Novel material degrades a widely used antibiotic that contaminates water

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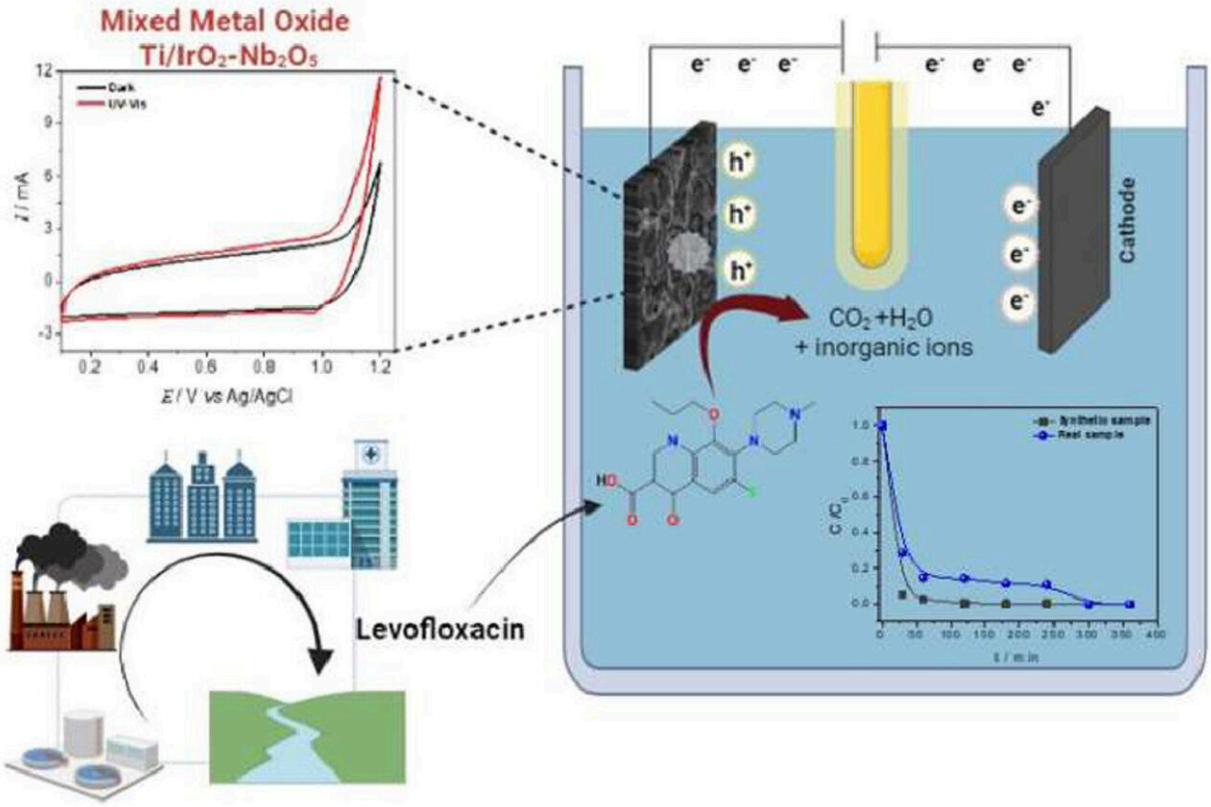

Graphical abstract. Credit: *Electrochimica Acta* (2023). DOI: 10.1016/j.electacta.2023.143586

Levofloxacin is a widely used antibiotic prescribed to treat pneumonia, bacterial rhinosinusitis, bacterial prostatitis, pyelonephritis, urinary tract

infections, skin disorders, and skin structure infections, among other conditions. The drug is prevalent in aqueous environments owing to its low degradability in wastewater treatment plants and is therefore considered an emerging pollutant.

In light of its high toxicity and possible endocrine-disrupting effects, widespread consumption of levofloxacin makes its impact on the environment particularly harmful. Researchers at several universities and institutions in São Paulo state (Brazil) have joined forces to develop ways of removing it from aqueous environments or converting it to biodegradable by-products with low toxicity.

The study obtained excellent results, degrading the antibiotic in simulated and real water samples with the aid of an electrode comprising iridium dioxide and niobium oxide films on a titanium substrate.

The results are described in an article published in the journal *Electrochimica Acta*.

The films were obtained by the modified Pechini method, and the electrode, after morphological, structural, and electrochemical characterization, was used to degrade the antibiotic using different processes, including electrolysis and photoelectrolysis. The material displayed excellent photoelectrocatalytic activity and stability, as well as a large electrochemically active surface area. The results were considered highly satisfactory, with promising prospects for the treatment and removal of organic pollutants in water.

The authors of the article include Lucia Helena Mascaro, a professor at the University of São Carlos (UFSCar), co-principal investigator at the Center for Development of Functional Materials (CDMF), and a researcher at the Center for Innovation in New Energies (CINE).

More information: Carlos H.M. Fernandes et al, Effective photoelectrocatalysis of levofloxacin antibiotic with Ti/$IrO_2Nb_2O_5$ in environmental samples, *Electrochimica Acta* (2023). DOI: 10.1016/j.electacta.2023.143586

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