

Anaplasmosis (canine/feline)



Intracytoplasmic inclusion (morula) in a polymorphonuclear neutrophil from a patient with human granulocytotropic anaplasmosis caused by *Anaplasma phagocytophilum*. The morula represents numerous organisms in a cytoplasmic vacuole (peripheral blood smear, Wright-Giemsa, original magnification x1000).

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 (> 500 copies/ml blood)	Anaplasmosis [interpretation must be correlated to clinical symptoms]
Low positive (< 500 copies/ml blood)	
Negative	<i>Anaplasma</i> spp. not detectable

Anaplasma phagocytophilum/platys

Anaplasma spp. are gram-negative nonmotile, coccoid to ellipsoid bacteria that infect many animal species and cause various diseases. They are obligate intracellular parasites and are usually transmitted through the bite of infected arthropods such as *Ixodes scapularis* and *Rhipicephalus sanguineus*. *Anaplasma phagocytophilum*, formerly known as *Ehrlichia phagocytophila*, infects neutrophils, and rarely eosinophils, of dogs, cats, ruminants, as well as humans and causes granulocytotropic anaplasmosis. *Anaplasma platys*, formerly known as *Ehrlichia platys*, causes thrombocytotropic anaplasmosis in dogs ([Billeter et al., 2007](#)).

Clinical Signs

Common clinical signs of canine anaplasmosis include high fever, lethargy, depression and polyarthritis. Neurologic signs (ataxia, seizures and neck pain) can also be seen. *Anaplasma platys* causes infectious canine cyclic thrombocytopenia (ICCT). Dogs infected with these bacteria will develop cyclic parasitemia and cyclic thrombocytopenia at 7- to 14-day intervals. *A. platys* formerly was not considered highly pathogenic, but recently cases of severe disease have been reported, similar in severity to *Ehrlichia canis* infections.

Standard Diagnostic Methods

Anaplasma infection can be detected via ELISA or IFA testing. Such serological testing can identify dogs with prior exposure but is prone to cross-reactivity and not very sensitive. Examination of blood smears can detect the pathogen but the sensitivity of this technique is very low. Molecular detection by PCR is very specific and sensitive, and hence is very useful to quickly identify this pathogen and confirm re-infection or carrier status ([Martin et al., 2005](#)).

Our Method

The Molecular Diagnostics Laboratory at Auburn University has developed a quantitative PCR approach targeting the 16S rRNA gene of *Anaplasma* spp. that detects *A. phagocytophilum* and *A. platys* with high sensitivity (as few as 7 organisms per ml blood) and high specificity. *A. phagocytophilum* and *A. platys* are differentiated by analysis of the product melting curves after PCR amplification.