Press Release

Diagnoses by dog noses
Dogs can discriminate between samples from SARS-CoV-2 infected humans and control samples.

July 23, 2020 A research team led by the University of Veterinary Medicine Hannover (TiHo), in cooperation with the Bundeswehr, the Hannover Medical School and the University Medical-Center Hamburg-Eppendorf, today published a study in the journal BMC Infectious Diseases on dogs that can sniff out people infected with the SARS-CoV-2 virus. The dogs only needed to be trained for one week to differentiate between samples from SARS-CoV-2 infected patients and non-infected controls. This method could be employed in public areas such as airports, sport events, borders or other mass gatherings as an addition to laboratory testing, helping to prevent further spreading of the virus or outbreaks.

The study was conducted with eight specialised scent detection dogs of the Bundeswehr. After training, they were able to correctly identify 94 percent of 1,012 saliva or tracheobronchial secretion samples. The samples were automatically distributed at random and neither the dog handlers involved nor the researchers on site knew which samples were positive and which were used for control purposes. The dogs were able to discriminate between samples of infected (positive) and non-infected (negative) individuals with an average sensitivity of 83 percent and a specificity of 96 percent. Sensitivity refers to the detection of positive samples. The specificity designates the detection of negative control samples.

Dr. Esther Schalke, veterinary behaviourist and dog trainer working at the Bundeswehr School of Dog handling said: "Dogs scent detection is far better than the general public can imagine. Nevertheless, we were amazed how fast our dogs could be trained to detect samples from SARS-CoV-2 infected individuals."

Prof. Albert Osterhaus, department chair of the Research Center for Emerging Infections and Zoonoses, University of Veterinary Medicine Hannover, said: "When Prof. Volk contacted me, I was at first dazzled but then intrigued about the idea of using scent detection dogs to detect samples from SARS-CoV-2 infected individuals. It is known that infectious respiratory diseases can release specific volatile organic compounds. This pilot study could be a starting block of how volatile organic compounds pattern can be used for future testing strategies."

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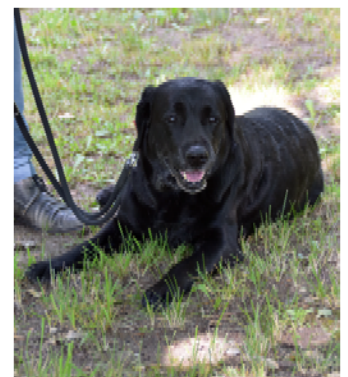
Prof. Holger A. Volk, department chair of small animal medicine and surgery, University of Veterinary Medicine Hannover, said: "These preliminary findings indicating that pre-trained scent detection dogs can discriminate reliably, accurately and rapidly between samples from SARS-CoV-2 infected patients and negative controls is truly exciting. We have built a solid foundation for future studies to explore what the dogs do scent and if they can be used to discriminate also between different disease timepoints or clinical phenotypes."

TiHo President Dr. Gerhard Greif said: "The Research Center for Emerging Infections and Zoonoses enables us at TiHo to work with pathogens such as SARS-CoV-2. The virus is subject to biosafety level 3 and without this high-security building, projects like this would not be possible".

Since the start of domestication, man has used canines' exceptional olfactory capabilities for scent detection to hunt down prey, but also to be protected themselves from predators. Nowadays, dogs are also increasingly used in the field of medical olfactory recognition. They are able to detect infectious and non-infectious diseases like different types of cancer, malaria, bacterial and viral infections.

Original publication:

Jendrny et al. (2020): Scent dog identification of samples from COVID-19 patients – a pilot study, BMC Infectious Diseases, https://doi.org/10.1186/s12879-020-05281-3