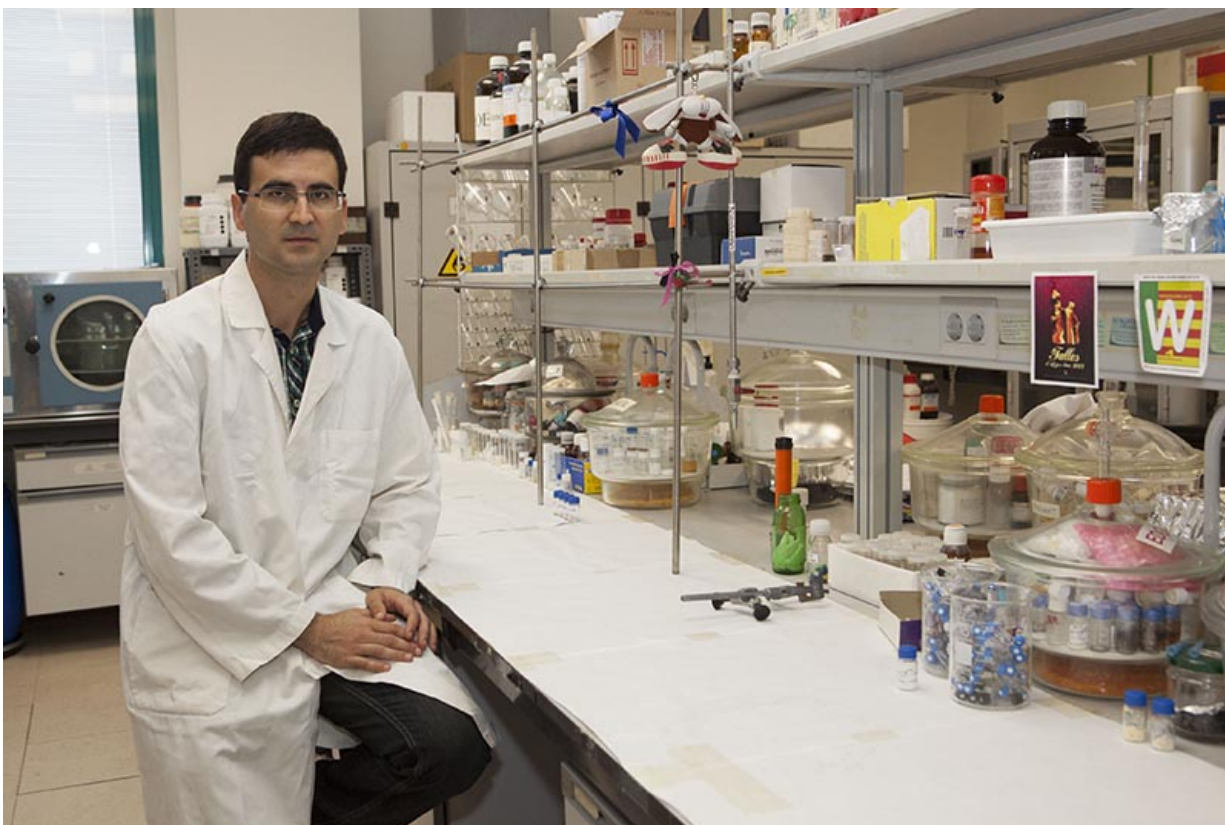


Pioneering method in the evaluation of nitrate pollution

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Credit: Vicente Marti-Centelles, UJI

A postdoctoral researcher at the Universitat Jaume I has designed an innovative model for the selective recognition of nitrates, which is big news for the prevention of environmental pollution. The idea, developed

by Vicente Martí-Centelles during a postdoctoral research stay at the University of Oxford, has been published in the prestigious journal *Chemistry-A European Journal*.

The article describes the preparation of a sensor that can selectively detect the nitrate anion over all other anions, such as phosphate. The nitrate anion is a pollutant molecule found in fertilisers and, therefore, the [water](#) we drink and in rivers. At high levels, it is harmful to health and the environment. As a result of the blanket use of fertilisers in agriculture, the abundance of the nitrate anion has caused the alteration of the natural aquatic ecosystem. Moreover, water with elevated nitrate levels is thought to cause diseases such as methaemoglobinemia, also known as blue baby syndrome in infants, a disorder characterised by an abnormal accumulation of haemoglobin.

The method proposed by Martí-Centelles paves the way for nitrate detection in water samples in different contexts, environmental or medical, to check for high levels and take preventive measures, where necessary. It is a ground-breaking model, with a purpose-designed [chemical structure](#) that homes in on this pollutant.

This chemical structure is the first step towards an efficient recognition of nitrates and could find applications in the development of nitrate detection systems such as filters to remove these pollutants from water sources. Martí-Centelles explains: "User-friendly systems are possible where the molecule changes colour in the presence of nitrates, and even water filter systems similar to those that use resins that remove calcium from water. By including molecules based on our prototype, we can filter this nitrate from water, too."

The research was carried out during a postdoctoral stay at the University of Oxford, supervised by Prof. Paul D. Beer, as part of the Generalitat Valenciana's VALi+d funding programme. It has been endorsed by UJI

professor of organic chemistry, Santiago Luis Lafuente. The various stages were completed at Universitat Jaume I and the University of Oxford. Martí-Centelles also completed an industrial placement at Biotics at Espaitec, the Jaume I Science, Technology and Business Park, and completed his doctoral thesis at the UJI's Supramolecular and Sustainable Chemistry research group, led by Santiago Luis Lafuente.

More information: Vicente Martí-Centelles et al. Nitrate Anion Recognition in Organic-Aqueous Solvent Mixtures by a Bis(triazolium)acridine-Containing [2]Rotaxane, *Chemistry - A European Journal* (2015). [DOI: 10.1002/chem.201406066](https://doi.org/10.1002/chem.201406066)

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