

Press Release

Study in Peer-Reviewed Journal *Vaccine* Demonstrates Decoding Mode of Action of mRNA Vaccines

- **CureVac succeeds in describing the detailed steps of an mRNA vaccine inducing potent immunity**
- **In-depth understanding of the mode of action allows for targeted and faster mRNA product development**

TÜBINGEN, Germany, July 14, 2016 – CureVac AG, the most clinically advanced mRNA company, today announced that a study of its RNAActive® technology was published in the renowned, peer-reviewed journal *Vaccine*. The study, titled, "Self-adjuvanted mRNA vaccines induce local innate immune responses that lead to a potent and boostable adaptive immunity," demonstrated a mechanistic insight into the mode of action and rationale for the use of messenger RNA (mRNA) for the development of multiple vaccines.

The study evaluated the early events upon intradermal application of RNAActive® to gain a more detailed understanding of the underlying mode of action of the mRNA vaccine. RNAActive is a two-component, self-adjuvanted vaccine that combines high antigen expression with potent adjuvant capacity, which induces balanced immune responses.

Mariola Fotin-Mleczek, Ph.D., CSO of CureVac, stated, "The results of this study are very exciting, since this is the first time the mode of action of an mRNA vaccine was described in great detail. In this respect, local administration seems to be a very effective approach for inducing a strong systemic immune response. At the same time this approach exhibits a beneficial safety profile, as activation of the innate immune system is transient and limited to the application site and draining lymph nodes, yet generates boostable systemic immunity. By characterizing the early events following mRNA application, we now have not only a proven mechanistic rationale for the observed efficacy of mRNA vaccines, but an excellent basis and accelerator for our ongoing development of potent and safe mRNA products."

Ingmar Hoerr, Ph.D., co-founder and CEO of CureVac, concluded, "Although we already initiated eight clinical trials in approximately 450 humans, we believe the knowledge generated from this study further strengthens the company to rapidly develop mRNA therapeutics and vaccines across a host of indications, comprising a broad range of formulations and with different routes of administration. As pioneers in the field of mRNA, we are proud we were able to further decrypt the secret of this exciting molecule. We look forward to leveraging this data to advance our clinical pipeline together with our partners."

Specific details regarding the paper, including a link to the abstract, can be found below:

"Self-adjuvanted mRNA vaccines induce local innate immune responses that lead to a potent and boostable adaptive immunity." by Kowalczyk A, Doener F, Zanzinger K, Noth

J, Baumhof P, Fotin-Mleczek M, Heidenreich R. *Vaccine*. 2016 Jul 19;34(33):3882-93.
DOI: 10.1016/j.vaccine.2016.05.046.

The abstract of the paper can be found under
<http://www.ncbi.nlm.nih.gov/pubmed/27269061>.

Copies of this paper are available to credentialed journalists upon request; please contact Elsevier's Newsroom at newsroom@elsevier.com or +31 20 485 2492.

About *Vaccine*

Vaccine is the pre-eminent journal for those interested in vaccines and vaccination. It is the official journal of The Edward Jenner Society and The Japanese Society for Vaccinology and is published by Elsevier (<http://www.journals.elsevier.com/vaccine>).

About CureVac AG

Founded in 2000 as a spin-off from the University of Tübingen in Germany, CureVac is a technology leader in the development of drugs that are based on the molecule Messenger RNA (mRNA). The company has more than 16 years of expertise in handling and optimizing this versatile molecule for medical purposes and has the most advanced product pipeline and IP portfolio in the industry.

The basic principle of CureVac's proprietary technology is the use of mRNA as a data carrier to instruct the human body to produce its own proteins capable of fighting a wide range of diseases.

Since its inception, CureVac has received approximately \$330 million (€300 million) in equity investments. CureVac has entered into various collaborations with multinational corporations and organizations, including agreements with Boehringer Ingelheim, Sanofi Pasteur, the Bill & Melinda Gates Foundation and IAVI.

In 2006, CureVac successfully established the first GMP facility worldwide for the manufacturing of mRNA. In 2008, CureVac initiated the first global human clinical trial of an mRNA therapeutic. Today, CureVac is the most clinically advanced mRNA company with its lead product – CV9104 – currently the subject of a Phase 2b clinical trial in metastatic prostate cancer. In 2016, CureVac expects to begin the construction of an industrial scale production facility.

For more information, please visit www.curevac.com.

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