

Study shows how *Salmonella* survives in environment

March 23 2009

Scientists at the University of Liverpool have demonstrated how a single-celled organism, living freely in the environment, could be a source of *Salmonella* transmission to animals and humans.

Salmonella are microscopic living creatures that can contaminate almost any food type, causing [diarrhoea](#), [abdominal pain](#) and fever. Scientists know that *Salmonella* - which can also cause typhoid fever - has evolved unique mechanisms to prevent the body's [immune system](#) from functioning effectively, but until now it was not understood how it survives so successfully in the [environment](#).

Scientists at Liverpool, in collaboration with the Institute for Animal Health, have shown that *Salmonella* use a [secretion](#) system to protect themselves inside amoeba - a single-celled organism living on land and in the water. The research suggests that amoeba may be a major source of *Salmonella* within the environment and could play a significant role in transmission of infection to man and animals.

Salmonella uses a system, called SP12 type III, which acts as a bacterial machine inside organisms and causes disease in humans, animals and plants. The system employs a 'syringe-like' mechanism to inject bacteria into cells that would normally release compounds to rid the body of harmful substances. This system changes the structure of the cell and prevents these compounds from coming into contact with pathogens and destroying them.

Dr Paul Wigley, from the National Centre for Zoonosis Research, based at the University's Leahurst campus, explains: "*Salmonella* has managed to survive extremely successfully in the environment, finding its way into our food and causing illness, despite the body's best efforts to fight it off. We found that it uses a system which operates in the human immune system as well as inside amoeba living in the environment. This system essentially protects *Salmonella* within [cellular compartments](#), called phagosomes, where it can survive and multiply.

"Its ability to survive in amoeba is a huge advantage to its continued development as it may be more resistant to disinfectants and water treatment. This means that we need to work to understand ways of controlling amoeba in water supplied to animals and prevent it acting as a 'Trojan Horse' for *Salmonella* and other pathogens."

More information: The [Salmonella](#) Pathogenicity Island 2-Encoded Type III Secretion System Is Essential for the Survival of *Salmonella enterica* Serovar Typhimurium in Free-Living Amoebae in Applied and Environmental Microbiology Vol. 75. Authors: Benjamin Bleasdale, Penelope J. Lott, Aparna Jaganathan, Mark P. Stevens, Richard J. Birtles, and Paul Wigley.

Source: University of Liverpool ([news](#) : [web](#))

Citation: Study shows how Salmonella survives in environment (2009, March 23) retrieved 1 May 2024 from <https://phys.org/news/2009-03-salmonella-survives-environment.html>

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