

[IMAGE]

## **The Inflamed Brain**

### **You're Overweight and Always Hungry; Is Your Brain Inflamed?**

By Dr. David Seaman

Can poor eating habits "inflamm" your brain? Evidence suggests consumption of pro-inflammatory foods can "confuse" your brain and the communication it has with your stomach - in effect, your brain has trouble recognizing when you're full. The result: a tendency to overeat and gain weight, which can lead to all sorts of serious health problems over time, including insulin resistance and diabetes.

At first glance, the notion that the brain can be inflamed may appear silly. This is because we typically view inflammation in the context of swelling after an injury. You sprain an ankle and the ankle swells; inflammation. You get hit in the eye with a ball and the tissue surrounding the eye swells; inflammation. However, the contemporary view of inflammation is that it reflects a manner of cellular communication and need not involve any of the classic signs of inflammation, such as redness, swelling, heat and pain. In fact, one can be systemically inflamed and have no symptoms at all.

#### **The Consequences of Inflammation**

Inflamed Brain - Copyright © Stock Photo / Register Mark For example, type 2 diabetes is caused by chronic inflammation, and its development occurs without the signs and symptoms classically associated with "inflammation." Consider the following statement by a researcher in this area: "Unequivocal experimental, epidemiological and clinical evidence produced during the past decade causally links inflammation, or the molecules and networks integral to inflammatory responses, to the development of these metabolic diseases and/or the complications that emerge from these pathologies, particularly in the context of obesity and type 2 diabetes."

The table above lists the predictors for the presence of metabolic syndrome X, which exists before a patient is obese or has type 2 diabetes. If a patient has three of these predictors, they have the metabolic syndrome and are inflamed.

The reason for our detour into the metabolic syndrome, obesity and diabetes is because the inflammatory state that causes these conditions is also what leads to hypothalamic inflammation. Indeed, a high-calorie, fat-rich diet causes cytokines to be expressed in the hypothalamus [a portion of the brain just above the brain stem that controls, among various other functions, hunger], contributing to the activation of something known as "intracellular inflammatory signal transduction."

salad - Copyright â Stock Photo / Register Mark The outcome is insulin resistance within the hypothalamus and a reduction in satiety signaling, which means a reduction in the brain's ability to recognize when you're full. As you might expect, this communication problem can lead to overeating and weight gain. In other words, the brain of an overeater is inflamed.

### **How to "Deflate" Your Brain**

The reduction of systemic inflammation can begin at the next meal. A diet rich in vegetables, fruit and lean meat reduces systemic inflammation. Additional calories can come from nuts and seeds, particularly chia and hemp. Grains, legumes and dairy should be consumed in modest amounts. Foods that should be avoided included refined sugar, flour and oils, as they are all highly inflammatory and yet, at this point they represent approximately 60 percent of the calories consumed by Americans.

Supplements that help to reduce the inflammatory state include a multivitamin, magnesium, omega-3 fish oils, and vitamin D. Supplements that can specifically help improve insulin sensitivity and help reduce inflammation include chromium and lipoic acid.

skeleton - Copyright â Stock Photo / Register Mark While the notion of brain inflammation might be new, the approach to reduce systemic inflammation is quite straightforward. Operationally, many patients only need to lose 5 percent to 20 percent of body weight to reduce or eliminate the metabolic syndrome, which means that reducing systemic and brain inflammation can be realized by almost everyone. Talk to your doctor for more information.

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### **Inflammation Dangers**

Predictors of Insulin Resistance (Metabolic Syndrome X)

<b>Predictor</b>	<b>Abnormal Value</b>
Blood sugar	> 100 mg/dL
Triglycerides	> 150 mg/dL
HDL cholesterol	< 50 for women; < 40 for men
Blood pressure	> 130/85 mmHg
Waist circumference	≤ 36 inches for women; ≥ 40 inches for men

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