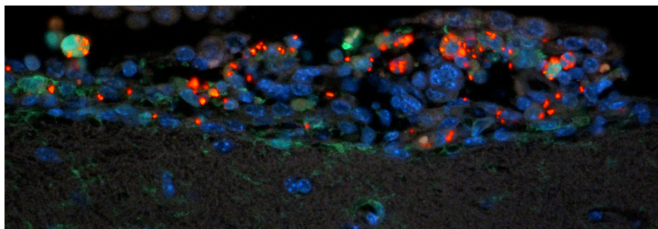


# Scientists develop new mouse model to study *Salmonella* meningitis

9 December 2016



This fluorescent micrograph shows detection of *Salmonella* (red) in macrophages (green) and other immune cells in the ventricles of the brain of a mouse orally fed *Salmonella*. *Salmonella*-infected areas were associated with an increase of cells (blue nucleus) in the ventricles and meninges of the brain, a hallmark of bacterial meningitis. Credit: NIAID

National Institutes of Health (NIH) scientists have established in mice a way to study potentially life-threatening meningitis caused by *Salmonella*. Bacterial meningitis happens when bacteria infect the central nervous system (CNS), causing a serious disease that can be life-threatening and difficult to diagnose and treat. Patients who survive often have permanent brain damage.

*Salmonella* Typhimurium is one of the most common causes of food-borne disease in the United States and often causes a self-limiting gastrointestinal (GI) infection. However, in people with impaired immune responses, *Salmonella* Typhimurium can cause severe systemic infections, spreading through the blood to other organs. In some cases, the bacteria spread to the CNS, causing meningitis. People at risk include the very young and the elderly, people with advanced HIV/AIDS, and those with [sickle cell disease](#). *Salmonella* meningitis, which was rare globally, is now one of the most common forms of [bacterial meningitis](#) in parts of Africa and has a high case fatality rate.

Researchers at NIH's National Institute of Allergy and Infectious Diseases (NIAID) infected mice orally with *Salmonella* Typhimurium to mimic food-borne infection. They found that *Salmonella* moved from the GI tract to the blood and then to the brain, resulting in meningitis. Damage observed in the brains of *Salmonella*-infected mice resembled that observed with human meningitis, providing a new model for investigators to study human disease.

Collaborators include *Salmonella* and neuroimmunology experts at NIAID's Rocky Mountain Laboratories and biologists at the University of Colorado. They plan to use the model to determine how *Salmonella* Typhimurium infects and causes damage in the brain, including which immune cells are involved. They also will use the model to study potential treatments to prevent *Salmonella* from gaining access to the CNS or limiting the damage during [meningitis](#).

**More information:** Timothy J. Bauler et al, *Salmonella* Meningitis Associated with Monocyte Infiltration in Mice, *The American Journal of Pathology* (2016). DOI: [10.1016/j.ajpath.2016.09.002](https://doi.org/10.1016/j.ajpath.2016.09.002)

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