

SERRAPEPTASE

Studies and Technical Information

Serrapeptase – Scientific Background of the Most Potent Proteolytic Enzyme?

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Inflammatory Response

The Inflammatory Response is normally an important mechanism for protecting the body from attack by invading organisms, faulty cells and trauma. When the immune system becomes dysfunctional, it loses its ability to differentiate between innocuous and potentially dangerous substances. This dysfunction results in a wide array of autoimmune diseases such as rheumatoid arthritis, ulcerative colitis, allergies, psoriasis, uveitis, multiple sclerosis and some forms of cancer.

In spite of the huge range of successful enzyme studies showing safety and effectiveness, the standard therapy for inflammatory-mediated diseases and trauma include drugs such as steroids and non-steroidal anti-inflammatory agents (NSAIDs). These classes of drugs do in most cases offer temporary, symptomatic relief from swelling, inflammation and accompanying pain, but without treating the underlying condition.

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Drugs

The drugs used to control the inflammatory response may be immunosuppressive and cause dangerous side effects. The benefits and long-term risks associated with the use of NSAIDs, especially in cases of rheumatoid arthritis, need to be weighed very carefully. If not successfully treated, the inflammatory process itself can lead to limitation of joint function and destruction of bone, cartilage and articular structures.

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NSAIDs

NSAIDs are one of the most widely prescribed drugs for rheumatoid arthritis and other inflammatory joint conditions. They inhibit the biosynthesis of prostaglandins by irreversibly blocking cyclooxygenase, the enzyme which catalyses the reactions of arachidonic acid to endoperoxide compounds.

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The Side Effects

The neurological and gastrointestinal side effects of these agents have been reviewed in considerable detail. All of the NSAIDs, with the exception of Cytotec, inhibit prostaglandin E₁, a local hormone responsible for gastric mucosal cytoprotection. A common side effect from these medications is gastric ulcers. More serious adverse reactions such as blood dyscrasias, kidney damage and cardiovascular effects have been noted. Most physicians rotate among the ten most widely prescribed NSAIDs, as soon as one causes side effects or stops working.

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The Enzyme Alternative

The search for a superior enzyme that offers safe but powerful anti-inflammatory properties, thus averting the terrible side effects, ended when Serratia peptidase (Serrapeptase) enzyme was discovered in the early 70's. Serrapeptase is now in wide clinical use throughout Europe and Asia as a viable alternative to salicylates, ibuprofen (sold as an OTC in the U.S.) and the more potent NSAIDs. Serrapeptase is an anti-inflammatory, proteolytic enzyme isolated from the microorganism, Serratia E15 and has no inhibitory effects on prostaglandins, is devoid of gastrointestinal side effects and offers a sensible alternative.

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Serrapeptase the Enzyme

Serrapeptase is processed commercially in the laboratory through fermentation. It was originally found in the silkworm where it is naturally present in its intestine. This immunologically active enzyme is completely bound to the alpha 2 macroglobulin in biological fluids. Histologic studies reveal powerful anti-inflammatory effects of this naturally occurring enzyme. The silkworm has a special relationship with the Serratia E15 microorganisms in its intestines. The enzymes secreted by the bacteria in silkworm intestines have the ability to dissolve avital tissue, but have no detrimental effect on the host's living cells. Thus by dissolving the silkworm's protective cocoon (avital tissue), the winged creature is able to emerge and fly away.

Wide Range of Applications

The discovery of this unique biological phenomenon led researchers to study clinical applications of the Serrapeptase enzyme in man. In addition to its widespread use in:

- **Arthritis**
- **Fibrocystic breast disease**
- **Carpal tunnel syndrome**
- **Atherosclerosis.**

Researchers in Germany have used Serrapeptase for atherosclerosis to digest atherosclerotic plaque without harming the healthy cells lining the arterial wall.

Chronic Inflammation

Today, researchers consider atherosclerosis an inflammatory condition (similar to many other degenerative diseases whose cause is identified as chronic inflammation). Some immunologists are even categorizing atherosclerosis as a benign tumour. Hardening and narrowing of the arterial wall is a cumulative result of microscopic trauma; inflammation occurs in the presence of oxidized lipids. Serrapeptase doesn't interfere with the synthesis of cholesterol in the body, but acts as an anti-inflammatory and helps clear avital tissue from the arterial wall. It is important to note that cholesterol in its pure state is an antioxidant and a necessary component of the major organ and hormonal systems in the body. The use of medications, which block cholesterol biosynthesis, may eventually damage the liver and compromise anti-oxidant status of the eyes, lungs and other soft tissues.

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Powerful Anti-Inflammatory

A wealth of information exists regarding its anti-inflammatory properties. Serrapeptase has been used as an anti-inflammatory agent in the treatment of:

- Chronic sinusitis
- To improve the elimination of bronchopulmonary secretions
- Traumatic injury (e.g. sprains and torn ligaments)
- Post-operative inflammation
- To facilitate the therapeutic effect of antibiotics in the treatment of infections
- Cystitis and epididymitis.

Standard Treatment In Europe

Serrapeptase has been admitted as a standard treatment in Germany and other European countries for the treatment of inflammatory and traumatic swellings. In one double-blind study of Serrapeptase conducted by Esch et al at the German State Hospital in Ulm, 66 patients with fresh rupture of the lateral ligament treated surgically were divided in three randomised groups. In the group receiving the test substance, the swelling had decreased by 50% on the third post-operative day, while in the other two control groups (elevation of the leg, bed rest, with or without the application of ice), no reduction in swelling had occurred at that time. The difference was of major statistical significance. Decreasing pain correlated for the most part with the reduction in swelling. The patients receiving Serrapeptase became pain-free more rapidly than the control groups. By the 10th day, all patients were free of pain in the Serrapeptase-treated group. The therapeutic daily dose was 1-2 tablets (5 mg) 3 times daily.

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Cystic Breast Disease

In another double-blind study, the anti-inflammatory enzyme, Serrapeptase, was evaluated in a group of 70 patients with evidence of cystic breast disease. These patients were randomly divided into a treatment group and a placebo group. Serrapeptase was noted to be superior to placebo for improvement of breast pain, breast swelling and induration, with 85.7% of the patients receiving Serrapeptase reporting moderate to marked improvement. No adverse reactions were reported with the use of Serrapeptase. The use of enzymes with fibrinolytic, proteolytic and anti-edemic activities for the treatment of inflammatory conditions of the ear, nose and throat has gained increasing support in recent years.

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ENT Success

In a third double-blind study, 193 subjects suffering from acute or chronic ear, nose or throat disorders were evaluated. Treatment with Serrapeptase lasted 7-8 days taking 5mg tablets. After 3-4 days treatment, significant symptom regression was observed in the Serrapeptase-treated group, while this was not noted in the control group. Patients suffering from laryngitis, catarrhal rhinopharyngitis and sinusitis noted markedly rapid improvement. The physicians' assessments of efficacy of treatment were excellent or good for 97.3% of patients treated with Serrapeptase compared with only 21.9% of those treated with placebo. In a similar study of chronic bronchitis, conducted by a team of otolaryngologists, the Serrapeptase-treated group showed excellent results compared with the placebo group in the improvement of loosening sputum, frequency of cough and expectoration. Other improvements included the posterior nasal hydro rhea and rhinostenosis. The administration of Serrapeptase reduces the viscosity of the nasal mucus to a level at which maximal transport can be achieved. It has also been demonstrated that the simultaneous use of the peptidase and an antibiotic results in increased concentrations of the antibiotic at the site of the infection.

The mechanisms of action of Serrapeptase, at the sites of various inflammatory processes consist fundamentally of a reduction of the exudative phenomena and an inhibition of the release of the inflammatory mediators. This peptidase induces fragmentation of fibrinose aggregates and reduces the viscosity of exudates, thus facilitating drainage of these products of the inflammatory response and thereby promoting the tissue repair process. Studies suggest that Serrapeptase has a modulatory effect on specific acute phase proteins that are involved in the inflammatory process. This is substantiated by a report of significant reductions in C3 and C4 complement, increases in opsonizing protein and reductions in concentrations of haptoglobin, which is a scavenger protein that inhibits lysosomal protease.

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Carpal Tunnel RSI

Carpal tunnel syndrome is a form of musculo-ligamentous strain caused by repetitive motion injury. Individuals who work at keyboard terminals are particularly susceptible to this condition. While surgery has been considered the first line treatment for carpal tunnel syndrome, recent studies reveal that the use of anti-inflammatory enzymes (e.g. Serrapeptase and bromelain), in conjunction with vitamins B2 and B6, is also effective. The use of non-invasive, nutritional approaches to the treatment of this common condition will become more important as a generation of keyboard operators approach retirement.

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Enteric Coating for Intestinal Absorption

Several research groups have reported the intestinal absorption of Serrapeptase. Serrapeptase is well absorbed orally when formulated with an enteric coating. It is known that proteases and peptidases are only absorbed in the intestinal area.

These enzymes are mobilized directly to the blood and are not easily detectable in urine. Other enzymes with structural similarities have been reported to be absorbed through the intestinal tract. Chymotrypsin is transported into the blood from the intestinal lumen. Horseradish peroxidase can cross the mucosal barrier of the intestine in a biologically and immunologically active form. Several studies have appeared so far which refer to the systemic effects of orally given proteases and peptidases (e.g. Serrapeptase), such as repression of oedema and repression of blood vessel permeability induced by histamine or bradykinin. These enzymes also affect the kallikrein-kinin system and the complement system, thus modifying the inflammatory response.

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Superior Effects

In vitro and in vivo studies reveal that Serrapeptase has a specific, anti-inflammatory effect, superior to that of other proteolytic enzymes. A review of the scientific literature, including a series of controlled, clinical trials with large patient groups, suggests that Serrapeptase is useful for a broad range of inflammatory conditions. If one considers the fact that anti-inflammatory agents are among the most widely prescribed drugs, the use of a safe, proteolytic enzyme such as Serrapeptase would be a welcome addition to the physician's armamentarium of physiologic agents.

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