

Bacterium that causes Q fever linked to non-Hodgkin lymphoma

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The bacterium that causes Q fever, an infectious disease that humans contract from animals, is associated with an increased risk of lymphoma, according to a study published online today in *Blood*, the Journal of the American Society of Hematology (ASH).

Q [fever](#) is caused by infection with *Coxiella burnetii*, a bacterium primarily transmitted through the excrement of cattle, sheep, and goats. Approximately 3 percent of healthy adults in the United States and 10-20 percent of those in high-risk occupations such as veterinarians and farmers have antibodies for *C. burnetii*, suggesting previous infection. Symptoms of Q fever vary from person to person and can be acute and resolve spontaneously, or chronic and persistent. Because some [patients](#) have been reported to also suffer from [lymphoma](#), researchers believed that this type of cancer could be a risk factor for Q fever. However, the experience of one patient prompted doctors to consider the opposite - that the infection might actually cause the lymphoma.

"During a follow-up scan in a patient we had successfully treated for Q fever, we observed a tumor close to the location of the previous infection," said senior study author Didier Raoult, MD, PhD, of Aix-Marseille University in Marseille, France. "The discovery that it was a lymphoma tumor containing *C. burnetii* encouraged us to consider that the infection might have contributed to the development of the cancer."

In order to better understand the association between *C. burnetii* and lymphoma, Dr. Raoult and colleagues screened 1,468 patients treated at

the French National Referral Center for Q Fever from 2004 to 2014. Investigators conducted imaging of patient tissue samples to identify seven people, including the initial patient, who developed lymphoma after *C. burnetii* infection (6 patients were diagnosed with diffuse large B-cell lymphoma and one with [follicular lymphoma](#)). Of all the Q fever patients included in the study, 440 presented a persistent infection concentrated to one area.

To determine if patients with Q fever have a higher risk of lymphoma than the general population, researchers compared the incidence of lymphoma in the Q fever registry to the incidence reported in France's general population. Based on this analysis, researchers conclude that patients with Q fever are 25 times more likely to develop diffuse large B-cell lymphoma than those without the [infection](#). In addition, the odds of lymphoma in patients with persistent concentrated infections are higher than those with other forms of Q fever.

Upon further imaging of the patient samples, investigators observed that Q fever patients with lymphoma demonstrate overproduction of the critical anti-inflammatory pathway interleukin-10 (IL-10), suggesting that suppression of the immune system may have allowed the [lymphoma cells](#) to evade immune detection and multiply.

"As we continue to learn more about the association between *C. burnetii* and lymphoma, these results should encourage clinicians to survey high-risk patients as early as possible for potential cancer," said Dr. Raoult. "Ultimately, this early diagnosis and treatment would improve outcomes for Q fever patients who subsequently develop lymphoma, particularly those with B-cell non-Hodgkin lymphoma."

Provided by American Society of Hematology

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