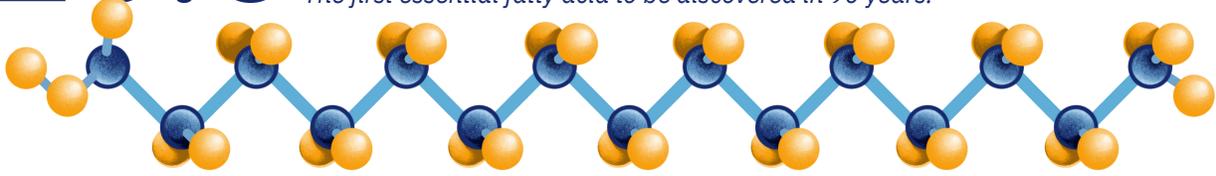


# C15:0

*The first essential fatty acid to be discovered in 90 years.*



## (Pentadecanoic Acid)

### *Application Fact Sheet*

#### **What is C15:0 (pentadecanoic acid)?**

C15:0 is a nutrient that can help support your long-term health and wellness. C15:0 (pronounced see-fifteen) is the first essential fatty acid to be discovered since omega-3 and omega-6, which was over 90 years ago.



#### **Metabolic Health**

Numerous studies have shown that people with higher circulating C15:0 concentrations have a lower risk having or developing type 2 diabetes. These studies were performed by prestigious research teams around the world, including Sweden, England, Canada, and Asia. One study showed that pregnant women with higher circulating C15:0 concentrations had a lower risk of developing gestational diabetes.

These benefits may be due to C15:0's demonstrated ability to:

- Reduce glucose and promote insulin-stimulated glucose uptake
- Lower total and LDL cholesterol in animal models
- Lower triglycerides in animal models
- Activate PPAR- $\alpha/\delta$  receptors, which regulate metabolism
- Activate AMPK, which regulates cellular homeostasis



#### **Liver Health**

Multiple studies have shown that people with higher circulating C15:0 concentrations have a lower risk of having nonalcoholic fatty liver disease (NAFLD) and severe nonalcoholic steatohepatitis, including children. NAFLD now affects 1 in 3 people, including 1 in 10 children, globally. It has been hypothesized that nutritional C15:0 deficiencies may be driving the global pandemic of fatty liver disease.

C15:0's liver health benefits may be due to its ability to:

- Decrease the severity of liver fibrosis
- Stop fibrotic cells from proliferating
- Prevent damaging iron deposition in the liver
- Lower inflammation
- Activate PPAR- $\alpha/\delta$  receptors, which can help protect the liver



## Immune & Joint Health

People with higher circulating C15:0 concentrations have lower inflammation. Additionally, a study evaluating a model of arthritis demonstrated that higher C15:0 concentrations in the serum and joint fluid was associated with a lower risk of joint degradation and osteoarthritis.

These benefits may be due to C15:0's demonstrated ability to:

- Lower many pro-inflammatory cytokines, including IL-6, MCP-1, PAI-1, and VCAM-1
- Decrease inflammation in human cell systems mimicking chronic inflammation
- Decrease pain by raising circulating concentrations of pentadecanoylcarnitine (PDC), a C15:0 metabolite that naturally activates CB1 and CB2 receptors.



## Anti-Cancer Activities

These studies are limited to cell-based studies.

Specifically, C15:0:

- Is an HDAC-inhibitor, which can slow or stop cancer cell proliferation.
- Actively decreases cancer cell proliferation, as well as human cell systems mimicking cancer.
- At higher doses, has clinically relevant cell-based activities that closely match that of gemcitabine and paclitaxel, two common anti-cancer therapeutics.



## Heart Health

Dozens of large, prospective cohort studies have consistently shown that people with higher circulating C15:0 concentrations are less likely to develop heart disease, including heart failure.

These benefits may be due to C15:0's demonstrated ability to:

- Reduce inflammation in the heart and vessels
- Lower total and LDL cholesterol in animal models



## Brain, Mood & Sleep Health

C15:0 and its metabolite, pentadecanoylcarnitine (PDC), can cross the blood-brain barrier and have targeted cell-based activities that support brain, cognitive, mood and sleep health.

These demonstrated activities include:

- Anti-inflammatory activities, including IL-6 and MCP-1, which can support brain health.
- Activation of PPAR $\alpha$ , which can support cognition, mood, brain and sleep health.
- Raised circulating concentrations of pentadecanoylcarnitine (PDC), a C15:0 metabolite, that naturally activates CB1, CB2, 5-HT1A and 5-HT1B receptors, which support brain health, cognition, mood, and sleep health.