Gates backs electronic nose to sniff out TB

OUR SPECIAL CORRESPONDENT

New Delhi, Nov. 7: A proposal by Indian scientists to develop an electronic device that can detect tuberculosis by sniffing out molecules in the breath of patients will receive a $950,000 research grant from a Canadian agency and the Bill and Melinda Gates Foundation.

Grand Challenges Canada and the Gates Foundation announced the funding today for a research effort that the scientists hope will lead to an on-the-spot tuberculosis screening test to replace the existing sputum test which takes up to three weeks to confirm a diagnosis.

Virander Chauhan, director of the International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi, and his colleague Ranjan Nanda are lead researchers in the effort that will seek to develop the “electronic nose” in collaboration with a US-based company Next Dimension Technologies.

“Diagnosing tuberculosis and other pulmonary disease simply by testing a patient’s breath is a bold idea with potentially big impact,” said Peter Singer, the chief executive officer of Grand Challenges Canada.

Public health experts estimate that 400,000 lives could be saved each year through early diagnosis.

An ICGEB team led by Chauhan began research to look for “biomarkers” for tuberculosis in human breath about five years ago under a project funded by India’s biotechnology department.

“We look for patterns of molecules in breath that are unique to tuberculosis patients,” said Nanda, a biologist who studied in Sambalpur University and IIT Kharagpur before moving to the ICGEB four years ago.

In the first phase of the project, the researchers identified a set of seven volatile organic compounds with a distinct pattern in patients with tuberculosis.

In the second phase — for which the grant was announced today — the scientists will validate the reliability of the seven compounds and, if possible, find additional biomarkers.

“This is a high-risk project,” Chauhan told The Telegraph. But, he said, a successful outcome could make possible immediate screening of patients for tuberculosis.

Traditional confirmatory diagnosis for TB involves examining sputum samples, coaxing microbes in it to grow, and looking for tuberculosis bacteria. This process takes up to three weeks. Although alternative molecular techniques are available, they are relatively expensive.

Scientists believe the electronic sensor designed to recognise biomarkers will also be able to distinguish tuberculosis from other lung illnesses such as pneumonia, chronic pulmonary obstructive disease or lung cancer.
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