

The potential to sniff out disease

The fact diseases have a smell comes as no surprise – but finding someone or something that can detect them at an early stage could hold huge potential for medicine.

Breath, bodily odours and urine are all amazingly revealing about general health. Even the humble cold can give off an odour, thanks to the thick bacteria-ridden mucus that ends up in the back of the throat. The signs are not apparent to everyone – but some super-smellers are very sensitive to the odours. Joy Milne, for example, noticed her husband's smell had changed shortly before he was diagnosed with Parkinson's disease.

Humans can detect nearly 10,000 different smells. Formed by chemicals in the air, they are absorbed by little hairs, made of extremely sensitive nerve fibres, hanging from the nose's olfactory receptors. And the human sense of smell is 10,000 times more sensitive than the sense of taste. But dogs, as the old joke might have had it, smell even better.

Their ability to detect four times as many odours as humans makes them a potential early warning system for a range of diseases. Research suggesting dogs' could sniff out cancers, for example, was first published about 10 years ago. And there have been many tales of dogs repeatedly sniffing an area of their owner's body, only for it to turn out to be hiding a tumour.

What they are smelling are the "volatile molecules" given off by cells when they become cancerous. Some studies suggest dogs can be 93% accurate. Others suggest they can detect very small tumours before clinical tests can. And yet more studies have produced mixed results.

Does cancer smell?

At Milton Keynes University Hospital, a small team has recently begun to collect human urine samples to test dogs' ability to detect the smell of prostate cancer. The patients had symptoms such as difficulty urinating or a change in flow, which could turn out to be prostate, bladder or liver cancer. Rowena Fletcher, head of research and development at the hospital, says the role of the dogs – which have been trained by Medical Detection Dogs – is to pick out samples that smell of cancer. Further down the line, a clinical test will show if the dogs' diagnosis is correct. She says the potential for using dogs in this way is far-reaching – even if it is not practical to have a dog in every surgery.

"We hope one day that there could be an electronic machine on every GP's desk which could test a urine sample for diseases by smelling it," she says. "But first we need to pick up the pattern of what the dogs are smelling."

And that's the key. Dogs can't tell us what their noses are detecting, but scientists believe that different cancers could produce different smells, although some might also be very similar.

Electronic noses

Lab tests to understand what these highly-trained dogs are smelling could then inform the development of 'electronic noses' to detect the same molecules. These might then give rise to better diagnostic tests in the future. The potential for using smell to test for a wide range of diseases is huge, Ms Fletcher says.

Bacteria, cancers and chronic diseases could all have their own odour – which may be imperceptible to only the most sensitive humans, but obvious to dogs. It may be possible in the future to use disease odours as the basis for a national screening programme or to test everybody at risk of a certain cancer in a particular age group.

However, there are fewer than 20 dogs in the UK trained to detect cancer at present. Training more will take more funding and time. On the positive side, all dogs are eligible to be trained provided they are keen on searching and hunting. Whatever their breed or size, it's our four-legged friend's astounding sense of smell which could unlock a whole new way of detecting human diseases.

Questions 1-5

Do the following statements agree with the information in the IELTS reading text?

In boxes 1-5 on your answer sheet, write

TRUE	if the statement agrees with the information
FALSE	if the statement contradicts the information
NOT GIVEN	if there is no information on this

1. You can have a specific smell even due to simple cold.
2. Human sense of taste is 10,000 less sensitive than human sense of smell.
3. Dogs and cats can sniff out different diseases.
4. Doctors believe that different cancers might have the same specific smell.
5. There are more than 20 dogs in the UK trained to detect cancer.

Questions 6-9

Choose the correct letter, A, B, C or D.

Write the correct letter in boxes 6-9 on your answer sheet.

6. All the studies suggest that dogs:

Can be 93% accurate Can detect very small tumours

Can't detect tumours at all Different studies have shown different results

7. What scientists give dogs to detect cancer?

Urine samples Bacteria Different odours Nothing

8. What's an electronic nose?

A specific tool for dogs A gadget to diagnose diseases

A recovery tool for ill patients An artificial nose

9. The main objective of this passage is to:

Bring awareness to the cancer problem

Show us how good dogs are at detecting cancer

Show us how important it can be to be able to diagnose a disease by an odour

Tell us about new technologies

Questions 10-12

Complete the sentences below.

Write NO MORE THAN TWO WORDS from the passage for each answer.

10. Scientists hope that one day an _____ will be on every desk.

11. Electronic nose would help to detect the _____.

12. Dogs can _____ a new way of diagnosing diseases.