

Science of why we age

February 12 2018, by Karl Gruber



Credit: CC0 Public Domain

Ageing is an accepted fact of life, trivialised and even glorified in books and movies. But why do we actually age? And can we stop it?

Ageing brings wisdom and respect, or so they say. But it also brings other less-desirable things like cognition decline, heart problems or

cancer, just to name a few.

Ageing is a complex process. Not everyone ages the same way, and it is influenced by a myriad of factors.

For centuries, scientists have been questioning this natural step of life, developing dietary approaches or [new drugs](#) with the hope of beating the clock on our lifespan. So what really works?

But first, what exactly is ageing, and when do we start ageing?

Ageing is defined as the progressive accumulation of damage to your cells, tissues and organs, leading to disease and death. According to one study, this dreadful process starts at [24 years of age](#), at least for the brain. According to others, it could be a bit later.

Maybe we start ageing somewhere in our 30s, [according to medical doctor and book author Michael Roizen](#). "Somewhere between 28 and 36 years of age, most people reach a turning point. They're not just growing any more—they're ageing," he says.

Although it really doesn't matter. The fact remains that you age, and the question you ought to be asking is what you can do about it.

Can drugs extend life?

Some drugs can, in animals at least. One of the best ones designed so far is called rapamycin, says [David Harrison](#), a researcher at The Jackson Laboratory and the [National Institute on Aging](#) in the US.

Rapamycin is a [drug](#) derived from a bacterium native to Easter Island. Give rapamycin to mice, and they will live on average 25% longer. As simple as that. Similar life-extending feats are observed in flies, worms

and [even pet dogs](#).

The drug works on a set of genes called the mTOR complex, which are involved in regulation of cell metabolism. When mTOR is blocked, cells enter into a special survival mode that tends to extend lifespan.

Now the company [PureTech](#) is planning to use rapamycin and other drugs to inhibit mTOR genes in humans. Their goal is to reverse the process of immunosenescence—the damaging changes that hit the immune system as we age.

Another exciting example is a drug called J147, derived from curcumin, a key ingredient of the curry spice turmeric. The drug was first designed back in 2011 to treat Alzheimer's disease as it had some amazing properties. It is able to [promote the production of new brain cells](#) and can even [reverse Alzheimer's progression](#) in mice.

Last year, [a new study](#) showed that the drug also targeted a mitochondrial protein called ATP synthase. This protein helps generate ATP, the cell's basic energy unit, generated within the mitochondria. Previous research has shown that ATP synthase influences ageing in [flies](#) and [worms](#).

Now, it turns out that the life-extending effects also apply to mice. "I was very surprised when we started doing experiments with how big of an effect we saw," said [Dave Schubert](#), head of Salk's Cellular Neurobiology Laboratory and senior author of the study. "We can give this to old mice, and it really elicits profound changes to make these mice look younger at a cellular and molecular level," he adds.

But so far, the development of life-extending drugs is a field seldom explored by big drug companies. The sole idea of an anti-ageing pill is still a bit of a plain crazy idea, partly because it is very hard to prove that

a drug actually extends life. The reason is simple: it would take too long to look at the effects.

Also, big funding agencies or regulatory bodies like the US Food and Drug Administration don't consider ageing a disease, which makes it harder to get funding or approval for new drugs, so far few companies are venturing in this arena.

PureTech is one of them. Another company worth mentioning is Calico, founded by Google and backed by \$1.5 billion in research funds. It aims to "harness advanced technologies to increase our understanding of the biology that controls lifespan", [according to their website](#). Their ultimate goal, they say, is to develop ways for people to live longer and healthier lives. How exactly they will do this remains a mystery, as the company is highly secretive, and no one really knows what they are working on.

But you don't need to wait for some magic new pill to live longer. There are many little things you can do to improve your chances of hitting the 100s.

DIY life-extension: sugar

So, you want to live longer? Start with taking care of what you put into your mouth.

You age what you eat, so to speak. What you eat says a lot about you, but it also has a say on how long you will live. Spend all your days eating chips, burgers and soda, and you will shorten your lifespan by decades.

Research is solid in the detrimental effects of a high sugar diet, for example. From an ageing perspective, too much sugar can lead to [accelerated skin ageing](#), not to mention all the other problems like [obesity](#), [diabetes](#), [heart disease](#) and [even cancer](#).

According to the [World Health Organisation guidelines](#), both adults and children should eat no more than 6 teaspoons of sugar a day. Just so you know, a can of soft drink contains more than 9 teaspoons of sugar.

DIY life-extension: fats

Be mindful of your fats. While it is important to reduce fat consumption, you need to remember that not all fats are bad. Omega-3 fatty acids, found in walnuts, chia seeds and some fish, have been found to [protect your brain from ageing](#).

DIY life-extension: eat less

Even reducing your overall food intake could help you live longer, [according to a study](#) that restricted food intake in mice. "Some calorie-restricted mice in our study population live incredibly long lifespans, some reaching almost 5 years of age. This is the equivalent of a human living up to 160 years!" said Dr. Gary Churchill from The Jackson Laboratory.

Swap blood with a younger person

Yes, you read that correctly.

[A 2014 study](#) found that injecting young blood into mice actually made their brain a bit younger.

Dracula might have been right all along.

The study used a bizarre technique called parabiosis in which two mice, one young and one old, are stitched together. These [mice](#) shared their circulatory system, and researchers found that the old mouse

experienced improved gene activity in the hippocampus, a brain region involved in event recall and [spatial memory](#). The older mouse also experienced an increase in connections between brain cells.

The results have yet to be replicated in other animals, but researchers are hopeful this idea could one day work in humans (hopefully not by stitching a baby to your back). Check out what the author of this study [has to say about the whole thing](#).

But if can't wait for new research, you can give new blood a try right now if you've got a bit of extra cash. A company called [Ambrosia](#) will literally fill your body with young blood and empty your bank account of \$8000.

So, get busy learning about the science of longevity, and you may just be able to beat the clock and live past 100.

This article first appeared on [Particle](#), a science news website based at Scitech, Perth, Australia. Read the [original article](#).

Provided by Particle

Citation: Science of why we age (2018, February 12) retrieved 19 April 2024 from <https://medicalxpress.com/news/2018-02-science-age.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--