



B88 An Analysis of Illicit Drugs in Wastewater: A Forensic Perspective

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After attending this presentation, attendees will understand the principles of wastewater analysis. Attendees will also be informed of the contribution this tool can bring in a forensic perspective, in particular deciphering the dynamic structure of illicit drug consumption in several types of environments.

This presentation will impact the forensic science community by emphasizing the value of the information that wastewater analysis can deliver and the added value of triangulating this data with other complementary sources of information.

In 1920, Edmond Locard formulated one of the core principles of forensic science, stating (in its epitomized form) that “every contact leaves a trace.” By extension, this principle can also be applied to the consumption of a drug or, in particular, to an illicit drug. Actually, when one consumes such a substance, in order to assimilate and eliminate it, the product is transformed into its related metabolites. In other words, cocaine will be excreted via urine and feces in the form of its metabolite, benzoylecgonine, as well as the parent compound, cocaine itself.

These traces are then relics conveying objective information about the type, the relative quantity, and the pattern of consumption of a specific population. To obtain this information, the sampling strategy is essential. It is necessary to choose a place where these residues of consumption of the target population are combined; in this case, the entrance of the wastewater treatment plant of the area under investigation. Another application of this wastewater-based approach focuses on (semi-) closed environments, such as a prison or music festival. These configurations influence the sampling setting as well as the interpretation of the obtained data.

This study presents the application and limitations of this approach of wastewater analysis using results gathered over a three-year period, both for longitudinal and comparative studies. The main application of these results focuses on the determination of the consumption of illicit drugs in a population based on the amounts of the drug residue present in the target wastewater treatment plant, known as back-calculation. From these loads, it is also possible to infer the quantity of related illicit drugs or even the number of doses. While such findings are the most commented aspects of wastewater analysis, especially by the media, this study advises that there is more potential in these results, mainly by performing cross-analysis. A discussion on this interdisciplinary approach will be illustrated by presenting the added value of combining wastewater results with existing data related to illicit drugs, such as epidemiological or police data, as well as public health information.

Illicit Drugs, Wastewater, Triangulation