

The Scent Of Things To Come

They can sniff out diseases ranging from Parkinson's to various cancers far earlier than today's routine diagnostic testing. They can identify minute changes in personal odour and alert their human of an imminent medical event.¹ They're specially trained dogs using their scent-smelling superpower to help keep people healthier.

Granted, dogs' capacity to detect odours is reportedly up to 100,000 times better than humans.² In fact, recent University of Alberta study results show dogs can detect approximately one-billionth of a teaspoon of gasoline.³ However, with all of today's technological advancements, why haven't we invented matching sniff test capabilities?

It turns out the sense of smell remains a "stubborn biological enigma." It's a challenge that researchers are working to meet as they build artificial noses. At Philadelphia's Monell Clinical Senses Center, they've created a detection machine that's achieving a 90% to 95%



success rate, getting closer to their canine competitors.⁴ At the Massachusetts Institute of Technology, researchers are focused on the Nano-Nose—a sensing device and diagnostic tool.⁵ Their future vision: a cellphone, for instance, with the built-in capability to sense skin cancer. On another front, Silicon Valley startup, Aromyx Corporation, is using engineered biosensors "to create digital representations of smell sensory data."⁶ Their biosensors have also been identified as a potential non-invasive diagnostic tool.

As research continues to solve the mystery of smell, our canine friends will continue to sniff out the health news humans emit. Just as we're catching up, scientists have discovered that dogs' noses can also sense weak thermal radiation.⁷ It's meant to help them sense the body heat of mammalian prey and is a legacy survival tool, which becomes more important as other senses decline. With all this in mind, the next time you see a dog sniffing, pause and consider the remarkable powers of that cold wet nose.

1. Pete Wedderburn, "Medical Detection Dogs – the science behind the sniff," *The Telegraph*, August 21, 2018, <https://www.telegraph.co.uk>.

2. "The Dogs Sniffing Out Hidden Cancer – Methods," *Science Friday*, April 9, 2020, <https://methods.sciencefriday.com/cancer-dogs>.

3. "A dog's nose knows: Canines detect traces of gasoline down to one billionth of a teaspoon," *CBC News*, May 12, 2020, <https://www.cbc.ca>.

4. "The Dogs Sniffing Out Hidden Cancer – Methods," *Science Friday*, April 9, 2020.

5. Sara Harrison, "The Quest to Make a Bot That Can Smell as Well as a Dog," *Wired*, May 16, 2019, <https://www.wired.com>.

6. Aromyx Corporation, <https://www.aromyx.com>.

7. Virginia Morell, "New sense discovered in dog noses: the ability to detect heat," *Science*, February 28, 2020, <https://science.sciencemag.org>.



Fiduciary
Trust
Canada™

Calgary
335 Eighth Avenue SW,
Suite 1940, Calgary,
Alberta, Canada T2P 1C9
(800) 574-3822

Toronto
200 King Street West,
Suite 1500, Toronto,
Ontario, Canada M5H 3T4
(800) 574-3822

Montreal
1002 Sherbrooke Street
West, Suite 1940
Montreal, Quebec
Canada H3A 3L6
(800) 574-3822

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