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Researchers take a step toward universal flu vaccine

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Researchers at a small Seattle biotech company, Theraclone, have discovered rare anti-flu antibodies that target a potential vulnerability in flu viruses.

They hope their discoveries will eventually help solve a serious problem with flu viruses: Because they multiply and change so rapidly, new vaccines to protect us against them must be formulated each year, sometimes missing the target and always taking precious time.

Sometimes, as was the case for last year's H1N1 "swine flu," by the time the vaccine is ready, the flu has already swept through. Each year, over 200,000 people are hospitalized in the U.S. because of flu-related complications.

Like other scientists, those at Theraclone have been searching for some commonality in all these viruses -- some tiny region that has remained unchanged through all the viruses' mutations and changes, and that could become the target for a future universal flu vaccine.

To find that area, the scientists, including researchers from the University of Wisconsin-Madison, University of Tokyo and Johns Hopkins University, searched healthy humans for antibodies, the body's natural infection-fighters.

Through a laborious search, they discovered a few rare antibodies that locked onto a previously overlooked region on flu viruses that almost all

of them have in common -- even the deadly ones like H5N1, the so-called "bird flu," and last year's fast-moving H1N1.

Administered to mice in large doses, those same antibodies proved very effective at protecting them against flu viruses, including the bird flu.

Like much of science, this is a step forward, not discovery of a "magic bullet." There is much left to be done, not the least of which is a safety trial in humans, likely at least a year away. If successful, other clinical trials would follow before these antibodies would be available to people as an option against flu.

And then, ideally, the work would leap from antibody to vaccine.

"The ultimate solution for flu is a vaccine," says Matthew Moyle, study co-author and chief scientific officer at Theraclone, which focuses on developing therapeutic antibodies to treat infection, inflammation and cancer.

Using antibodies is a "stopgap measure," he said, although in large quantities, they might be able to provide short-term protection during an extremely lethal flu outbreak.

A vaccine, which would provide longer-term protection, would stimulate a person's own body to produce large quantities of this particular antibody, which would then lock onto the unchanged part of the particular flu virus -- scientists call that the "conserved" region, as it is conserved despite mutations that occur in other parts of the virus.

"We found a new part of the virus that nobody else has found that's highly conserved and protective," Moyle said. To find it, they started with 140 people, eventually poring over some 100,000 antibodies. Of those, 17 were the ones they were looking for. "It was a needle in a

haystack."

So where is this discovery in the spectrum? "It's an encouraging first step," Moyle said. "It's hopeful. It's a place that hasn't been looked at before."

But, he added: "It's not the cure."

The work is part of an $18 million deal struck with a Japanese company, Zenyaku Kogyo, Moyle said. According to Xconomy, Theraclone formed an alliance last year with the Tokyo-based company, which markets a blockbuster antibody drug for cancer and rheumatoid arthritis called rituximab (Rituxan) in Japan.

The research was reported this week in the online Early Edition of the Proceedings of the National Academy of Sciences. The paper is dedicated to David J. Fanning, who was president and CEO until he died suddenly June 14.