

New technique opens the door to development of osteoporosis drugs

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Scientists from the University of Granada (UGR) have opened the door to the development of new drugs against osteoporosis, one of the most common chronic illnesses in the world, especially among women 65 or over.

The researchers, from the University of Granada's Department of Physio-Chemistry, have patented a new methodology that allows specialists to measure – none-invasively and in real time – the concentration of phosphate ions inside living cells. The scientific importance of measuring phosphate ions is based precisely on the fact that it can be applied in evaluating the bio-availability of drugs used in certain illnesses, among which is osteoporosis.

Currently, there are only invasive treatments to calculate phosphate concentration within osteoblasts, which are the precursors to bone cells. To do this, radioactive phosphorus is used, which has serious drawbacks. The methodology developed by the University of Granada researchers has managed something unachievable until now.

Fluorescence Microscopy

The methodology is based on using a substance that gives out fluorescence, generated via prior agitation using a pulse laser. The time the fluorescence lasts is a signal of the phosphate concentration within the cellular cytoplasm. To measure this time period, a special

fluorescence microscope is needed. The University of Granada's Faculty of Pharmacy has this equipment. It is very expensive to use and is the only such instrumentation in Andalusia.

Following this important scientific breakthrough, patented via the University of Granada's Research Results Transference Office (OTRI), the researchers are looking for pharmaceutical companies that are currently working on the development of drugs to measure the bio-availability of phosphate.

The main author of this scientific breakthrough, University of Granada professor, Jose Maria Alvarez Pez, points out that "our methodology is the only one that uses a technique that, in real time and none-invasively, allows the detection of phosphate ions inside living cells. We believe that this technique will help to develop [new drugs](#) to combat illnesses such as [osteoporosis](#)."

More information: "Real-Time Phosphate Sensing in Living Cells using Fluorescence Lifetime Imaging Microscopy (FLIM)." Jose M. Paredes, Maria D. Giron, Maria J. Ruedas-Rama, Angel Orte, Luis Crovetto, Eva M. Talavera, Rafael Salto, and Jose M. Alvarez-Pez. *Journal of Physical Chemistry B* 2013, 117, 8143–8149. [dx.doi.org/10.1021/jp405041c](https://doi.org/10.1021/jp405041c)

Provided by University of Granada

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