Cracking the Code of Gut: The power of Proteomics and Metabolomics in Veterinary Gastroenterology

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Keywords: feline chronic enteropathy, proteomics, metabolomics

Chronic enteropathy (CE) in cats is typically classified based on response to treatment, this includes food responsive enteropathy, inflammatory bowel disease and low-grade intestinal T cell lymphoma.[1] Despite advancements in diagnostics, the current diagnostic approach largely relies on clinical signs, exclusion of other primary or extra- gastrointestinal diseases and histopathology.[1] However, histopathological assessment does not reliably predict treatment response. As such, biomarkers have been investigated in attempt to reach a diagnosis of CE with minimally invasive diagnostic methods, monitor disease progression, assess severity and evaluate response to treatment.[2]

Proteomics and metabolomics are powerful technologies that enable comprehensive assessment of biological systems.[2,3] Proteomics involves the large-scale study of proteins, including their structure, function and interaction.[2] Metabolomics focuses on the analysis and profiling of small molecules (metabolites) in cells and tissues.[3] One of their primary applications in veterinary gastroenterology is biomarker discovery. [2,3] By identifying distinct molecular profiles associated with disease, these tools might identify potential biomarkers that aid in diagnosis, disease monitoring and prediction of treatment response.[2,3]

Beyond biomarker discovery, proteomic and metabolomic profiling also provide valuable insights into disease pathophysiology.[2,3] They can assess dysregulated biological pathways, identify altered microbial metabolites, and reveal changes in gene and receptor expression.[2,3] Importantly, proteomic and metabolomic data can be integrated to generate a comprehensive understanding of disease mechanisms. This presentation will explore the principles of these technologies, highlight current literature, and discuss their emerging role in understanding pathophysiology and potential use in feline CE.

References

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