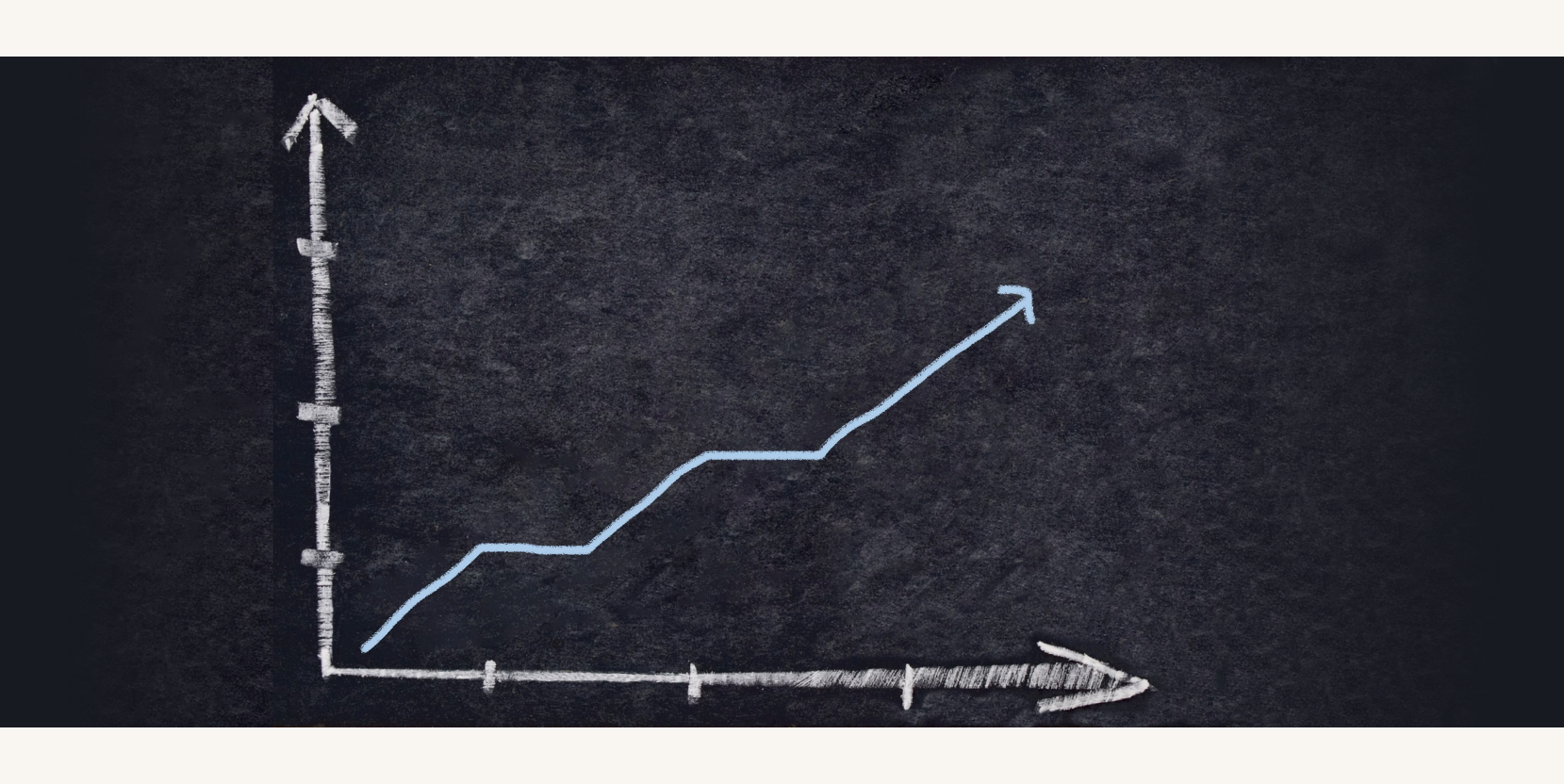
N—154

C15:0 Science Round-Up Series: Optimal C15:0 Levels & Daily Intake

October 26, 2025



Welcome to Issue 154 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

How to Optimize Your C15:0 Levels

It's back to school time, so we thought, what better time to do a Round-Up Series on what makes C15:0, well, so science-backed? In this series, we have been covering the following six key topics on C15:0:

- ☑ **Optimal Effective Levels & Daily Intake:** C15:0 bioavailability and amounts needed to achieve active levels
- ☑ **Mechanisms of Action:** How C15:0 works
- ☑ **Cell-Based Efficacy:** What C15:0 does at the cellular level
- ☑ **In Vivo Efficacy:** What C15:0 does at the whole-body level
- ☑ **Epidemiological Studies:** People who have higher levels of C15:0 have healthier ________ (we'll fill in the blanks)
- ☑ **Clinical Trials:** Randomized controlled clinical trials with C15:0

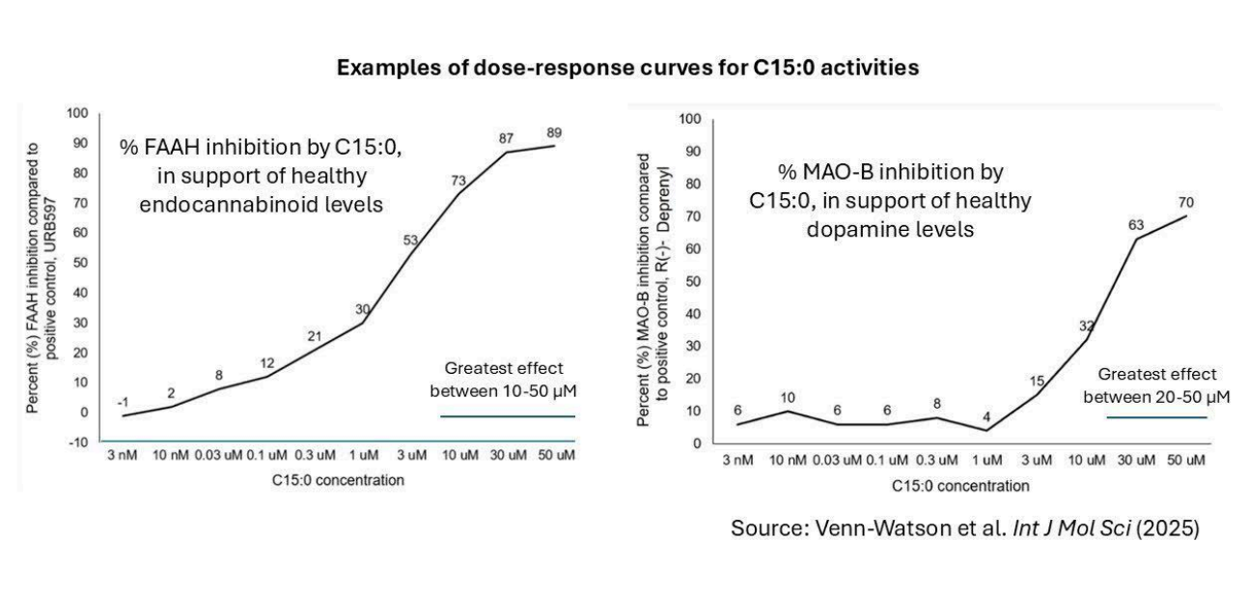
What makes the science behind C15:0 so robust is its consistency across all six topics above - including 100+ studies across numerous independent research teams throughout the world. We have also been sharing how C15:0 study outcomes - from its mechanisms of action to clinical trials - are intricately interlinked.

Last week, we covered how C15:0 activates receptors that support our immune, cognitive, and mood health. For the last week of this series, we share how to achieve optimal C15:0 levels.

Sounds good. But how do you know what C15:0 levels are optimal?

Good question! We are able to define optimal C15:0 concentrations, thanks the following:

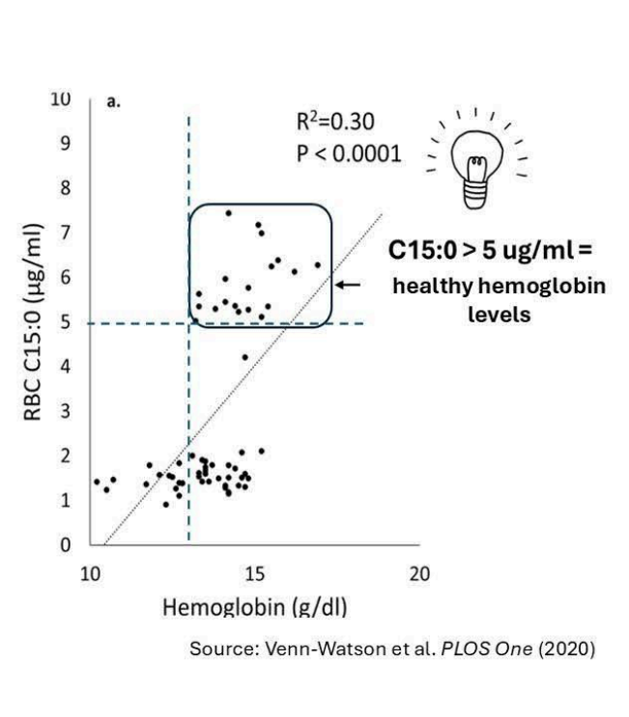
Dose-dependent mechanisms of action. Over the past few weeks, we have covered multiple mechanisms of action of C15:0, including how C15:0 activates AMPK, AKT, and PPARα/δ… all while inhibiting mTOR, JAK-STAT, FAAH, and MAO-B. Importantly, these mechanisms have been shown to be dose-dependent, which means that the higher the concentration of C15:0 within a certain range, the better the activities. In almost all cases, optimal C15:0 activities were between 10 and 50 μM. An example of a C15:0 dose-dependent curve for inhibiting FAAH and MAO-B, which we published earlier this year, is provided below.



Source: Venn-Watson et al. *Int J Mol Sci* (2025)

Dose-dependent cell-based efficacy. In our study co-authored with Dr. Nicholas Schork, who is the lead scientist of the NIH-funded Longevity Consortium, we assessed the dose-response effects of C15:0 in human cell systems that mimic a variety of aging-associated conditions. In this study, we found that C15:0 has a beneficial dose-response effect on 36 biomarkers across 10 human cell systems relevant to immune, heart, liver, gut, and lung health. In this extensive study (and similar to the mechanism of action studies above), efficacy was observed between 6.7 and 50 μM, with the broadest number of C15:0 benefits at around 20 μM.

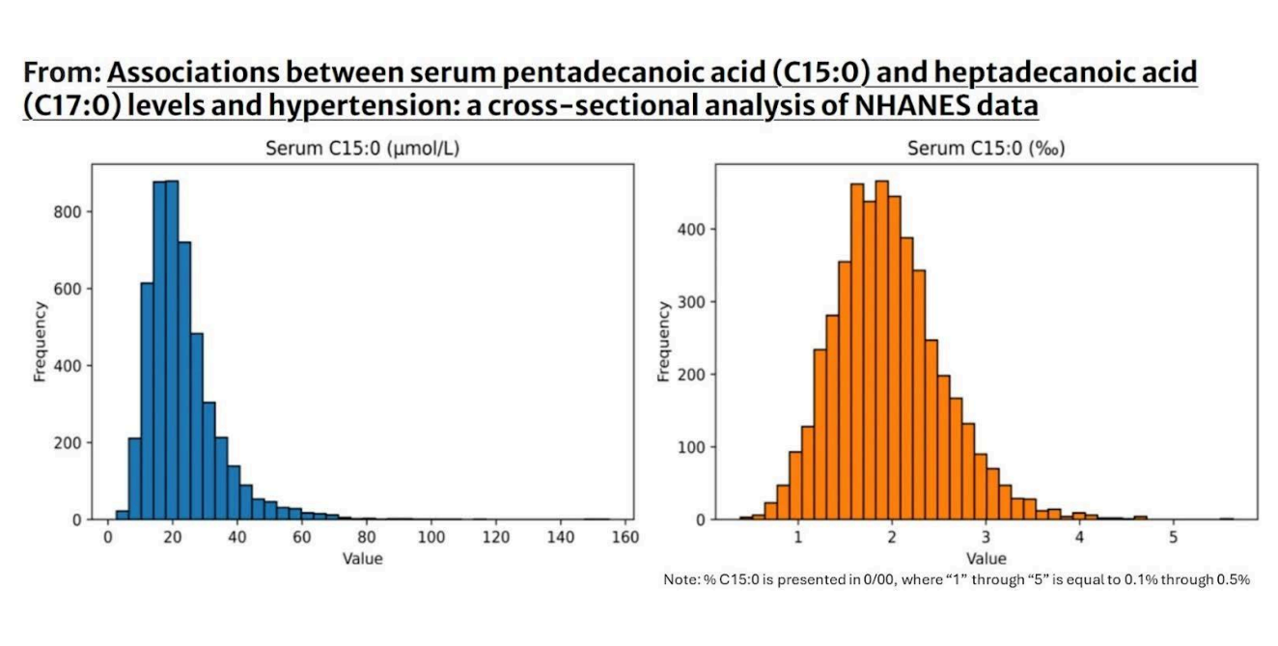
Helping-dolphin studies. Our initial studies to support the health of older Navy dolphins showed that increasing C15:0 in the diet resulted in higher C15:0 concentrations in their red blood cell membranes. Importantly, if dolphins achieved red blood cell membrane C15:0 levels greater than 5 μg/ml (aka 20 μM), they also achieved optimal red blood cell health (aka healthy hemoglobin levels).



Source: Venn-Watson et al. *PLOS One* (2020)

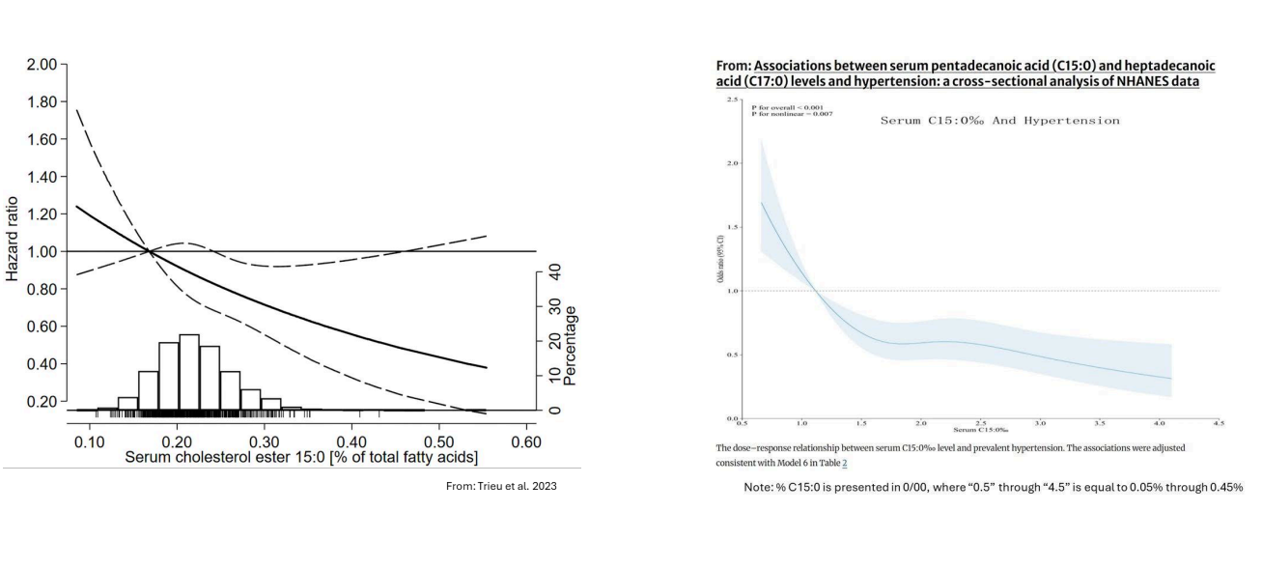
Human population studies. As shown below by Chen et al., human C15:0 concentrations range from about 5 to 70 μM, with most people having between 10 to 30 μM (left graph). This is equivalent to between 0.15 to 0.25% of C15:0 among all fatty acids (right graph). This overlays well with optimal C15:0 concentrations above, which are between 10 to 50 μM. Isn't it great when science in the lab aligns with real world data?

From: Associations between serum pentadecanoic acid (C15:0) and heptadecanoic acid (C17:0) levels and hypertension: a cross-sectional analysis of NHANES data



Note: % C15:0 is presented in 0/00, where "1" through "5" is equal to 0.1% through 0.5%

The dose-response curves of C15:0's health benefits also translate to human population studies. As shown below, both Trieu et al. and Chen et al. showed that, as C15:0 concentrations in humans increased from 0.2% to 0.5% (approximately equal to 20 to 50 μM), this increased the likelihood of having optimal cardiovascular health and blood pressure, respectively. As we have shared previously, Manca et al. showed that people living in Sardinia's High Longevity Zone have average C15:0 concentrations > 0.4% (approximately equal to 40 uM).



Note: % C15:0 is presented in 0/00, where "0.5" through "4.5" is equal to 0.05% through 0.45%

Given all the above, optimal C15:0 levels are between 20 and 50 μM. There is increasing evidence (at least for cardiovascular health and longevity) that the higher our C15:0 within this range, the better our health.

So, how do I achieve these optimal C15:0 levels?

Here's the good news: It's well established that the more C15:0 we eat, the higher our C15:0 levels. In fact, even before the world knew about C15:0's health benefits, researchers had long been using circulating C15:0 levels as a reliable biomarker of how much dairy fat (our primary source of dietary C15:0) a person ate.

Further, based on their extensive clinical trials in humans, Stallings et al. and Mascarhenas et al. demonstrated that for every 100 mg of pure C15:0 ingested, our circulating C15:0 levels go up, on average, by 1 μg/ml (or 10 μM).

As shown above, the average person has a baseline of 10 to 30 μM. That means that ***adding 100 to 200 mg of C15:0 to a daily routine*** will help most people get comfortably within the optimal zone of 20 to 50 μM.

In addition to increasing daily C15:0 intake via dairy fat or supplements, there are a number of ways that C15:0 levels can be further boosted:

- ☑ **Exercise.** Liu et al. showed that people who exercised more had higher C15:0 levels. Their hypothesis is that exercise helps to release C15:0 stored in our tissues into our bloodstream - which allows C15:0 to work throughout our body.
- ☑ **Eat organic foods.** Simone-Rust et al. linked eating more organic foods to higher C15:0.
- ☑ **Think F: as fermented and fish.** A new study by Sun et al. was just published supporting that, in countries with low dairy consumption, dietary C15:0 comes from fermented foods and whole fish.
- ☑ **Use fiber to feed C15:0-producing gut microbes.** Wei et al. showed that healthy gut microbes use inulin in fiber to make their own moderate amounts of C15:0. Which helped to explain why this gut microbe is, well, healthy.

Combined with diet and supplements, these approaches can help a person achieve Sardinian longevity-supporting C15:0 levels.

Wrap-Up of our C15:0 Science Round-Up Series.

With that, we have officially completed our Science Round-Up Series. Congratulations, fellow *Science Says* readers!

Over the past couple of months, this round up included the following support of C15:0's health benefits:

- **Clinical Trials** showing that increases in C15:0 levels, via increased C15:0 intake, are linked to supported red blood cell, liver, and cardiovascular health.
- **Epidemiological Studies** following tens of thousands of people over years repeatedly show that people with higher C15:0 levels have better long-term metabolic and cardiovascular health.
- **In Vivo Efficacy** studies in relevant models demonstrating that pure C15:0 supplementation directly supports cardiometabolic, immune, liver, gut, and red blood cell health.
- **Cell-Based Efficacy** studies showing dose-dependent benefits across human cell systems mimicking cardiometabolic, immune, liver, and gut health.
- **Mechanisms of Action** studies showing dose-dependent benefits across multiple mechanisms of action known to support metabolic, heart, immune, liver, and cognitive health.
- **Optimal Effective Levels & Daily Intake**, including defined optimal C15:0 levels between 20 to 50 uM, based on robust studies, that can be achieved by reliably increasing our daily C15:0 intake by at least an additional 100 to 200 mg.

This all adds up to how and why C15:0 plays an important role in supporting our long-term health and wellness. Next week, we'll get back to covering the latest and greatest science on C15:0. In the meantime, have a fantastic week, everyone!

Dive deeper into the science

READ THESE STUDIES AT DISCOVERC15.COM/RESOURCES

OPTIMAL EFFECTIVE LEVELS & BIOAVAILABILITY

- Venn-Watson & Jensen (2025) Int J Mol Sci 26, 3746.
- Venn-Watson & Schork (2023) Nutrients 15, 4607.
- Venn-Watson et al. (2020) PLOS ONE 15, e0230769.
- Chen et al. (2025) Lipids Health Dis 24, 219.
- Trieu et al. (2021) PLOS Med 18:e1003763.
- Manca et al. (2021) Gerosci 43(4), 1783–1798.
- Mascarenhas et al. (2015) J Clin Pharmacol 55(7), 854–865.
- Stallings et al. (2013) Int J Clin Pharmacol 51, 263–273.
- Arghavani et al. (2025) Nutr Metab, Cardiovasc Dis 35,104112.
- Liu et al. (2022) Am J Clin Nutr 116, 729-737.
- Simone-Rust et al. (2017) Public Health Nutr 20, 145-156.
- Sun et al. (2025) Eur J Prev Cardiol zwaf60.
- Wei et al. (2023) Nature Microbiol 8, 1534-1548.

MECHANISM OF ACTION STUDIES

- Venn-Watson et al. (2020) PLOS ONE 15, e0230769.
- Garg, R. (2025) J Hematol All Sci 5, 115-124.
- Venn-Watson et al. (2020) Scientific Reports 10, 8161.
- Duan et al. (2025) J Nutr 155, 1298-1310.
- Fu et al. (2021) Food Nutr Res 65, 10.29219.
- Bishop et al. (2023) Nutrients 15, 2052.
- Wei et al. (2023) Nature Microbiology 8, 1534-1548.
- To et al. (2020) Nutrients 12, 1663.
- Ediriweera et al. (2021) Biochimie 186, 147-156.
- Venn-Watson & Schork (2023) Nutrients 15, 4607.
- Venn-Watson & Jensen (2025) Int J Mol Sci 26, 3746.

CELL-BASED AND IN-BODY EFFICACY STUDIES

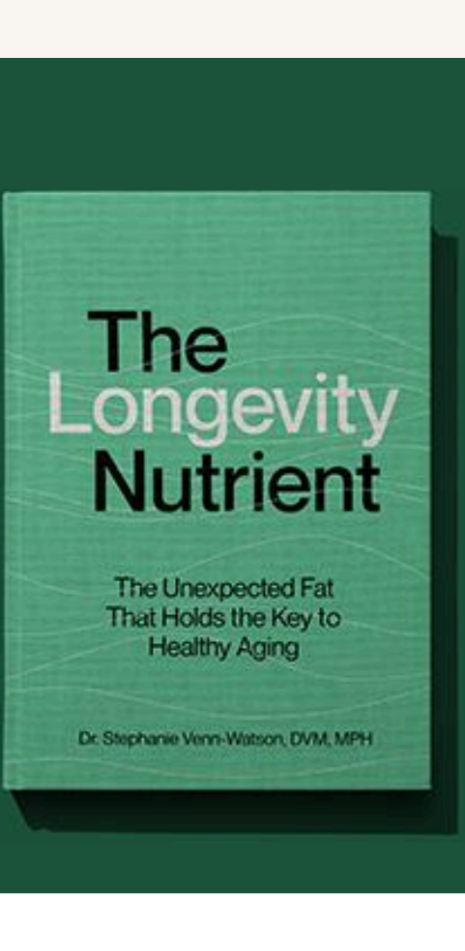
- Wei et al. (2023) Nature Microbiology 8, 1534-1548.
- Aabis et al. (2025) Nauyn Schmied Arch Pharmacol doi:10.1007/s00210-025-04143-6.
- Wu et al. (2024) Nature Comms 15, 9291.
- Bishop et al. (2023) Nutrients 15, 2052.
- Singh et al. (2024) Nutrients 17, 3031.
- Venn-Watson et al. (2020) Scientific Reports 10, 8161.
- Venn-Watson & Schork (2023) Nutrients 15, 4607.

POPULATION STUDIES

- Li et al. (2022) Frontiers in Nutrition 9, 963471.
- Arghavani et al. (2025) Nutr Metab, Cardiovasc Dis 35,104112.
- Zheng et al. (2017) BMC Med 15, 203.
- Chen et al. (2025) Lipids Health Dis 24, 219.
- Huang et al. (2025) Clin Nutr 46, 30-36.
- Kratz et al. (2014) Am J Clin Nutr 99:1385-1396.
- Sawh et al. (2021) J Pediatr Gastroenterol Nutr 72:e90-e96.
- Soboleva et al. (1994) Bull Exp Biol Med 117, 600-602.
- Brydges et al. (2022) Brain Behav Immun 102, 42-52.
- Liu et al. (2023) Aging Cell 22, e13934.

CLINICAL TRIALS

- Stallings et al. (2013) Int J Clin Pharmacol Ther 51, 263-273.
- Mascarenhas et al. (2015) J Clin Pharmacol 55, 854-865.
- Robinson et al.(2024) J Nutr 154, 2763-2771.
- Chooi et al. (2024) Am J Clin Nutr 119, 788-799.
- Salamanca-Sanabria et al. (2025) Front Nutr 12, In Press.
- Arghavani et al. (2025) Nutr Metab, Cardiovasc Dis 35,104112.
- Kaneko et al. (2023) Med Cons New-Remed 60, 459-470.
- Nerd out on all the C15:0 science at DiscoverC15.com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