aspectimaging

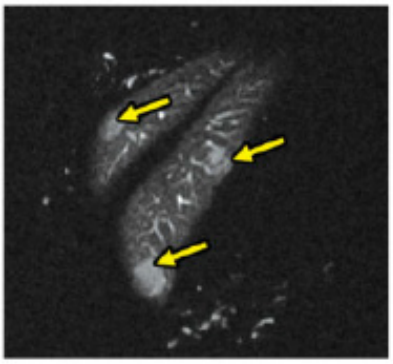
3D MR-Based Histology

Automated multi-sample *ex vivo* imaging

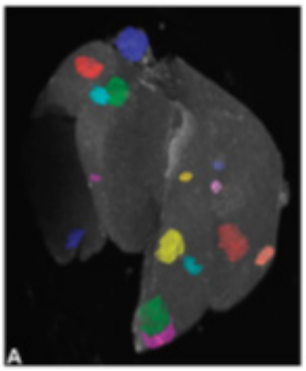
MRI Histology = Smart Toxicologic Pathology

Aspect Imaging's 3D MR-based histology system allows automated multi-sample *ex vivo* imaging of fixed samples and embryos for toxicological and developmental studies.
The histology system works with Aspect Imaging's M3™ and M7™ Compact MRI systems and transforms high-throughput 3D imaging of fixed samples into a quick, efficient and simple task for the modern toxicology lab or researcher.
The 3D MR-based histology system was designed for high spatial resolution enabling easy-to-use multi-sample ID and data management system.

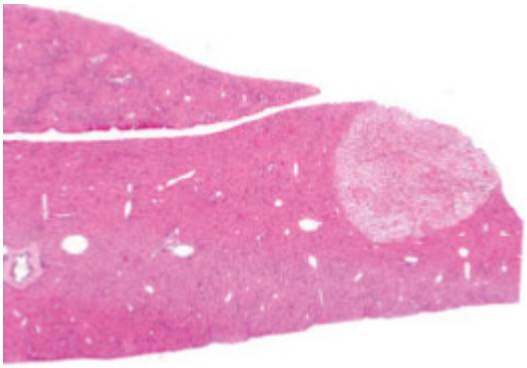
Hepatoxicity: Detecting, counting and measuring volume of hepatic lesions



Ex vivo detection of lesions

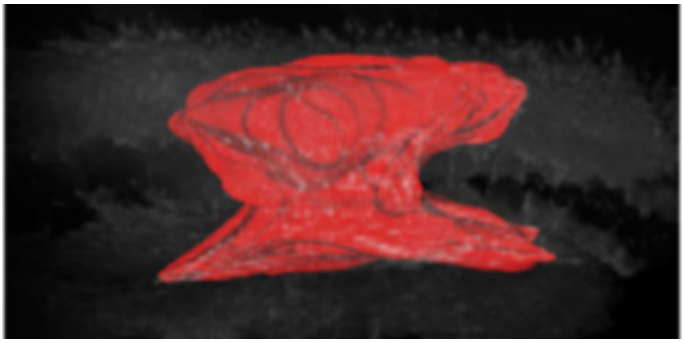


Segmentation of lesions

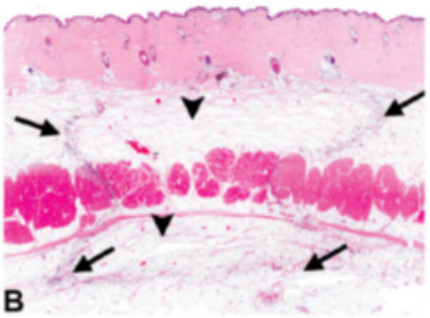


Histology validation

Injection site toxicity: Location and extent of irritation-related changes following drug injection

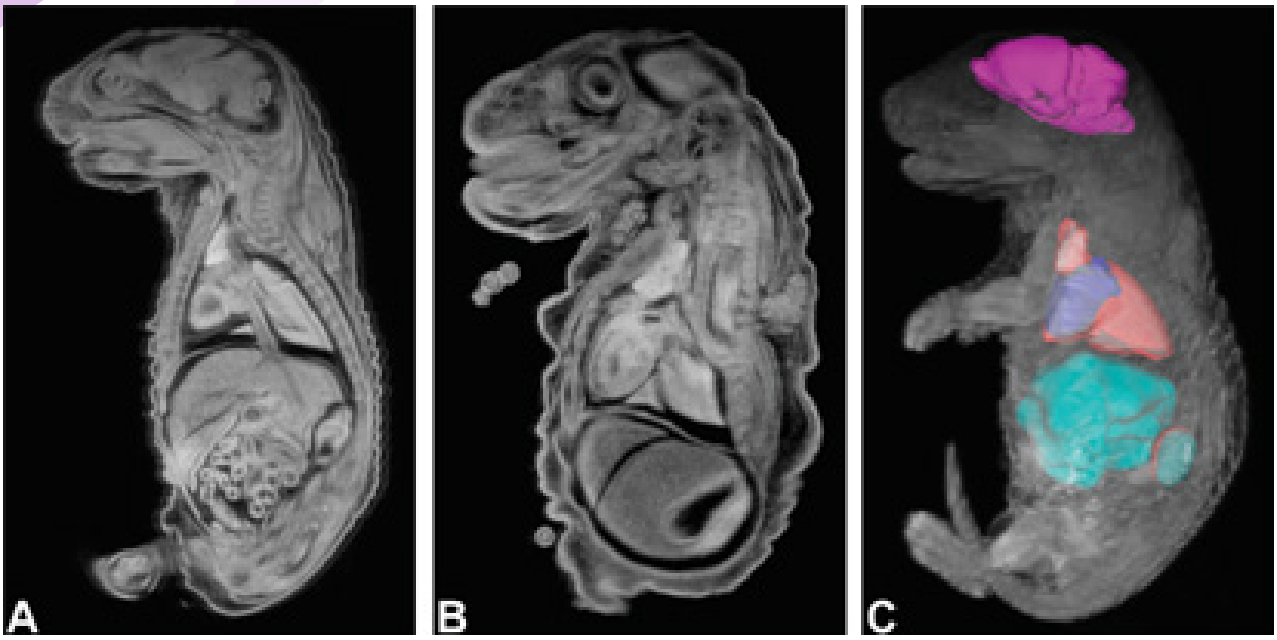


Segmentation of the subcutaneous affected volume

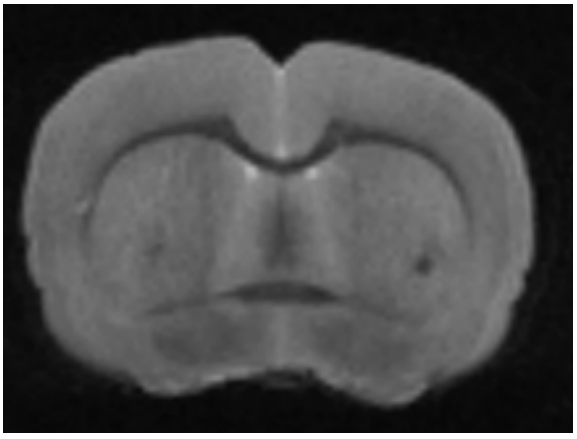


Histology validation

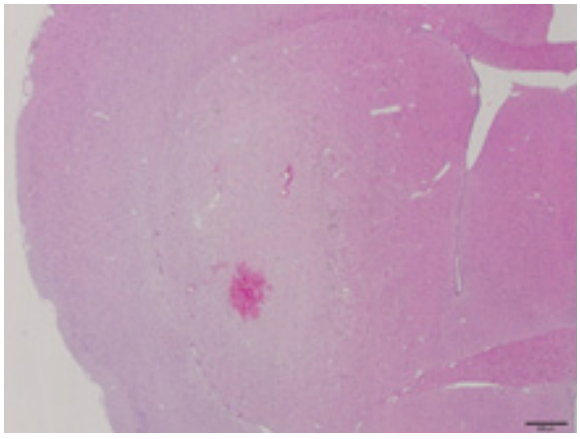
Reproductive and teratology studies: Phenotyping and volume measurements of organs



Neurotoxicity: Detection and quantification of toxicity-related changes



Ex vivo detection of neurotoxic lesions



Histology validation

Workflow for 3D MR-based Histology:

Step 1

Samples are placed in cartridges
Fixed samples (whole organs or tissue samples) are placed in the cartridges. As MR imaging is non-destructive, the tissue remains unchanged, and routine immunohistochemistry is easily performed following the 3D MR-based histology scans.

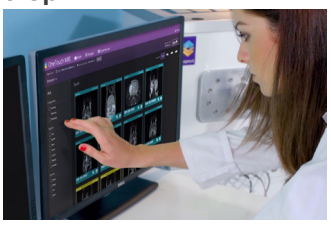
Step 2

Custom barcodes are printed and samples are scanned
The system produces unique barcode stickers which are applied to each cartridge. The cartridge is scanned and the study software brought up, which allows the operator to enter study-specific and sample-specific data. The appropriate imaging protocol is selected and associated with the sample barcode.

Step 3

Up to 9 cartridges are pre-loaded and scanned
The "auto-loader" allows up to 9 cartridges to be pre-loaded. A sample is advanced into the system, its bar code is read and the appropriate protocol run. The next sample is automatically advanced, starting the process again. The samples can be scanned overnight and left unattended.

Step 4



High resolution 3D digital images obtained
The system can automatically generate high-resolution 3D data sets of the samples.

Aspect Imaging's M-Series Compact One-Touch MRI systems enable a wide variety of *in vivo* and *ex vivo* applications, multi-modality imaging, and contrast agent research for molecular imaging. The systems can be uniquely placed behind the bio-containment barrier for *in vivo* imaging.
Aspect Imaging M-Series MRI assists in detecting and quantifying lesions in tissue. This dramatically improves the accuracy of toxicology studies.

A recent paper by the FDA describes in detail the use of MRI in living animals in a neurotoxicity study. MRI was shown to dramatically improve the section selection for neuropathology study:
https://www.ncbi.nlm.nih.gov/pubmed/25265367

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