Anti-Aging: A Look Under the Hood

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Welcome to Issue 23 of Science Says! Our weekly newsletter where you'll learn the latest healthy aging and C15:0 research news that our team of doctors, scientists, and experts are most excited about—without having to go search for it.

Eric and Steph
Co-Founders, Doctors, Nerds

What Dr. Stephanie Venn-Watson, our co-founder and author of over 80 peer-reviewed scientific publications, is reading.

HEALTHY AGING

The engine of longevity science

There have been many advances in science around aging - and ideas on how to slow it. While anti-aging used to be an area limited to anti-wrinkle creams, some of the smartest researchers at the most prestigious institutions are pursuing the fountain of youth. Well, at least a drinking fountain that will keep us healthier longer.

This next series of Science Says!, inspired by a feature in *GEN Biotechnology*, is dedicated to the most promising advances in longevity research - and popular concepts that have recently fallen. This week, let's talk about the most common techniques used to study aging.

Okay, just how *is* aging studied?

While the task of prolonging life is big, the list of scientific approaches to accomplish that task is quite short. Each approach has advantages and disadvantages.

Expanding longevity in short-lived models. As the *GEN Biotechnology* article covers, the Achilles heel of aging research is that it takes too long to find out if something new helps humans live longer or not. To get around this, most research teams use models of aging that can be studied over shorter periods of time. The most popular? Mice, worms and flies.

These short-lived animals allow scientists to easily tweak a gene or test a candidate anti-aging drug, then quickly observe these models for prolonged life. While researchers have indeed found a multitude of ways to make a worm live three times longer, these wiggly creatures only naturally live about 20 days. For mice that typically live 2 or so years, it's a bit better - but still a long way to matching our 80+ years of life.

So, it probably isn't too surprising to find that what is helping highly controlled, short-lived lab species live longer is not readily translating to us long-lived folks.

Helping dogs could help us. More recently, our pets have garnered the aging research world's attention. What if we used the most promising and safe longevity drug candidates to help our pets live longer? If they work in dogs, perhaps these compounds can help us live longer, too.

The upside to this approach? Dogs live longer than mice, they share human environments, and they develop similar aging-associated diseases - including arthritis, cancer, heart disease, and cognitive decline. All that said, dogs typically only live between 6 to 15 years, they live in highly variable home environments, and have breed-driven genetics that differ greatly from their owners. Regardless of the outcome for humans, however, it's great to think that we may help our best and furriest friends live longer.

Analyzing human population data. Clearly, the best data to help humans live healthier and longer are data that come from humans. The great news is that there are now many studies that have followed thousands of people for decades to determine which factors predict longer life.

While these studies are great at finding which factors are *associated* with longer life, they don't confirm that these factors *cause* longer life.

The bottom line?

Aging is complex, and use of traditional approaches to prolong life have had significant limitations.

But, don't lose hope! The combination of relevant models, new innovations, and human data is helping researchers rapidly find ways to define the aging process and discover exciting interventions that can be tested in the near-term.

Next week, we'll start diving into key anti-aging processes that have been discovered - and what approaches are rising and falling to help us live healthier, longer.

A new approach to understanding longevity *

So, what if there was a population of long-lived mammals that aged just like us, lived in a real-world environment, ate the same diet and exercised every day, received the same outstanding healthcare, and had health data and samples routinely collected as part of a proactive preventive care program - for over 60 years and across three generations?

Well, that would get around many of the limitations of aging studies listed above. And that's exactly what describes the U.S. Navy's dolphin population. For over half a century, the Navy has cared for a population of about a hundred dolphins living in San Diego Bay. Thanks to their good care, Navy dolphins live at least 50% longer than their wild counterparts. While wild dolphins on average live 20 years, Navy dolphins increasingly live more than 50 years.

As a natural outcome of this unprecedented patient population, paired with advanced omics technologies, archived longitudinal serum samples and routine blood and health data, we are discovering which small molecules, nutrients, genes, and molecular pathways predict healthy aging in long-lived mammals. Our team has even proven that long-lived mammals in the same population can have different aging rates.

The best part? Helping dolphins live healthier is leading to actionable discoveries of natural molecules that help explain why long-lived species live longer than mice, worms, and flies_ and how we can advance from there.

Check out our TEDx talk on how C15:0 was discovered, while helping dolphins, as nature's ultimate healthy aging molecule.

In our next issue, we'll dive into the latest longevity discoveries. In the meantime, have a wonderful week!

Dive deeper into the science

READ THESE STUDIES

- Blueberries and blood: Aging research goes from great science to snake oil
- Dog models of aging
- Dolphin aging rates
- C15:0 benefits to cell membranes, mitochondria, and cell receptors
- How helping dolphins may just save the world (and you, too)