

**TITLE: EFFECT OF BACTERIOCIN-LIKE SUBSTANCE ISOLATED FROM
BACILLUS CEREUS ON *LISTERIA MONOCYTOGENES* ADHESION AND
INVASION**

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ABSTRACT:

The bacteriocins or bacteriocin-like substances (BLIS) are produced by different bacteria, and increasingly attract industry's interest for application in food technology for the biopreservation processes. One of the most well-known is member of the genus *Bacillus* that produce a wide arsenal of antimicrobial substances, including peptide and lipopeptide antibiotics, and bacteriocins. *Listeria monocytogenes* is a bacterium responsible for human listeriosis, a foodborne disease characterized in immunocompromised individuals by severe septicemia and meningoencephalitis. In pregnant women, it induces placental infection that can lead to abortion or meningoencephalitis of the newborn. The purpose of this study was to evaluate the protective effect of BLIS isolated from *Bacillus cereus* LFB-FIOCRUZ 1640, during the adhesion and invasion processes of *L. monocytogenes* in Caco-2 and Hep-2 eukaryotic cells. BLIS was isolated from *B. cereus* by centrifugation; the supernatant was membrane filtered (0.22 µm). After this process, the filtrate was applied on a chromatographic column of Amberlite XAD-16 resin, obtaining a partially purified extract. This substance was used in adhesion and invasion tests to demonstrate that BLIS can modulate the ability of *L. monocytogenes* to adhere and to invade Caco-2 and Hep-2 cells. The average percentages of *L. monocytogenes* adhesion in Caco-2 cells decreased from 74.05 (±4.66) % to 51.10 (±3.05) % in the presence of BLIS of *B. cereus*, showing a decrease of about 31%. For the invasion assay in Caco-2 cells, the average percentages were 44.75 (±2.37) % for the control (only *L. monocytogenes*) e 32.07 (±1.18) % for *L. monocytogenes* in presence of BLIS. The test of adhesion was also performed on Hep-2 cells and, *L. monocytogenes* adhered 42.70 (±2.11) % (control). However, in the presence of BLIS, occurred a decrease of 1.7-fold in adhesion in relation to the control. In the presence of BLIS, the rate of *L. monocytogenes* invasion in Hep-2 cells was halved. These data suggest that BLIS produced by *B. cereus* has potential for application in food preservation.

KEYWORDS: bacteriocins, *Listeria monocytogenes*, *Bacillus cereus*, adhesion and invasion, cell culture

AGENCIES: FAPESP, PNP/DCAPES