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Life Extension Update Exclusive

### **Diet and exercise work (here's how)**

The July 20, 2007 issue of *Science* published the results of research conducted at Children's Hospital in Boston which provides one explanation for the benefits of improved eating habits and exercise on life span.

Working with mice, Akiko Tachi, PhD, Lynn Wartschow, and Morris White of Harvard demonstrate that reducing insulin receptor substrate-2 (Irs-2) signaling increases life span as well as brain levels of superoxide dismutase, a protective antioxidant enzyme. Acting on the basis of previous research in roundworms and fruit flies which found an increase in life span associated with a reduction in insulin signaling, the trio engineered mice to reduce the amount of Irs-2, a protein that carries the insulin signal inside the cell, by half. Because reducing insulin signaling can cause diabetes, the researchers tested their hypothesis that reducing insulin signaling just in the brain, but not the rest of the body, would result in an increase in life span. They engineered two groups of animals to experience a reduction in Irs-2 in their brains alone, while one group of animals was engineered to have lower Irs-2 in all cells, and another group served as controls.

"To our surprise, all of the engineered mice lived longer," Dr Taguchi remarked. Despite being overweight and having higher insulin levels, animals with diminished brain insulin signaling experienced an 18 percent increase in lifespan compared to the normal controls. The mice were also more active and retained greater levels of superoxide dismutase in old age.

"The idea that insulin reduces lifespan is difficult to reconcile with decades of clinical practice and scientific investigation to treat diabetes," Dr White noted. "The engineered mice live longer because the diseases that kill them – cancer, cardiovascular disease and others – are being postponed by reducing insulin-like signaling in the brain regardless of how much insulin there is in the rest of the body. The easiest way to keep insulin levels low in the brain is old-fashioned diet and exercise."

"Our findings put a mechanism behind what your mother told when you were growing up—eat a good diet and exercise, and it will keep you healthy," White observed. "Diet, exercise and lower weight keep your peripheral tissues sensitive to insulin. That reduces the amount and duration of insulin secretion needed to keep your glucose under control when you eat. Therefore, the brain is exposed to less insulin. Since insulin turns on Irs2 in the brain, that means lower Irs2 activity, which we've linked to longer lifespan in the mouse."

"We are beginning to appreciate that obesity, insulin resistance, and high blood insulin levels are connected to Alzheimer's disease, Huntington's disease, and dementias in general," he added. "It might be that, in people who are genetically predisposed to these diseases, too much insulin overactivates Irs2 in the brain and accelerates disease progression. Thus, insulin resistance and higher insulin levels might be the environmental influences that promote these diseases."

Health Concern

## Diabetes

Type 2 diabetes, formerly known as noninsulin-dependent diabetes, occurs when the body is no longer able to use insulin effectively and gradually becomes resistant to its effects. It is a slowly progressing disease that goes through identifiable stages. In the early stages of diabetes, both insulin and glucose levels are elevated (conditions called hyperinsulinemia and hyperglycemia, respectively). In the later stages, insulin levels are reduced, and blood glucose levels are very elevated. Although few people are aware of this crucial distinction, therapy for type 2 diabetes should be tailored to the stage of the disease.

There are acute differences between the early stages of diabetes and the advanced stages. Thus, it doesn't make sense to treat all people with type 2 diabetes the same. In the early stages of the disease, people suffer from both hyperglycemia and hyperinsulinemia. Rather than take drugs that further increase the level of insulin in the blood, people with type 2 diabetes would do better to pursue therapies that increase the sensitivity of insulin receptors on the cell membranes.

One of the best defenses against mild to moderate type 2 diabetes and hyperinsulinemia is improved diet and exercise. Although the disease has a genetic component, many studies have shown that diet and exercise can prevent it.

[http://www.lef.org/protocols/metabolic\\_health/diabetes\\_01.htm](http://www.lef.org/protocols/metabolic_health/diabetes_01.htm)

### Featured Products

#### Metabolic Modulator

Modern food processing "denatures" whole grain foods such as flour, cereals, and bread, stripping them of their beta-glucans and cytokinins. Countless studies show these natural food components play a vital role in maintaining already healthy blood sugar levels, body weight, and cardiovascular function.

The new Metabolic Modulator provides missing constituents naturally found in oats and barley. The result is a neutral-tasting, easy to mix soluble fiber that can help modulate after-meal blood sugar effects, along with the insulin response to a meal containing carbohydrates.



<http://www.lef.org/newshop/items/item00985.html>

#### Chromium Ultra

Chromium, is now generally recognized to play an important role in maintaining a healthy blood sugar level. In addition, supplemental chromium has been shown to promote a healthy cardiovascular system.

For many years, Life Extension has included niacin in its chromium supplements. In response to evidence that people may benefit from higher doses of chromium, a formula has been developed that provides 500 mcg of chromium along with 60 mg of flush-free niacin in just one capsule. To provide full-spectrum benefits, the antioxidants and gene-protecting nutrients like curcumin, resveratrol and green tea have been included.



<http://www.lef.org/newshop/items/item00671.html>

### Life Extension magazine

#### Controlling blood sugar to regulate body weight, by Debra Fulghum Bruce, PhD

The meager amounts of fiber that characterize the modern Western diet are a potent contributor to aberrant blood sugar metabolism and the growing epidemic of insulin resistance, metabolic syndrome, and type II diabetes.

Currently, about 35 million Americans between the ages of 40 and 74 have impaired fasting glucose, and 16 million have impaired glucose tolerance. Because so many people have both conditions, the total number of adults aged 40 to 74 with pre-diabetes in the United States is estimated to be an astounding 41 million!

[http://www.lef.org/magazine/mag2007/jul2007\\_report\\_blood\\_sugar\\_01.html](http://www.lef.org/magazine/mag2007/jul2007_report_blood_sugar_01.html)

If you have questions or comments concerning this issue or past issues of *Life Extension Update*, send them to [ddye@lifeextension.com](mailto:ddye@lifeextension.com) or call 954 202 7716.

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