Selection of new diagnostic markers for *Dirofilaria repens* infections with the use of phage display technology

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Dirofilaria repens is a parasitic nematode causing vector-borne zoonotic infection (dirofilariosis), considered an emerging problem in human and veterinary medicine. Currently, diagnosis is based on the detection of the adult parasite and microfilariae in the host tissues. However, the efficacy of test relying on microfilariae detection is limited by microfilariae periodic occurrence. Therefore, a new reliable diagnostic method is needed.

With the use of Ph.D.-12™ Phage Display Peptide Library (NEB), we selected highly immunogenic 12-mer peptides reacting with IgG and IgM antibodies from dogs infected with *Dirofilaria repens*. After prescreening steps, we used antibodies pooled from 5 dogs infected with *Dirofilaria repens*. Selected peptides were further tested with positive and negative sera. Collected blood samples were classified as positive or negative based on detection of microfilariae in the bloodstream (Knott's method/PCR) or by adult *Dirofilaria repens* somatic antigen (*Dr*SA) ELISA test.

We selected several IgG and IgM specific peptides with diagnostic potential in ELISA test. Interestingly, our approach enables us to detect infections in dogs with no clear microfilariae presence in the bloodstream or showing a weak signal in the *Dr*SA ELISA test, which might indicate occult/prepatent infection. Our method could be considered as a new specific diagnostic tool for subcutaneous dirofilariosis.

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