

Quantitative Magnetic Particle Imaging Using Anatomically Correct Phantoms

Magnetic Particle Imaging (MPI) enables direct measurement of magnetic nanoparticle (MNP) distributions, but accurate iron mass estimation remains challenged by background signal, spillover effect, and anatomically complex uptake patterns. This webinar presents a phantom-based framework for quantitative MPI using anatomically realistic mouse models to emulate clinically relevant biodistribution scenarios, including liver accumulation and multiple localized signals throughout the body that can mimic different tumor types. We discuss segmentation strategies and background correction approaches required to obtain robust iron quantification in the presence of strong off-target signal. By leveraging controlled and biologically-relevant phantom structures, this work illustrates how quantitative MPI can be validated and optimized for reproducible, ethically responsible imaging in theranostics.