

BIODEGRADATION OF FLUOROQUINOLONES BY SINGLE BACTERIA

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The growing occurrence of human and veterinary pharmaceuticals in the environment is causing increasing concern. Fluoroquinolones (FQs) are broad-spectrum antibiotics that play an important role in the treatment of serious bacterial infections. The elimination of FQs in Wastewater Treatment Plants (WWTP) is incomplete and these compounds are directly discharged in surface waters. The accumulation of FQs in environment due to its extensive use is causing an increasing concern providing a strong drive for developing efficient treatment processes to overcome this problem.

The present work describes the degradation of three fluoroquinolones: Ofloxacin (OFL), Norfloxacin (NOR) and Ciprofloxacin (CPF) by single bacteria. A range of bacterial strains isolated in our labs, namely *Labrys portucalensis* strain F11, *Rhodococcus* sp. strain FP1 and *Rhodococcus qingshengii* strain S2 were tested. Biodegradation of FQs was assessed in batch mode in the presence of a conventional carbon source.

Strain F11 was able to completely remove 3.0 mg L⁻¹ of OFL in 21 days. For NOR and CPF only 90% and 37% of degradation were respectively achieved after 21 days. Concerning strains S2 and FP1 only small traces of biodegradation activity were found.

FQ-degrading microorganism could be useful for application in bioaugmentation processes towards more efficient removal processes in WWTPs.

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