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E. John Wherry's Flu-Vaccine Research (Fall 2007 Trust Magazine briefing)

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Smithsonian Magazine recently featured "37 Under 36: America's Young Innovators in the Arts and Sciences," and one of the up-and-comers was E. John Wherry, Ph.D., an immunologist at the Wistar Institute, an independent nonprofit biomedical research institute in Philadelphia.

The profile highlights Wherry's contributions to an effort to develop a universal vaccine against influenza that would provide long-lasting protection against all strains of the virus, including those yet to emerge and the avian flu. The vaccine would reduce the need for annual vaccination programs and defend against pandemics. As conceived, the vaccine will also be more effective in protecting the at risk elderly than current vaccines.

Existing flu vaccines target two prominent protein molecules on the surface of the influenza virus. Because these proteins mutate constantly, the vaccines must be redesigned and re-administered regularly to remain effective—thus the need for an annual flu shot. By contrast, a universal flu vaccine would induce broad protection, lasting year after year.

To achieve this goal, the Wistar team aims to design a vaccine directed against internal viral proteins that are less prone to mutation than the surface proteins. Based on the same research, they will also develop a "cocktail" of antibodies against the flu virus to be given as an early treatment for flu infection.

Wherry is examining the normal decline of the immune system with age, and his insights into this problem will be reflected in the design of the Wistar universal flu vaccine. The elderly are less able to fight off infections of all kinds, and they respond poorly to vaccines compared to younger individuals. Early findings from Wherry's laboratory indicate that specific immune-system genes become inactivated in the elderly. A universal vaccine would incorporate tactics for reactivating these genes.

Wherry arrived at Wistar in 2004 under a Pew-supported program enabling the institute to recruit outstanding biomedical investigators.