Multimodal nanotracers for molecular imaging of cardiovascular diseases

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Iron oxide nanoparticles are the eternal promise in the field of diagnosis by non invasive molecular imaging. These nanomaterials have some remarkable properties to fulfil such promise: biocompatibility, flexible surface chemistry and tailored synthesis. However, traditional superparamagnetic iron oxide nanoparticles, active as "negative" contrast probe in magnetic resonance imaging, are not suitable for many diseases. The identification of nanoparticle uptake in the area of interest is many times imposible because of the dark, hypointense, signal these nanoparticles provide.

^{68}Ga nanoradiomaterials (^{68}GaNRM) join both aspects: biocompatible nanoparticles with tailored properties providing hot-spot (bright) signal simultaneously in magnetic resonance imaging and positron emission tomography.[1] In our goup we are using these nanomaterials for the unambiguos detection of different molecular aspects of cardiovascular diseases, such as inflammation,[2] thrombobitc events[3] and, particularly, atherosclerosis plaque development.[4–6]

This talk will focus on the advantages of using such NRM as molecular imaging probes, their combination with other strategies (particularly the use of bioorthogonal chemistry) and possibilities for clinical translation.

References

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