

## Sermorelin: An Alternative to Traditional HGH?

For over a decade, Human Growth Hormone (HGH) or somatropin has been used by physicians to address adult growth hormone deficiency. Although effective in opposing degenerative changes of aging, there are certain liabilities and concerns associated with the use of HGH.

Regarding legal issues, the Code of Federal Regulations expressly forbids the off label use of HGH. Thus, unless practitioners are prescribing HGH for the treatment of growth retardation in children, physical wasting in AIDS patients or for properly diagnosed growth hormone deficiency in adults, they are at risk for reprimand by the DEA, FDA, and Board(s) of Medicine.

In addition to these legal issues, side effects may result from HGH replacement therapy. Because HGH is administered directly into the body, its effects cannot be finely regulated and thus, overdosing, which causes side effects is possible. Furthermore, because it is administered as a pharmacological agent, i.e., in square wave, constant and long term presentation to the target tissues, tachyphylaxis eventually occurs, requiring a period of withdrawal until efficacy can be restored.

Sermorelin is an alternative to HGH that can legally be prescribed "off label". Sermorelin which stimulates production of the body's own HGH has recently become available for use to address adult hormone deficiency. Sermorelin is a biologically active truncated analog of growth hormone releasing hormone or factor (GHRF 1-44) that is naturally produced by the brain to simulate pituitary production and secretion of human growth hormone (HGH) by the pituitary gland.

The natural brain hormone contains 44 amino acids; whereas, Sermorelin consists of the first 29 amino acids of GRF, which are the ones responsible for its pituitary stimulating activity. Thus, it is designated GRF 1-29NH<sub>2</sub>. Since Sermorelin stimulates the pituitary gland to produce and secrete its own HGH, side effects associated with overdosing of this hormone are significantly reduced.

The reason that Sermorelin has a lower risk of causing side effects than injected HGH is because the brain automatically prevents too much of the body's own HGH from being released by the pituitary gland through feedback processes involving the inhibitory factor, somatostatin.

Sermorelin not only provides the benefits of HGH on body composition, but it also helps sustain pituitary health and opposes loss of activity of the endocrine system that normally occurs during aging. Since estrogen and adiposity negatively affect growth hormone action on the liver to produce IGF-1, higher doses of Sermorelin are recommended for women and men with high BMIs.

During youth, ample amounts of GHRH are produced so that the pituitary is able to provide the body with sufficient growth hormone to sustain normal aspects of form and function.

GHRH declines with age causing reduced production and secretion of pituitary HGH and thereby increasing the sequelae of growth hormone insufficiency. Unlike HGH, Sermorelin affects a more primary source of failure in the GH neuroendocrine axis, has more physiological activity, a better safety profile and its use for adult hormone deficiency is not prohibited (as is HGH). Thus, Sermorelin should be

considered a valuable alternative to HGH for patients seeking treatment to combat the signs and symptoms of adult growth hormone deficiency.

**Benefits of Sermorelin:**

Increased levels of growth hormone are reported to assist in -

- Increased calcium retention
- Stronger bone density
- Increased muscle mass
- Increased protein synthesis
- Stimulation of the growth of all internal organs, excluding the brain
- Promotion of lipolysis
- Playing a role in energy homeostasis
- Reducing liver uptake of glucose, promoting gluconeogenesis (formation of glucose from noncarbohydrate source, i.e., energy formation from fat breakdown)
- Contributing to the maintenance and function of pancreatic islets
- Stimulating the immune system
- Increased stature in children with diagnosed short stature
- Treatment of the prevention of HIV-induced cachexia

**Possible blockage of oxidized-LDL binding, resulting in lower atherosclerotic plaque production.**

This will reduce the risk for developing

- Hypertension
- Stroke/Aneurysm
- Myocardial Infarction – “Heart Attack”
- Heart Failure
- Kidney Failure
- Vision changes/loss
- Promoting the breakdown of body fat while promoting lean muscle mass

Sermorelin is a “growth hormone-releasing hormone” (GHRH). It stimulates the pituitary gland to naturally produce increased amounts of human growth hormone.

### **What is Sermorelin?**

Sermorelin is a form of GHRF, growth hormone releasing factor, that contains only the first 29 amino acids. GHRF that is produced by neurosecretory neurons in the brain contains 44 amino acids. When the structure of GHRF was first described by the Nobel Laureates, R. Guilleman and A. Shalley in the 1970's one of their students, William Wehrenberg sought to determine which part of the HGH molecule was essential for its pituitary stimulating action.

By eliminating individual amino acids and then testing the remaining peptide, he found that only the first 29 amino acids are responsible for stimulating pituitary production and secretion of HGH.

### **Is Sermorelin the same thing as HGH?**

No, it is a growth hormone secretagogue, which means that it stimulates the pituitary gland to produce and secrete HGH. Sermorelin is a small peptide containing only 29 amino acids whereas HGH is a much larger molecule containing 191 amino acids.

### **Must Sermorelin be injected like HGH?**

Sermorelin is injected in the subcutaneous fat like HGH. It is recommended that you inject the product 60 minutes prior to going to bed to maximize the production of HGH during sleep.

### **Are the costs for HGH and Sermorelin Comparable?**

Costs of Sermorelin are much less expensive which allows more patients to benefit from growth hormone.

### **What causes that loss of potency and does it also occur for Sermorelin?**

Loss of HGH potency after about six months or more of continuous use is not unusual and is not due to inferior product. It is due to the fact that injection of HGH elevates blood levels of the hormone to unnaturally high values for several hours each day. Also, constant stimulation causes increased production of IGF-1 which also has more constant tissue exposure than under normal conditions. These factors causes target tissue receptors to “down regulate” in an attempt to prevent over stimulation by the unnatural exposure to HGH and IGF-1. Under physiological conditions, HGH is released from the pituitary gland in episodes that cause levels to increase and decrease many times throughout the day. Under such conditions, tachyphylaxis or down regulation does not occur since the tissues receptors get time to “rest” between each stimulatory event. In contrast to HGH, there is no loss of potency with Sermorelin because its action on the pituitary gland is modulated by feedback through somatostatin. This causes HGH to be released from the pituitary in episodes, rather than in “square wave” pharmacological presentation as occurs upon injection of the gene recombinant product. In addition, the pituitary gland up-regulates to stimulation by Sermorelin causing the gland to rejuvenate.