

## SCREENING

BAD BREATH ...  
SCENTING VICTORY?

We have all read news articles where a beloved family dog has identified cancer in a patient, just by using the amazing nose that nature provided. However, when Hossam Haick and his team read similar stories they recognized the potential for a more rigorous cancer screening method.

The dogs are almost certainly detecting volatile biomarkers that are emitted into the blood, and therefore the breath, when cancer cells are under oxidative stress. Luckily for Haick's plans for screening, each cancer type has a 'signature' of these markers.

Haick has been leading the development of an electronic 'nose' called the Nanoscale Artificial Nose (NA-NOSE) that, as Haick explains "harnesses nanotechnology, biomedical engineering, pulmonary medicine, medical oncology and computation strategies for the detection of pre-neoplastic volatile biomarkers in human breath." In a recent study, Haick and his team have used this device to try to identify patients with head and neck cancer or lung cancer.

Using 62 breath samples collected under reproducible conditions, the NA-NOSE was able to distinguish between healthy controls and head-and-neck cancer patients (accuracy of 98%), between healthy controls and lung cancer patients (96%) and between head-and-neck and lung cancer patients (100%). The fact that 20% of the patients with the head-and-neck cancer that was detected using the NA-NOSE had early-stage disease indicates that it could be used as a diagnostic tool in this hard-to-identify and often fatal disease.

The potential for this tool has been recognized by the grant of >\$10 million by the European Commission to fund large-scale studies of nanosensors to detect cancer. Hopefully the trial results will allow Fido and his furry friends some breathing space!

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**Original article** Hakim, M. *et al.* Diagnosis of head-and-neck cancer from exhaled breath. *Br. J. Cancer* doi:10.1038/bjc.2011.128