

## Interpretations

### **Antinuclear Antibody Titer**

There is no consensus as to what is a significant ANA titer in animals. Many investigators feel that titers >10 are significant while others feel that titers > 40 are significant. A negative result does not rule out systemic lupus erythematosus or other immune-mediated diseases as these conditions can occur without detectable antinuclear antibodies.

### ***Bartonella henselae* Culture**

Blood samples should be collected aseptically.

**Negative** - No growth indicates the organism was not recovered from the cat.

**Positive** – Cat was bacteremic; start appropriate treatment. 30 days after treatment submit another sample.

### **Cryptococcal Antigen Titer**

A titer of 0 rules out the presence of disseminated infection, but not the possibility of a localized lesion.

**Titers >0 and <8** suggest prior infection; however, there is a high rate of false positive titers that are < 8. If this is the first titer a second follow-up titer is recommended along with other lab tests such as microscopy and culture. In cases where animals have completed therapy and are being monitored, titers <8 in conjunction with resolution of clinical signs usually indicates completion of drug therapy. Titers should be rechecked periodically (every 2-6 months) for 1 - 2 years following completion of drug therapy.

**Titers  $\geq 8$**  are considered positive. If the test is used for monitoring drug therapy, it may be 2 – 4 months before a significant decrease in titer occurs. Treatment may be considered successful if follow-up titers for one year are  $\leq 20$ . If therapy is completed and titers are still >20, treatment should be continued. If further treatment is not possible, then check titers every 2 months.

### ***Ehrlichia canis* Antibody Titer**

**Titers < 64** are negative.

**Titer = 64** indicates a borderline positive result, a recheck in 2 weeks is strongly recommended.

**Titers  $\geq 128$**  are positive for antibody to *Ehrlichia canis* and are indicative of prior infection with *Ehrlichia canis* or a closely related species.

### **FIP Antibody Titer**

**Titers <128** are negative for antibody to feline coronavirus. Some young cats with acute or overwhelming infections do not have antibody titers.

**Titers of 128-512** suggest vaccination or infection. One-third of cats with a post infection titer are shedding virus. A definitive diagnosis of clinical FIP cannot be made with titers of this magnitude. A follow up titer in 6 to 12 months should be made if it is a closed household or the cat is isolated.

**Titers  $\geq 1024$**  have been associated with clinical FIP. This prediction is reliable if the cat is from a solitary or closed household with no change in the last year. If the cat is from a multi cat or open household then it has been infected with feline coronavirus and the likelihood to develop disease cannot be determined. A follow up titer in 6 to 12 months should be made if it is a closed household or the cat is isolated.

### **FIV Antibody Test**

A positive test result correlates with vaccination or an FIV infection. False negative titers are seen within 60-90 days of infection or very late in infection in cats with terminal immunosuppression.

### **Feline Leukemia Virus Antigen**

The Feline Leukemia Virus (FeLV) antigen test is run using the Synbiotics ViraCHECK antigen test kit. A **positive antigen** test indicates that the cat has circulating FeLV antigen. Following exposure, a cat may test positive within 14 days. Approximately 70% of cats testing positive for FeLV will be able to clear the infection

and become immune to the virus. Cats with persistent infections will remain positive while transient infections may revert to FeLV antigen negative within 8-12 weeks. It is recommended that cats that test positive for FeLV be isolated and retested after 2-3 months. A **negative antigen** test indicates that at the time the sample was taken the cat did not have detectable levels of circulating FeLV antigen. Some cats can be latently infected and not demonstrate viremia.

### **Feline Heartworm (*Dirofilaria immitis*) Antibody**

The heartworm antibody test is run with Heska's Solo Step FH. This test uses a highly specific recombinant antigen to identify antibodies to heartworms in infected cats. Research indicates that antibody can be detected as early as 6-8 weeks following infection. A negative reaction in this test demonstrates that there are no detectable heartworm antibodies; therefore, preventatives should be considered. If there is a positive reaction in this test, it is suggested that the heartworm antigen test be performed for verification of presence of heartworms as antibody against heartworm may remain for months after adult heartworms have died.

### **Feline and Canine Heartworm (*Dirofilaria immitis*) Antigen**

The heartworm antigen test is run with Synbiotics DiroCHEK Antigen Test Kit. This test detects antigen shed by adult female heartworms, *Dirofilaria immitis*. Research indicates that this antigen is in the circulation when adult heartworms are present in the animal or have been present within the last 60 days. A negative reaction in the antigen test does not eliminate the possibility of a heartworm infection. In animals with an early infection or in animals with small numbers of heartworms (10 or less), the level of circulating antigen may be below the detection threshold of the ELISA test. The animal may have an all male heartworm infection.

### **Lyme Disease Antibody Titer**

**IgM titers <1024 and IgG titers <256** suggest that the animal has not mounted a detectable antibody response to *Borrelia*. Positive titers take 2-3 months to develop after infection and usually correlate with the onset of clinical illness.

**IgM  $\geq$ 1024 titers and IgG titers  $\leq$ 128** suggest recent exposure to *Borrelia*, although other spirochete infections (leptospirosis, GI spirochetosis) may cause cross-reactivity in IgM antibodies, but usually at lower dilutions.

**IgM titers  $\geq$ 1024 and IgG titers  $\geq$ 256** are seropositive and usually correlate with clinical illness or vaccination. A western blot test is available to distinguish antibodies from *Borrelia* infections from those associated with vaccination or other spirochetal infections.

**IgM < 1024 and IgG titers  $\geq$ 256** suggest infection with *Borrelia* or vaccination. A western blot test is available to distinguish antibodies from *Borrelia* infections from those associated with vaccination or other spirochetal infections.

### **Western Blot Lyme Confirmation Test**

Banding patterns are compared with positive and negative controls for interpretation.

**VC** = band patterns of the western blot are consistent with a vaccine IgG response. However, this pattern is sometimes seen in later stages of natural infection.

**NG** = band patterns of the western blot IgG are negative for *Borrelia burgdorferi* exposure.

**NI** = band patterns of the western blot IgG are consistent with natural exposure to *Borrelia*.

**BT** = band patterns of the western blot IgG are consistent with both a vaccine response and a natural infection exposure.

### ***Neospora caninum* Antibody**

**Titers  $\leq$  64** are negative for *Neospora caninum*. A **titer of 128** indicates low levels of antibody to *Neospora caninum*. Since this is a borderline positive result, a recheck in 2 weeks is strongly recommended.

**Titers  $\geq$  256** are positive for antibody to *Neospora caninum*. This is suggestive of an active infection.

## **Rheumatoid Factor (RF)**

Synbiotics CRF Latex agglutination assay is used. A positive result indicates the presence of rheumatoid type antibodies. A negative result does not rule out the diagnosis of rheumatoid arthritis as RF may not be detected in 70% of dogs with rheumatoid arthritis.

## **RMSF Antibody Titer**

**IgM titers  $\geq 16$**  are considered seropositive and compatible with a recent RMSF infection. A borderline positive of 16 should be rechecked in 2 weeks. An elevated **IgM titer ( $\geq 16$ )** without presence of IgG suggests infection within the past 2-4 weeks.

**IgG titers  $\geq 64$**  are seropositive. Response to antibiotic therapy and type and duration of clinical signs should be considered in any assessment. A very high **IgG titer ( $\geq 512$ )** along with the high IgM titer suggests recent or active infection. Elevated titers for both antibodies suggest infection occurred within the past 4-8 weeks.

**IgM titers  $\leq 8$  and IgG titers  $< 64$**  are seronegative for antibody to RMSF. If clinical signs have been present for  $< 2$  weeks, there is the possibility of an early infection. We recommend a recheck sample in 2 weeks to verify a rising IgM and/or IgG titer.

**IgM titers  $\leq 8$  and IgG titers = 64- 256** suggest past infection. Some IgG titers at this level may persist for years. This also may represent an early infection. A four-fold or greater increase in the IgG titer on a recheck sample in 2 weeks indicates an active infection. Early antimicrobial therapy may reduce the peak antibody titers.

**IgM titers  $\leq 8$  and IgG titers  $\geq 512$**  are compatible with a recent RMSF infection of between 2 weeks to 3 months duration. Since IgG titers of this magnitude rarely persist longer than 1 year, the dog was most likely infected this season.

## ***Toxoplasma gondii* Antibody Titer**

**IgM titers  $< 64$  and IgG titers  $< 64$**  are negative for antibody to *Toxoplasma gondii*. In rare cases, a pre-acute infection may be present. If clinical signs are suggestive of toxoplasmosis, we recommend a recheck sample in 2 weeks to verify a rising IgM and/or IgG titer.

**IgM titers  $\leq 64$  and IgG titers  $\geq 64$**  indicate past *Toxoplasma* infection. Since only IgG is positive, the duration of infection may range from 6 months to several years. Rechecking a sample in 2 to 3 weeks will help clarify the state of infection if a 2-fold dilution or greater change in titer (increase or decrease) is observed. However, dogs with **titers  $\geq 1024$**  are more likely to have an active infection than dogs with lower titers.

**IgM titers  $\geq 64$**  indicate recent infection. Cases with **IgM titers  $\geq 256$**  are more compatible with clinical toxoplasmosis. **Titers  $< 256$**  should be rechecked in 2 - 3 weeks if clinical toxoplasmosis is still suspected. In some cases, cats may maintain an IgM titer  $< 256$  for more than 6 months. Animals with chronic, encysted infections may also show a rise in IgM if the infection becomes reactivated and may be indicated by a titer for IgG  $\geq 64$ .