The hunt for a universal flu vaccine

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Geese are migrating south, and this year's flu vaccine is at pharmacies. Have you ever wondered why we need a new flu vaccine every year? Or why there isn't a single-shot, life-long flu vaccine?

Unlike polio and most other viruses, influenza isn't one uniform virus. Instead, influenza is a swarm of closely related, yet distinct viruses that change their genetic material every year as they move through ducks and pigs before infecting humans. For this reason, scientists across the globe closely monitor influenza virus infections. This information helps researchers make an educated guess about which flu strains are likely to infect people, and use those strains to make the annual flu vaccine.

Some years this process is accurate and vaccine protection is high, but in other years, unanticipated flu strains arise and the vaccine does not fully protect us. This uncertainty is the driving force behind the push to develop a universal flu vaccine that would protect against all strains of influenza, regardless of what specific virus arises in a given year.

A one-shot, universal flu vaccine would have an immediate and powerful effect. The Centers for Disease Control and Prevention estimates influenza results in more than 400,000 hospitalizations and 42,000 deaths every year in the U.S. Sadly, these deaths are often among the most vulnerable in our population, namely the elderly, children and those with pre-existing medical conditions. These numbers make influenza a clear and present danger to our society.

I know firsthand how serious influenza infections can be. In the summer of 2014, my then 5-year-old son contracted swine flu and wound up in the emergency room. Although he recovered, this experience personally motivated me to join the effort to develop a better influenza vaccine. Thanks to a Grand Challenges grant from the Bill & Melinda Gates Foundation and the Flu Lab, I and my OHSU colleagues have the opportunity to develop and test a radical new approach toward a universal influenza vaccine.

Every successful vaccine developed to date functions by directing your immune system to remember and target viruses with antibodies, small proteins that stick to the

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