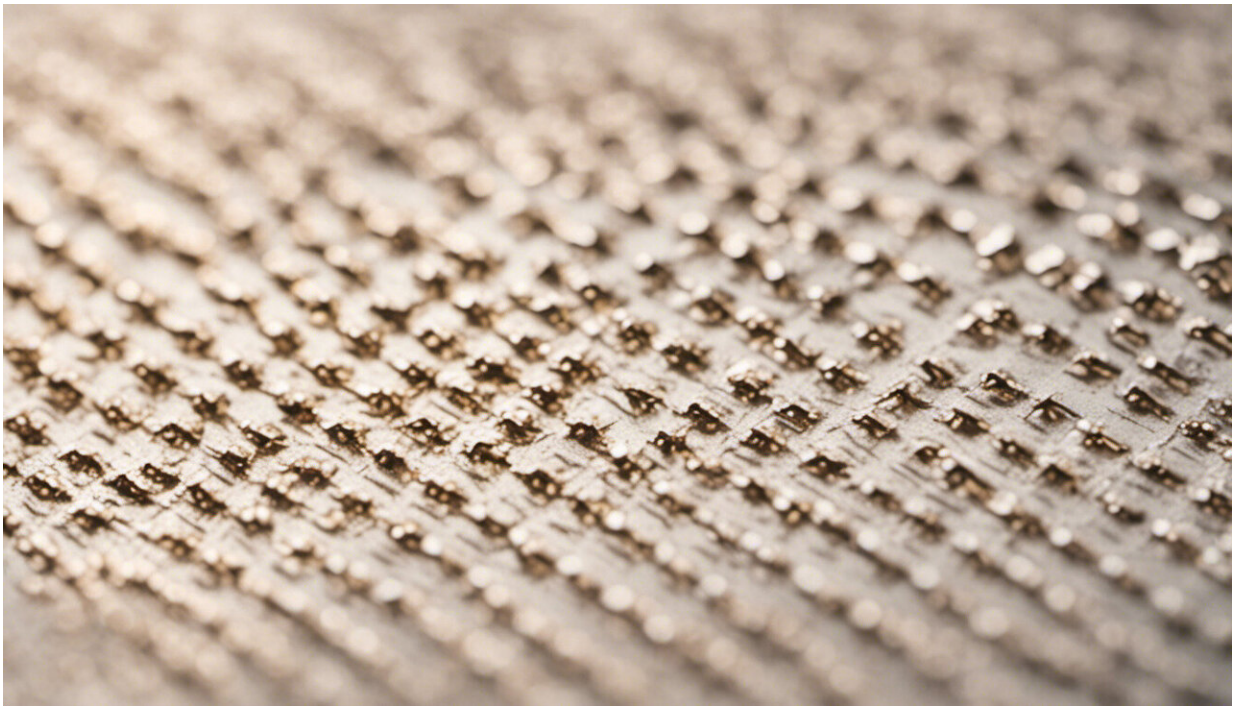
Delivering animal vaccines and antibodies to protect humans from diseases like COVID-19

April 24 2020



Credit: AI-generated image (disclaimer)

Zoonoses—diseases that can spread between animals and humans, like avian influenza, rabies and severe acute respiratory syndrome—comprise a large percentage of all newly identified infectious diseases. As they represent a persistent global threat to public health, scientists are striving to develop strategies that effectively tackle widespread outbreaks, such

as the novel coronavirus disease (COVID-19).

The EU-funded ZAPI project was at the forefront of this endeavor. Launched in March 2015, it has focused on establishing a swift response to major new infectious disease threats in Europe and across the world. It did so by designing new manufacturing processes for delivering effective and rapid control tools (vaccines, antibodies) against (re-)emerging zoonotic diseases with pandemic potential. Bringing together human and veterinary research institutions, NGOs, regulatory agencies, expert academic groups, and vaccine and biotech manufacturers, ZAPI used the "One Health' approach. According to the World Health Organization (WHO), the One Health approach involves designing and implementing programs, policies, legislation and research in which several sectors work together to achieve better public health outcomes. A WHO Q&A document states: "Many of the same microbes infect animals and humans, as they share the eco-systems they live in. Efforts by just one sector cannot prevent or eliminate the problem. For instance, rabies in humans is effectively prevented only by targeting the animal source of the virus (for example, by vaccinating dogs)."

Using recent zoonotic models

ZAPI, which has worked on tackling outbreaks like those caused by coronavirus, used three different prototype models of diseases appearing in recent years that are zoonotic in nature. These are Middle East respiratory syndrome coronavirus (MERS-CoV), Schmallenberg virus (SBV) and Rift Valley fever virus (RVFV). MERS-CoV, causing severe lower respiratory tract disease in humans, was first identified in Saudi Arabia in 2012. Dromedary camels are a major animal source of infection in humans. RVFV, which is transmitted by mosquitoes, primarily affects animals but also has the capacity to infect humans. SBV is a novel Orthobunyavirus that has been associated with disease in ruminants (cattle, sheep and goats) and was initially reported in 2011 in

Europe. It's unlikely that SBV may pose a risk to humans, according to the European Centre for Disease Prevention and Control. MERS-CoV and SARS-CoV-2, the virus responsible for the COVID-19 pandemic, are genetically related, as noted in a news item.

In the same news item, Jean-Christophe Audonnet from project coordinator Merial Animal Health Ltd, part of the Boehringer Group of Companies since 2017, says: "A platform is a generic methodology or technology that can be used for multiple targets; in the case of vaccines, the only thing that will change will be the immunogen. It's an assembly of different components, so the way we manufacture the vaccine will always be the same." He adds that although it's unlikely to produce technology that can address every single new virus, "the ZAPI system design is flexible enough to address about 90% of all the targets that we can face."

The outcomes of ZAPI (Zoonotic Anticipation and Preparedness Initiative) can be directly applied to SARS-CoV-2, according to Dr. Audonnet. "It's a real life experiment now for us. A factor that we need to explore better through dialog is how we can reduce the timelines for the key decisions—political and regulatory ones," he says.

More information: ZAPI project website: zapi-imi.eu/

Provided by CORDIS

Citation: Delivering animal vaccines and antibodies to protect humans from diseases like COVID-19 (2020, April 24) retrieved 30 April 2024 from https://phys.org/news/2020-04-animal-vaccines-antibodies-humans-diseases.html