A New Biologically Active Thymic Protein to Stimulate Cell-Mediated Immunity

by Dr. James Lapcevic

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Introduction

The immune system is a complex network of specialized organs, glands and cells which, when working properly, protect the body from pathogens such as viruses, bacteria, fungi and foreign cells such as cancer. It is composed of two basic sub-systems, the Humoral and the Cell-Mediated, each with specific methods of defending the body against disease. The Humoral system uses antibodies in a sort of "chemical warfare." B-lymphocytes, which are formed and matured in the bone marrow, are utilized to produce antibodies to defend against pathogens.

The Cell-Mediated immune system employs T-lymphocytes (T-cells) as "shock troops." They are formed in the bone marrow, but are matured by proteins produced by the thymus gland (hence the T for thymus).

Both portions of the Immune System must function properly in order for the body to have an optimum Immune Response to invading pathogens. T-4 lymphocyte (helper cell) activity is central to efficient immune response, and occurs when the T-4 cell recognizes an antigen displayed by an invading pathogen. Once activated, the T-4 cell produces Interleukin and Interferon proteins, also called lymphokines or cytokines, which in turn activate or program T-8 lymphocytes (killer cells) to find and kill the specific antigen-producing pathogen. Additionally, the activated T-4 cell causes B-cells to produce antibodies more efficiently.

Before a T-4 cell can recognize an antigen and begin this cascade of events to protect human health, it must first receive its programming from a specific thymic protein, whose specialized role is to "turn on" or activate newly formed T-4 cells.

The Function of the Thymus

The thymus gland is a ductless gland located just beneath the breast bone. It produces proteins or factors which program T-lymphocytes. While this organ has long been known to exist, its critical function in the immune system has recently been discovered, about 30 years ago. It is only in the past 20 years, due to advances in cellular biology and development of genetic engineering, that the vital importance of thymus proteins is beginning to be appreciated.

In the past few years, scientists have discovered that the epithelium of the thymus gland produces about 30 distinct proteins, the properties of which are now in the process of being unraveled. Research on thymic proteins has accelerated in recent years, fueled by growth in the number of people with AIDS. This area of study is important to AIDS research because the HIV virus infects T-cells, specifically the T-4 cell.

A number of other factors, the most common of which is age, affect thymic function. Normal thymus function diminishes beginning at birth; such that by age 40 to 45, a person has greatly diminished thymus protein production. Other known factors which will accelerate thymus atrophy are exposure to radiation, chemicals, chronic disease, and trauma. Perhaps most importantly, common viral infections such as Chicken Pox, Measles or Epstein-Barr can impair thymic activity.[1]

HIV also affects the thymus gland. Some research shows that production of thymic protein may be reduced within weeks of an HIV infection, thereby inhibiting the T-4 cells from starting the immune response.[2,3]

Immune Dysfunction and Suppression

It is estimated that sixty-five million Americans suffer from a dysfunctional immune system. Among the manifestations of this disorder are a variety of diseases, such as arthritis, asthma, allergy, diabetes, chronic viral infections, Chronic Fatigue Syndrome (CFS), Epstein-Barr virus, AIDS, and Cancer. A large portion of immune dysfunction and suppression may be due to thymus functional deficiency, because the thymus gland plays such a pivotal role in initiating and regulating immune response.

A Case for Replacements

Knowledgeable alternative and complementary physicians have treated deficiencies involving the thyroid gland and other glands with physiologic replacements. Extracts of thymus generally consist of whole thymus gland which is ground and dried, or strained into liquid and administered in capsules or sublingual drops. By the very method of processing, such products are a conglomeration of thymus tissue, cell debris, fragments of thymus proteins, and thymus by-products. These extracts have been available for years and have shown variable levels of effectiveness for various immune deficiencies and some specific medical conditions. One such fragmented thymus protein, the drug Thymosin, has been approved as an adjuvant treatment for Hepatitis B in China. Prior to the introduction of the new intact thymic protein, thymic extracts have contained only fragmented thymic peptides, limiting their effectiveness. To attain full efficacy, a protein must have a specific shape with precisely defined transmitter and receptor sites. Only a whole biomolecule can be reasonably expected to achieve full

biological activity. The new intact thymic protein contains the complete chain of over 500 amino acids in its natural form.

If supplying whole thymus in a processed and fragmented form is of some value, it appears logical that a purified and intact whole biologically active single thymus protein would be far more useful.

A Novel Intact Purified Thymus Protein

Dr. Terry Beardsley, PhD has patented a technology to grow thymus cells in a laboratory, and from the product of these cells' metabolism, purify a specific thymus protein. It has been proven in laboratory and animal experiments that this specific thymus protein is the protein which causes the T-4 lymphocyte to mature, thereby initiating a specific cell-mediated immune response.[4]

This specific protein has been assayed both chemically and in animal models for the production of Interleukin 2, which is the benchmark measure for T-cell maturity and initiation of immune response. The protein is routinely tested in a rat model for the suppression of flu virus, which further demonstrates effectiveness in initiating Cell-Mediated Immune Response.[5]

A trial with 22 cats infected with Feline Immunodeficiency Virus (FIV) concluded that this protein enhances immune response as measured by clinical and laboratory parameters.[6]

An experiment published in *The Journal of Immunology and Immunopathology* in 1984[7] found that this protein is conserved among species. The experiment entailed transplant of human thymus cells which produce this protein into the renal capsule of athymic (nude) mice. Because these specific mice have no thymus, therefore no immunity, they must be kept in a sterile environment.

After the transplant, the mice demonstrated immune response outside the sterile environment and did not exhibit any rejection of the transplanted human tissue. This experiment demonstrated that the protein induced cell-mediated immunity in the mice, and the restored immune system of the mice did not recognize the transplant as foreign.

This thymic protein is the result of 23 years of research. Only in the past two years has it been made in sufficient quantity to become commercially available, first as a wafer, now as a purified powder. It has proven to be a powerful immune stimulant in extensive laboratory and animal experiments, including testing at the US National Institutes of Health. It is derived by a patented process from live cells, then purified, resulting in an intact biologically active native molecule. This protein is scientifically proven to be the thymus protein which programs the T-4 Lymphocyte (T-4 helper cell), a function many consider the most important aspect of immunity; it is one of the true keys to longevity.

Dosage and Clinical Observations

The protein is available as a highly stable freeze-dried powder with a shelf life of several years. It is currently available in 2 microgram individual doses, triturated onto several hundred milligrams of maltodextrin powder, and packaged in individual sealed packets. The powder is administered sublingually by pouring the contents of the packet under the tongue and allowing it to dissolve over 2-3 minutes. If the powder is swallowed, the protein will be denatured by the stomach contents.

The effective dose ranges from a low of 2 micrograms per day for maintenance, to 8 to 12 micrograms per day for more serious immune deficiencies. Results are often obtained within the first week or two of use, since the protein, once absorbed, works immediately in the bloodstream to seek out and program T-4 cells. Some sensitive people will notice a transient rise in body temperature shortly after taking a dose, due to immune activation.

Using this protein is similar to that of hormone replacement. In essence it is functional medicine, where the goal is to support and strengthen the body's own functions. As we age, we make less thymus protein. Our immune function gradually declines, opening us to some opportunistic infection which may not be defeated, as it could have been with a stronger cell-mediated immune reaction.

The protein may be used in any situation where strengthening the immune system is desirable, as would be the case in most types of illnesses, with the exception of certain autoimmune diseases such as Lupus.

It is most rapidly effective especially in cases of known acute or chronic viral infection. The author has observed impressive results with patients having herpes, shingles, and hepatitis infections, among others. Rapid and dramatic improvements, often within the first month of use, have been observed. It is also effective at protecting white blood cell levels during toxic therapies such as chemotherapy or radiation. One of the actions of this protein is to stimulate the bone marrow to manufacture more white and red blood cells.

Known Contraindications: Other than in certain types of autoimmune illness, the use of this thymic protein is not recommended if a person is taking large doses of steroid hormones, as with hormonal treatment for prostate cancer. The presence of large doses is known to interfere with the adherence of the protein to lymphocytes' surfaces. This is not a problem with people taking steroid hormone replacement therapy, where the aim is to merely restore a normal amount of hormones.

Toxicity: Because this protein is identical to human thymic protein, it has a very low potential for toxicity. It is made from the cloned thymic cells of a single calf born over 11 years ago. It is prepared in a sterile lab environment by the research scientist who discovered it, and is so highly purified that potential allergic components from the bovine source are eliminated. To date, in over 2 years of use, there are no reports of allergic reactions. In addition, there does not seem to be a toxic or lethal dose for animals. Test animals given several hundred times the human dose did not suffer any negative effects. A human given several

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subcutaneous doses of 200 mcg. within a 5 day period showed only fatigue, which disappeared when the high doses ended.

How Long to Use the Protein

Recent research indicates that T-4 cells are divided into two main types: Longer term and shorter term "memory cells." Both these types need to be "programmed" by the same thymic protein. However, shorter term memory cells retain the programming for only about 7 days, while longer term ones retain it for up to 60 days. This research is so new that it is not yet known what portion of T-cells are of each type of memory. However, this research indicates that, for optimum long-term benefits, the protein should be taken on a continuous basis, with frequency and dose dependent on the health of the individual.

For example, a relatively healthy person who merely wishes to increase cell-mediated immunity may use a dose of 2 micrograms daily to several times a week. A severely ill person should start at a high dose, preferably 12 micrograms daily, until clinical signs of illness have disappeared or abated as much as possible, after which the dose may be gradually reduced to a maintenance dose of 2-4 mcg. daily or less. Some experimentation with dosage should be expected. It is not harmful to continue high doses as long as necessary.

Observed Clinical Improvements

The clinical improvements will manifest as:

1. Increase in total white blood cell count. As explained, the protein will cause increased production of lymphocytes, but only if the count is low. It will not raise the level above normal.

2. Increased T-4 (CD-4) and T-8 (CD-8) levels. This occurs because of (1) above. In HIV-infected people with very low T4 cell counts, below 100, the increase may be slow, and may be preceded by a period of several weeks in which the count falls before rising. This is due to the fact that the test for total T-cells does not distinguish between infected and healthy cells, and the protein activates the immune system to destroy infected T-cells. After a few weeks, newly formed healthy T-cells will eventually increase the total count.

3. An increase in total red blood cells is also possible, since the T-4 cell exerts some control over production of these as well.

4. An increase in CD-56 (Natural Killer) Cells has been found in some individuals.

5. A decrease in viral load with viral infections is to be expected and is an excellent measure of success.

While the protein has many applications, because it is a sort of "common denominator" for the immune system, practitioners may wish to consider first using it with patients having known acute or chronic viral infections, where progress is usually relatively rapid and easily measurable by blood tests.

Is This a Magic Bullet?

This thymic protein is not a cure, panacea, or magic bullet. Knowledgeable practitioners understand the central importance of the immune system in human health and well-being, but they also know that lifestyle, diet, general nutrition, and state of mind are essential components to sound health and longevity.

This protein offers an important tool which, if used properly, can aid the body to unlock serious health conditions and heal them naturally. Unlike agents which directly attack pathogens, this substance strengthens the body's defense force against all infections, thus playing a major role in protection against future illness.

For more information on this protein, interested parties may call 800-933-9440 weekdays between 10 AM - 6 PM Eastern time.

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Also Recommended

Beardsley, Swain, and Dutton. *Mechanisms of Lymphocyte Activation*, (Resch and Kirchner, Eds.), p. 384. Elsiever/North-Holland, Amsterdam, 1981.

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Important Notice:

It was discovered after publication of this article that Thymic Protein A will NOT OVERSTIMULATE the immune system, because its only function is to mature the T-4 cell. It is now understood that dysregulation of immunity is a major cause of auto-immune illness. Improving the function of the T-4 cell, which regulates immunity, should *help*, not hinder, existing dysregulation, whether from weakened or overactive immunity. The more regulation, the more chance of improving auto-immune illness.