Salmonella is an intestinal bacteria found in the GI tract of many animal species. It is a major concern in the animal production industry due to the fact that it is easily transmissible to humans. The bacteria can be ingested through contaminated meat, milk, milk products, and eggs. It can cause salmonellosis, the symptoms of which include diarrhea, fever, and headache. In severe cases the bacteria can cause the more serious condition of typhoid fever. The liver and spleen may become enlarged and may lead to other conditions such as pneumonia and meningitis. The main mode of transmission of the bacteria to an animal is through ingesting feces containing the bacteria. A better understanding of the bacteria could aid in treatment of these conditions.

Previous research using electron or light microscopy has required the use of unnaturally high doses of bacteria for study. These high doses could lead to septic shock in the animal models and results that could be inaccurate. The use of confocal laser scanning microscopy and computer imaging analyses the study of the bacteria in animal models, such as the mouse, at low doses is possible. These low dose studies are more comparable to real-life conditions. Immunostained sections of the liver of an infected animal can be viewed and used to further our understanding of the bacteria in real-life conditions. In contrast to conventional microscopy, this technique will allow examination of the infection in early stages, and to view single bacterium large tissue sections. Detection of the bacterium is made easier because thicker sections (30 µm) can be
viewed. Conventional immunohistochemistry can only view very thin sections (1-4 µm).
Electron microscopy is even more constricting (sections of 50-100 nm). Confocal microscopy will allow identification of the type of host cells that the bacterium infects and the specific location within the cell.

References:
http://nyschap.vet.cornell.edu/module/salmonella/section3/SalmonellaTeachingSlides.pdf
http://www.jem.org/cgi/content/full/186/4/569