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## WHY RESEARCH TO PREVENT DIABETES IS TARGETING THE ROLE OF GUT BACTERIA

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When researchers from the Hospital for Sick Children (SickKids) inoculated young female mice with healthy gut bacteria, they were surprised to find that these young mice were strongly protected against type 1 diabetes. (1)

Type 1 diabetes, also called juvenile onset diabetes, is an autoimmune disease involving specific signals in the blood that initiate an attack on the body's own cells.

More women than men develop autoimmune diseases.

The immune system ends up attacking and destroying tissue in the pancreas, which produces insulin. Insulin is a hormone that regulates blood sugar.

According to researchers, the baby female mice were genetically programmed to develop type 1 diabetes—about 85% of mice from this group went on to develop diabetes.

**However, armed with the gut bacteria from healthy male mice, only 25% of the female mice ever developed autoimmune complications.**

Dr. Jayne Danska, senior Scientist in Genetics & Genome Biology at SickKids, explains what this means. "Our findings suggest potential strategies for using normal gut bacteria to block progression of insulin-dependent diabetes in kids who have high genetic risk."

In other words, in order to limit the development of type 1 diabetes in children, doctors may begin using *probiotic* therapy.

### What Do Sex Hormones Have To Do with Gut Bacteria?

Researchers were in for a second surprise when they realized that the inner ecology of the gut may affect sex hormones, like estrogen, progesterone, and testosterone.

After the young female mice received healthy gut bacteria from male mice, their levels of testosterone went up. Dr. Danska explains, "We were surprised to see that when young female mice received normal gut microbes from adult males, their testosterone levels rose."

**In this case, it turns out that testosterone is essential for balance within the inner ecosystem and for the full protection against disease.**

"It was completely unexpected to find that the sex of an animal determines aspects of their gut microbe composition, that these microbes affect sex hormone levels, and that the hormones in turn regulate an immune-mediated disease," says Dr. Danska.

**This means that sex hormones:**

- Shape the inner ecology of the gut
- Are affected by gut bacteria

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Something as simple as gut bacteria could protect children against type 1 diabetes. Research has proven time and again that a healthy inner ecosystem can improve health and ward off disease.

- Regulate autoimmune diseases

For years, research has pointed out that more women than men develop autoimmune diseases. Certain forms of estrogen have been suggested as the likely culprit in an immune system that cannot seem to keep track of self and non-self.

The inner ecology of the gut is usually left on the fringe of this discussion. While researchers do not fully understand how gut bacteria are able to increase certain sex hormones (in this case, testosterone), it seems that the subject of autoimmunity and inner ecology is worth exploring.

## **An Imbalanced Inner Ecosystem Makes Us Sick**

According to the National Institutes of Health (NIH), we have over 10 times more microbes than human cells in our bodies. A large percentage of these microbes are in the gastrointestinal tract and make up what we call the *inner ecology* of the digestive system.

From the moment we are born, bacteria begin to colonize the human body. As we emerge from the womb, the gut is inoculated either with bacteria from the birth canal or, if born via Cesarean section, with mostly skin bacteria.

The following year is one of the most influential when it comes to our health. How we are fed shapes the inner ecology of the gut and lays the foundation for health in adulthood. Processed foods, refined sugars, and antibiotics within the first year of life can all damage this precious inner ecosystem.

According to the *hygiene hypothesis*, the dramatic rise in autoimmune and inflammatory diseases over the past 50 years is a result of the changes that we have seen in our inner ecology.

**The development of a robust and balanced immune response relies on gut bacteria.**

"Our gut microbial community is an essential part of ourselves...we live with them as partners," explains Dr. Danska.

As research into our inner ecology continues to grow, we are finding that probiotics play an important role in maintaining health and in recovery from disease. While this is the cutting edge of science, it is also what traditional medicine has acknowledged for centuries and what we at Body Ecology have been suggesting for decades.

## **Heal the Body with Fermented Foods and Probiotic Drinks**

Research has shown that beneficial gut bacteria survive the harsh environment of the stomach when consumed as **fermented foods** (<http://bodyecology.com/weight-loss-vegetable-culture-starter.html>). While researchers called this a "protective delivery matrix," it's the equivalent of sending probiotics into the digestive system with the baggage and materials that they need to thrive—as opposed to throwing them in unequipped and alone. (2)

**The best way to nourish the inner ecology of the gut is not with a probiotic capsule supplement—it is with fermented foods (<http://bodyecology.com/weight-loss-vegetable-culture-starter.html>) and probiotic drinks (<http://bodyecology.com/probiotic-beverages.html>).**

If you are struggling with an autoimmune condition, the research is now more suggestive than ever. The message is loud and clear: Gut ecology matters. And in children, a healthy inner ecosystem could inhibit the development of a serious autoimmune disease.

We recommend fermenting foods at home with the **Body Ecology Kefir Starter** (<http://bodyecology.com/digestive-health-kefir-starter.html>) and **Veggie Culture Starter** (<http://bodyecology.com/weight-loss-vegetable-culture-starter.html>). If you are traveling or cannot find the time to make up a batch of fermented foods, a few ounces of our **probiotic liquids** (<http://bodyecology.com/probiotic-beverages.html>) offer a potent dose of beneficial bacteria.

**WHAT TO REMEMBER MOST ABOUT THIS ARTICLE:**

SickKids researchers came to an interesting find: When they inoculated young female mice with healthy gut bacteria, these young mice were protected against type 1 diabetes. Soon, doctors may begin exploring probiotic therapy to limit the development of type 1 diabetes in children.

Researchers went on to discover that sex hormones can shape the inner ecology of the gut and are affected by gut bacteria. Sex hormones in the body can also regulate autoimmune diseases, shedding light on the fact that women are often more likely to develop autoimmune diseases than men.

*The moment that the inner ecosystem becomes out of balance, you are at risk for illness.* Research continues to confirm that probiotics play a pivotal role in supporting health and improving disease recovery time.

You can heal your body naturally with **fermented foods** (<http://bodyecology.com/weight-loss-vegetable-culture-starter.html>) and **probiotic drinks** (<http://bodyecology.com/probiotic-beverages.html>) at home, especially if you are suffering from an autoimmune condition. Children can benefit greatly from home ferments made from the **Body Ecology Kefir Starter** (<http://bodyecology.com/digestive-health-kefir-starter.html>) and **Veggie Culture Starter** (<http://bodyecology.com/weight-loss-vegetable-culture-starter.html>). On-the-go, try a few ounces of a **probiotic liquid** (<http://bodyecology.com/probiotic-beverages.html>) to keep your inner ecology on track!

### **VEGGIE CULTURE STARTER ([HTTP://BODYECOLOGY.COM/WEIGHT-LOSS-VEGETABLE-CULTURE-STARTER.HTML](http://bodyecology.com/weight-loss-vegetable-culture-starter.html))**

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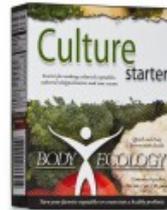
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