

4th Jagiellonian Symposium on Advances in Particle Physics and Medicine



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Key talk: PET-MRI nanotheranostics with radio-labelled nanoparticles

Thursday, 14 July 2022 14:00 (25 minutes)

In radiation oncology and nuclear medicine, the efficacy of theranostic strategies (i.e. combining treatment with diagnostic imaging) may be dramatically improved by leveraging the unique properties of nanoparticles. Due to their nanoscale size, nanoparticles can penetrate target tissues and tumour cells, and enhance physico-chemical reaction rates. In this talk, I will discuss the opportunities presented by superparamagnetic nanoparticles, which, when labelled with suitable radioisotopes, offer a means for realising PET-MRI theranostics. I will present results on a novel chelate-free technique for radio-labelling superparamagnetic nanoparticles with clinically relevant isotopes and discuss how such nanoparticles can improve the overall image quality of PET-MRI. I will also discuss how radio-labelling superparamagnetic nanoparticles with therapeutic isotopes presents an opportunity for enhancing internal targeted radiotherapy by leveraging MRI guidance and nanoparticle radio-enhancement effects.

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