

Did you know the Trace Element Chromium Could Help Your Body's Cells Absorb Glucose?

Chromium is a trace element in your body, meaning that it is present only in very small quantities, yet like many trace elements it is extremely important to your health. Most people associate chromium with the shiny finish on car fenders, but it is more than that.

Chromium oxide was discovered as being a part of crocoite, better known as red lead, which is actually lead chromate, sometimes containing some molybdate and perhaps vanadium. Although it was discovered in the middle of the 18th century, it was not until 1797 that chemist Louis-Nicholas Vauquelin discovered it for what it was. He synthesized it in his laboratory in 1798, which is the ultimate proof of the identity and chemical structure of any substance.

It was eventually named chromium, after the Greek 'chroma' meaning color, because its compounds are highly colored, normally yellow, red and green, and it is chromium that gives emerald its green color. It is also found in low concentrations in the human body, but too low, thankfully, to color your body red, green or yellow! Perhaps Martians contain a lot of chromium!

The first indication of the potential benefits of chromium to health was when a pork kidney extract called the Glucose Tolerance Factor was discovered in 1957 to enable rats to improve their use of insulin in maintaining the effective use of blood sugar in generating energy. The GTF contained chromium, and that was believed to be the effective ingredient.

Diabetes is a condition in which people either do not generate enough insulin or cannot use it properly. Insulin is a hormone biosynthesized in a group of cells known as the islets of Langerhans in the pancreas and is a necessary part of your metabolism. Your metabolism converts carbohydrates and various sugars into glucose, and when the glucose level reaches a certain concentration in your blood, you stop feeling hungry and the pancreas is stimulated into secreting insulin.

The insulin allows the cells to admit sugar and the mitochondria within them to convert the glucose to energy. Your body likes the blood glucose level to be maintained at between 70 and 110 mg/dl. If it falls below 70, then you will be suffering from hypoglycemia, but you can be above 110 if you have recently eaten. If your blood glucose is being measured it must be at least four hours after your last meal, which is why you are asked to fast first. The absolute maximum is 180 mg/dl, above which you are in trouble and suffering hyperglycemia.

If your pancreas cannot produce any insulin you are regarded as having Type 1 diabetes, and if it produces too little or your body cannot use it effectively, it is Type 2 diabetes. It is believed today that chromium is one of the factors involved in allowing the cells to absorb glucose, and that without it the mitochondria are unable to convert your blood glucose into energy.

Although up to 90% of Americans are thought to have a low chromium content, few are believed to be deficient and there is a big difference between the two. However, pregnant women and the elderly are particularly prone to a deficiency, as are those that consume too many sugary foods. A deficiency in chromium not only leads to an excess of blood sugar however, but also of cholesterol and triglycerides. This can in turn lead to atherosclerosis, heart disease and strokes.

Although the role of chromium in the control of blood sugar levels was discovered in the 1950s, it was not until the 1970s that it was proven. As with many such proofs it came about accidentally, through what was known as Total Parenteral Nutrition (TPN). This provided intravenous nourishment to patients who were unable to eat, and contained a mixture of the nutrients believed to be essential to life.

However, the mixture was based on current knowledge, and it was found that some patients developed the symptoms of hyperglycemia, or high blood sugar levels. This was what would have been expected of untreated diabetics, but none were diagnosed with the condition so the cause was a mystery. The physicians responsible for the treatment had no option but to administer insulin, even though there appeared to be no deficiency in the patients.

If you are with us so far, then you will realize that the insulin would not have had the expected result. That is because the condition is not caused by too much sugar or carbohydrate in the diet, and also not caused by a deficiency of insulin. However, due to the known role of chromium in the action of insulin, it was then thought that TNP solution would be improved by adding chromium. When chromium was added in small quantities of under 50 micrograms (5 hundredths of a gram) the patients' condition improved to normal, and the effect of chromium on blood sugar levels was finally proven.

So how does chromium achieve this? In fact the biochemistry is complex, and dietary chromium works in a different way to the chromium picolinate that is the most popular form of chromium supplement. However, in a nutshell, what appears to happen is that its effect on human tissue may be through an increase in the activation of Akt Phosphorylation, which is a protein within the body cells that enables the easy absorption of glucose into

the cells.

In addition to that, cell membranes contain insulin receptor sites that respond to biochemical signals from messengers such as hormones and nutrients, and it is believed that chromium might be involved in promoting the binding of insulin to these sites. Alternatively, it is possible that it may promote the reactions that occur after the insulin has bound to the receptor site, an occurrence that is referred to as a post-receptor event.

Whether chromium is involved in a post-receptor event or in binding the insulin to the receptor sites, there is no doubting the importance of the element to the overall insulin-glucose-energy metabolism, and that the trace element chromium is indeed important in helping your body cells to absorb glucose.

About the Author

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