Toxic shock syndrome toxin-1 from Staphylococcus aureus

Product Number T5662
Storage Temperature –20 °C

Synonym: TSST-1

Product Description
Molecular weight: 24 kDa
pI: 6.8 - 7.2

TSST-1 is a toxin secreted by Staphylococcus aureus in response to environmental stress, such as low oxygen or low nutrient content in its surroundings. The protein is highly resistant to proteases and is stable from pH 2.5-11 and at temperatures exceeding 60 °C. In its active form, TSST-1 contains 194 amino acid residues and has a molecular weight of approximately 24 kDa. It has a low level of sequence homology with other pyrogenic toxin superantigens.

This product is a superantigen for T-lymphocytes and activates production of immune signaling molecules such as tumor necrosis factor, interleukin-1, M protein, and γ-interferon. The term "superantigen" was first used to describe the pathogenic activities of certain bacterial toxins. Superantigens differ from conventional antigens in four major ways:

1. Superantigens elicit a strong primary immune response.
2. The Vβ chain of the T cell receptor (TCR) is sufficient for recognition of a superantigen, while a conventional antigen requires an interaction with the third hypervariable region of the TCR.
3. Superantigens are not MHC class II restricted as seen in conventional antigen T-cell responses.
4. Superantigens are able to interact with MHC class II molecules in an unprocessed form, while conventional antigens must be presented via the endocytic pathway.

There are several examples of superantigens that have been identified. They have been categorized into at least three major groups:

1. Viral encoded superantigens such as murine mammary tumor virus M1s antigen, rabies virus nucleocapsid protein, and Epstein-Barr Virus (EBV) associated superantigen.
2. Pyrogenic toxin superantigens (PTSAgs) such as toxic shock syndrome toxin-1 (TSST-1), staphylococcal enterotoxin A, staphylococcal enterotoxin B, and streptococcal scarlet fever toxin (SPEs).
3. Other bacterial superantigens such as staphylococcal exfoliative toxins, Mycoplasma arthritidis mitogen, Yersinia enterocolitica and pseudotuberculosis superantigens, and streptococcal M protein.

All of these superantigens bind to the Vβ portion of the TCR and residues on α-1 chain of an class II MHC molecule. This interaction causes activation of the T-cell and induces a major immune response that often has pathological consequences.

Precautions and Disclaimer
This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions
This product is soluble in water (0.5 mg/ml).

Storage/Stability
Store the product at –20 °C.
References


CMH,RXR,NDH,MAM 12/05-1