



Innovation and Intellectual Property | Tue Sep 15, 2015 5:57pm EDT

The influential patent that's driving anti-aging research

BY DAVID KROLL



REUTERS TOP 100

(Reuters) - At first glance, "Method for altering the lifespan of a eukaryotic organisms" does not appear to be the kind of title that demands general reader attention. But the implications of this U.S. patent filing centered on a single-celled yeast strain closely related to the microbes used in brewing and baking, are way bigger than beer and pretzels. According to researchers, it could one day lead to treatments for Parkinson's and Alzheimer's, slow down aging, or even extend life expectancy.

That may explain why U.S. Patent No. 8,642,660 is the most-cited discovery to emerge from academic research in recent years, according to an analysis performed by Reuters and its sister company Thomson Reuters IP & Science. "I guess people really want molecules that extend lifespan," says the patent's sole inventor, David Goldfarb, who owns four other patents and is a professor in the Department of Biology at the University of Rochester.

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As part of its World's Most Innovative Universities ranking, Reuters looked at tens of thousands of patents filed by researchers at global universities, and counted every time a filing cited other

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patents as prior art. The results showed more scientists who say Goldfarb's research influenced their work more than any other recent discovery - 108 citations

since the patent was initially filed on Nov. 17, 2010. (Patent data was sourced from Thomson Reuters Derwent World Patents Index, and limited to filings from the period 2008-2012, in order to allow sufficient time for patent examinations to be conducted and citations to accumulate.)

Goldfarb's area of research isn't new, and his patent isn't the first to capitalize on it. Since the late 1990s, the popular press and research literature have devoted plenty of attention to resveratrol, a chemical that appears in red wine, which has been shown to extend yeast lifespan by increasing the expression of a class of cellular regulatory proteins called sirtuins. The resveratrol effect on one sirtuin, SIRT1, was discovered by researchers led by David Sinclair, a [Harvard University](#) biologist, who in 2004 spun out the research into a startup, Sirtris Pharmaceuticals. That company was acquired by GlaxoSmithKline in 2008 for \$720 million.

Goldfarb's research builds on his earlier discoveries. In his previous patent (U.S. Patent No. 7,618,774), Goldfarb and Michael Breitenbach at the University of Salzburg, Austria, created a new method to find compounds that extend the lifespan of cells.

Despite some early criticism from peers, Goldfarb's work continued to resonate in international research circles, which took a particular interest in his focus on an unusual subset of chemicals that altered the lifespan of yeast.

It's those carefully engineered chemicals that could have major implications on future drugs to treat cancer, diabetes and obesity, such as PRMT5 inhibitors. Others such as 12-lipoxygenase inhibitors could also lead to drugs that block the inflammation process that contributes to diabetes and heart disease, and pyruvate kinase M2 activators that may eventually eradicate the most resilient of cancer cells. Any one of these new discoveries could lead, in turn, to extend human longevity.

Such products and treatments are years away. Researchers and pharmaceutical companies citing Goldfarb's patent don't yet have their compounds ready for clinical trials. The closest so far is a drug called EPZ015666 developed by biopharmaceutical manufacturer Epizyme, which cited Goldfarb's work in its patent. Epizyme licensed the drug to GlaxoSmithKline and the two companies reported at last year's American Society of Hematology meeting that the drug could lead to a treatment for mantle cell lymphoma, a rare cancer that typically affects men over 60.

"Aging and age-related diseases are part and parcel of the human condition," says Goldfarb. "It would be thrilling if these compounds improve the lives of people who are suffering."

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