WORKSHOP:

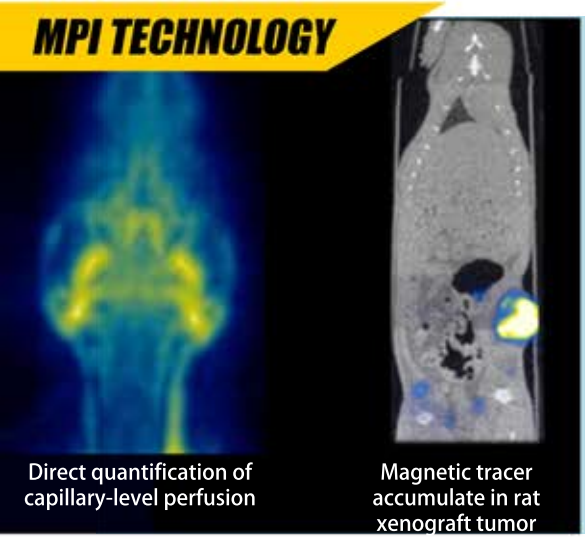
Magnetic Particle Imaging: Novel Magnetic-based Tracer Imaging



9.30 AM~12.00 NOON
29TH APRIL 2019

SINGAPORE BIOIMAGING CONSORTIUM
LEVEL 2 SEMINAR ROOM, HELIOS BUILDING,
11 BIOPOLIS WAY, S138667 (PLEASE ENTER VIA LEVEL 1)

MPI TECHNOLOGY



Direct quantification of capillary-level perfusion

Magnetic tracer accumulate in rat xenograft tumor

Magnetic particle imaging (MPI) is an emerging tracer imaging modality that detects magnetic nanoparticle tracers with high image contrast (zero tissue background signal), high sensitivity (~200nM Fe) with linear quantitation, and zero signal depth attenuation nor attenuation correction. Superb image contrast similar to PET or SPECT images can be achieved using magnetic tracers without radiation or decay of signal with time. Emerging applications for MPI are vascular and blood pool imaging, stem cell quantitation and tracking (200 cells in vivo over 89 days), cancer imaging, and acute gut bleed diagnosis (bleed rate as slow as 1–5 μL/min).



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Imaging Cancer Immunology

The success of cancer immunotherapy has driven the rapid growth of research into immuno-oncology, which has in turn fueled the need to be able to determine the location of a variety of immune cells in solid tumors and systemically over time. MPI is a novel pre-clinical cellular imaging technique for non-invasive tracking of iron-oxide tagged immune cells in vivo. By combining accurate quantification and specificity, MPI's long-lasting magnetic tracers can provide information on macrophage and other immune cell biodistributions in vivo over weeks or even months.

RF hyperthermia therapy with MPI

Magnetic nanoparticles used in MPI imaging can also be heated by RF excitation to provide therapeutic heat dose. We discuss how combining RF hyperthermia with MPI provides new theranostic opportunities such as: image-guided millimeter-scale spatial control and real-time monitoring of the therapeutic heat dose.



Live demonstration of MPI Scanner

Refreshment provided!

Presented by:

magnetic INSIGHT

A*STAR Singapore Bioimaging Consortium

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