Website address:
https://www.gesundheitsindustrie-bw.de/en/article/news/vernachlaessigte-tropenkrankheiten-franz-werner-haas-die-rolle-von-technologie-und-pharmaunternehmen

Expert interview on NTDs – part 3

Neglected tropical diseases – Franz-Werner Haas: the role of technology and pharmaceutical companies

Neglected tropical diseases (NTDs) are poverty-related infectious diseases that suffer from scant attention in terms of research or control. NTDs exist in the shadow of the "big three": malaria, tuberculosis and HIV/AIDS. They affect many people living in poverty in the emerging and developing countries of the tropics and subtropics. Active control can only be achieved when people with NTDs are treated effectively and given information on what to do to reduce the risk of reinfection. Poor living conditions, the lack of public health services and inadequate infrastructure make the fight against NTDs difficult. Research-based diagnostics and pharmaceutical companies play a vital role, contributing to the research and development of necessary technologies and medicines. Dr. Franz-Werner Haas, Chief Operating Officer and member of the Executive Board of CureVac AG, talked with Sarah Triller from BIOPRO Baden-Württemberg GmbH about the role research-based technology and pharmaceutical companies play in the fight against NTDs and what the challenges are.

How do technology and pharmaceutical companies that are engaged in research contribute to research on and control of NTDs?

Dr. Franz-Werner Haas, Chief Operating Officer and member of the Executive Board of CureVac AG

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NTDs pose yet another immediate and long-lasting threat to already disadvantaged populations in the world's poorest countries. People in these areas, most of whom have no access to adequate medical care, nutrition and clean drinking water, receive little attention in general, and this lack of attention extends to efforts to combat NTDs. This contrasts sharply to diseases that are a threat to people in industrialised countries, such as pandemic flu, AIDS or high blood pressure. The public and economic significance of NTDs and diseases that are more common in industrialised countries differs considerably. However, the fundamental importance of technologies in the fight against and treatment of NTDs and diseases such as high blood pressure, AIDS or pandemic flu is the same. Scientific and technical progress in the development of active ingredients and basic technologies is therefore directly applicable to the research and control of NTDs and should be approached accordingly.

How can a technology company such as CureVac AG help combat NTDs?

The medical use of ribonucleic acid (RNA) – the oldest biomolecule in the world – was long considered impossible. However, mRNA-based drugs have the potential to be used medically and fundamentally change treatment options. What makes CureVac's approach so special is that we use the natural mRNA molecule, which consists of a sequence of only four building blocks, as a data carrier to instruct the human body to produce its own proteins to fight a wide range of diseases. Proteins are involved in many body functions, and therefore differ immensely. When mRNA enters a body cell, it begins to produce proteins according to the genetic instructions it carries. Vaccines, for example, are composed of recombinant (harmless) proteins from a disease-causing pathogen, and elicit a protective immune response against this pathogen when administered. This means that the body receives specific information coded in mRNA and uses this information to produce its own, tailored protein as a medicine against a variety of different diseases. Our mRNA technology and research and development work has three overarching goals: fighting cancer, protecting against infectious diseases, and creating molecular therapies, such as protein replacement or immunisation.

In addition, our mRNA substances can be produced quickly and inexpensively. This enables us to produce and deliver small and large drug quantities at short notice. We can produce small quantities of mRNA substances with our proprietary RNA Printer, a compact transportable mRNA manufacturing platform that will in the future be able to produce a vaccine directly in the area where an outbreak occurs. The production of mRNA vaccines is a three-step process. CureVac's platform is capable of producing vaccines within just a few weeks. Several grammes of mRNA vaccine can be produced, which is enough for over a

hundred thousand vaccine doses. This can be a key advantage, especially when responding to the emergence of a disease at an early stage, thus preventing a pandemic and a subsequent humanitarian crisis. In contrast, it takes up to nine months to produce preventive vaccines using traditional methods.

What motivates research-based technology and pharmaceutical companies to engage in topics such as the fight against NTDs? Apart from financial goals, are technology and pharmaceutical companies driven by a feeling of social responsibility?



With the mRNA technology and its research and development work, CureVac aims at three overriding goals: the fight against cancer, protection against infectious diseases and the development of molecular therapies.
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We call ourselves 'the RNA people'. CureVac, our partners in the biotech and pharmaceutical industries and our investors are therefore all driven by the motivation to develop our RNA technology and our RNA product candidates for human application. It is irrelevant where a person who needs a vaccine lives in the world. Of course, one cannot and should not ignore the fact that developing the technology and the products requires considerable investment, so the financial costs need to be taken into account. But we have some good support. The Bill & Melinda Gates Foundation, which is heavily involved in developing countries and their populations that are particularly prone to NTD infection, believe in the potential of our mRNA technology, including its use in combatting infectious diseases, and we are working closely with them, amongst others. We also work with the Coalition for Epidemic Preparedness Innovations (CEPI), which has set itself the task of providing vaccines against epidemic-related infections for people in need within a short response time. Both partnerships focus around the further development of our mRNA production platform with the overall aim of being able to rapidly supply mRNA vaccine candidates that can target pathogens responsible for a wide range of infectious diseases. These will then be used widely for vaccinating people in the poorest countries in the world. We also have the advantage of access to our cooperation partners' large networks. We are convinced that we can make a significant contribution to the fight against NTDs with our versatile technology. However, no one can accomplish this task alone. Everybody involved needs to pull together in a coordinated way. The process starts with a sound scientific understanding of the concrete, sometimes highly complex diseases, we then need to understand regional conditions before going on to develop the medicines and seeking approval for the active agents in the countries where they will be used. It is also clear that the affected population groups cannot manage distribution/administration of vaccines and other medicines on their own. The keywords here are "cross-functional and international cooperation".

What kind of challenges does a technology company face when developing NTD technologies and vaccines in emerging and developing countries?

In February 2019, CureVac signed a partnership agreement with CEPI for the further development of the aforementioned RNA

Printer. Under this agreement, CureVac's mRNA platform will be used to develop vaccines against rabies, which is classified as an NTD, as well as Lassa and yellow fever. Following successful preclinical tests for the three indications, two of the vaccine candidates will undergo phase 1 clinical trials in humans.[1]

The advantage of vaccines is that they would provide preventive protection against these diseases. A major challenge in the fight against NTDs is that patients must not only be treated effectively, but also kept adequately informed about how they can help reduce the risk of reinfection.

NTDs affect the poorest people in the world and are especially widespread in developing and emerging countries in the tropics and subtropics. The affected countries face the challenge of controlling these diseases with vaccines that are essentially unaffordable. These countries also lack well-trained healthcare workers as well as good transport conditions and appropriate storage.[2]

The RNA Printer is a prototype for a transportable, down-scaled, automated, local mRNA printing facility. It is capable of producing large quantities of vaccine doses within a few weeks, enabling rapid onsite delivery to outbreak areas.[1]

This interview with Dr. Franz-Werner Haas is the third of a series of four. The interviews were conducted with experts from the fields of health, science and economy who participated in the "Neglected tropical diseases – impulses from Baden-Württemberg" conference held in Stuttgart on February 7, 2019.

References:

[1] CureVac AG (2019): CEPI awards US$ 34M contract to CureVac to advance The RNA Printer™—a disruptive, transportable mRNA vaccine manufacturing platform that can rapidly combat multiple diseases (as of 26th July 2019)

[2] Bill & Melinda Gates Foundation: What we do – vaccine delivery - strategic overview - the challenge (as of 26th July 2019)

Article

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Sarah Triller
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Further information

Dr. Franz-Werner Haas
Chief Operating Officer
CureVac AG
Paul-Ehrlich-Straße 15
72076 Tübingen
Phone: +49 (0)7071 9883-0
E-mail: info(at)curevac.com

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The article is part of the following dossiers



Human infectious diseases: new threats

infectious diseases | rare diseases | vaccine | basic research | expert interview

More interviews:

Expert interview on NTDs – part 1

Neglected tropical diseases – Carsten Köhler: impulses from Baden-Württemberg

More than one billion people worldwide suffer from neglected tropical diseases (NTDs). NTDs are mostly poverty-related infectious diseases that prevail in tropical countries due to lack of research and measures to detect, prevent and control them. Dr. Dr. Carsten Köhler reports on the political, economic and scientific contributions Germany and Baden-Württemberg can make to successfully change this situation.

Expert interview on NTDs – part 2

Neglected tropical diseases - Gisela Schneider: the burden of disease

The fight against NTDs is defined as a major aim of the 2030 Agenda's sustainable development goals. The World Health Organisation (WHO) regards twenty poverty-related infectious diseases as NTDs. Dr. Gisela Schneider, Director of the German Institute for Medical Mission e. V., was interviewed by Sarah Triller from BIOPRO and explained why NTDs affect mainly the poorest people in the world, and the kind of diseases these people suffer from.