

## Fat Cell Size Regulation: The Leptin Factor

# How Lepti-Trim6 Shrinks Fat Cells

After fat intake, one of the major things that the hormonelike protein leptin does is suppress appetite and even modulate the taste for sweets. This is a major breakthrough. We are not talking about burning calories but rather simply not having the desire to eat as much. We also know that leptin suppresses a specific enzyme that is essential for fat production. By suppressing the enzyme responsible for fat production, your fat cells will shrink accordingly. The American Medical Association has published a major study that shows that 95 percent of subjects' weight loss with leptin was actually fat loss—without any clinically significant side effects. In fact, large fat cells indicate a leptin deficiency or inability to properly utilize leptin. These are the issues that **Lepti-Trim6** from Immune Tree addresses.

An important breakthrough in weight-loss, body composition and muscle building comes to us from Immune Tree. There Dr. Kleinsmith succeeded in concentrating the leptin molecule that is a natural part of colostrum and thought to be a key in regulating the body's fat intake. Such a development of natural and safe weight-reducing methods to treat chronic obesity is important. Researchers anticipate that leptin-rich colostrum formulations will have fewer side effects than current controversial weight-loss drugs such as Redux (dexfenfluramine) or fen/phen (fenfluramine and phentermine).

In recent years physicians have taken a different attitude toward using pharmaceutical products to treat obesity. This isn't just some cosmetic desire for thinner thighs in 30 days. According to a recent editorial in *The New England Journal of Medicine*, obesity affects 58 million people in the United States, contributing to 300,000 deaths each year by adding to the risk of heart attacks, strokes, diabetes, and some cancers. Physicians have begun to regard obesity as a chronic disease, not a behavioral problem, a change that the editorial described as a "paradigm shift." This change in medical thinking has fueled the race to discover a safe pharmaceutical product that treats obesity.

Thankfully, Dr. Anthony Kleinsmith from Immune Tree is on the cut-

ting edge of colostrum science. They have successfully isolated the leptin molecule from bovine colostrum. We've always known that colostrum contains leptin, but now they've begun to "supercharge" their whole first-milking colostrum with additional concentrated amounts of the leptin molecule added to the base. This has the potential to become a breakthrough in natural health, weight loss and muscle building.

### Fast-moving Leptin Story

Leptin (from the Greek *leptos*, meaning thin) has long been thought to be a holy grail in the area of weight control but until the new Immune Tree formulation hasn't been available to consumers—even though it is a completely natural molecule that is found throughout the human body.

Since the discovery in 1994 of the obesity gene and its product, the fat-busting protein leptin, scientists have been racing to understand and apply this modern marvel. The *ob* gene—*ob* for obesity—was moved into mice in 1995, and the photo of the fat mouse next to the thin mouse with the *ob* gene was carried by nearly every media outlet in the nation. The obese mice dropped 40 percent of their body weight after only one month of treatment with the protein. Leptin also appeared to improve symptoms of diabetes in the mice. Non-obese mice also lost

weight when given the protein. "I'm...impressed," obesity researcher Richard Atkinson, University of Wisconsin, told *Science* magazine. "The level at which body weight is defended is reduced by this stuff."

Overnight the *ob* gene became the world's first celebrity gene, frequently mentioned in popular publications such as *Newsweek*, *Time* and *The Wall Street Journal*.

Leptin, the product of the obese gene, is a hormone-like protein primarily produced in adipose cells, and also at smaller amounts in some other peripheral organs. It regulates food intake, energy expenditure, and body weight. Leptin is thought to promote weight loss, at least in rodents, by suppressing appetite and stimulating metabolism. Mutant mice that lack either leptin or functional leptin receptors are hyperphagic (i.e., they suffer abnormally increased appetite), massively obese, and diabetic.

### Inhibits Sweet Taste Responses

So how does leptin work? Central hypothalamic targets are mainly responsible for the effects of leptin on food intake and weight loss. However, there are also direct effects on peripheral tissues.

Recently, the taste organ was found to be one of the peripheral targets for leptin. The protein specifically inhibits sweet taste responses in lean mice. Thus, leptin appears to act as a modulator of sweet taste.

Purdue University Professor Ki-Han Kim is in the forefront of research on leptin. His research provides new information about how this weight-reducing protein works. All of the reports and research on the *ob* gene and leptin thus far have assumed that the protein acts by causing a hormonal response in the brain, causing the body to feel satiated.



Kim, of Purdue's Department of Biochemistry, has discovered that these findings are only partly correct. He was able to show that production in fat cells also was slowed by leptin. The finding gives scientists the first indication that leptin suppresses biochemical reactions in fat cells without the participation of the brain.

When researchers injected laboratory mice with leptin, previously obese mice became as thin as rodent track stars. "It's true that the animal isn't eating as much when it is given leptin," Kim says. "But that doesn't mean that the brain is initiating this. Whenever we eat, we alter the hormonal status of the

body. The body has to tell its various parts to do something with this food that has been ingested. When leptin inhibits fat synthesis, it causes the body to have extra food in its system, which causes the hormonal system to send a message back to the brain saying that the body is satiated and to stop eating.

"So leptin's interaction in the brain isn't the whole story," says the Purdue researcher. "Leptin also appears to act via pathways that are independent of the brain. My thinking is that it works by inhibiting the synthesis of fat in fat cells and increasing the burning of fat in muscle cells. It works at an enzymatic, cellular level."

**Kim has found that the ob gene causes the muscle cells to produce leptin and suppresses a gene that produces an enzyme known as acetyl-CoA carboxylase, or ACC, which is essential for fat production. Not only will this new information speed the process of delivering a pharmaceutical product to consumers, it provides scientific credibility to the new Immune Tree Lepti-Trim6 formula.**

In a sense, leptin may be a critical aspect of the body's set point, and its low levels may be a reason why people reach a plateau where they just don't seem to be able to lose any more weight. "When a person loses weight, leptin concentration in the blood is reduced," notes researcher Jeffrey Friedman, M.D., Ph.D., whose own clinical studies on leptin are being done in association with The Rockefeller University. "Low leptin levels cause the human body

to go through changes that reduce the rate the human body burns its calories. The result is a decrease in the rate of weight reduction, and increased appetite. Leptin may be involved in regulation of these processes, and low leptin levels may explain the high failure rate of dieting. Leptin treatment may change these effects and result in an increased rate of weight loss and increase the success of maintaining a reduced weight."

No less a publication than the *Journal of the American Medical Association* has reported on the leptin-weight loss connection. In a randomized, double-blind, placebo-controlled, multicenter study, conducted from April 1997 to October 1998, it was found that weight loss "increased with increasing dose of leptin among all subjects," note researchers. More than 95 percent of the subjects' weight loss was fat loss at the highest dose. No clinically significant adverse effects were observed on major organ systems. "A dose-response relationship with weight and fat loss was observed," the researchers say. "Based on this study, administration of exogenous leptin appears to induce weight loss in some obese subjects..." ❖

#### REFERENCES

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- Saris, W.H. "The concept of energy homeostasis for optimal health during training." *Can J Appl Physiol*, 2001;26 Suppl:S167-75.

#### Prescription for Healthy Living

**Immune Tree's Lepti-Trim6** formula with leptin and insulinlike growth factor-I (IGF-I) in a colostrum base is an innovative and potential major breakthrough in weight loss. Its use appears to be particularly suitable for people who're at a weight-loss plateau, who desire to alter their bodily composition from fat to lean muscle, and for anyone who has had difficulty losing weight due to an uncontrollable appetite.

**Immune Tree's Lepti-Trim6** is available through health food stores and practitioners. Please call 877-295-1269 for a vendor new you or visit an online vendor at [www.dockofhealth.com](http://www.dockofhealth.com).

