Development of the Dog Reference Gut Microbiome (DRGM) Catalog to Address Sample and Diversity Bias in Dog Microbiome Research

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The gut microbiome is associated with various aspects of host health, and this relationship holds true for dogs as well. A comprehensive and well-established reference genome catalog is essential for advancing research on the dog gut microbiome. However, existing catalogs are often constrained by limited sample sizes and a lack of diversity, resulting potential biases. To overcome these limitations, we have developed the Dog Reference Gut Microbiome (DRGM) catalog. This new catalog incorporates Metagenome-Assembled Genomes (MAGs) derived from geographically diverse samples, including those from Asia, Africa and Europe, to mitigate geographical bias. The MAGs were constructed using de novo assembly of whole metagenomic sequencing (WMS) data, comprising 1,497 publicly available fecal samples and 16 newly collected dog fecal samples. The DRGM catalog enables comparative studies of human and dog gut microbiomes, advancing research on the interconnectedness of human and animal health within the One Health framework.