Press Release

Press Contact:
Dr. Linda Kirchner
L.Kirchner@corat-therapeutics.com
Phone: +49 1522 4047488

How human antibody COR-101 neutralizes the coronavirus SARS-CoV-2

Dec. 4, 2020, Braunschweig, Germany – Because SARS-CoV-2 is a novel virus, many people have not yet developed antibodies against the pathogen. Vaccines can protect healthy people, but they cannot cure people affected by COVID-19. Furthermore, not everyone responds to the vaccine. Passive immunisation by administering antibodies can help here for both, curing those people affected and prevent infection and/or onset of the diseases for healthy people that come into contact with the virus. CORAT Therapeutics GmbH is developing such a drug against the SARS-CoV-2 virus based on human antibodies, which are produced using biotechnological methods, i.e. in test tubes. The structure of this antibody and the history of its development performed in the laboratories of Professor Michael Hust and Professor Stefan Duebel of the Technical University of Braunschweig together with YUMAB GmbH have now been published (https://www.biorxiv.org/content/10.1101/2020.12.03.409318v1).

COR-101 is a fully human antibody of the same type that our body normally generates after infection or vaccination but produced by biotechnological methods. Together with Joop van den Heuvel and Thomas Kluenemann from the Helmholtz Centre for Infection Research, the atomic structure of the interaction between the antibody COR-101 and the SARS-CoV-2 spike protein has now been elucidated. The results show that COR-101 blocks exactly that binding site on the surface of the virus which the virus needs for docking to human cells. Moreover, COR-101 covers an extraordinarily large area and with very high binding strength. As a result, the virus can no longer attack and penetrate the cells and multiply.

"We know that a vaccine does not work in every person, and this is especially observed in older people. There are patients with other diseases that cannot be vaccinated as well. Unfortunately, these are precisely the two groups of people, who usually have a higher risk of developing COVID-19," says Dr. Andreas Herrmann, Managing Director of CORAT Therapeutics, and explains: "At this point, our antibody COR-101 comes in. Since COR-101 permanently occupies the essential contact point between the virus and our body, the virus can no longer use its "spike" proteins to infect us. Therefore, we expect COR-101 to be able to help all those, who already have COVID-19 but whose immune system was unable to initiate the necessary immune response in time. We will also examine whether COR-101 can protect both medical staff and risk groups from infection."

Herrmann also emphasises that COR-101 can also recognise and neutralise virus variants ("mutations") that have already been observed.

Thanks to the development of a novel, greatly accelerated production process, COR-101 has also already been made available for clinical studies in accordance with regulatory compliant drug standards. The start of such studies is planned for early next year. Dr. Herrmann emphasises: "In contrast to the vaccines currently being developed, our anti-corona drug does not require sophisticated deep-freeze logistics. Antibodies are very stable and robust molecules. A century ago, doctors carried vials of antibodies in their pockets for weeks without refrigeration, so that they were always ready for use against tetanus or diphtheria, for example. Consequently, we expect a much simpler and cheaper logistics for the distribution of COR-101 than for RNA vaccines".

Why do we need antibody drugs against COVID-19 in addition to virus vaccines?

Our body normally generates its own antibodies to fight viruses like SARS-CoV-2. This happens either after a natural infection or after a vaccination. Antibodies are the policemen of our bloodstream and can literally grab invading viruses and neutralize them, preventing a further spread of the infection. However, in patients with other illnesses and elderly people, the formation of the necessary antibodies is often slowed down or no longer possible. Then they are not protected even after a vaccination. However, they can be helped by administering suitable antibodies from outside, which can then fight the viruses immediately. Antibodies of this kind have been known for more than one hundred years as a life-saving treatment in medicine, for example, against tetanus and diphtheria. Due to the generally very good tolerance of antibodies, which are the body's own substances, antibodies against other lung viruses are already used today for the preventive protection of children with heart disease and of premature infants. Therefore, antibodies are intended to help all those, who are already infected or for whom the vaccination does not work. With the reported efficiency data of the SARS-CoV-2 vaccines between 70% and 95% so far, between 350 million and two billion people would not be protected at all by vaccination, even if everybody on the planet can be vaccinated. However, they could be protected against severe or fatal COVID-19 infection with antibody drugs such as COR-101 as well.

CORAT Therapeutics GmbH
Inhoffenstr. 7 | D-38124 Braunschweig
Phone: +49 1522 4047488
Email: info@corat-therapeutics.com
Web: www.corat-therapeutics.com

Managing Director:
Dr. Andreas Herrmann

Local Court Braunschweig
HRB 208500

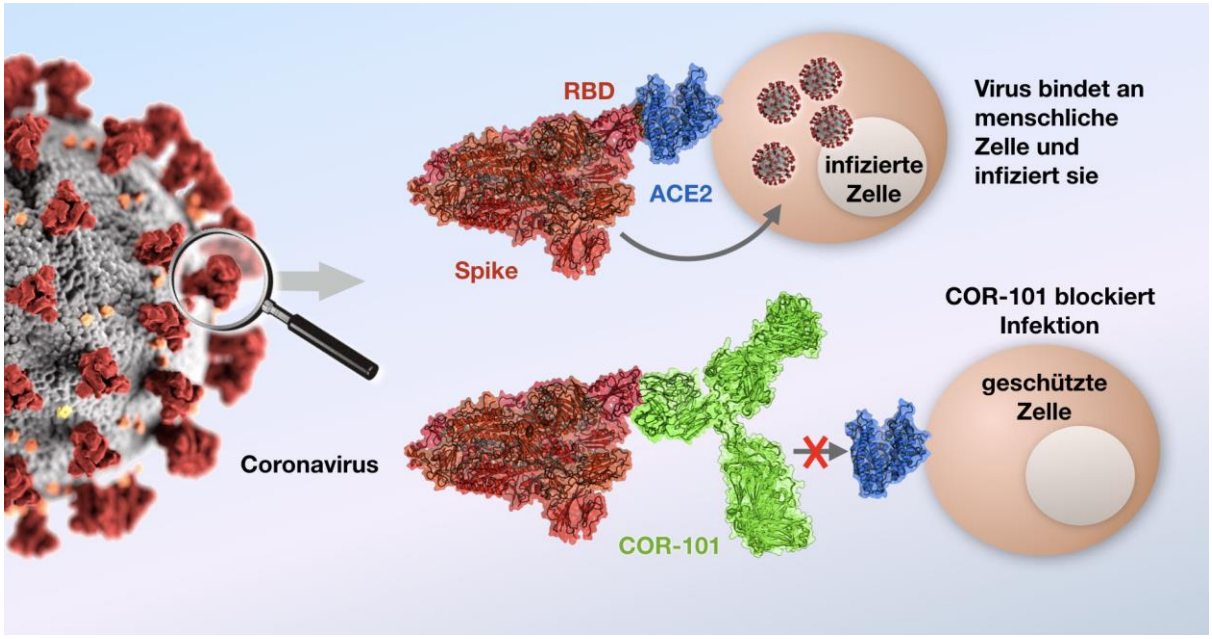

Image text: Mechanism of action of COR-101: The binding site of the biotechnologically produced fully human antibody COR-101 (green) on the virus surface is almost identical to that of the human receptor ACE2 (blue), which is the docking site of the coronavirus to our tissue. When COR-101 is bound, the virus is unable to use its spike structure (red) to attach itself to our cells in order to infect them, thus preventing it from multiplying (Image: CORAT Therapeutics).

Video explaining the function of the drug:
https://www.youtube.com/watch?v=OLDJQVitWo4

CORAT Therapeutics GmbH is based in Braunschweig, Germany. It is is a subsidiary of YUMAB GmbH and was founded with the support of the State of Lower Saxony and private investors. Using phage display, CORAT develops fully human antibodies as passive vaccines for the treatment and protection against infectious diseases.

Further information:
Dr. Andreas Herrmann,
CORAT Therapeutics GmbH
Inhoffenstr. 7
38124 Braunschweig
Tel. +49 (0)152 2404 7488
hello@corat-therapeutics.com
www.corat-therapeutics.com

Image text: Doses of COR-101 ready for clinical testing (Photo: Holger Ziehr, Fraunhofer ITEM).

Image text: Professor Michael Hust, Braunschweig University of Technology, analyses a petri dish with corona antibody clones. (Photo: CORAT Therapeutics).

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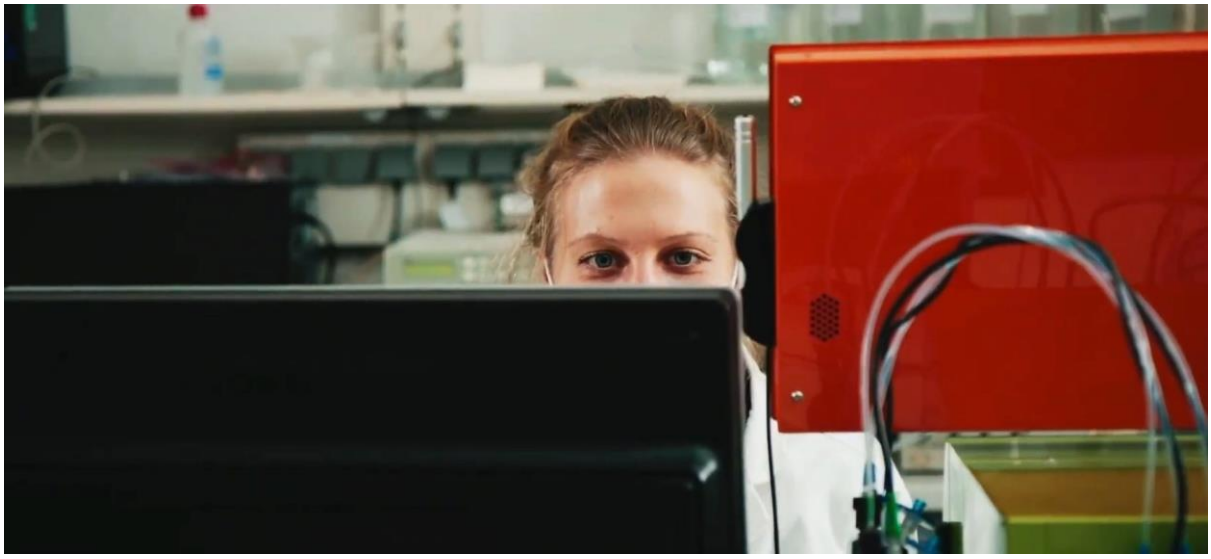
Following pictures: CORAT team members working on the generation and testing of COR-101 (Photos: NBank).



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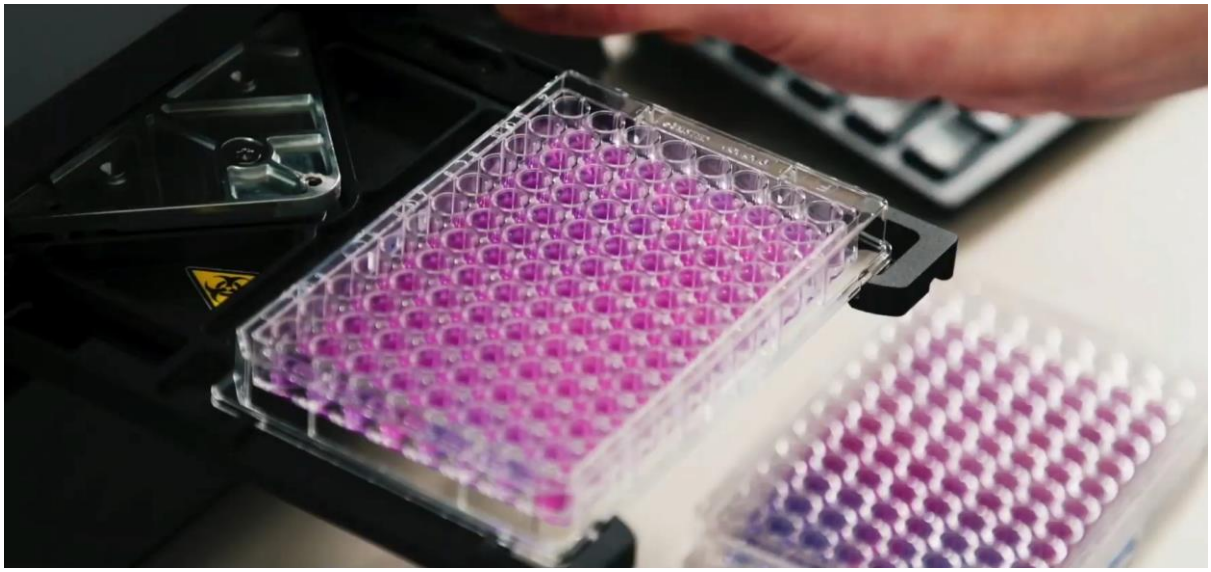

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