

SEMINAR

Wednesday, 17.12.2025, 9:30, Kolar's Lecture Hall

Multicore Magnetic Nano-Assemblies for Imaging, Hyperthermia and Drug Delivery

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Multicore magnetic nano-assemblies (MNAs) based on iron oxide nanoparticles are promising platforms for combined imaging and therapy. In our group, MNAs are prepared by flash nanoprecipitation, allowing the co-assembly of magnetic cores, hydrophobic drugs (e.g. curcumin derivatives) and a polymer shell into a single colloidally stable object. I will present our formulation strategy and structural characterization, with an emphasis on STEM imaging that clearly resolves the internal multicore organization. The surface of MNAs is coated with cationic polyelectrolytes (such as poly-L-lysine), which can be further functionalized by click chemistry to graft peptides and other biomolecules. I will show recent results on peptide conjugation as a first step towards immunomodulatory and tolerogenic applications. Finally, I will briefly discuss our preliminary in vivo data in mice, which indicate good tolerability at relevant doses and support further development of these MNAs as magnetic theranostic nanoplatforms.

Kindly invited.