



# Biology @ Acadia

## THE EFFECT OF GENETIC MUTATIONS ON BIOFILM PRODUCTION IN *LISTERIA MONOCYTOGENES*

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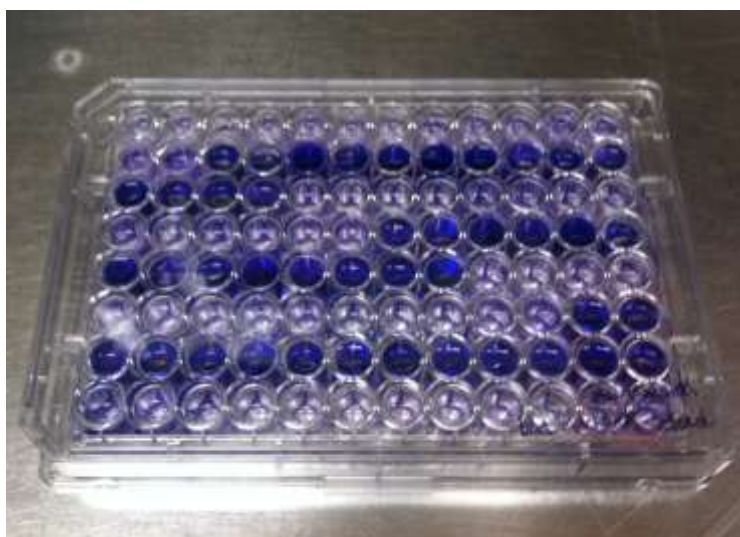
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The foodborne pathogen *Listeria monocytogenes* is responsible for Listeriosis, a disease that endangers immunocompromised individuals. The pathogen is capable of surviving harsh conditions, allowing it to inhabit food-processing facilities for long amounts of time. This persistence is due to the ability of *Listeria* spp. to form biofilms, which protect against disinfectants. Understanding the influence genes have in biofilm formation of *L.*

*monocytogenes* is limited. To

examine the genetic role in this process, a transposon library of 4300 mutants of *L. monocytogenes* 568 serotype 1/2a was screened for biofilm formation. The screening process consisted of a crystal violet assay, in which the mutants were cultured in 96 well microtitre plates in Modified Welshimer's broth. After 72h, 0.3% crystal violet was added, and then an ethanol destaining solution was measured spectrophotometrically for quantitative analysis. Mutants exhibiting variability in biofilm formation were isolated but were unable to be sequenced. Assays were also conducted on previously sequenced mutants with known transposon insertions to see how specific genes alter biofilm production when they are introduced to stressful conditions (NaCl, H<sub>2</sub>O<sub>2</sub>, and ethanol). Tests showed significant variability in biofilm production. Future studies into specific genes that affect biofilm production may aid in preventing the pathogen from inhabiting food-processing facilities.



**Adam Tucker** graduated from Moncton High School in Moncton NB in 2006. He is currently completing his Honours thesis for an Honours Conversion in his fifth year at Acadia. Adam graduated from Acadia University, completing a double major in Biology and Political Science, in 2010. Working at the Atlantic Food and Horticulture Research Centre in Kentville NS, Adam completed research for his Honours Degree. While at Acadia, he worked as a Resident Assistant for two years while completing his undergraduate degree, and also as an Assistant Resident Director in his fifth year. He has been involved in the

Sensory Motor Instructional Leadership Experience (S.M.I.L.E.) program at Acadia for the past four years as an instructor and leader. Adam is looking to attend Law School in the future, and eventually practicing law in an area related to biology.

