

## Pitt scientists developing universal flu vaccine in partnership with Sanofi Pasteur

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(Medical Xpress) -- A vaccine strategy that protects against all strains of seasonal influenza and avoids the need for annual vaccination is the ultimate goal of a research collaboration between the University of Pittsburgh and vaccine-maker Sanofi Pasteur.

Ted M. Ross, Ph.D., and his laboratory scientists at the University of Pittsburgh's Center for Vaccine Research (CVR) are exploring new vaccine technologies intended to protect against all strains of [seasonal influenza](#) and be made in less than half the time of the traditional [flu](#) shot. The vaccine could potentially cover influenza strains circulating over multiple seasons, eliminating the need for a seasonal flu shot.

“Our vaccine is adaptable to any delivery method, whether it is a needle to the arm or a nasal spray,” said Dr. Ross, associate professor of microbiology and molecular genetics, School of Medicine, and a CVR scientist. “It would protect against whatever strain of seasonal flu happens to be circulating, and it can be produced in as little as four months.”

Pursuant to the sponsored research agreement, Sanofi Pasteur will have exclusive access to the University of Pittsburgh's vaccine technology and will have an option to worldwide exclusive development and commercialization rights to any resulting influenza vaccine.

The University of Pittsburgh's CVR scientists will work directly with scientists at Sanofi Pasteur, the world's top influenza vaccine maker and

a division of Sanofi, one of the world's largest pharmaceutical companies. The agreement demonstrates the University of Pittsburgh's commitment to develop meaningful partnerships with industry.

“This project will have a tremendous impact here and around the world,” said Arthur S. Levine, M.D., University of Pittsburgh senior vice chancellor for the health sciences and dean, School of Medicine. “Many people will embrace the opportunity of getting a single shot of vaccine to prevent flu -- and its potentially deadly consequences – for a lifetime. With this outstanding effort, the CVR has accomplished its mission of improving health on a global scale by studying the world's most dangerous infections.”

The CVR is directed by Donald S. Burke, M.D., dean of the University of Pittsburgh Graduate School of Public Health.

“The University of Pittsburgh is where Dr. Jonas Salk pioneered the polio vaccine, and the university continues to be a leader in vaccine research,” said Dr. Burke, UPMC-Jonas Salk Chair of Global Health. “The seasonal influenza vaccine that our CVR scientists are developing could do to the flu – and the thousands of people who die from it annually – what Dr. Salk and his team did to polio.”

The U.S. Centers for Disease Control and Prevention (CDC) estimates that annual flu-associated deaths in the United States range from 3,000 to 49,000, depending on the severity of the virus. The CDC has stated that, in the next five years, it wants vaccine manufacturers to create improved seasonal flu vaccines that cover more strains.

While the traditional [flu vaccine](#) uses a mix of inactivated viruses, the experimental shot would be a synthetic vaccine created from the genetic sequence of flu viruses. Termed “computationally optimized broadly reactive antigen,” or COBRA, the method would produce protection

against all strains of seasonal influenza, including those not yet in existence. So, the synthetic flu shot may also be effective far longer than the traditional flu vaccine.

Dr. Ross previously used the COBRA method to produce a vaccine against bird flu, or H5N1. This vaccine successfully protects against all known strains of bird flu and has been well-tolerated in pre-clinical trials.

The traditional seasonal flu vaccine takes nearly a year to create. Each year at the conclusion of flu season, world health officials meet to select the three strains of flu they believe are most likely to circulate in the coming fall and winter. If they choose the wrong strains, the seasonal [flu shot](#) is less effective.

The strains of flu that circulate every year can exchange genes with one another and with some animal [influenza](#) viruses. This reshuffling of genes means that new flu strains emerge each year. Health officials must then capture, inactivate and grow these new strains into the seasonal flu vaccine. Because the synthetic vaccine is created using the genes that make up flu viruses, this reshuffling is already accounted for and the vaccine could protect against millions of different flu [strains](#).

For the next two to four years, the University of Pittsburgh's seasonal flu vaccine will be in pre-clinical trials. If successful, the vaccine could then enter FDA clinical trials in humans. Each stage of the project will be evaluated by the University of Pittsburgh-Sanofi Pasteur joint steering committee.

If all goes well, the new vaccine could potentially replace the [seasonal flu vaccine](#) in about a decade.

Provided by University of Pittsburgh Schools of the Health Sciences

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