

The fight against COVID-19 with Prof. Dr. Kremsner

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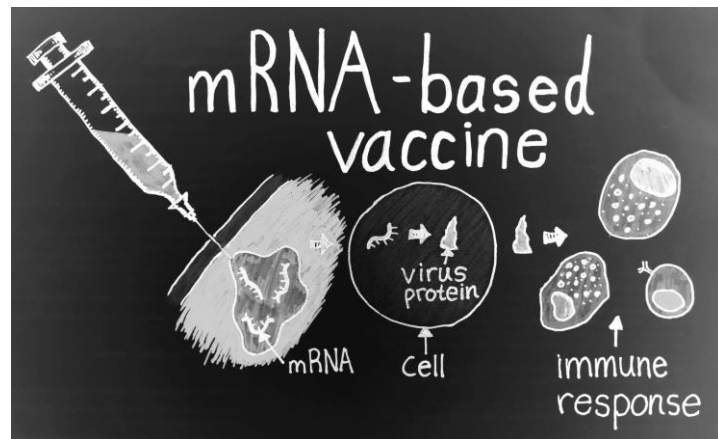
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Over the last months, around 38.000.000 people worldwide have been infected with the virus SARS-CoV-2, which is the causative agent of the disease COVID-19, a.k.a. Coronavirus. Of those people, about 1.000.000 have lost their lives. In this interview, Prof. Dr. Kremsner evaluates the current situation of finding a cure, talks about the different approaches of designing a potential drug and gives personal insight into his academic career.

You are currently involved in three major vaccine studies. One that is an mRNA-based vaccine, another one that is based on the use of viral vectors, and a third one that uses virus-like particles. Could you explain to us the basic differences between the approaches a little more?

A so-called mRNA-based vaccine injects mRNA (the blueprints for a virus protein). The mRNA then penetrates the cells and is translated into a protein which sends out an alarm triggering an immune response.



Another vaccine study will be based on a previously researched malaria vaccine. At that time, we incorporated the malaria antigen, which is used for immunization, into virus-like particles. Now, this will be done analogously using the antigen of the coronavirus.

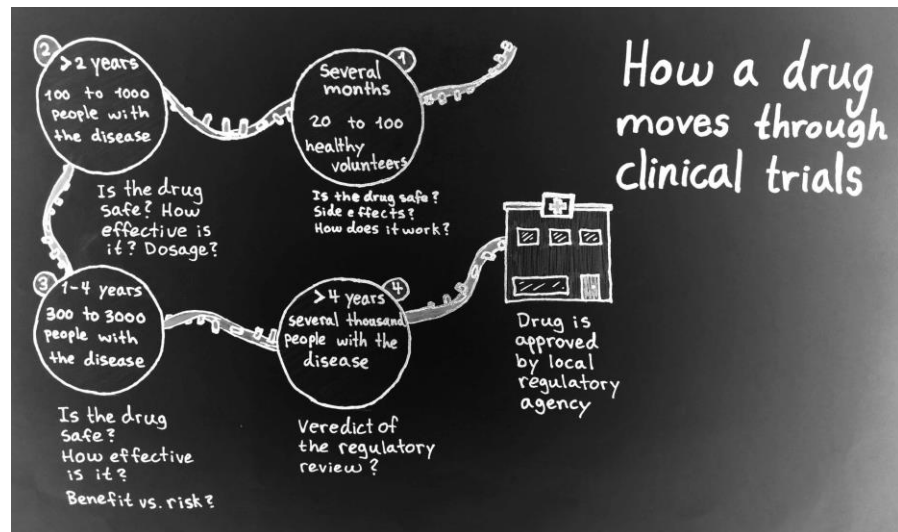
The third approach is based on Modified-Vaccinia-Ankara viral vectors in which the antigen of the coronavirus is incorporated.

Have you noticed a difference in working with other scientists since the pandemic has started? Did it bring all of you closer together or are you rather fighting in the search for an active compound?

At the moment, many groups are working together in the university area, but also keeping close contact with private initiatives. Especially in times like these, we as scientists have to move closer together. It usually takes 10 or even 20 years before a possible vaccine is designed and approved for selling. Decreasing this time to one to two years is only possible in a very close and well-coordinated cooperation. This is because despite the high-pressure work, no reduction in the very high standards of development, security testing, and especially in the work of the ethics committee can be made. I am very optimistic that we will find a vaccine soon.

When do you think the first COVID-19 vaccine will be available?

I believe that the CureVac vaccine will be approved by the end of next winter, mainly because of the joint efforts. Right now, we are in phase 1 of the drug trial. We aim to get the first results in the next two months, so that we can move on to phase 2 and, if possible, to phase 3 before the beginning of the next year.



Recently there were news reports that cured COVID-19 patients show a measurable decrease in neutralizing antibodies in the blood. This is seen as an indication that the permanently acquired immunity to SARS-CoV-2 may decrease. Do you see the vaccine effort at risk?

Of course, this is a phenomenon that still needs to be investigated, but the immune system and in particular the acquired immunity cannot simply be characterized by measuring the antibody concentration. To evaluate the chances for the effectiveness of an active ingredient, one has to examine the dynamics of the entire immune system. There are other viral diseases in which immunity can be acquired that is not necessarily detectable by an increased antibody concentration. Therefore, despite these reports, I do not consider efforts to get a vaccine at risk.

If you had yourself in front of you as a student, what advice would you want to give him for his career as a scientist?

The most important qualities in my experience are hard work, perseverance, and self-organization. I can remember how I always got up at six a.m. in my first semester to study as much as I could before the lectures started. This made it possible for me to spend my free time however I liked it. You will not be successful without discipline. It is also important to specialize in what interests you most as early as possible in your studies.

ACKNOWLEDGEMENT

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