



IGF-1

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Among the thousands of herbs used in traditional Chinese medicine, a small but elite group known as the 'kingly' or 'Imperial' herbs is comprised of tonic herbs used only by emperors, sages and the wealthy. Highly prized among these special herbs, which are revered for their extraordinary health promoting benefits, is deer antler velvet. Although not technically an herb, deer antler velvet is among the most expensive remedies used throughout Asia and is regarded as a premier tonic for promoting strength and virility, replenishing "vital essence," and strengthening bones and tendons.^{1,2}

Antler velvet is the soft, growing tissue that surrounds the forming antlers before they become calcified and hard. During the velvet stage, antlers quickly grow at a tremendous rate (up to 1 inch per day in some species). In order to maintain such accelerated growth, the cartilage, bones and supporting tissues such as blood vessels and nerves must also grow at an expedited rate. Scientists have identified multiple growth factors in antler velvet, which are responsible for stimulating such fast growth. Growth factors are proteins that bind to receptors on the surface of cells, in order to activate cellular growth and differentiation (the process by which cells acquire completely individual characteristics and/or functions). In particular, researchers have confirmed the presence of high amounts of an important growth factor called *insulin-like growth factor-1* (IGF-1) in antler velvet.¹⁻⁸

IGF-1 (originally called somatomedin-C) is a natural growth factor found in both animals and humans. IGF-1 is used by scientists as a marker for the level of growth hormone present in the body, as IGF-1 elicits many of the growth-promoting and metabolic effects associated with growth hormone in vivo. During youth, concentrations of IGF-1 and growth hormone are relatively high, which promote healthy muscle development and lower body fat. Following adolescence and during the early twenties, IGF-1 levels begin to decline. With advancing age, blood levels of IGF-1 decrease continuously, thus giving rise to the conclusion that the acceleration of aging is related to the decline in IGF-1 and growth hormone—this process of decline is referred to as somatopause. Thus, somatopause is associated with the loss of muscle mass and strength, as well as slower muscle protein synthesis. Somatopause is also listed among the causes of the development of bone disorders such as osteopenia (reduced bone mass).^{1,7-14}

Although there is much still to be learned concerning the role of IGF-1 in the body, research has shown that IGF-1 stimulates whole body protein synthesis, as well as increases fat-free mass and decreases fat mass. IGF-1 plays a key role in the formation and maintenance of skeletal muscle and has been shown to produce significant increases in muscle mass and strength in animal experiments. IGF-1 has been shown to increase levels of triiodothyronine (T3), a thyroid hormone, as well as contribute to healthy immune function through its role in the regulation of thymulin secretion (a hormone produced by the thymus gland). IGF-1 even appears to be involved in sperm production in men—a recent study found that men with the lowest sperm-counts also had the lowest mean and median IGF-1 levels.^{9,10,15-20}

In addition, because IGF-1 is structurally similar to insulin, it shares many of the biologic properties of insulin. For example, IGF-1 lowers blood glucose, suppresses circulating insulin, and increases insulin sensitivity. Studies indicate that adding IGF-1 to insulin therapy improves insulin sensitivity and glycemic control, and decreases insulin requirements in individuals with Type 1 diabetes (insulin-dependent diabetes mellitus). Since IGF-1 appears to improve insulin sensitivity, it may also be helpful in Type 2 diabetes (non-insulin-dependent diabetes mellitus) and other conditions associated with insulin resistance.^{7,10,15,21-25}

There is also growing evidence that IGF-1 may be beneficial in the treatment of heart disease. Recent studies have shown that IGF-1 inhibits apoptosis (programmed cell death) of heart muscle cells and improves myocardial (heart muscle) function in experimental heart failure. Research has also shown that IGF-1 may help prevent coronary artery disease—a condition where blood vessels supplying blood to the heart (coronary arteries) are narrowed or blocked—by decreasing blood levels of lipoprotein(a), a substance similar to LDL cholesterol. Elevated serum lipoprotein(a) is a strong risk factor for coronary artery disease, because it may contribute to atherosclerotic activity—the forming of fatty plaque within the arteries—and thrombogenic activity—the forming of blood clots.^{26,27}

Furthermore, IGF-1 is an essential factor for bone formation and long bone growth and is strongly associated with bone mineral density and bone quality. In fact, serum IGF-1 has been found to be an independent predictor of total bone mineral content. IGF-1 stimulates collagen synthesis, encourages the absorption of chondroitin sulfate (a structural component of connective tissue, particularly cartilage), and decreases bone matrix degradation, thus playing a role in the maintenance of bone mass. Not surprisingly, IGF-1 has been shown to be significantly lower in postmenopausal women with osteoporosis.^{8,28-34}

The relatively high levels of IGF-1 found in deer antler velvet, along with other related growth factors, may help to

explain why this ancient Asian remedy is proving to be such a remarkable natural anti-aging supplement. Unlike other "growth hormone" products available, deer antler velvet is neither the glandular extract of a dead animal, nor the result of recombinant DNA technology (genetic engineering).^{1,5,8}

Each bottle of NSP's IGF-1 contains at least 2,500 nanograms of IGF-1 and other naturally-occurring growth factors, derived from premium deer antler velvet. Additional contents include stevia leaf extract, purified water, natural and artificial flavors, xylitol, citric acid, lecithin, and potassium sorbate (to protect freshness).

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