Can dogs smell cancer?

Can dogs smell cancer? 1 (New Scientist 1/2/2014)

- Claire Guest, is the CEO of Medical Detection Dogs charity at Milton Keynes U.K.
- She claims that her fox red labrador, Daisy, detected her breast cancer, when she was 45 (2001?).
- "She kept staring at me and lunging into my chest.
- It led me to find a lump," Guest remembers.
- “It turned out to be breast cancer”.

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- An article suggesting the use of sniffer dogs was published in **The Lancet** in 1989 by two dermatologists who cited a case in which a woman claimed she was sent to them by her dog.
- Her doctor had misdiagnosed a spot on her upper leg as being a mole.

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- She accepted the diagnosis but her dog did not.
- He kept sniffing and scratching the spot.
- One day her dog pounced on her and tried to bite off the spot.
- As a result, she sought a second opinion, which found the spot to be a malignant melanoma.

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- It then took more than ten years before there were any studies of the idea that dogs can smell cancer.
- The feasibility study conducted by Churcher, Guest et al, in Amersham, England commenced in 2002 and was published in 2004.
- The **six** dogs used in this study were able to correctly identify bladder cancer in the urine 41% of the time.

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- Since then there have been numerous other studies, but with insufficient numbers of dogs and mixed results.
- Many scientists remain unconvinced:
- In a 25th May, 2012 article, “What to make of Medical Dogs”, published by Science-Based Medicine, Peter Lipson reported on his review of the scientific literature regarding these claims and found valid support for positive conclusions to be lacking.

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- In a research study conducted by the Pine Street Foundation, and reported in 2009, breath samples of 31 breast cancer patients, 55 lung cancer patients and 83 healthy people were presented to **five** trained scent dogs (three Labrador retrievers and two Portuguese water dogs).
- These dogs were able to detect or rule out breast and lung cancer, at all stages of the disease, with approximately 90 percent accuracy.

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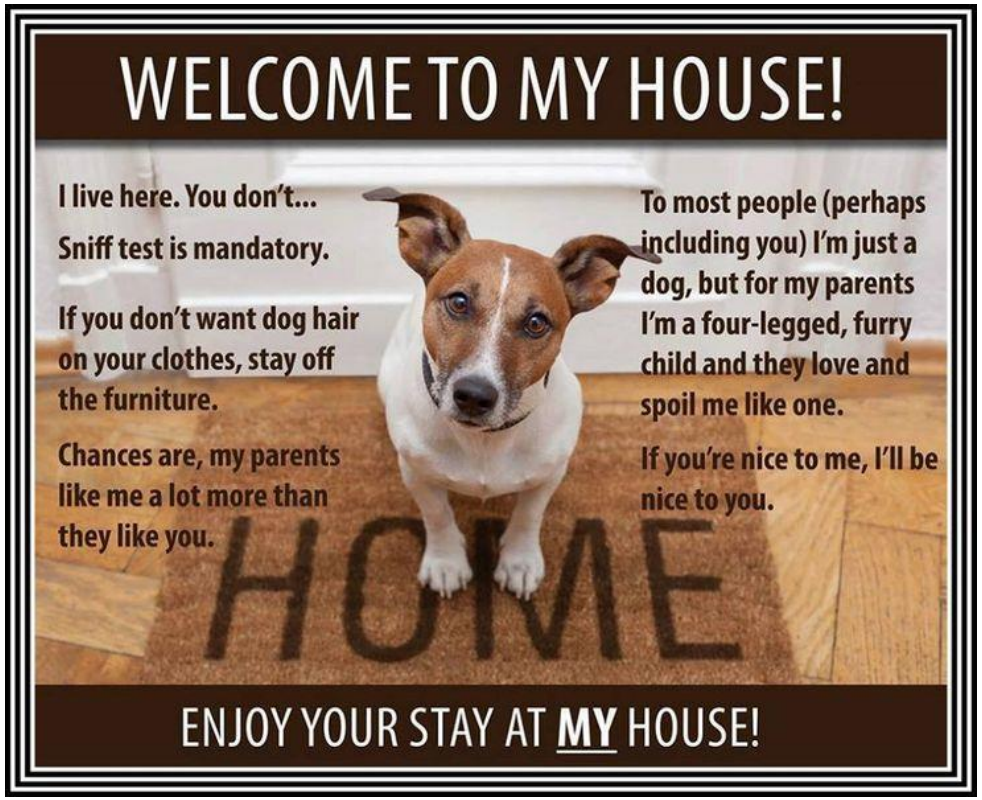
- An expert in melanomas, Dr. Armand Cognetta of Tallahassee, studied (1995-97?) whether dogs could detect skin cancer and enlisted the help of a dog trainer.
- With the samples of melanomas, he worked to train a dog to sniff out the skin cancer.
- George, the **one dog** used in the study, was able to detect the melanoma **approximately(?)** 99 percent of the time.



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- There are at least three other reports involving one dog, two dogs and four dogs respectively, without any experimental details.
- They claim success rates 97% success for colon cancer, 98% for prostate cancer and 71% for lung cancer, respectively.

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- Researchers in the current British study have set a particularly high bar.
- They want to make sure dogs are actually smelling cancer and not something else, such as old age or some other set of symptoms.

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- In the study, dogs will circle a carousel holding eight evenly spaced urine samples, one from a cancer patient and seven from patients who don't have cancer.
- At least one of those seven samples will be from someone about the same age as the cancer patient who had symptoms of cancer but didn't actually have the disease.

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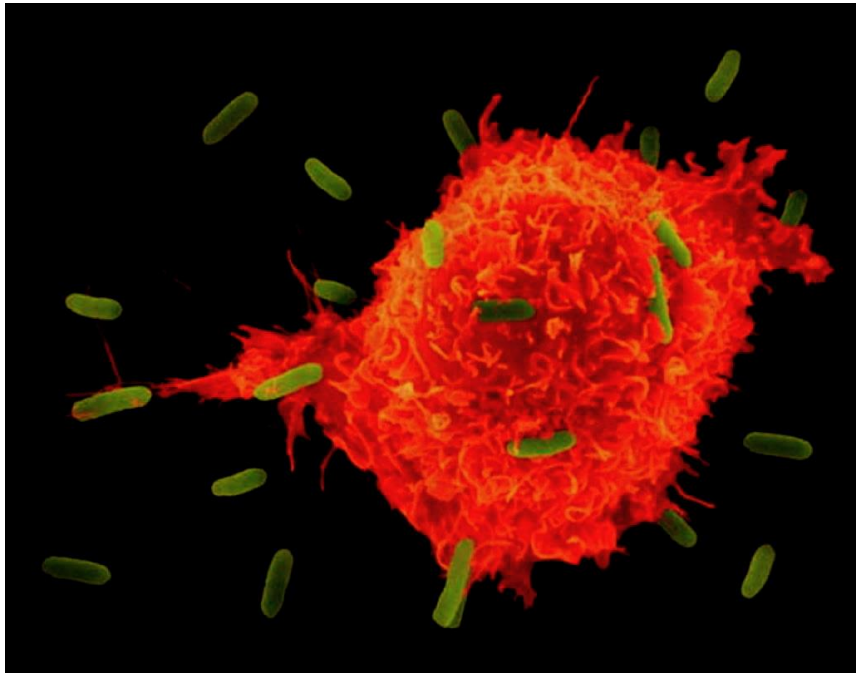
- It is claimed, but as yet unverified, that cancerous cells produce volatile organic compounds (VOCs) that are excreted from the body in urine, sweat and breath.
- It is also claimed that dogs can smell the VOCs.



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In the May 25, 2012 article, Peter Lipson also states:

“While anecdotes abound, there is scant literature to support this ability. …

The idea behind cancer dogs is that there may be volatile compounds produced in cancer patients that dogs can detect by scent.

In these studies, the compounds are not identified, not tested for, not named.

There are many confounders, for example, in the samples used there may be other differences being detected by the dogs”.

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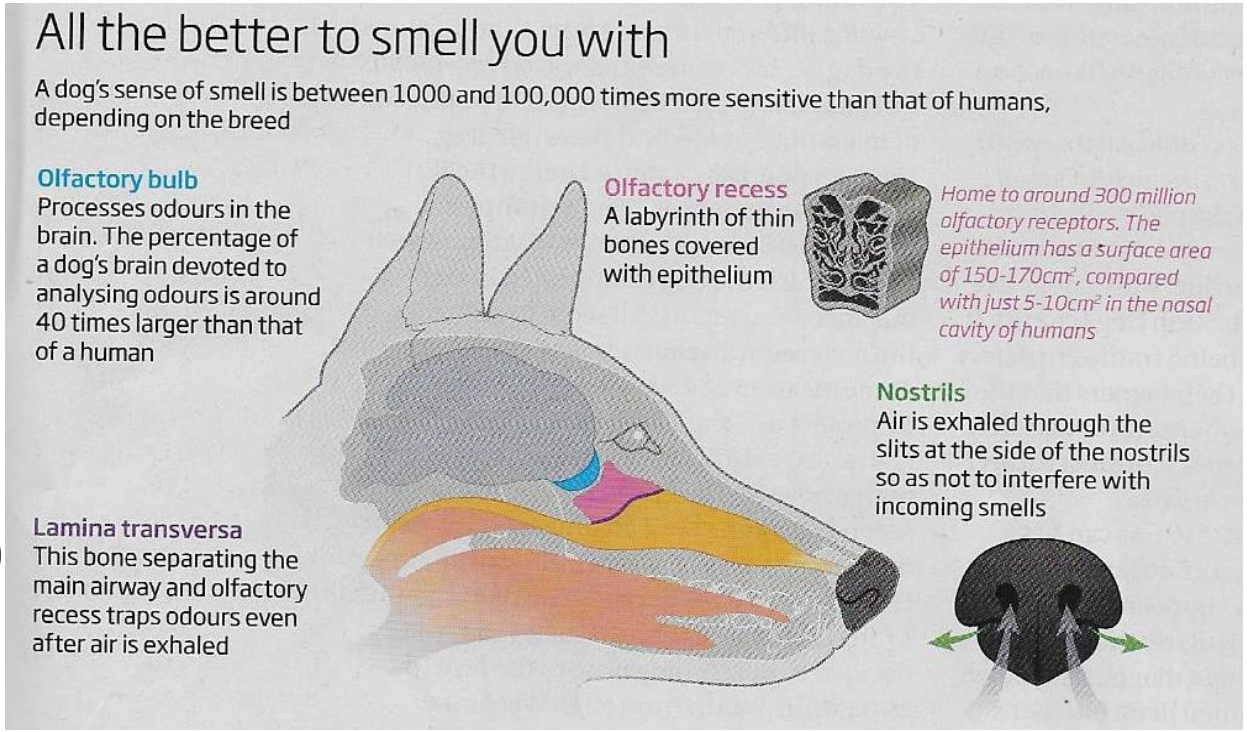
- As yet, the awesome smelling powers of dogs has not met with commercial success.
- Dr. Sheryl Gabram the surgeon-in-chief at Grady Memorial Hospital in Atlanta thinks she knows why.
- The problem, she thinks, is that while cancer-smelling dogs make for great headlines, it's not always easy to envision how sniffing out cancer could be used commercially.

Why dogs can detect odours much better than humans

The brain of a human is dominated by the visual cortex, but the brain of a dog is controlled by the smell or olfactory cortex, which is approximately 40 times larger than that of a human.

Furthermore, the olfactory bulb in a dog has a large number of smell-sensitive receptors, which range between 125 to 220 million, and it is 100,00 to 1,000,000 more more reactive than that of humans.

(Note the disagreement in sources.)



Slightly related: rats and fruit flies.

- APOPO(an acronym for Anti-Persoonsmijnen Ontmijnende Product Ontwikkeling: "Anti-Personnel Landmines Removal Product Development" in English) is a non-profit Belgian company that
- trains pouch rats to smell out land mines.
- Of 12,500 people tested for TB, 1700 tested positive by conventional methods.
- APOPO asserts that their rats detected an additional 764 cases.
- The same article in NS says that fruit flies have also been used.