New type of vaccines deliver stronger and faster immune response

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A new vaccine principle is being developed by scientists at the University of Copenhagen which – if it works to its full expected potential – could help to save millions of lives and revolutionise current vaccine technology. The 'InVacc' platform, as it is known, represents an advance on the original DNA vaccines and generates new vaccines with greatly enhanced properties. The platform consists of a chain of amino acids attached to a gene of the virus being vaccinated against. This genetic cocktail is then inserted into an incapacitated flu-like virus such as the adenovirus and injected into the body, where it triggers a broader and more aggressive immune response, enabling the immune system to quickly seek out and destroy the disease when it invades.

"We are excited to be working on the vaccine technology", says Associate Professor Jan Pravsgaard, the lead scientist behind the project. "The platform has proved very effective in our recent tests and could have enormous potential. In principle, vaccines of this type could be used to inoculate against a range of deadly viruses, bacteria and other disease-causing agents and even be used to cure certain cancers once they take hold."

Tests of the vaccine platform on mice so far look extremely promising with the scientists able to provide 100% protection against different, lethal strains of flu given to the test animals.

The scientists also believe that the new technology will be effective despite the ability of different viruses and bacteria to constantly mutate

and develop resistance.

Key benefits of the new technology:

-- The new platform delivers a broad and very powerful immune response, enabling the immune system to defeat invading pathogens.

-- Unlike many vaccines, InVacc activates the CD4+ T cells of the immune system, which govern and coordinate the other immune system attack cells. For reasons not yet fully understood, activating the CD4+ cells enhances the response of the associated attack cells (producing large numbers of CD8+ cells) and is an important reason why the platform is able to deliver such a strong immune response.

-- InVacc provides rapid protection. In animal tests, complete protection was achieved in less than 3 days after a single vaccination. This could have significant implications for the handling of epidemics, quickly halting infection rates and preventing major outbreaks.

The Scandinavian company Novo A/S and the Novo Nordisk Foundation have such faith in the new technology that they have already invested funds to create a strategic plan for development and use of the platform. "The grants awarded through our Novo Seeds programme are only for very select projects that show outstanding promise, both scientifically and commercially, explains Novo Seeds Investment Director, Stephen Christgau." "The InVacc platform is definitely one of those. Our grants will help the team to develop and commercialise their groundbreaking research and validate the advantages of the vaccine platform against competing technologies".

Peter Holst, PhD, from the research team, (together with the Technical Transfer Unit at the University of Copenhagen), are currently also seeking backing from international funds to take the project to its next

phase of development and ultimately into clinical trials.

Source: University of Copenhagen