UNIVERSITY OF WYOMING
RESEARCH PRODUCTS CENTER

Hydrolytic Enzyme for Foodborne Pathogen Degradation

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Patent Status:
Patent Pending

Description of Technology

Researchers at the University of Wyoming have discovered an enzyme that may combat a harmful foodborne pathogen. *Listeria monocytogenes* is a foodborne pathogen that is present all over the world. This pathogen forms a toxic biofilm on food products, food-processing equipment, and storage facilities. When consumed with food, *L. monocytogenes* causes listeriosis, a severe disease that is particularly dangerous for immunocompromised individuals, pregnant women, the elderly, and infants.

L. monocytogenes, along with other types of bacteria form exopolysaccharide-rich aggregates, or biofilms, that pose formidable challenges in medicine and industry because of their resistance to antibiotics, disinfectants, desiccation and other treatments. It has been discovered that *L. monocytogenes* produces an N-acetylmannosamine (ManNAc) based exopolysaccharide that protects it against desiccation and commonly used disinfectants, including bleach and hydrogen peroxide.

University of Wyoming researchers have discovered a *L. monocytogenes* enzyme, designated PssZ, that has been shown to efficiently degrade listerial exoplysaccharide biofilms. PssZ can be purified from *E. coli* and is the first enzyme known to degrade listerial exopolysaccharid biofilms.

Applications

Toxic listerial biofilms can be eliminated or prevented with the addition of the PssZ enzyme to listeria containing food, equipment, or storage spaces. The enzyme can be used separately or in combination with other disinfectants, to efficiently disintegrate toxic biofilms. PssZ may also be used as a food additive to prevent formation of toxic biofilms in foods prone to contamination by *L. monocytogenes* or other pathogenic bacteria producing ManNAc-based exopolysaccharides.

Features & Benefits

- The PssZ enzyme is shown to degrade listerial exopolysaccharide aggregation and reduce the spread of foodborne listeria
- PssZ can be used separately or in combination with other disinfectants
- The enzyme is predicted to be safe for consumption if used as a food additive

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