

# SERRAPEPTASE OVERVIEW

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For more than 25 years, Serrapeptase has been used by millions of people concerned about their health. Originally, Serrapeptase was exclusively used in Asia and Europe due to its anti-inflammatory activity, but when the benefits of this miracle enzyme spread, the US and many other countries began to use it for its wide range of benefits. For many the question still remains, what exactly is Serrapeptase and what are the benefits for which it has gained such enormous popularity?

## **WHAT IS SERRAPEPTASE?**

Serrapeptase is a proteolytic enzyme that is also known as serrapeptidase, serratiopeptidase, serratia peptidase, nicolase, the super enzyme, and the miracle enzyme. This enzyme is produced by non-pathogenic bacteria called *Serratia* sp. E-15 which is found in the intestines of silkworms. It was discovered that serrapeptase dissolves the cocoon walls that silkworms live in when they begin to transform into moths. Due to this discovery, it is theorized that this enzyme is capable of dissolving dead tissue without causing harmful side effects to an organism's healthy cells (1, 2, 3)..

Interestingly, enzymes such as Serrapeptase can be found in various microorganisms, two of the most common being *Escherichia coli* and *Salmonella typhimurium*. Furthermore, the September 2003 edition of 'Life Extension Magazine' mentioned that this Serrapeptase has been an anti-inflammatory drug in Europe and Asia for more than 25 years, whereas in the US it started gaining recognition after 1997 and began being sold as a dietary supplement. Although this enzyme was initially isolated from the *Serratia* sp. E-15 bacteria originally discovered in silkworm larvae, it is now produced commercially through microbial fermentation and in laboratory settings in order to meet its unexpectedly high demand. It is important to note that although the bacteria was discovered in the silkworm larvae, the silkworm is not used in the manufacturing of the enzyme.

## **HOW IT WORKS?**

Serrapeptase is a proteolytic enzyme, in that it helps speed up the breakdown of proteins within an organism (1, 2, 3).

This enzyme has been shown to reduce pain and inflammation in three different ways:

Serrapeptase thins the fluids that are associated with inflammation. This allows fast drainage away from the site of inflammation and leads to quicker recovery times after injury or surgery. Serrapeptase has the ability to reduce pain by blocking the release of Bradykinin in damaged tissue. Bradykinin is a protein that is responsible for triggering a pain response.

And finally, Serrapeptase breaks down fibrin, which is an important protein in the blood that is involved in blood coagulation or clotting.

Currently, researchers are also evaluating the ability of this enzyme to promote cardiovascular health by analyzing the role Serrapeptase plays in removing and preventing the development of arterial plaque(4).

### **Anti-inflammatory properties**

Inflammatory reactions generally consist of pain, swelling, tissue damage and even muscle spasms depending on the injury. The release of enzymes such as cyclooxygenase and prostaglandins usually causes these types of complications to develop. The symptoms of inflammation can be treated by corticosteroids and non-steroidal anti-inflammatory drugs that reduce the accumulation of harmful fluids that leak from the circulatory system into areas of inflammation (5, 6). These types of drugs also inhibit the release of cyclooxygenase and prostaglandins (7). However, the potential side effects of these drugs include delayed wound healing and adrenal suppression and they cannot be used for certain conditions (8).

Serrapeptase has been shown to reduce inflammation and swelling without causing harm to healthy tissue or adverse side effects and therefore is a safer alternative to anti-inflammatory drugs (9-18). Furthermore, when taken orally serrapeptase is easily absorbed through the lymphatic system and the intestines and released into the body through the bloodstream (19). Once released into the body, this enzyme promotes the degradation of cellular debris and causes fluid accumulations to become thinner, thereby facilitating the drainage of harmful substances away from the site of inflammation. As a result, Serrapeptase has the ability to rapidly decrease the signs and symptoms of inflammation while speeding up tissue repair (20-25).

More specifically, when an injury occurs, proteins which are carried in the bloodstream (e.g., C3 and C4) often accumulate at the injury site. These types of proteins attack and kill harmful particles such as bacteria that may have entered the injury site. However, this influx of fluid increases swelling and inflammation. Serrapeptase leads to the reduction of these proteins at the injury site by thinning the fluid that has accumulated. This allows the proteins to attack and degrade harmful substances away from the site of inflammation. Serrapeptase itself also has the ability to break down dead proteins that have accumulated within bodily fluid. Therefore, this process leads to the reduction of swelling and inflammation while allowing harmful material to be removed from the body.

Serrapeptase also demonstrates anti-edemic activity due to its ability to reduce the presence of an edema, which may form due to inflammation (13). An edema is the accumulation of excess fluid at an injury site. It is not surprising that the use of enzymes with anti-inflammatory, proteolytic, fibrinolytic, and anti-edemic activity such as Serrapeptase, have become increasingly popular dietary supplements for individuals suffering from inflammation as well as swelling of the mucosal membranes (e.g., ear, nose, throat) (1).

### **Analgesic properties**

Serrapeptase has the ability to inhibit the release of pain-inducing amines such as bradykinin from inflamed tissue (11, 20, 26, 27). Bradykinin is a protein that causes blood vessels to dilate and its main function is to increase the sensation of pain. Bradykinin also makes nerves in inflamed tissue more sensitive, causing them to be hypersensitive to heat and light touch, thereby creating a general sensation of soreness. By leading to the reduction of proteins that cause pain sensations and soreness, Serrapeptase shows promise as a pain-reducing supplement.

### **Fibrinolytic and Anti-thrombotic properties**

Lastly, Serrapeptase has the ability to reduce the accumulation of fibrin in the body which subsequently decreases the risk of developing blood clots and arterial plaque. Fibrin is a protein that is typically produced by the body in response to an injury and is responsible for the formation of blood clots and scar tissue. When produced in the right amounts, fibrin prevents excessive bleeding from a wound and is an important part of the healing process. However, when too much is produced, blood clots may persist and increase in number, resulting in deadly health problems such as heart attacks, strokes, and deep vein thrombosis (DVT) (13, 28-30). Complications that are caused by fibrin (fibrosis) can also lead to a number of chronic and progressive diseases such as Alzheimer's, endometriosis, and fibrocystic breast disease (FBD).

Fortunately, research has shown that taking enzymes that dissolve fibrin, which is the case for Serrapeptase, helps remove excess fibrin from the body and prevents this protein from being overproduced (10). Therefore, Serrapeptase has the potential health benefits of preventing dangerous blood clots from forming, reducing scarring, and improving cardiovascular health by preventing arterial plaque buildup.

Serrapeptase is also capable of reducing neutrophils in the bloodstream, which are white blood cells that have been associated with respiratory inflammation. Neutrophils generally accumulate at a site of infection to ingest and destroy harmful cells. However, they tend to accumulate in the lungs of individuals who have respiratory diseases and can cause unnecessary inflammation (31). Serrapeptase may have beneficial effects on respiratory health by reducing the number of neutrophils that can accumulate in the respiratory system (15).

## **HEALTH BENEFITS OF SERRAPEPTASE**

### **SERRAPEPTASE FOR RESPIRATORY HEALTH**

Seiichi Nakamura and his team of Japanese researchers randomly assigned patients to receive Serrapeptase for 4 weeks or a placebo in order to evaluate the effects this enzyme has on respiratory health. After four weeks, the researchers found that Serrapeptase supported healthy mucus clearance by reducing neutrophil numbers and altering the viscoelasticity of sputum (15). This was reported in the September 8, 2003 issue of 'Respirology'.

Another publication that serves as evidence of the efficacy of Serrapeptase was published in 'Minerva Cardioangiologica'. An Italian team of researchers from the University of Naples published this study explaining that Serrapeptase can play a beneficial role in reducing pain, weakness, swelling, and nighttime cramps that are associated with inflammation and venous thrombosis (3).

### **SERRAPEPTASE FOR HEART HEALTH**

Numerous researchers have demonstrated the efficacy of Serrapeptase as a healthy enzyme for maintaining good heart health. Around 40 studies were conducted and all showed Serrapeptase to be helpful in improving heart health. Among all of these studies, the late Dr. Hans A. Nieper of Hanover was the leading researcher. He was well known around the globe for being one of the best integrative physicians available. He was also widely known for being among the best cardiovascular doctors in the world.

Dr. Nieper was the first person who showed strong belief in the positive effects of Serrapeptase on heart patients. He spent an extensive amount of time conducting studies on this very issue. His main goal was to see whether or not Serrapeptase was capable of reducing the accumulation of plaque in the arteries. Interestingly, it was he who called Serrapeptase 'the miracle enzyme' after discovering the benefits it has to offer to heart patients. Through his thorough research, Dr. Nieper was able to determine that Serrapeptase is effective at reducing fat, plaque, and cholesterol debris that are associated with atherosclerosis (4). Atherosclerosis is a condition that is caused by the accumulation of plaque in the arteries. It is one of the major causes of strokes, heart attacks, high blood pressure, and other cardiac conditions.

Dr. Nieper performed several experiments and discovered that Serrapeptase can dissolve harmful particles that accumulate and form plaque in the arterial walls. These particles include cellular waste, fat, fibrin, bad cholesterol, and calcium. Moreover, he also proved that Serrapeptase did all of this without harming the living, healthy cells or tissues that line the arterial walls. What

makes his studies even more reliable is the fact that modern science and the recent studies conducted have shown that plaque formation inside the arterial walls is a form of inflammation (32). In other words, this means that Serrapeptase is capable of improving heart health by reducing the accumulation of harmful particles in the arteries.

## **SERRAPEPTASE FOR ARTHRITIS**

In 1947, Dr. Arnold Renshaw from Manchester took the initiative of investigating the efficacy of Serrapeptase on improving the symptoms of inflammation that are associated with arthritis. In the 'Annals of Rheumatic Diseases', he reported that 700 patients were recruited to take Serrapeptase for inflammation and the results were marvelous (33). He also added that 283 patients out of 556 with different types of arthritis showed great recovery after taking Serrapeptase and 21 patients showed slight recovery. Similarly, 264 patients out of 292 with rheumatoid arthritis showed great recovery. Most of the patients started showing recovery after two months of taking Serrapeptase.

According to numerous studies, Serrapeptase also works faster on osteoarthritic pain than rheumatic pain (11, 33). Furthermore, many studies have revealed that the only way to naturally control arthritis is by supplementing the diet with systemic enzymes and/or maintaining a strict diet.

## **SERRAPEPTASE FOR FIBROCYSTIC BREASTS**

Millions of women every year are affected by complications related to breast lumps and cysts. Cysts or lumps moving freely within the breast tissue indicate fibrocystic breast diseases. The pain and the condition itself get worse during menstruation. These lumps are usually soft initially and get harder with time. At times, the cysts become full of fluid as a result of increased hormone levels. Over time, the cysts also become surrounded by fibrous tissues and can become chronically inflamed.

Several studies involving supplementation with Serrapeptase have been conducted in the past with women who had breast tenderness and cysts. The results were quite effective on women who were already taking other medications. They were not told to stop taking their medication, but began taking Serrapeptase as a dietary supplement. Serrapeptase supplementation reduced breast swelling, breast firmness, and pain. The conclusion was that Serrapeptase is effective in alleviating breast cyst inflammation and swelling without any side effects (10, 34).

## **SERRAPEPTASE FOR MUCUS BUILDUP**

In addition to being able to digest and break down dead tissues, Serrapeptase also has the ability to reduce the elasticity and thickness of nasal mucus. Research has demonstrated that Serrapeptase supplementation is an effective means of improving sinus issues (35). Also, some studies have shown that patients with chronic bronchitis have found Serrapeptase to be highly beneficial in cutting down the thickness of mucus and reducing recurring coughing when compared with other common treatment methods (15). Similarly, patients with respiratory conditions have also benefited from using Serrapeptase merely because it prevents the increased production of mucus and makes the mucus less thick.

Serrapeptase, unlike most medications, does not completely eliminate the production of mucus. Instead, it works on the elasticity and thickness of the mucus. By breaking down the dead tissue and thick, excess fluid, Serrapeptase allows the body to restore healthy lung and tissue function.

## **SERRAPEPTASE FOR MUSCLE INFLAMMATION**

In March 2007, The Myositis Association reported that myositis is a condition in which a patient experiences extreme swelling and inflammation in the muscles. This inflammation and swelling can be the result of an injury, an infection, or side effects of medications. It has been reported that this type of inflammation can become chronic in some cases. Weakness, muscle aches, and fatigue as well as difficulty standing, reaching upward, climbing stairs, lifting weights, and swallowing are all symptoms of myositis.

Research has shown that Serrapeptase has anti-inflammatory properties (11, 13). Serrapeptase is also known for providing relief from pain as reported by 'Life Extension Magazine'. Furthermore, Serrapeptase has the ability to thin fluids which surround the area of injury. By thinning these fluids, Serrapeptase is able to reduce both pain and inflammation. Also, Serrapeptase can break down fibrin and other types of dead tissue that can elevate the degree of pain and inflammation.

### **IMPORTANT POINTS TO REMEMBER:**

Serrapeptase can be taken every day. Remember, you should take Serrapeptase on an empty stomach and only as recommended by most doctors.

People suffering from chronic inflammation may be able to take higher doses. It is best to take Serrapeptase one hour before eating or two hours after eating. Make sure you talk to your doctor about taking Serrapeptase along with other drugs. Although Serrapeptase has not yet shown any reactions when taken in conjunction with other drugs, it is always best to be on the safe side when it comes to your health (36)

