A New Discovery on C15:0 & Cognitive Health

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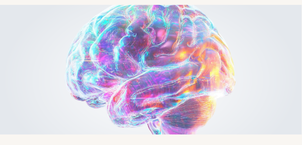

Welcome to Issue 131 of Science Says! Our weekly newsletter where you'll learn the latest healthy aging and C15:0 research news that our team of doctors, scientists, and experts are most excited about—without having to go search for it.

Eric and Steph
Co-Founders, Doctors, Nerds

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

HEALTHY AGING

Let's Protect Our Brain

We had another exciting science drop this week! First, we showed that older dolphins can develop age-related Alzheimer's disease. Second, we discovered that C15:0 promotes key activities that support our cognitive and brain health. So, let's dive into this latest peer-reviewed study.

Older dolphins can develop brain changes that mimic Alzheimer's disease in humans.

Thanks to over 60 years of continually improving the health of aging Navy dolphins, we have learned that our fellow large brained, long-lived mammals age a lot like us. For example, we found that about 1 in 3 older dolphins developed:

- Insulin resistance
- Chronic inflammation
- Hypercholesterolemia
- Anemia
- Fatty liver disease

As published in our most recent paper in the *International Journal of Molecular Sciences*, we also found that changes in older dolphin brains mimic the same changes found in people with Alzheimer's disease.

This included the following:

- Age-related increases in amyloid-β plaques
- Activated microglia (aka neuroinflammation)

Importantly, these changes were most prominent in the hippocampus, which is the brain's primary center for memory and happiness.

Nerdy Fact: Only primates and cetaceans (aka whales, dolphins and porpoises) develop the full suite of changes in the brain that mimics Alzheimer's disease, including amyloid beta plaques, hyperphosphorylated tau proteins, and neurofibrillary tangles. This is why Gunn-Moore et al. proposed that Alzheimer's disease is a consequence of *longevity*, not just aging.

One aging body, many connected declines. But, a new hope.

Our body and brain do not age in isolation. As shown by Azizan et al., cognitive decline is intricately linked to whole body decline, including declining metabolic health.

Because C15:0 supports long-term health and wellness, including metabolic health in both humans and dolphins, we used an independent third party to test pure C15:0 for 39 different activities shown to protect cognitive health.

Fantastic! What did you find?

Excitedly, our Office of Naval Research-funded study showed that C15:0 had the following two dose-dependent neuroprotective activities:

- **C15:0 *inhibits* fatty acid amide hydrolase (FAAH).** To better understand what this means, let's start with endocannabinoids. Endocannabinoids are "happy" molecules made by our bodies that naturally balance healthy immune responses in our brain and support our cognitive health. Unfortunately, as we get older, an enzyme called FAAH rapidly breaks down endocannabinoids, resulting in age-related declines in cognitive function. By inhibiting FAAH, however, C15:0 can support healthy levels of our oh-so-wonderful happy molecules - not just to protect our brain health, but also to support healthy sleep, better joint comfort, and calmer moods. Yes, please.
- **C15:0 *inhibits* monoamine oxidase B (MAO-B).** To better understand what this means, let's start with dopamine. Dopamine is a key messenger in our brain that supports healthy memory and mood, resulting in improved cognitive function. As we get older, however, an enzyme called MAO-B increasingly breaks down dopamine. Here's the good news: by inhibiting MAO-B, C15:0 can help to maintain healthy dopamine levels in the brain, which in addition to protecting brain health, can also support calm moods and better sleep. Further, as described by Knoll and Ruehl et al., ***MAO-B inhibitors have also been shown to extend the lifespan of both rats and dogs.*** Due to the many anti-aging benefits of MAO-B inhibitors (aka C15:0), these molecules have been proposed as a means to slow biological aging and protect against age-related cognitive decline. Well, that's pretty exciting!

Supporting evidence of C15:0 cognitive health benefits in humans.

These newly discovered activities of C15:0 are consistent with a prior human study by Shen et al. showing that people with higher C15:0 levels have better overall cognitive performance scores, including better memory and better mood. How about that?

Here's to happy and healthy brains. Have a great week, everyone!

Dive deeper into the science

READ THESE STUDIES

- Venn-Watson S, Jensen ED Aging-associated amyloid-β plaques and neuroinflammation in bottlenose dolphins (Tursiops truncatus) and novel cognitive health-supporting roles of pentadecanoic acid (C15:0).
- Venn-Watson et al. Hemochromatosis and fatty change: building evidence for insulin resistance in bottlenose dolphins.
- Venn-Watson et al. Physiology of aging among healthy, older bottlenose dolphins (Tursiops truncatus): comparisons with aging humans.
- Venn-Watson et al. Modified fish diet shifted serum metabolome and alleviated chronic anemia in bottlenose dolphins.
- Gunn-Moore et al. Alzheimer's disease in humans and other animals: A consequence of postreproductive life span and longevity rather than aging.
- Azizan et al. Deciphering molecular bridges: unveiling the interplay between metabolic syndrome and Alzheimer's disease through a systems biology approach.
- Knoll. The striatal dopamine dependency of life span in male rats. Longevity study with (-) deprenyl.
- Ruehl et al. Treatment with L-deprenyl prolongs life in elderly dogs.
- Shen et al. Improved cognitive function among people with higher C15:0.

- Nerd out on all the C15:0 science at DiscoverC15.com