

MRI Research Facility

www.medicine.uiowa.edu/mri

Facility Description

The MRI Research Facility provides MR imaging equipment and expertise to any researcher with MR imaging needs. Three field strengths are available (1.5T, 3T, and 7T). Oversight is provided by both internal and external research advisory committees. The internal research committee reviews new project proposals and equipment acquisitions. The MR research Facility currently supports more than 60 research imaging projects from fourteen different departments representing five colleges within the University of Iowa.

Instrumentation

The facility currently has two research dedicated whole body MR scanners (3.0T GE Discovery Premier, 7.0T GE 950) and one small animal MR scanner (7.0T GE 901 Discovery) available for research. A shared clinical/research 3T scanner is also available in the clinical imaging suite (3T Siemens Skyra). An MRI Simulator is available to all researchers.

3.0T GE Discovery Premier 750W MRI Scanner (L425 PBDB)

This scanner offers a 70cm bore and is equipped with parallel RF Transmit (MultiDrive), Total Digital Imaging (TDI), and AIR Coils for neuro and body imaging. TDI is composed of three advancements in RF technology: 1) Direct Digital Interface (DDI), 2) Digital Surround Technology (DST), and 3) Digital Micro Switching (DMS). The scanner is equipped with gradient coils of strength of 100 mT/m and a maximum slew rate of 200 T/m/s. The scanner also has multi band echo-planar imaging, spectroscopic imaging, and multi-nuclear imaging capabilities. Additionally, the Department of Radiology has research agreements in place with GE Healthcare to support pulse programming efforts and sharing of state-of-the-art pre-release pulse sequences.

Specialized Sequences:

- IDEAL (Fat/Water Imaging)
- 3D ASL
- SWAN (QSM)
- Cardiac Expert
- MERGE (Multi-echo GRE)
- T1q
- 2D COSY
- Propeller
- HARDI DTI
- MAVRIC (Metal Reduction)
- LAVA (T1 DCE)
- Single Voxel Spectroscopy
- EPSI
- 3D CUBE
- Multi-band (SMS) echo-planar
- Parametric Mapping (T2, T2*)
- 2D/3D SSFP
- PROMO (Motion Correction)
- Chemical Shift Imaging
- CEST
- MP-RAGE/MP2RAGE
- Silent
- 4D Flow
- Elastography
- Propeller
- ZTE

Other Equipment:

- BIOPAC Physiological Monitoring System -Including: photoplethysmograph (PPG), respiratory, galvanic skin response (GSR), pulse ox, air flow, and expired gas analysis.
- Merasens FerroGuard metal detector

Functional (fMRI) Equipment:

- Avotec Silent Scan
- Stimulus Computer
- FOMRI II Dual-channel MRI microphone
- Avotec Silent Vision
- Software: E-prime, Presentation & Matlab
- Response Pads: Lumina Response Pad, Psychology Software Tools (PST) fiber optic manipulandums
- Lumina Response pad
- Avotec Real Eye Tracker
- MediGlasses corrective lenses
- OptoAcoustics II active noise cancelling headphones
- Avotec Silent Vision (SV-6060)

Coils:

- 60-Channel Posterior Array
- 48-Channel Head Coil
- 21-Channel Head/Neck Array
- 16-Channel Shoulder Array
- 32-Channel Head Coil
- TR ¹²⁹Xe Body Coil
- 30-Channel Anterior Array
- 18-Channel Knee Coil
- 16-Channel ¹²⁹X3 Body Array
- 16-Channel Hand/Wrist Array
- 8-Channel Body Array
- Dual Tuned Rapid ¹H/³¹P Head Coil
- 12-Channel Spine Coil
- 16-channel Flex Coils (Md, Lg)
- ¹⁹F Body Coil
- T/R Head Coil



7.0T GE 950 Scanner

Specialized Sequences:

- IDEAL (Fat/Water Imaging)
- 3D ASL
- SWAN (QSM)
- LAVA
- T1 ρ
- 2D COSY
- Propeller
- HARDI DTI
- FLEX
- Silent
- Single Voxel Spectroscopy
- EPSI
- 3D CUBE
- Multi-Band (SMS) echo-planar
- Parametric Mapping (T2, T2*)
- TRICKS
- Chemical Shift Imaging
- CEST

Functional (fMRI) Equipment:

- Avotec Silent Scan
- Avotec Silent Vision
- MediGlasses prescriptive lenses
- Stimulus Computer
- Software:
E-prime, Presentation, Matlab & PsychoPy
- Lumina Response Pad

Coils:

- 2Tx/32Rx Channel Head Coil
- 8Tx/32Rx Channel Head Coil
- 8Tx/32Rx MR Coils Body Coil
- 2Tx/28Rx Extremity Coil
- $^1\text{H}/^{31}\text{P}$ Dual Tuned Head Coil
- $^1\text{H}/^{23}\text{Na}$ Dual Tuned Head Coil
- $^1\text{H}/^{23}\text{Na}$ Dual Tuned Flex Coil

Other Equipment:

- BIOPAC Physiological Monitoring System - Including:
photoplethysmograph (PPG), respiratory, galvanic skin response (GSR), pulse ox, air flow, and expired gas analysis.
- Merasens FerroGuard metal detector



Siemens 3.0T Skyra MR Scanner (0400 JCP)

This scanner offers a 70cm bore to provide a high level of patient comfort. The system is equipped with various features to support research initiatives. The scanner has 45 mT/m gradient coils with a maximum slew rate of 200 T/m/s.

Psychology Software Tools, Inc. MRI Simulator (L550A PBDB)

An MRI Simulator, built by Psychology Software Tools (PST), provides a realistic approximation of an actual MRI scanner to allow acclimatization and fMRI training of participants in an environment less daunting than a real scanner. Access is controlled by a University ID badge reader. The MRI Simulator is available free of charge for any researcher participating in MR imaging studies.

Availability and Pricing

The research-dedicated GE 7T (L547 PBDB) and GE 3T (L425 PBDB) scanners are available Monday through Friday 8:00am - 6:00pm. The Other systems have limited availability which can be found on our website. Pricing for the scanners is set yearly, is charged in fifteen-minute increments, and includes a technologist to run the scanner. The FY2021 rate for the whole body 7T is \$650/hr., 3T and 1.5T scanners is \$650/hour (7T small animal scanner \$100/hour). Gadolinium contrast is \$100 per injection. Additional service fees are charged on a per-use basis.

Contact Information

Vincent Magnotta, PhD

Director

☎ L311 PBDB

☎ (319) 335-5482

✉ vincent-magnotta@uiowa.edu

Dan Thedens, PhD

Co-Director

☎ L425 PBDB

☎ (319) 335-5482

✉ dan-thedens@uiowa.edu

Alan Stolpen, MD, PhD

Co-Director

☎ 0453-C JCP

☎ (319) 353-8686

✉ alan-stolpen@uiowa.edu

Alan McCarville

IT Support Consultant

☎ L425 PBDB

☎ (319) 335-5189

✉ alan-mccarville@uiowa.edu

Marla Kleingartner, RTR, MR

MRI Technologist

☎ L425 PBDB

☎ (319) 335-8706

✉ marla-kleingartner@uiowa.edu

Autumn Craig, RTR

MRI Technologist

☎ L425 PBDB

☎ (319) 335-8706

✉ autumn-craig@uiowa.edu

Kori Rich, RTR, MR

MRI Technologist

☎ L425 PBDB

☎ (319) 335-8706

✉ kori-rich@uiowa.edu