Type 2 Diabetes Defined:

(/un-uh-BEET-te) Previously known as “non-insulin-dependent diabetes mellitus” (NIDDM) or “adult-onset diabetes.” Type 2 diabetes is the most common form of diabetes mellitus. About 90 to 95 percent of people who have diabetes have type 2 diabetes. People with type 2 diabetes produce insulin, but either do not make enough insulin or their bodies do not use the insulin they make. Most of the people who have this type of diabetes are overweight.

www.diabetes.org/glossary.htm

“TNF-alpha is a soluble cytokine (A hormone-like molecule, produced by one cell, that has an effect on another cell) with a wide variety of functions: it causes damage to tumor cells but has no effect on normal cells; it is involved in the induction of cachexia; it is a potent pyrogen, causing fever by direct action or by stimulation of interleukin-1 secretion; and it can stimulate cell proliferation and induce cell differentiation under certain conditions.”

http://www.infobiogen.fr/db/index-emboss/prints/PR01235

Research conducted to pinpoint the activities of TNF-alpha interaction with IRS-1 receptors shows that the presence of TNF-alpha during the early maturation of IRS-1 cells interrupts the normal processing of glucose into glycogen. Glycogen in a complex carbohydrate molecule made up of glucose and stored in the liver and muscle cells. When carbohydrate energy is needed, glycogen is converted into glucose for use by the muscle cells. This process is slightly improved when the body tries to produce extra insulin to counteract the lack of glycogen, but does not return levels to normal. TNF-alpha has been shown to affect the uptake of glucose into muscle cells and can alter the growth of muscle tissue.

http://www.fasebj.org/cgi/content/full/15/12/2099#ABS

Theoretical Model of IRS-1

Obesity And Diabetes

“Although there are some genetic causes for insulin resistance, the most common cause is an excess of nutrition a condition called ‘Nutrient Toxicity.’ Both excess glucose and excess fat can cause insulin resistance in muscle and fat tissues and excess fat can cause insulin resistance in the liver. High fat feeding and fat infusion rapidly lead to the development of insulin resistance caused by impairment in glucose transport.”

“Obesity resulting from excess nutrient intake can also cause insulin resistance by an increase in the production of agents that impair insulin action such as TNF-alpha and resistin and a decrease in the production of an insulin sensitizing compound adiponectin.”


However research has definitively shown that when excess TNF-alpha is removed from the IRS-1 structure, insulin processes return to normalized levels, and muscle cell maturation can take place normally.

http://diabetes.diabetesjournals.org/cgi/content/full/50/5/1102