandemic, prevent future events and cope with the consequences of the crisis. “Finally, the conditions must also be created to enable us to quickly resume the currently severely restricted scientific activities in our other research fields in due course”.

More than 40,000 employees work at the 19 Helmholtz Centers. “It is important to develop solutions for the staff that are appropriate to their personal situation as well as to secure necessary basic functions and infrastructures,” says Wiestler. In addition, numerous Helmholtz experts are working at high speed to deliver further research results on SARS-CoV-2. “A significant part of our research at the Centers in the Research Field Health, but also beyond, is now focusing on the new virus,” says Wiestler. “It will be crucial to decipher the structure of the virus and its infection pathways and to develop more effective drugs and test methods as well as a vaccine.”

In the biomedical field, Helmholtz has modern and efficient research infrastructures. Examples include drug screening as well as big-data and AI applications that analyze molecular events at the cellular level. Many of these structures are used for SARS-CoV-2 research and for the identification of potential active substances.

Researchers at the Helmholtz Centre for Infection Research (HZI) focus on the development of active substances and vaccines against the virus and on deciphering the mechanisms of disease development and progression. In addition, the dynamics of the spread of infection in the population is being researched. An app for disease control and risk assessment (SORMAS) developed at the HZI is now also available for the current SARS-CoV-2 pandemic.

Scientists from Forschungszentrum Jülich are working with the University of Heidelberg and the Frankfurt Institute for Advanced Studies (FIAS) to develop mathematical models of the dynamics of the corona outbreak in Germany, which can be used to simulate the effect of containment measures. Their goal is to predict when the outbreak will peak and how many people may fall ill. In addition, the Jülich Supercomputing Centre, together with the other Gauss partners, is providing the research community with computer resources to, for example, simulate the effect of potential drugs.
Using the high-intensity X-ray light from the synchrotron source BESSY II at the Helmholtz Zentrum Berlin (HZB), researchers from the University of Lübeck and the Helmholtz Centre for Infection Research were able to decipher the three-dimensional architecture of an enzyme. This enzyme is the main viral protease of SARS-CoV-2, which is involved in the replication of viruses. This could lead to concrete targets for the development of efficient drugs.

Researchers at the Max Delbrück Center for Molecular Medicine in the Helmholtz Association (MDC) use methods of single cell biology to analyze how lung cells react to infection with the novel coronavirus in comparison with the old SARS-CoV-1 – on the level of mRNA of body cells and viral RNA as well as on the level of proteins. Other MDC groups are investigating which antibodies the body produces during disease with COVID-19 and how to block the so-called ACE2 receptor through which the virus enters the cells. An online tool of the MDC visualizes the case numbers in Germany.

"These are just a few examples of the valuable contributions that researchers at our Helmholtz Centers make," said Otmar D. Wiestler. Apart from the already enormous challenges for our health system and the urgently needed research in this field, Helmholtz also sees it as a major challenge and task to identify interactions and long-term negative effects of the pandemic on other sectors at an early stage and to take measures to contain them. The Helmholtz President emphasised that SARS-CoV-2 research at the Helmholtz Centers will be continued to the full extent – as long as it is possible and justifiable.

The Helmholtz researchers are constantly exchanging information with other national and international experts on these topics, Wiestler said. It is now important to cooperate particularly closely in this area and to continue to exchange information. "This shows once again how important networking and cooperation – especially at international level – is for research".

For Helmholtz, another important element in combating the pandemic is the active support of clinics and laboratories. "The doctors, nurses and indeed all the employees in our health system are currently doing outstanding work. And much more will be demanded of them in the future, if the situation worsens," said the Helmholtz President. "We want to make a dedicated contribution here. For this reason, we will in particular release our doctors, virus experts and study nurses and assistants from their duties when necessary, so that they can actively support the staff in hospitals on site.

Helmholtz is also responding to the population’s increased need for information, especially with its patient information services on cancer, lung diseases, diabetes and neurodegenerative diseases. The demand for information among the population is immense – especially among risk groups. "The telephones at our cancer information services in Heidelberg and Dresden don’t stop ringing at the moment. In addition, we are receiving large numbers of e-mails and there is high traffic on our websites," says Otmar D. Wiestler. "Especially people with a possibly already weakened immune system, such as cancer patients or people with previous lung diseases, receive valuable information here".

More information: helmholtz.de/corona

Helmholtz contributes to solving major challenges facing society, science, and the economy through top-level scientific achievements in six Research Fields: Energy, Earth and Environment, Health, Key Technologies, Matter, and Aeronautics, Space, and Transport. With more than 40,000 employees at 19 Research Centers and an annual budget of more than 4.8 billion euros, Helmholtz is Germany’s largest scientific organization. Its work is rooted in the tradition of the great natural scientist Hermann von Helmholtz (1821–1894).

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