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The anti-inflammatory property of serratiopeptidase enzyme

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Therapeutic enzymes have become a fundamental part of modern medicine due to their distinct selective ability and efficiency. Enzymes possess immense catalytic capacity and can provide robust applications in present-day healthcare. Inflammation is an immunogenic response caused against infections, autoimmune disorders and many other diseases. To achieve homoeostasis physiologically, acute inflammation is necessary and so is its complete resolution. It is essential for inflammation to be resolved to maintain tissue homoeostasis and balanced immune activity. Nonetheless, failure to self-resolve acute inflammation can lead to chronic inflammation, which poses a great problem. In the field of medicine, enzymes were first used as anti-inflammatory agents in the 1950s when intravenous trypsin was discovered to alleviate inflammation caused by rheumatoid arthritis, atypical viral pneumonia and ulcerative colitis as well as bruises caused by sports activities and post-surgical swelling. According to published reports, serratiopeptidase was first used for inflammation by the Japanese in 1957. Serratiopeptidase holds a long history as an effective enzyme against several kinds of inflammatory disorders. It is a proteolytic enzyme, extracted from the non-pathogenic enterobacterium, Serratia E15.

Studies have shown that due to its fibrinolytic and caseinolytic properties, it holds a crucial role in atherosclerosis therapy. Apart from that, serratiopeptidase being anti-inflammatory, analgesic and anti-endemic in nature, is prescribed by several units, such as orthopaedics, gynaecology, surgery and so on. It has also been studied to have an impact on immune cell migration from the lymph node to the region of inflamed tissue. It helps in the recruitment of lymphocytes to the site of inflammation. Recent studies have shown that serratiopeptidase reduces capillary permeability stimulated by histamine, serotonin and bradykinin; cleaves abnormal proteins and exudates; promotes the absorption of decomposed products through lymphatics and blood. The enzyme even facilitates wound healing, repairing and restoring the temperature of the inflamed area to normal. On oral administration, it remains unaffected when absorbed by the systemic circulation, from where it permeates to all the tissues. It does not adhere to lipoxygenase (LOX) and blocks LOX-catalysed specialised pro-resolving mediator (SPMs) biosynthesis, unlike other conventional anti-inflammatory agents. The efficiency of the enzyme has been observed to increase when combined with metal ions like zinc and manganese. Such a distinctive mechanism and a wide-range substrate affinity propose a role of the enzyme in maintaining tissue homoeostasis. The enzyme, serratiopeptidase, having strong proteolytic activity and being a serine protease, has potential applications in wound cleaning and healing.

Keywords: Serratiopeptidase, Inflammation, Therapeutic enzymes, Homoeostasis, Modern medicine

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