

# BEYOND TYPE 1

## Is folic acid a trigger for Type 1 diabetes?

5/8/18

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You've probably heard of folate and folic acid, especially if you're a woman who's been [pregnant](#) or is trying to get pregnant. The folate cycle helps the body complete necessary metabolic processes, maintain a strong immune system, and develop healthy neural tubes. A recent study by two [Diabetes Research Institute](#) scientists explored an unexpected relationship between this micronutrient and autoimmune conditions — specifically, [diabetes](#).

### Folate vs. Folic Acid

First, here's a little background: Folate is a naturally occurring micronutrient that your body easily converts into [5-MTHF, the active form of vitamin B9](#) that can then be used by the body. Among other important functions, it is a critical part of the body's response to foreign invaders like viruses. Folic acid is synthetic, and the process for converting it into 5-MTHF is more intensive because it is processed by the liver instead of the digestive system. Folic acid deficiencies in pregnant women can cause birth defects and low levels of the micronutrient may lead to anemia and other health issues.

Folate is found in vegetables like spinach, asparagus, and Brussels sprouts. Since 1998, many foods containing processed flour have been fortified with folic acid, which is also called pteroylmonoglutamic acid, in an effort by the World Health Organization (WHO) to reduce birth defects due to deficiencies. This means that when you eat your morning breakfast cereal or evening pasta dish, you're likely consuming foods made with fortified flour. For instance, all Canadian products containing white flour, enriched pasta, and cornmeal are fortified, according to [Dieticians of Canada](#). Pregnant women around the world are also encouraged to take vitamin B9 supplements to prevent birth defects.

As a result of the WHO's Fortified Flour Initiative, global consumption of the micronutrient has risen. This has led to scientists looking into whether consuming too much folic acid might have negative health effects that stem from high levels of un-metabolized folic acid found lingering in the bloodstream.

Interestingly, the DRI study notes, the increase in enriched flour products is taking place alongside a growing trend in diagnoses of [Type 1](#) and [Type 2 diabetes](#) “that significantly exceeded epidemiological predictions.” Co-authors Dr. Allison Bayer and Dr. Christopher Fraker, both researchers at the University of Miami, used this observation as the springboard for

their examination of the folate cycle and its relationship to the immune system's ability to operate properly.

## **New Findings**

The study notes, "The folate pathway is instrumental in the production of molecules that fuel the activation and suppression of the immune response. Potential dysfunction in several segments of folic acid metabolism... could have direct impact on proper immune function and lead to T1D and T2D, if uncorrected."

Published in [Frontiers in Endocrinology](#), the study examined the body's susceptibility to certain viruses. Bayer and Fraker cite the Coxsackie and Herpes virus families among those that may contribute toward autoimmune conditions. When it comes to defense, natural killer (NK) cells are key protectors against destructive foreign invaders like viral infections, and NK development is affected by the folate cycle. Previous research has indicated that overconsumption of folic acid can result in inefficient NK cells that don't perform as they should — leaving the body vulnerable in the face of attacks (check our list for a refresher on the [warning signs of Type 1](#)).

What about Type 2 diabetes? The researchers summarize, "As it broadly affects all cells in the body, [the folate cycle] can adversely impact multiple systems by slowing cellular metabolism reactions, accumulating unwanted reaction byproducts and disrupting homeostasis." This means that the metabolic effects of folic acid on a cellular level could lead to [insulin resistance, among other issues](#).

## **The Bottom Line**

These observations call for more research to discover more about how the folic acid we consume as a modern society is affecting us, and what kind of lasting results overconsumption has on our bodies. It's already known that an expecting mother's folate levels affect her baby's development, and Bayer and Fraker go back further in the cycle of human development to caution that "disruption of the folate cycle could, therefore, result in epigenetic changes from conception, onward."

Other researchers, like Ligi Paul, PhD., who co-authored a 2016 study that [examined high folic acid intake and NK cells](#), have been quoted suggesting that we may need to rethink our approach toward [folic acid supplements](#). This direction is supported by the Oregon State University Micronutrient Information Center, which notes that concerns arise from overconsumption of [folic acid](#), not naturally occurring folate. Either way, deeper research into the connections made in this study will further illuminate the way our systemic fortification of our foods may be contributing toward viral infections and autoimmune sabotage.

Despite more knowledge about the role viruses play, the hunt for a "primary causal agent" of autoimmune conditions like Type 1 continues. Bayer and Fraker observe, "All of the findings detailed above suggest an environmental factor that still eludes researchers despite many suggestions over the years ranging from heavy metals to chemical toxins and including viruses, more recently."