

# Breathalyzer test detects lung cancer: study

August 30 2009

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Scientists in Israel have devised a portable breath tester that detects lung cancer with 86 percent accuracy, according to a study released Sunday.

The device could provide an early warning system that flags the disease before tumours become visible in X-rays, the researchers reported in the journal *Nature Nanotechnology*.

"Our results show great promise for fast, easy and cost-effective diagnosis and screening of [lung cancer](#)," they said.

The sensor uses gold nanoparticles to detect levels of so-called volatile organic compounds (VOC) -- measured in a few parts per billion -- that become more elevated in cancer patients.

Early detection of lung cancer dramatically increases the odds of survival. Currently, only 15 percent of cases are discovered before the disease has begun to spread.

Screening via computerised tomography (CT) or chest x-rays can reduce lung cancer deaths, but is expensive and exposes patients to undesirable radiation.

In the study, a team of researchers lead by Hossam Haick of the Israel Institute of Technology took breath samples from 56 healthy people and 40 lung cancer patients.

To avoid contaminants, participants repeatedly filled their lungs to

capacity for five minutes through a filter that removed 99.99 percent of organic compounds from the air, a process called "lung washout".

Then the scientists hunted for VOCs present only in the cancer patients that could serve as biomarkers for the disease.

They found 33 compounds that appeared in at least 83 percent of the cancer group, but in fewer than 83 percent of the control group.

The next step was to design an assembly of chemical sensors using [gold nanoparticles](#) measuring five nanometres across.

An average strand of human hair is about 100,000 nanometres in width.

After "training" the arrays to detect a selection of the cancer-specific VOCs, Haick and his team tested it on both artificial mixtures of biomarkers and real human breath.

The devices were able to "distinguish between the breath of lung cancer patients and healthy controls, without the need for de-humidification or pre-concentration of the lung cancer biomarkers," they concluded.

They also suggested the technique could be extended to other forms of cancer.

"Given the impact of the rising incidence of cancer on health budgets worldwide, the proposed technology will be a significant saving for both private and public health expenditure," they say.

Lung cancer claims some 1.3 million lives worldwide each year, accounting for nearly 18 percent of all deaths from cancer, according to the World Health Organisation.

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Citation: Breathalyzer test detects lung cancer: study (2009, August 30) retrieved 19 April 2024 from <https://phys.org/news/2009-08-breathalyzer-lung-cancer.html>

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