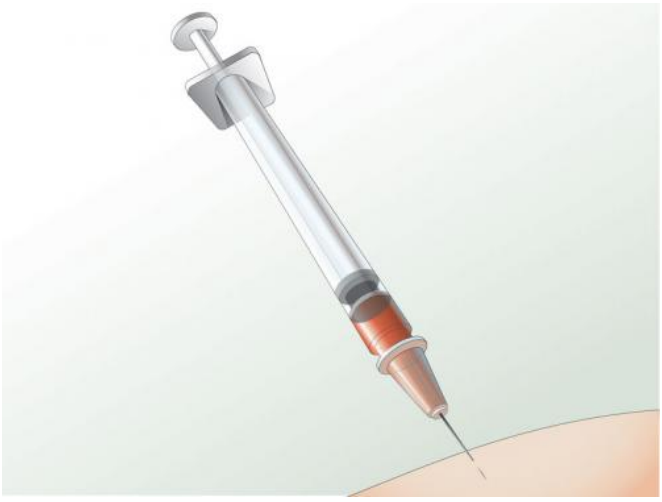
Researchers take 'first baby step' toward anti-aging drug

24 December 2014, by Dennis Thompson, Healthday Reporter



Inhibiting the mTOR pathway in 200 elderly volunteers improved immune function, as measured by their response to an influenza vaccine. Credit: V. Altounian/Science Translational Medicine

Researchers could be closing in on a "fountain of youth" drug that can delay the effects of aging and improve the health of older adults, a new study suggests.

Seniors received a significant boost to their immune systems when given a drug that targets a genetic signaling pathway linked to aging and immune function, researchers with the drug maker Novartis report.

The experimental medication, a version of the drug rapamycin, improved the seniors' immune response to a flu vaccine by 20 percent, researchers said in the current issue of *Science Translational Medicine*.

The study is a "watershed" moment for research into the health effects of aging, said Dr. Nir Barzilai, director of the Institute for Aging Research at Albert Einstein College of Medicine in New York City.

Rapamycin belongs to a class of drugs known as mTOR inhibitors, which have been shown to counteract aging and aging-related diseases in mice and other animals.

Barzilai, who wasn't involved in the study, said this is one of the first studies to show that these drugs also can delay the effects of aging in humans.

"It sets the stage for using this drug to target aging, to improve everything about aging," Barzilai said. "That's really going to be for us a turning point in research, and we are very excited."

The mTOR genetic pathway promotes healthy growth in the young. But it appears to have a negative effect on mammals as they grow older, said study lead author Dr. Joan Mannick, executive director of the New Indications Discovery Unit at the Novartis Institutes for Biomedical Research.

When drugs like rapamycin are used to inhibit the effects of the mTOR pathway in mice, they "seem to extend lifespan and delay the onset of aging-related illnesses," Mannick said.

Mannick and her colleagues decided to investigate whether a rapamycin-like drug could reverse the natural decline that elderly people experience in their ability to fight off infections.

In the clinical trial, more than 200 people age 65 and older randomly received either the experimental drug or a placebo for several weeks, followed by a dose of flu vaccine.

Flu is particularly hard on seniors, with people 65 and older accounting for nine out of 10 influenza-related deaths in the United States, according to background information provided by the researchers.

Those who received the experimental version of rapamycin developed about 20 percent more antibodies in response to the flu vaccine, researchers found. Even low doses of the medication produced an improved immune response.

The researchers also found that the group given the drug generally had fewer white blood cells associated with age-related immune decline.

Mannick called this study the "first baby step," and was reluctant to say whether it could lead to immune-boosting medications for the elderly.

"It's very important to point out that the risk/benefit of MTOR inhibitors should be established in clinical trials before anybody thinks this could be used to treat aging-related conditions," she said.

Barzilai was more enthusiastic. Research such as this could revolutionize the way age-related illnesses are treated, he said.

"Aging is the major risk factor for the killers we're afraid of," he said, noting that people's risk for heart disease, cancer and other deadly illnesses increases as they grow older. "If the aging is the major risk, the way to extend people's lives and improve their health is to delay aging."

Until science focuses on aging itself, "you're just exchanging one disease for another," Barzilai said. For example, he said, a person receiving cholesterol-lowering treatment to prevent heart disease likely will instead fall prey to cancer or Alzheimer's disease.

More information: "mTOR inhibition improves immune function in the elderly," by J.B. Mannick et al. *Science Translational Medicine*, stm.sciencemag.org/lookup/doi/ … scitranslmed.3009892