Progress Toward a Population Screening Test for COPD

- *70% of Chronic Obstructive Pulmonary Disease (COPD) cases go undiagnosed. Now, a study led by Hospital del Mar and the Hospital del Mar Research Institute has validated ten metabolites that are altered in patients with this disease.*

- *These metabolites can be identified through a simple blood test, which opens the door to their use in future population-based screening for suspected COPD.*

- *The study used artificial intelligence tools to determine which of these molecules yielded the most accurate results.*

Barcelona, August 5, 2025 – The possibility of having a **tool that facilitates population screening for Chronic Obstructive Pulmonary Disease (COPD)** is getting closer. A multicenter study involving leading hospitals across Spain, led by Hospital del Mar and its research institute, has confirmed that people with COPD show altered **levels of specific metabolites in their blood**. This finding may make it possible to use these biomarkers to identify, at an early stage, those likely to have COPD. The study, conducted with researchers from the CIBER Respiratory Diseases (CIBERES) and Epidemiology and Public Health (CIBERESP) areas, has been published in the *International Journal of Molecular Sciences*.

"**This could serve as a screening method to define high-risk populations for COPD, who could then be referred for the definitive diagnostic test, spirometry**," explains Dr. Joaquim Gea, Emeritus Head of the Pulmonology Service at Hospital del Mar and Coordinator of the Myogenesis, Inflammation, and Muscle Function Research Group at the Hospital del Mar Research Institute. Currently, **70% of COPD cases are underdiagnosed**, largely due to the difficulty of correctly performing the reference test—spirometry—on a population scale. This leads to late or missed diagnoses, which delay the start of treatment and result in patients reaching care with advanced disease. It also increases the risk of COPD-associated conditions such as lung cancer.

Ten Altered Metabolites
The study analyzed data from **91 COPD patients and 91 healthy controls**. All participants underwent blood tests, which were analyzed using mass spectrometry to detect metabolite levels. Of the 360 molecules identified, about 50 were selected as the most relevant. **Using artificial intelligence**, researchers pinpointed **the ten best-performing metabolites** in combination for identifying individuals with COPD.

The results showed these metabolites had very **high sensitivity and specificity—over 90%—** in distinguishing COPD patients from healthy individuals. These molecules are linked to energy production, which may explain fatigue and other limitations experienced by COPD patients, as well as lipid metabolism, which could relate to the cardiovascular comorbidities often found in these individuals. The findings suggest that COPD patients have a reduced capacity to produce energy and altered lipid metabolism

Selecting a small group of biomarkers could facilitate their implementation in a population screening program for COPD. Moreover, their use may be relatively simple, as they can be detected through a routine blood test. As Dr. Gea explains, this **"could provide us with a tool for the early detection of people with COPD, which means starting treatment at an early stage of the disease and allowing for closer monitoring of potential comorbidities."**

Focusing on a limited group of biomarkers could facilitate their inclusion in a population screening program for COPD. Moreover, their application could be relatively straightforward, as they can be detected through a routine blood test. As Dr. Gea points out, this "**could give us a tool for early detection of individuals with COPD, which would allow treatment to begin in the early stages of the disease and enable closer monitoring of potential comorbidities.**"

The next step in this line of research is to verify the efficacy of these biomarkers in a larger and more diverse population. If successful, this could pave the way for their implementation in clinical practice.

Reference Article

Casadevall, C.; Agranovich, B.; Enríquez-Rodríguez, C.J.; Faner, R.; Pascual-Guàrdia, S.; Castro-Acosta, A.; Camps-Ubach, R.; Garcia-Aymerich, J.; Barreiro, E.; Monsó, E.; et al. Metabolomic Plasma Profile of Chronic Obstructive Pulmonary Disease Patients. *Int. J. Mol. Sci.* **2025**, *26*, 4526. https://doi.org/10.3390/ijms26104526

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