DISCOVERY OF NOVEL BIOMARKERS FOR ANXIETY DISORDERS IN DOGS

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Anxiety disorders lead to hormonal and immune-regulation changes that have not been fully elucidated but negatively affect health (Dreschel, 2010), and are the most common underlying cause of behavioral issues. Psychological stress, for instance, induces alterations in platelets, coagulation factors and inflammatory responses, leading to an enhanced risk of cardiovascular disease in humans (Sandrini et al., 2020).

The prevalence of anxiety disorders and their impact on animal welfare highlight the need to better understand the biochemical pathways involved, better diagnostics and treatment progress-monitoring technologies, which could be achieved using mass spectrometry (MS)-based analyses (Luque-Garcia and Neubert, 2007).

We recruited ten anxious and ten sex- and breed-matched control/non-anxious dogs. All dogs were assessed and either diagnosed with an anxiety disorder or confirmed to be non-anxious by a diplomate of the American College of Veterinary Behaviorists. Blood was collected, plasma generated, then analyzed in parallel following a proteomic and metabolomic workflow for MS to investigate profile differences between the two groups.

Results show upregulation of proteins involved in coagulation, inflammation, and synaptic function, as well as downregulation of an immune system modulator and a protein involved in lipid metabolism, including the production of the precursor of cortisol, a stress biomarker. Metabolomic results are currently being analyzed and expected to further shed light on additional dysfunctions that may occur in anxious dogs.

Our study constitutes the early steps toward the discovery of biomarkers that may in the future lead to earlier, more objective diagnosis, and treatment monitoring of anxious dogs.

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