

Iron oxide nanoparticles for t1 positive contrast in magnetic resonance imaging.

Jesús Mejías Martín¹, Aitor Herraiz Pérez¹, Fernando Herranz^{1,2}

¹NanoMedMol Group, Instituto de Química Médica (IQM), Consejo Superior de Investigaciones Científicas (CSIC), 28006 Madrid, Spain. ²CIBER de Enfermedades Respiratorias, 28029 Madrid, Spain
aherraiz@iqm.csic.es

Iron oxide nanoparticles (IONP) are well-known owing to their magnetic properties and their potential as Magnetic Resonance Imaging (MRI) probes. For several years, IONP-products were clinically available, but industry discontinued the production of these nanoparticles due of the lack of a clear application. The main reason for this is their typical signal in MRI, due to their superparamagnetic behavior, they provide the so-called “negative” contrast, a darkening of the tissue there where the IONP accumulate. For many diseases, this type of signal is far from optimal for diagnosis. [1-3]

To get the best of two worlds, i.e., the bright signal typical in Gd chelates plus the biocompatibility and multifunctional character of the IONPs, we're developing IONP that can provide positive contrast, a brightening of the tissue where the nanoparticles accumulate.

In this work we will present our most recent results showing different synthetic routes to produce IONPs for positive contrast in MRI and their application in the diagnosis of cardiovascular diseases.

References

- [1] Pellico, J., *et al. Langmuir*, **2017**, 33, 10239-10247.
- [2] Fernández-Barahona, I., *et al. ACS Omega*, **2019**, 4, 2719-2727.
- [3] Pellico, J., *et al. Nanomedicine Nanotechnology*, **2019**, 17, 26-35.

Figures

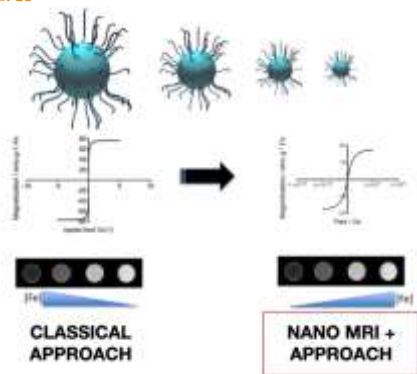


Figure 1: NanoMed+ project approach to MRI.