

Sleator lab identifies single point mutation in *Listeria monocytogenes*

March 12 2013

The bacterial foodborne pathogen, *Listeria monocytogenes* is the causative agent of listeriosis—a debilitating disease linked with ~2,500 illnesses and more than 500 deaths per annum in the US alone. A characteristic feature of *L. monocytogenes* is its ability to grow at refrigeration temperatures and in the presence of high concentrations of salt—traditional food preservation techniques, which arrest the growth of most other pathogens.

Work in the Sleator lab has shown that the bacterium protects itself from such stresses by twisting into a protective corkscrew type shape in an effort to reduce its exposure to the stress—in the same way a human might wrap up tight—hugging the core to reduce the effects of the cold.

Furthermore, Sleator and colleagues have identified a single point mutation (out of a total of 3 million or so nucleotides that constitute the entire listerial genome), which dramatically improves the growth of the pathogen in the refrigerator.

The research paper, "A single point mutation in the listerial betL σ A-dependent promoter leads to improved osmo- and chill-tolerance and a morphological shift at elevated osmolarity," will be published in the November/December 2013 issue of *Bioengineered*. It is available open access ahead of press:

<http://www.landesbioscience.com/journals/bioe/article/24094/>

Sleator claims that this mutation represents "a double edged sword;"

"from a food safety perspective, a single [point mutation](#) with the potential to induce such dramatic shifts in cell growth and survival at low temperatures—making an already dangerous pathogen even more formidable—raises significant food-safety concerns which need to be addressed." However, from a synthetic biology point of view, such a boosted-[stress resistance](#) gene represents a useful BioBrick (or building block) for the design of more physiologically robust probiotics or, indeed, plants that are more resistant to cold [arid conditions](#).

Provided by Landes Bioscience

Citation: Sleator lab identifies single point mutation in *Listeria monocytogenes* (2013, March 12)
retrieved 9 April 2024 from

<https://phys.org/news/2013-03-sleator-lab-mutation-listeria-monocytogenes.html>

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