Bacteria and viruses are some of the smartest organisms in the world and are able to penetrate and disguise themselves inside the host. In this article we will look into Dr. Edward Shaw’s research in the molecular interactions between obligate-intracellular bacterial pathogens and their eukaryotic host-cell. The two bacteria Dr. Shaw has been working with is Coxiella *burnetii* and *Rickettsia.* *C. Burnetti* is the bacteria that is associated with Q fever and *Rickettsia* is the bacteria that is associated with rocky mountain spotted fever. Dr. Shaw looking in depth to how these bacteria are able to survive in the cell, how do they get into the host cell, how they manuiplate the host to do what the bacteria want and which proteins they use to do that. Each bacterium has gene regulators that infect the host cell ,Dr. Shaw is looking into ways to immunize against these organisms. Dr. Shaw have found out where these bacteria live inside the host cell. *Coxicella* lives inside the vacuoles while *Rickettsia* lives freely inside the cytoplasm of the host. In Dr. Shaw’s research there hasn’t been major breakthroughs but he has found interesting things about the bacteria. In the past couple of years, Dr. Shaw has mainly just been focusing on *Coxicella* and how it is able to manipulate the cell, one of the interesting facts he has found about this bacterium is that *Coxicell*a proteins secreted into the host cell while living in the vacuole the proteins manipulate the host cells regulatory pathways. The pathways that the host cell uses to regulate its own transcription the bacteria is using its own regulators to regulate the host cells regulators, which is how the bacteria is controlling the host cell to do what the bacteria wants.

Although Dr. Shaw has been mostly focused on working with *Coxicella,* he has also made some interesting discoveries with *Rickettsia* as well. Dr. Shaw has found that using non-virulent *Rickettsia*, once its killed and used a nasal vaccine that it protects the host in this case Dr. Shaw uses Guinea pigs as the host, and the vaccine is used against virulent bacteria. Virulent bacteria are bacteria that is able to invade the host, cause diseases and evade the host defenses. Once Dr. Shaw injects the Guinea pig with the non-virulent he waits for the Guinea pig to have a built up immune response then he infects them on purpose with live virulent *Rickettsia*, and has found that Guinea pig is protected by the non-virulent *Rickettsia*. But if the host hasn’t been treated with the non-virulent *Rickettsia*, the host is more than likely to be infected.

In the course of Dr. Shaw’s research, he has used over several publications such as PLOS pathogens, frontier infectious diseases and Infection and Immunity. One of the publications Dr. Shaw used to reference his research is Vaccination against Q fever for biodefense and public health indications. Since *Coxicella* is linked to Q-fever this publication gave an insight on history of *Coxicella.* This article explains how *Cedilla* is able to manipulate the host and how *Coxciella f*inds its host and how the bacteria infects humans. Dr. Shaw mention in the interview most of the information he received about *Rickettsiae* was a publication found in IAI (Infection and Immunity)” *A recombinant Rickettsia conorii vaccine protects guinea pigs from experimental boutonneuse fever and Rocky Mountain spotted fever.”* This publication helped Dr. Shaw understand the molecular interaction the bacteria has with mammals although Dr. Shaw is mainly working with Eukaryotic cells he still wanted to fully understand the bacteria. Dr. Shaw is still conducting research with both bacteria and is continuing to make small breakthroughs every day.