Detecting respiratory infections: simply blow for diagnosis

Professor Claudia Denkinger from Heidelberg University's Faculty of Medicine is leading the international collaborative project "BreathForDiagnosis", which is co-funded by the European Commission under the "Horizon Europe" framework programme and also by the Swiss State Secretariat for Education, Research and Innovation (SERI) with a total budget of 3 million euros. Researchers from Germany, Italy, South Africa and Romania are working with an industrial partner from Switzerland to develop user-friendly breath tests for the rapid diagnosis of respiratory infections such as tuberculosis.

Affordable, easy-to-use and widely available tests are the best way to prevent the spread of serious respiratory infections and enable those affected to receive early treatment. The international consortium "BreathForDx" has set itself the goal of initially developing and testing such tests for the diagnosis of tuberculosis (TB) and putting them into practice. In the future, there is potential to extend the methodology to other respiratory diseases. Heisenberg Professor Dr Claudia Denkinger, Faculty of Medicine at Heidelberg University and Medical Director of the Department of Infectious Diseases and Tropical Medicine at Heidelberg University Hospital, is coordinating the project. It is funded by the European Commission under the "Horizon Europe" framework programme and by the Swiss State Secretariat for Education, Research and Innovation (SERI) with a total budget of 3 million euros.

The project partners are the IRCCS San Raffaele Hospital Milan, Italy, the South African organisation Desmond Tutu Health Foundation, the Marius Nasta Institute of Pneumophthisiology Bucharest, Romania, and the Swiss company Avelo, which develops innovative containers for breath sampling and the detection of pathogens in breath.

Timely diagnosis can prevent deaths

Respiratory infections led to more than 7 million deaths in 2020 alone. One of the most dangerous respiratory infections, especially in the poorer countries of Africa, Southeast Asia and the Middle East, but not only there, is tuberculosis: it claims more than 1.4 million lives every year, including 250,000 children. "A timely diagnosis is crucial to prevent deaths. However, tests are often not available," explains Prof Denkinger. "Breath-based tests have great potential to revolutionise tuberculosis diagnostics, as the critical step of sample collection is significantly simplified and the sample is easily accessible. This would allow us to reach more affectedpeople ."

Is it also suitable for detecting antimicrobial resistance?

The project partners will develop two special breath sample collectors, optimise them in test runs and evaluate the benefits of the entire diagnostic procedure for early detection and screening in clinical trials. They will also examine the suitability of this diagnostic procedure for the detection of antimicrobial resistance and how well Avelo's new sample collectors perform in terms of cost-effectiveness and user-friendliness compared to conventional, more complex procedures. Another research focus is the extent to which diagnostics that use breath as a sample can contain the spread of infections - similar to the SARS-CoV-2 rapid tests for Covid. Because only those who know that they are infected can change their behaviour and protect those around them.

"In BreathForDx, we are bringing together innovations in bioaerosol and materials science with the expertise of the participating universities, industry and non-governmental organisations. Our shared vision is that a single breath sample in combination with molecular testing methods will enable accessible and reliable immediate diagnosis of highly transmissible respiratory infections and thus improve the health of individuals and populations," says Prof Denkinger.

13-May-2024
Source: Heidelberg University Hospital

Further information

Dr. Stefanie Seltmann
Press spokesperson
Phone: +49 (0) 6221 56 5052
E-Mail: presse(at)med.uni-heidelberg.de

Julia Bird
Vice spokesperson
Phone: +49 (0) 6221 56 7071
E-Mail: presse(at)med.uni-heidelberg.de

Prof. Dr. Claudia Denkinger
Medical Director (Department of Infectious Diseases and Tropical Medicine)
Group Leader (AG Global DX)
Phone: +49 (0) 6221 56 22999
E-Mail: Claudia.Denkinger(at)uni-heidelberg.de

- Heidelberg University Hospital International Patients