DISCOVERIES

One breath away from diagnosing disease

Researchers are closing in on commercially viable devices to detect cancers by analyzing human breath

Breath has been described poetically as the bridge that unites your body to its thoughts. Breath can also provide a window to the body's health. – Thich Nhat Hanh, Vietnamese Buddhist monk, teacher, author, poet and peace activist

RICK PILGER

For at least as far back as the fifth century BC, when Hippocrates recognized the sweet, fruity odour signalling diabetes, the distinctive fishy reek of advanced liver disease and the urine-like smell associated with failing kidneys, physicians have used breath odour as a diagnostic tool.

In the early 1970s, Linus Pauling was able to show that exhaled breath contains more than 250 substances, including a multitude of volatile organic compounds. In the past decade or so, increased interest in these compounds as biomarkers of disease has spurred scientific interest in the early detection of disease, including cancer, through breath analysis.

Recent medical science has begun to regard cancer as fundamentally a metabolic disorder. Evidence points to impaired cellular energy metabolism being the defining characteristic of almost all cancers, regardless of whether they originate in tissue or cells, and researchers are looking to find the resulting biomarkers in breath samples.

John Cormier, of Picomole Instruments Ltd., demonstrates a breath sensor in his Moncton lab Thursday that could possibly detect cancer. THE GLOBE AND MAIL

THE SERIES

This is the fourth in a six-part series on inventions and breakthroughs in science and

onstrated the ability to detect cancer based on the changing colours of an array of reactive chemical indicators embedded in a pigment matrix.

dug a little deeper," he recalls, "and found that the existing technologies for breath analysis really weren't cutting it. While they were

cific wavelengths characteristic of their structure. Picomole's technology, called LISA (Laser Infrared Sample Analysis), is capable of