

SUPRAS

THE SUPRAS PROJECT DESIGNS NEW, MORE EFFECTIVE SOLVENTS TO DETECT DOPING IN HIGH-PERFORMANCE SPORTS

PROJECT CODE: PCC-195500 R119-SUPRAS

CALL: PPC GRANT

PERIOD: 36 MONTHS

BUDGET: 195.000 \$

PRINCIPAL INVESTIGATOR: SOLEDAD RUBIO BRAVO



Supramolecular solvents, often referred to by their acronym SUPRAS, have a great capacity to improve the selectivity and performance of extractions, thereby reducing the time and costs involved in sample analysis. These are liquids with very low toxicities and that, over the last few years, have been used in the analysis of pollutants in environmental and agri-food samples, and in the treatment of wastewater. Henceforth, in addition to these applications, these solvents will have a new one: detecting doping in high-performance sports.

The new solvents make possible the simultaneous extraction of a large number of illegal substances in urine

The SUPRAS research project, spearheaded by the University of Cordoba, will incorporate the use of these solvents into the detection of drugs in athletes, an initiative that will enhance the effectiveness of the initial screening of urine samples for the detection of positives, at the same time simplifying the process.

The number of substances on the World Anti-Doping Agency (WADA) Prohibited List is over 300, to which must be added all the compounds with similar chemical structures or biological effects, as well as any drug not approved for

therapeutic use. When conventional solvents are used for the extraction of doping substances in urine samples, they only efficiently extract nonpolar compounds - those with low solubility in urine - which constitute just a small fraction of the substances prohibited by the WADA. Unlike these, the new solvents proposed in the project are also capable of extracting polar molecules; that is, those that are highly soluble in urine.

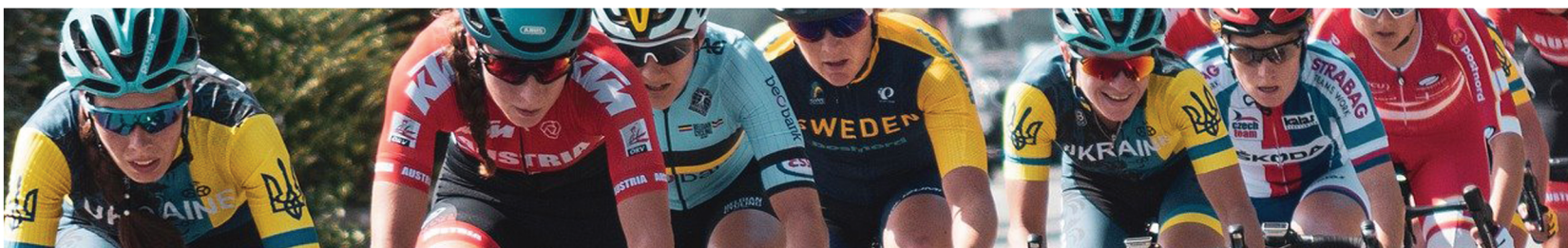
The principal investigator on the project, Soledad Rubio, emphasises that the anti-doping protocols establish a first screening of the samples, generally urine, followed by a confirmatory analysis of the positive cases, "such that the substances not detected in the first phase are not subjected to a confirmatory analysis." The preparation of the samples, she notes, "is an especially critical stage, since the reliable detection of drugs at the levels required calls for a methodology that efficiently extracts all the prohibited substances from the urine while eliminating the main components of it."

Thus, the SUPRAS project proposes the use of new solvents for the development of an analytical platform that makes possible the efficient

extraction of prohibited substances and the simultaneous elimination of the urine's components through a "low cost and fast" procedure. This an important factor, considering that official anti-doping laboratories analyse about 300,000 samples annually, on which they must report reliable results within 24 hours, as a general rule.

The project, which will test the new solvents by extracting 100 representative substances from the 11 categories established by the World Anti-Doping Agency, is funded by the Partnership for Clean Competition, a non-profit organization created in 2008 by different US organizations related to sport (the Olympic Committee, the National Football League, Major League Baseball and the Anti-Doping Agency).

The project team is comprised of researchers Soledad Rubio, Ana María Ballesteros and Soledad González, from the FQM-186 group in the Department of Analytical Chemistry at the UCO; Professor Eloy Girela, from the Department of Morphological and Social Health Sciences, and Dr. Gloria Muñoz, director of the Spanish Agency for Health Protection in Sport's Doping Lab.



This report forms part of the communications strategy of the International Projects Office, to publicize notable University of Cordoba international projects.