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CORSAI

Raman analysis of saliva from COPD patients as new biomarker: AI-based point-of-care for the disease monitoring and management

Chronic obstructive pulmonary disease (COPD) is a debilitating and chronic pulmonary syndrome that causes a rapid decline in lung function. Nowadays, there is not specific biomarker that allows its immediate identification and the phenotyping of COPD patients is based on very long standard procedures, exposing them to the high risk of exacerbation and hospitalisation. Therefore, it is of primary importance to search for a unique biomarker that can help clinicians in the differential diagnosis of COPD patients from those with asthma, the evaluation of their exacerbation risk and the identification of non-adherence to therapy. On the basis of this, the main goal of the CORSAI project is to validate a new method based on the Raman spectroscopy (RS) analysis of saliva (ideal biofluid for diagnostics and monitoring purposes, as the collection procedure is minimally invasive) for the optimised and personalised management of COPD patients. The Raman spectrum of saliva (Raman fingerprint) will represent a single biomarker for COPD, obtained in a sensitive, fast and label-free manner. By the combination of RS-based method with artificial intelligence (AI), the project will lead to the COPD patients' management in a personalised medicine dimension, with a particular focus on stratification of patients, prediction of the risk of exacerbation and adherence to therapy. Finally, the ultimate goal is to transfer the RS directly to the hospital, thanks to the use of a portable Raman spectroscope: it will be possible to test the effectiveness of a point of care method able to investigate different aspects of COPD in a single analysis.

