Your dog may have an anti-aging drug before you do

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Before we have an anti-aging drug for humans, we're likely to have one for dogs. Multiple clinical trials are currently underway to test potential anti-aging compounds on dogs, since our best friends have become a

popular animal model for human aging. Fido also represents a potentially huge market.

The science could benefit both species, but premature claims are already causing a credibility problem.

Recently, Harvard University biologist David Sinclair started marketing life-extension supplements for dogs, touting unpublished clinical trial data that others in the field found completely unconvincing. In March, Sinclair, who didn't respond to requests for an interview, changed the wording of a press release, which originally promised the chewy treats would "reverse aging." Now it says they reverse the effects of age-related decline.

Sinclair's trial used dog owners' subjective assessments of cognitive changes in their older pets—and other scientists say the trials don't show a consistent enough effect even for this more modest claim. (Sinclair became famous in the 1990s for some highly publicized papers tying aging to proteins called sirtuins—an idea that led to the now widely disputed belief that red wine has anti-aging properties.)

While the FDA is authorized to regulate veterinary drugs, it doesn't approve supplements for pets or people, so these can be sold without going through tests for safety and efficacy.

Whether anti-aging supplements for dogs work or not, there's likely to be demand, said Arthur Caplan, a professor of ethics at New York University. In the past, desperate dog owners have had their dead or dying dogs cloned—hoping the clone would be essentially a reincarnation of their dead pet.

Some researchers who study aging fear that the spectacle of a high-level professor hawking dog longevity supplements will further tarnish the

reputation of a field already dragged down by self-proclaimed experts pushing fad diets and unproven anti-aging treatments for people.

There's a lot to gain from a better scientific understanding of aging. Getting older is a risk factor for all the major killer diseases—heart disease, cancer and even severe COVID. And in the US, the ranks of people over 70 will swell within the coming years, creating a vast increase in the number of people suffering from dementia or other age-related problems.

But scientists don't yet agree on what causes aging or what approach would work best to slow it down. While wear and tear will eventually affect all living things, some organisms live many times longer than others, even among closely related species. Some researchers think an animal's aging rate is controlled by certain genes.

Other experts cite the shrinking of the caps on the end of or chromosomes, called telomeres. Others blame the degeneration of the packaging around our DNA—so-called epigenetic markers, which can activate or suppress certain genes. Some scholars blame damage caused by chronic inflammation. Still others, the buildup of cellular waste products.

Some of these possible mechanisms of aging can be altered with drugs in a way that endows worms, fruit flies and mice with longer lives. Which drugs should be tried in humans? Clinical trials to test their effects on longevity in people could take decades—long enough for the study subjects to live out the rest of their lives.

One way to identify the more promising candidates would be to see which ones also work in dogs. Dogs are long-lived enough to serve as a better model for human aging than mice, but short-lived enough that treatment can be tested in a few years.

Matt Kaeberlein, CEO of Optispan and an affiliate professor at the University of Washington, was among the most vocal critics of Sinclair's dog longevity claims. He's also in competition as co-director of The Dog Aging Project. That project involves collecting data on thousands of dogs as well as conducting a dog clinical trial with a drug called Rapamycin. It's currently approved for people who've had organ transplants. At high doses, it causes mouth sores and other nasty side effects, he admits, but can extend the lives of mice and—at low doses—might do the same in dogs or humans.

A group of biohacker types is already taking Rapamycin off-label in the hope of life-extension, he said. He's trying to get data from them, messy as it is, because there might be useable information there. (Caplan, the NYU ethicist, says he thinks it's unethical for doctors to prescribe this drug off-label for longevity.)

Kaeberlein said the biological data they're collecting from all those thousands of dogs could lead to an explanation for the fact that big dogs don't live as long as small ones. "If you compare a Great Dane to a chihuahua on average, it's at least a twofold difference in life expectancy," he said.

But his project might be a victim of the field's wider credibility problem. It had been funded by the National Institutes of Health, but he and his colleagues learned recently that a five-year grant established in 2018 and extended one year probably won't be renewed. He's now working to get private money.

Charles Brenner, a biochemist at the City of Hope National Medical Center in Los Angeles, is another vocal critic of Sinclair's claims regarding dogs and humans. (Like most researchers on the forefront of aging, he has his own supplement ties as chief scientific advisor of a bioscience company called ChromaDex.)

Brenner is also skeptical of those who claim various treatments or drugs can reverse a person's "biological age" as calculated through proxies measured in blood—including telomeres and epigenetic markers. None of these measure aging as well as walking speed, he said.

When I asked him about the Rapamycin study in dogs, he said it's "worth a try" because the trial measures actual lifespan rather than some proxy. But he isn't betting on this particular drug. He's more optimistic about work done by a company called Loyal, profiled in 2021 by Bloomberg Businessweek.

Brenner says while Loyal has been secretive about the drug, he thinks what they're now testing inhibits the production or action of growth hormone. Growth hormone, he said, is connected to the faster aging they see in larger dogs compared to smaller ones.

There's promise in studying how and why animals age—not just dogs but clams that can live to 500, rockfish that survive until 200 and whales that reach 80. Once scientists understand the mechanisms of aging, they'll be much better able to find ways to help us—and our furry friends—live longer and healthier lives.

But first, they need investors and the public to take them seriously.