Drugs and exposome: everything wastewater can tell about us.

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In this last year we have learned that wastewater can be a really useful early-warning tool to monitor the presence of the SARS-CoV-2 virus at a local scale. However, this is only the latest application of called Wastewater-Based Epidemiology (WBE), which is based on a very simple premise: municipal wastewater can be considered as a large (and diluted) pooled urine sample. Thus, we can perform a pseudo-human biomonitoring, but covering the whole population at local level, (almost) without ethical issues and in a much cost-effective and rapid manner. Indeed, there are limitations and different considerations that need to be accounted for. In this talk I will talk about the basis of WBE, those limitations, analytical and quality assurance considerations, as well as some of the various applications. In this context, the very first applications of WBE data back to 15 years ago when the technique was applied to the determination of cocaine consumption. Since then, measuring the abuse of illicit (and later licit) substances has been a major application field, particularly since the European Monitoring Centre for Drugs and Drug Additions (EMCDDA, https://www.emcdda.europa.eu/topics/pods/waste-water-analysis) started its annual monitoring campaign based on WBE. However, as already mentioned for COVID-19, many other applications are possible, among which monitoring human exposure to chemical pollutants is an emerging application field, that will also be covered in the talk. Finally, the Spanish Network of WBE (ESAR-Net: www.esarnet.es) which is currently establishing a WBE monitoring network with the support of the Spanish "Plan Nacional Sobre Drogas" and its activities will be also presented.

Biographical notes:

José Benito Quintana obtained his PhD in Chemistry in 2004 (University of Santiago de Compostela, USC). Then he was a postdoc at the Technical University of Berlin (2004-2005) until November 2015 when he got a competitive program postdoc (I. Parga Pondal, Galician postdoc program similar to Ramón y Cajal) at the University of A Coruña. In March 2018 he returned to the USC with a senior researcher position (Ramón y Cajal, selected no. 2 in Chemistry that year) until March 2013, when he promoted to Associate Professor (Profesor Contratado Doctor), which is his current position. He has published >110 papers in indexed journals (including 9 in Anal. Chem and 5 in ES&T) and 8 book chapters in the fields of analytical and environmental chemistry mainly. His H-index is 43 and his average citation rate is over 50 cites/publication (18 of his papers have 100 cites or more). He has leaded several national and international projects, such as the Water JPI project PROMOTE (www.promote-water.eu) or the INTERREG-POCTEP project NOR-Water (www.nor-water.eu) , as the Spanish PI and responsible for coordinating analytical tasks. As concerns wastewater-based epidemiology (WBE), he was the Spanish representative in the SCORE Network during COST funded period. Furthermore, he coordinates the Spanish network ESAR-Net (www.esarnet.es) which w has secured funding for the period Jan 2021-Dec 2023 through the project "Exploration of wastewater as a complementary, rapid and objective indicator on substances abuse". Currently (since September 2016), he is the deputy director of the Institute of Research on Chemical and Biological Analysis (IAQBUS, formerly known as IIAA until January 2020) at the USC.

More info: http://webspersoais.usc.es/jb.quintana