

Canine Babesiosis



Blood smear of a dog infected with *Babesia gibsoni*. The parasites are visible as basophilic dots inside erythrocytes in this Diff-Quick-stained blood smear.

Samples

Blood	EDTA-blood as is, purple-top tubes, or EDTA-blood preserved in sample buffer (preferred)
Notes: Send all samples at room temperature, preferably preserved in sample buffer MD Submission form .	

Interpretation of PCR Results

High positive (> 1,000 copies/ml blood)	Babesiosis
Low positive (< 1,000 copies/ml blood)	
Negative	<i>Babesia gibsoni</i> / <i>canis</i> not detectable

Babesia gibsoni / *canis*

Canine babesiosis is a worldwide, tick-borne, protozoal hemoparasitic disease caused by hemoprotozoan parasites of the genus *Babesia*. The two predominant species capable of naturally infecting dogs are *Babesia (B.) canis* and *B. gibsoni*. Both organisms have *Ixodid* tick vectors and are found throughout Asia, Africa, Europe, the Middle East, and North America. Following attachment of an infected tick, *Babesia* spp. trophozoites are released into the blood, infecting erythrocytes. Within the erythrocytes, the parasite multiplies

by binary fission, an asexual form of schizogony ([Homer et al., 2000](#)). Naïve ticks attach to parasitemic dogs and become infected with *Babesia* spp. when they ingest a blood meal.

Clinical Signs

Canine babesiosis is characterized by varying degrees of hemolytic anemia, splenomegaly, thrombocytopenia, and fever. Cases of canine babesiosis may present with a wide variety of clinical signs, ranging from a hyperacute, shock-associated, hemolytic crisis to an inapparent and subclinical infection. The acute form of babesiosis is characterized by symptoms such as pyrexia, weakness, mucous membrane pallor, depression, lymphadenopathy, splenomegaly, and general malaise ([Boozer and Macintire, 2003](#)).

Standard Diagnostic Methods

Classically, babesiosis has been diagnosed by demonstrating intraerythrocytic trophozoites on a blood smear stained by the Giemsa, Romanowsky, Field's, or modified Wright's methods. Other diagnostic tests including fluorescent antibody and ELISA tests are becoming increasingly available to diagnose babesiosis. Serologic diagnosis of babesiosis has certain limitations. A positive test result is dependent on an antibody response by the host, which may take up to ten days to develop, and the antibody remains at a detectable level after full recovery.

Our Method

The Molecular Diagnostics Laboratory at Auburn University has developed a quantitative PCR approach targeting the 18S rRNA gene of these protozoal parasites that detects babesiosis with higher sensitivity than any other test (as few as 7 organisms per ml blood). *B. gibsoni* and *B. canis* are [differentiated](#) by analysis of the product melting curves after PCR amplification. ([Wang et al., 2010a](#))