



University of New Hampshire NH Veterinary Diagnostic Laboratory

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Respiratory Syndrome of Unknown Etiology in Dogs 2022-3: Diagnostic Investigation - update #2

January 25, 2024

The Hubbard Center for Genome Studies (HCGS) and the New Hampshire Veterinary Diagnostic Laboratory (NHVDL) at UNH have additional preliminary findings in the diagnostic investigation of an atypical respiratory syndrome in dogs.

Additional results: (1) Screening via 16s rRNA gene metabarcoding has revealed more evidence of the potential novel bacterial respiratory pathogen, as noted in our first studies, in samples from dogs in several other states. In total there have been 31/226 dog with presence of genetic material from this potential pathogen, including 15/64 in NH, 10/45 in OR, 5/33 in RI, and 1/1 in CT. Samples from ME (n=4), MA (26), CO (31), NM (1), MD (18), AZ (1), FL (1), and SC(1) did not show evidence of the potential pathogen.

(2) We have tested 15 dog lung samples from 2018, which were retrieved from a biological specimen repository at the NHVDL, and none of these samples had evidence of the potential pathogen. In addition to these negative controls, we searched published data from sequencing studies of the dog respiratory tract, and in all five of these studies no evidence of the potential pathogen was found.

(3) Using additional bioinformatic analyses and some alternative sequencing technologies we have identified more segments of the potential pathogen's genome.

Context: Findings are still preliminary, but the identification of additional positive cases in more recent clusters of the syndrome in new states, and the lack of the bacterium in multiple temporal controls helps support the potential that this bacterium may be new to the canine infectious respiratory disease complex. This is further bolstered by identifying more sequencing reads that map to the potential pathogen. The technology and methods used by the HCGS include cutting edge metagenomic sequencing, and multiple bioinformatic pipelines that are uncommonly utilized in veterinary medicine. There is still a chance that this preliminary data is disproven with further study, but at this point each new datapoint has supported the initial findings. These findings should not significantly alter how clinicians should approach CIRDC cases, except to support the potential recognition of a new component to the CIRDC complex.

Next steps: Additional work is ongoing. We have some more samples incoming from other sites, which will be screened via metabarcoding. We will be working with another laboratory to grow fastidious and atypical bacteria and will attempt to culture from selected cases.

If you are a veterinarian and are appreciating increased respiratory disease cases in dogs and are interested in contributing cases to the study, please contact David Needle to discuss sample submission, etc.

Thank you to the clinicians, clinics, and individuals that supported the work with funding donations and to the clinics and clinicians that have provided samples and metadata.

Clinicians, please email david.needle@unh.edu with any questions or to arrange submissions, etc.

Media requests should be directed to Robbin Ray, director of media relations at UNH; robbin.ray@unh.edu