

Danish researchers behind vaccine breakthrough

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A Danish research team from the University of Copenhagen has designed a simple technique that makes it possible to quickly and easily develop a new type of vaccines. The simple and effective technique will pave the way for effective vaccines against not only infectious diseases but also cancer and other chronic diseases.

The next generation of vaccines may soon see the light of day, because Danish researchers have discovered a completely new and simple method which sets new standards for the development of vaccines.

"The major research breakthrough is that we have created a general and user-friendly platform for the development of a special type of effective and safe vaccines. The highly effective method opens a new door for controlling diseases such as cancer, asthma, allergies and cardiovascular diseases by means of vaccines. We are therefore already now able to initiate strategies to combat some of the biggest killers in the western world," says Postdoc Adam Sander, Department of Immunology and Microbiology, University of Copenhagen.

How the new vaccines work

The idea behind the new technique is to mimic the structure of a virus. When you have made the virus structure, it is used as a platform onto which are glued harmless parts of the disease which you want to vaccinate against. This creates an overall virus-like structure, which

constitutes an important danger signal for the body. The immune system will therefore produce antibodies against the disease - a mechanism which has been difficult to activate by traditional vaccines.

The Danish research team's technology is also so effective that it can trick the immune system into attacking the body's own cells, which may be used in the treatment of a number of serious diseases, e.g. cancer, which are not caused by foreign organisms.

"We can see from our experiments that the method works. The method is generic, which means that we can glue, for example, different parts of pathogenic organisms onto the surface of the virus-like platform. Previously, it was a major problem to activate the [immune system](#) and get an adequate response. We have lacked the possibility to easily create a [vaccine](#) which mimics something that will trigger a natural response from the body, but the new virus-like platform now allows us to do so. In other words, we now have a unique technique that enables us to develop vaccines against diseases that we have so far been unable to fight," says PhD student Susan Thrane.

The vaccine breakthrough also means that previous research in vaccines can get a new life. For many years, researchers have tried to find vaccines against, for example, malaria, cancer and allergies, but the vaccines have either been too ineffective or dangerous. However, the new research provides the 'structural' building blocks that were needed to make the vaccines effective. This means that new vaccine research can proceed directly to the development and testing of new vaccines against, for example, breast cancer and allergies.

Huge potential for development of inexpensive vaccines in low-income countries

The technique for the development of the new type of vaccines is very simple. Where vaccines have so far been complicated to develop and produce, it will now be possible for laboratories all over the world to employ and implement the technique.

"It has always been an important mission for us to make the platform available for researchers all over the world. With our research, we offer a very simple tool that allows health professionals to produce complex vaccines in an effective, safe and cost-effective manner. It will be a game changer for low-income countries, which can now make vaccines targeted at widespread diseases such as tuberculosis and malaria. There is no doubt that the new results will have a significant impact on tomorrow's vaccines and public health," says Professor Ali Salanti.

Provided by University of Copenhagen

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