

US PATENTED TECHNOLOGY FOR HIGHLY THERMOSTABLE ENZYME - *SUPEROXIDE DISMUTASE*

Biotech Consortium India Limited (BCIL) is seeking companies interested in commercializing a technology for production of a novel recombinant enzyme *Superoxide Dismutase (SOD)*, developed at the Institute of Himalayan Bioresource Technology (IHBT), India. The technology enables the use of SOD in industrial applications and two US patents () have been granted for the same.

BCIL was incorporated as public limited company in 1990 under the Indian Companies Act 1956. It is promoted by the Department of Biotechnology, Government of India and is financed by several all India financial institutions, venture capital funds and the corporate sector. BCIL has been actively involved in technology transfer, project consultancy, fund syndication, information dissemination, and manpower training & placement related to biotechnology over the last decade and half. BCIL has transferred more than 15 technologies in the last 5 years using its expertise in facilitating licensing agreements that allows a healthy and productive cooperation between the inventor and the licensee.

INTRODUCTION

Superoxide dismutase (SOD) is a ubiquitous enzyme present in plants, animals and microbes, which protects them against oxidative damage caused by Superoxide radical ($O_2^{\cdot-}$) including lipid peroxidation, abiotic stress (radiation stress, water stress, low temperature stress, light stress, salt stress etc.) where $O_2^{\cdot-}$ is generated in excess.

The enzyme has wide-spread implications in pharmaceutical, cosmetic and food industry. It can be used as anti-inflammatory agent for wounds & burns, suppressor of asthmatic response, suppressor of side-effects of anti-cancerous agents, in relieving rheumatoid arthritis, in reducing harmful effects of treatment with ionizing radiations and in conferring cardiac protection during heart surgery. Injection of SOD is helpful in reducing the frequency of intraventricular brain hemorrhage following hypertension, in protecting kidneys against acute pyelonephritis, in ameliorating the functional abnormalities caused due to high blood pressure and in relieving the depressor effect of spinal chord injury.

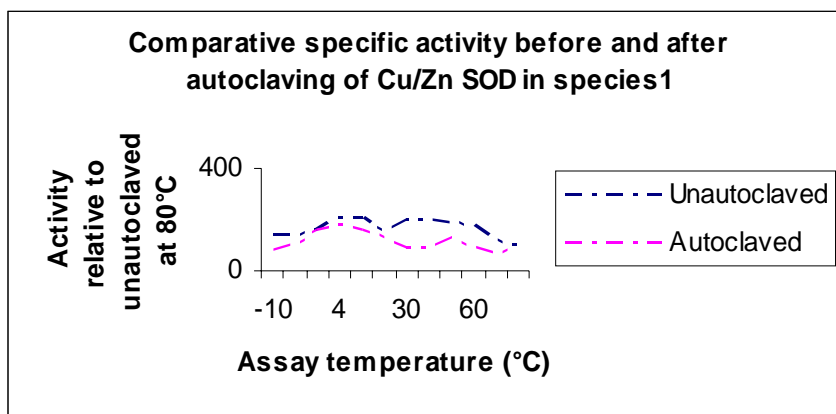
For human use, a sterile composition of injectable SOD is required. An autoclavable SOD offered by the present technology would be ideal candidate for use in humans. Moreover, in reperfusion applications and storage of the organs at low temperature, an autoclavable SOD which can function efficiently at low temperature as well would be required. The present technology is a breakthrough to address these problems.



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TECHNOLOGY

- ✚ The offered technology relates to the production of highly thermostable recombinant superoxide dismutase active over a broad range of temperature(-10°C to 80°C).
- ✚ It pertains to well characterized novel SODs from four different sources which can be used alone or as a cocktail for better applications.
- ✚ The SOD genes from various natural Himalayan sources have been expressed in *E.coli* enabling the production of SOD in recoverable quantities whenever desired.
- ✚ Specific activity of the enzyme remains more or less same even after autoclaving as shown in the figure below:



AREAS OF APPLICATION

State-of-the-Art autoclavable germ free sterile preparation of SOD enzyme with immense potential to be used in medical, cosmetic and food industries.

PATENTS

- ✚ A novel isozyme of autoclavable SOD: a process for the identification and extraction of the SOD and use of the said SOD in the cosmetic, food and pharmaceutical composition. **US Patent 6,485,950** (Granted)
- ✚ A novel isozyme of autoclavable SOD: a process for the identification and extraction of the SOD and use of the said SOD in the cosmetic, food and pharmaceutical composition. **US Patent 7,037,697**. (Granted)
- ✚ A gene encoding autoclavable superoxide dismutase and its expression in *E. coli*. P.S. 0038 NF 2006/IN
- ✚ A method for cloning functional gene of copper/zinc superoxide dismutases using oligonucleotide primers. (0035nf2008). Filed in India 28th March, 2008.
