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Researchers identify urine biomarkers linked to regular red wine consumption

Findings could improve accuracy of dietary studies and support research on wine's role in chronic disease prevention

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A research team from the Institute of Grapevine and Wine Sciences (ICVV) in La Rioja, Spain, has identified new biomarkers that can objectively indicate regular red wine consumption. The study, led by the MedWine group (Wine and Mediterranean Diet), used advanced metabolomics techniques to analyze urine samples from volunteers. The goal was to find specific compounds that appear in the body after moderate wine intake, which could help validate dietary data in future health studies.

The research involved 40 participants between the ages of 52 and 78, all residents of La Rioja. They were divided into two groups: regular wine drinkers and non-drinkers. Over a 24-hour period, urine samples were collected and analyzed using high-resolution liquid chromatography at the ICVV's Instrumental Analysis Service. The study combined both targeted and untargeted metabolomics approaches to detect and identify metabolites derived from wine polyphenols.

Untargeted metabolomics allowed researchers to annotate sixteen compounds found only in the urine of regular wine consumers. These compounds were not present in the control group. In parallel, targeted metabolomics focused on specific metabolites related to resveratrol, a well-known polyphenol found in red wine. The results showed significantly higher concentrations of resveratrol-derived metabolites in the urine of wine drinkers, particularly those processed by the liver.

These findings support the use of these metabolites as reliable biomarkers for moderate wine consumption. This is especially relevant because traditional methods for collecting dietary information—such as food frequency questionnaires or 24-hour diet recalls—often rely on self-reporting. These tools can be affected by memory errors, misunderstanding of portion sizes, or misinterpretation of questions.

The study is part of a broader project funded by Spain's Ministry of Science and Innovation (MCIN/AEI), under grant PID2019-108851RB-C22. The project explores the relationship between wine consumption, diet, and microbiome modulation in Alzheimer's disease within a cohort from La Rioja. Researchers from the University of La Rioja and the Biomedical Research Center of La Rioja (CIBIR) also contributed to the work.

The results have been published in the journal *Food Chemistry* under the title "Exploring biomarkers of regular wine consumption in human urine: Targeted and untargeted metabolomics approaches." The publication provides detailed data on how these biomarkers were identified and their potential use in future nutritional and epidemiological studies.

The MedWine group continues to validate these biomarkers across different populations to confirm their reliability and usefulness. Their work could improve how scientists assess dietary patterns and their links to chronic disease prevention, especially when studying complex diets like the Mediterranean diet where moderate wine consumption is common.