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Wait, what did I go upstairs to get?

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Welcome to Issue 66 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

C15:0 is associated with better short-term memory & overall healthier cognition

When our metabolism is unbalanced, so are a lot of other things. For example, imbalanced metabolism has been linked to overactive immune responses, sulky moods, and foggy brains. As such, many researchers and physicians around the world have been leading studies to understand *why* metabolism, immunity, and brain health are linked.

This week, we're covering a peer-reviewed study by Shen et al. that evaluated associations between circulating fatty acids, inflammation, and cognitive function among people with type 2 diabetes_ and what these outcomes could mean to protect our own long-term brain health. Ready? Let's do this.

How do we know that metabolic, immune & brain health are linked?

Well, science. Shen et al. summarize studies showing that people with type 2 diabetes are more likely to have both chronic inflammation and cognitive decline, including impaired memory. In fact, papers in the past year have shown the following:

- **Inflammation lights the flame of insulin resistance.** In their paper, Blériot et al. propose that it all starts with inflammation. Specifically, they provide evidence that overactive parts of our immune system (called macrophages and monocytes) attack the pancreas, leading to insulin resistance and a condition called "inflammatory-mediated type 2 diabetes".
- **Hyperglycemia damages brain vessels.** Dao et al. then go on to explain that type 2 diabetes impacts blood vessels in the brain, leading to the increased risk of cognitive decline.
- **Inflammation can also impair brain health.** Additionally, Cao et al. propose that increased levels of a pro-inflammatory chemokine, called MCP-1, may lead to both type 2 diabetes and mood disorders.

So, how can we stop this negative health cascade?

To help answer this question, Shen et al. measured fatty acid levels among 372 adults (26 yo 75 years old) with type 2 diabetes. They also included measurements of inflammation, insulin sensitivity, and outcomes of a variety of cognition tests.

And... what did they find?

We'll cut to the chase.

- First, similar to prior studies, higher hip circumference was associated with higher circulating inflammation and poorer cognition.
- Second, among all fatty acids evaluated, higher C15:0 was most strongly correlated with *better* insulin sensitivity.
- Third, among all fatty acids evaluated, higher C15:0 was most strongly correlated with *better* overall cognition scores across two major assessments, as well as better short-term memory scores and visual-spatial abilities.

Controlling for all variables, Shen et al. showed that higher C15:0 independently predicted improved short-term memory, which appeared to be mediated by C15:0's positive effects on insulin sensitivity.

Dang. Go, C15:0!

Right? Shen et al.'s paper linking higher C15:0 to better brain and cognitive health is further supported by other peer-reviewed studies including the following:

- C15:0 activates AMPK and improves glucose uptake by cells, supporting healthy glucose (and insulin) metabolism.
- C15:0 has a dose-dependent effect on lowering the pro-inflammatory chemokine, MCP-1, which can calm macrophages and help support immune, metabolic, and cognitive health.

Pop quiz! In addition to improving overall cognition scores, higher C15:0 levels are associated with improvements in which specific cognitive tests?

Answer: Short-term memory & visual-spatial abilities

Look at that. Not only did you show off your stellar short-term memory, you also showed you have the visual-spatial skills to read upside down. Have a great week, everyone!

Dive deeper into the science

READ THESE STUDIES

- Shen et al. The association between fatty acids, cognitive function, and inflammation in people with type 2 diabetes
- Blériot et al. Inflammatory and immune etiology of type 2 diabetes
- Cao et al. Correlation of MCP-1, cognitive impairment, and type 2 diabetes
- Fu et al. C15:0 (pentadecanoic acid) and insulin-stimulated glucose uptake
- Bishop et al. C15:0 as a key mediator supporting insulin sensitivity
- Venn-Watson et al. C15:0 lowers glucose and MCP-1 in support of healthier metabolism and immunity
- Venn-Watson et al. C15:0 lowers MCP-1 across multiple cell systems
- Check out all the C15:0 science at discoverC15.com