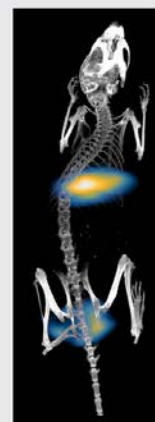
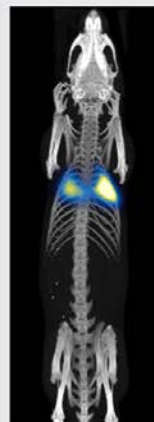
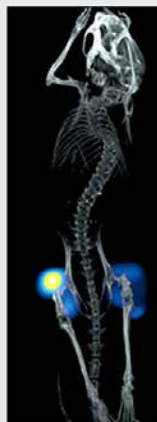




magnetic  
**INSIGHT**

Advancing *In Vivo* Research  
Through  
Quantitative, Non-invasive  
**Magnetic Particle Imaging**



## Magnetic Particle Imaging Applications: Inflammation, Theranostics, and Cell Tracking

Advances in cancer immunotherapy have fueled a boom in immuno-oncology research. There is an urgent need to track and accurately quantify cells *in vivo*. In addition, researchers need a method to systematically measure the biodistribution of immune cells in solid tumors over time.

**Magnetic Particle Imaging (MPI)** is a novel preclinical imaging technique used to non-invasively track iron-oxide-tagged immune cells *in vivo*.

Track *in vivo* the biodistributions of macrophages, other immune cells, stem cells, tumor cells for weeks or even months. The data is specific and quantitative. Data acquisition from nanoparticles can be combined with MRI or CT. Researchers can generate localized hyperthermia zones, as therapy or as an adjunct to radiation or immune therapies.

Magnetic Particle Imaging can be used for:

- *In vivo* systemic tracking and quantitation of immune (and other) cells in 3D
- Localized RF hyperthermia for tumor immunogenesis and nanoparticle actuation
- Drug delivery monitoring and image-guided theragnostics

Results from immune cell tracking, *in vivo* quantitation, drug-delivery monitoring and localized hyperthermia will be discussed.

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- Zhu, X. *et al*, Nano let **2019**, 19, 10, 6725-6733 - Quantitative Drug Release Monitoring in Tumors of Living Subjects by Magnetic Particle Imaging Nanocomposite DOI: [10.1021/acs.nanolett.9b01202](https://doi.org/10.1021/acs.nanolett.9b01202)

### Presenter: James Mansfield

James R. Mansfield is a scientist with over 25 years of experience in instrumentation and application development for the Life Sciences. His work has been in *in vivo* and pathology imaging and analysis, multispectral imaging, *in vivo* spectroscopy and applied data analysis, directed towards finding of novel methods for the diagnosis and monitoring of medical conditions. Jim is an associate editor of two journals, holds 8 patents, and has over 60 peer-reviewed publications.

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