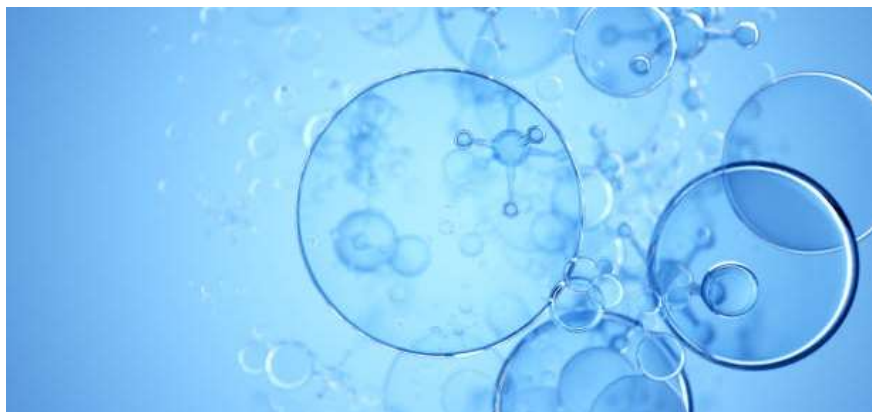


Technology Offer

CSIC/XA/010

Nanoparticles as positive contrast agents in magnetic resonance imaging



Iron oxide nanoparticles (IONP) doped with Gallium (Ga) and Zinc (Zn) (GaZn-IONP), which have application as positive contrast agents in magnetic resonance imaging (MRI), in particular as positive contrast agents (T1-MRI).

Intellectual Property

PCT application filed

Stage of development

In vivo proof of concept

Intended Collaboration

Licensing and/or co-development

Contact

Xavier Gregori
 Vice-presidency for
 Innovation and Transfer
xavier.gregori@csic.es
comercializacion@csic.es



Market need

Iron oxide nanoparticles (IONP) are an alternative to conventional magnetic resonance imaging (MRI) contrast agents. Since years ago, when they were approved by the FDA, they have been postulated to replace Gadolinium (Gd), the only one currently used in the clinic. Gd has very good imaging properties, but it is a toxic compound (it cannot be used in patients with renal problems, for example) and it has a limited number of applications due to its physicochemical properties. When developing MRI probes, the key parameters are longitudinal (r1) and transverse (r2) relaxivity.



Proposed solution

The GaZn-IONP nanoparticles combine a bright signal in MRI, comparable or even better than the signal obtained with Gd compounds commonly used, with the best properties of IONP (variety of applications and biocompatibility). They have been tested in vivo, in magnetic resonance angiography of healthy mice. The results showed that they provided clear excellent positive contrast signals at large magnetic field at concentrations ten times lower than those clinically approved for Gd compounds, and that the signal lasted longer compared to the signal obtained with Gd compounds.

Competitive advantages

- They allow to carry out an angiography, with positive contrast, at concentrations as low as 0.05 mmol Fe/Kg, half the concentration approved for humans in iron oxide nanoparticles.
- The signal at low concentrations is stronger than that of Gd-based compounds and, very important for many applications, it circulates in blood for much longer (up to 120 min after injection).