Adhesin proteins in *Bacillus cereus* biofilms.

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Background:

The human pathogen *Bacillus cereus* is responsible for many recurrent outbreaks of food poisoning. Spores and biofilms are considered the most important reservoirs of *B. cereus* in contaminated fresh vegetables and fruits. Bacterial biofilms are difficult to eradicate specially due to the presence of a protective extracellular matrix made of exopolysaccharides, proteins, and other components. Amyloid-like proteins are essential for the integrity of biofilms of the related bacteria species *Bacillus subtilis*.

Objectives:

To investigate the presence of amyloid-like fibers in biofilms of *B. cereus*.

Methods:

We identified two genomic loci in *B. cereus*, which encode two orthologues of the amyloid-like protein TasA and a SipW signal peptidase of *B. subtilis*. Mutagenesis in *B. cereus* or heterologous expression of alleles in *B. subtilis* mutants combined with crystal violet staining served to evaluate the formation of biofilm. Electron microscopy let us visualize the presence of fibers on cells.

Conclusions:

We demonstrate that the proteins TasA and CalY are necessary for *B. cereus* biofilm formation: i) as pellicle on the air-liquid interphase or ii) adhesion to abiotic surfaces. TasA and to a lesser extent CalY polymerizes in the form of fibers in the cell surface. Our findings of heterologous expression in *B. subtilis* let us propose an amyloid-like nature of the *B. cereus* TasA-based fibers.