

IVD_12 - Evaluation of a *Wuchereria bancrofti* recombinant antigen for the capture antibody diagnosis of dog heartworm

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Introduction: Heartworm disease is caused by *Dirofilaria immitis* and transmitted through insect vectors of various genera. The definitive host is the dog, but it eventually infects other mammals. The gold standard diagnostic test is the SNAP 4DX which detects a specific antigen produced only by adult females, leading to false-negative results in some cases. Known antigens from parasites of the same family as *D. immitis*, such as *Wuchereria bancrofti*, have been used in immunodiagnostic tests of lymphatic filariasis.

Objective: This work aimed to evaluate a new enzyme-linked immunosorbent assay (ELISA) to capture antibodies against *D. immitis* in dogs with heartworm disease.

Methodology: A *W. bancrofti* antigen with 63% identity to its *D. immitis* orthologue was used. The his-tagged antigen was expressed in *E. coli*, affinity-purified, and evaluated in the ELISA test with canine sera from dirofilariasis endemic and non-endemic areas from Brazil.

Results: A total of 189 sera from dogs previously tested by SNAP 4Dx were tested: 114 positive and 25 negative from the endemic area of Recife, and 50 negative from the non-endemic area of Brasília. Positivity values were significantly higher for the positive sera from Recife (64%; 74/114), decreasing to 36% (9/25) for the negative sera from the endemic region and 22% (11/50) for the negative sera from the non-endemic region. A sensitivity of 64% and specificity of 73% were determined when compared to SNAP 4Dx.

Conclusion: The findings revealed that the *W. bancrofti* antigen is not ideal for the immunodiagnosis of canine heartworm disease using the indirect ELISA assay. However, it was the first Brazilian ELISA developed to search for antibodies in dogs with heartworm disease. Also, the comparison with the SNAP4Dx, an antigen-capture assay, is not ideal. Some infected animals do not produce antibodies and false negatives in SNAP4Dx could be infected and produce antibodies. It is possibly the reason for the greater positivity seen for the negative group from the endemic area in comparison with those from a non-endemic locality. Further studies aiming at the development of antibody tests for heartworm disease should be pursued, so as to better define the real status of the canine immune response in endemic and non-endemic areas.

Keywords: Dirofilariasis; Dogs; Biotechnology