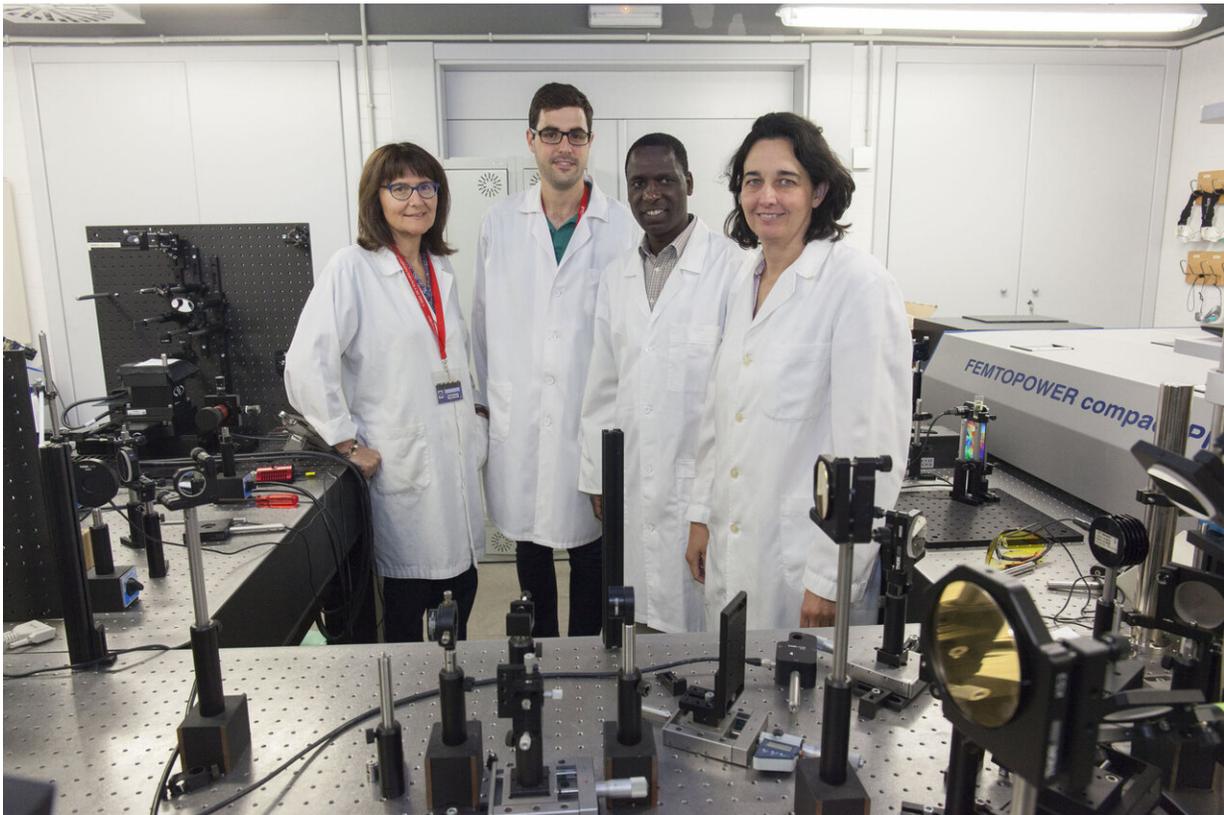


Researchers develop an optical sensor that detects very low glucose concentrations

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The Optical Research Group. Credit: Universitat Jaume I

The Optical Research Group of the Universitat Jaume I (GROC-UJI) has developed an optical nanoparticle sensor capable of detecting very low glucose concentrations such as those present in tears by means of

fluorescent carbon quantum dots.

The main objective of this project is to create a tool for the diagnosis of non-invasive diabetes through the detection of ocular [glucose](#) in vitro, which can be integrated into a smartphone for both clinical and private use. Therefore, diabetics would not have to prick themselves several times a day to control their glucose levels, thus avoiding the discomfort it entails. In addition, the use of mobile phones would enable the systematic collection and management of electronic glucose level records to reduce errors and improve diabetes control.

Laser-based [synthesis](#) enables the development of green and sustainable nanotechnology, because it does not require an excess of polluting chemical products, nor does it necessarily produce waste. Furthermore, the functionalization of nanoparticles is simple and efficient, since it is obtained in situ during the synthesis process with a pulsed laser. Finally, thanks to the [manufacturing process](#), nanosensors are not blocked by any other chemical component or residue that may cause unwanted [chemical](#) effects.

The researchers developed a technique to produce a single carbon quantum dot capable of detecting very low [glucose levels](#), thanks to its 63 percent quantum efficiency in fluorescence, and with a high photostability demonstrated for more than 15 hours. This new type of carbon quantum dot opens the door to numerous applications in companies specializing in the synthesis of nanoparticles.

Provided by Asociacion RUVID

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