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Validation and development of an optical detection microfluidic device for the determination of antibiotics in environmental waters

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This work consists of the development and calibration of a microfluidic device for direct fluorescence detection. First, the microchip was evaluated and tested using fluorescein, a substance of high fluorescence, soluble in methanol and widely used as a marker in methods of measuring other non-fluorescent substances. This microfluidic device was applied to the determination of an antibiotic commonly used for people and animals: norfloxacin. The measurements were carried out using two optical fibers, spectrometers and optical potentiometers at a wavelength of 278 y 445 nm. Finally, the microfluidic device was calibrated for norfloxacin with detection limits and quantitation limits of 0.07 mg/L and 0.24 mg/L, respectively. This device was satisfactorily applied in environmental samples, specifically to waters from the Llobregat River passing through Manresa, Barcelona. This has been demonstrated to be a low-cost device offering the short time of analysis and low detection and quantification limits. Additionally, this device is reusable and easy sampling to use.

Biography

Maria Ramos Payan has expertise in improving sample preparation techniques focused on microfluidic-chip devices as miniaturization. The novelty of her microfluidic devices offers more advantages than the existing methodologies. Maria has worked at different institutions (the University of Seville, University of Huelva, University of Lund, University of Copenhagen, University of North Carolina, USA, Microelectronic National Center of Barcelona and Universitat Autónoma de Barcelona). Currently, she works at the University of Seville with the aim of implementing optical detection into microfluidic devices for multiple different applications.

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