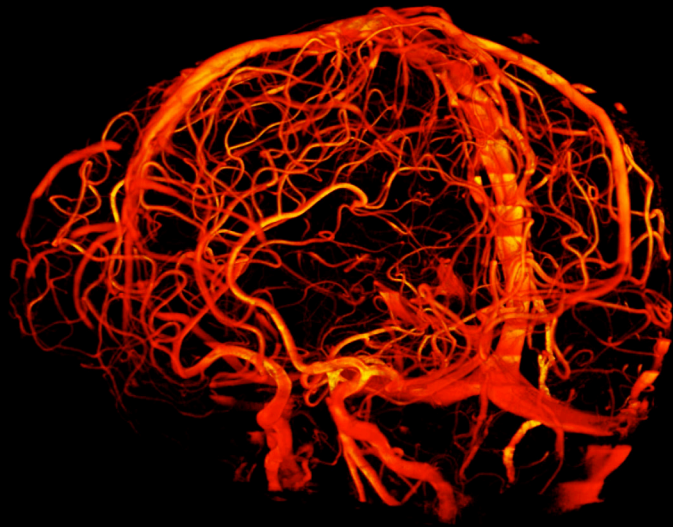


Human Imaging



The University of Queensland's Centre for Advanced Imaging (CAI) offers state-of-the-art imaging facilities with a comprehensive range of advanced magnetic resonance and molecular imaging instruments.

Access to CAI human imaging facilities is available on a fee basis. Our experienced staff are experts in the field and offer the following fee-to-service:

- Assistance with experimental design
- Optimisation
- Data and image analysis and interpretation

Magnetom 7T Whole Body MRI

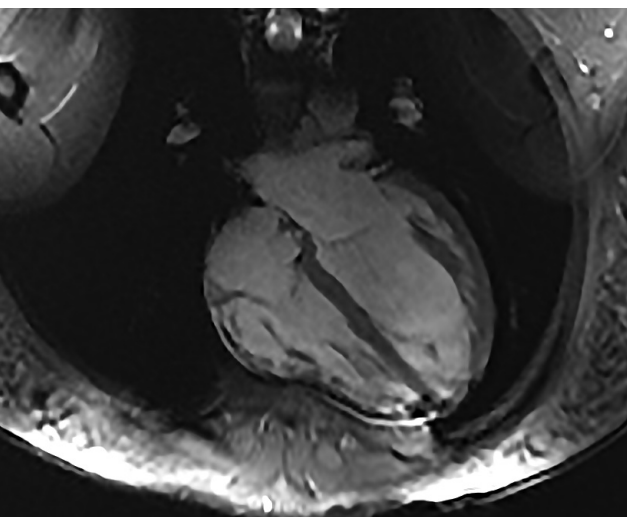
The Siemens Healthcare 7 Tesla Whole Body MRI system is the first in Australia and is also a Flagship instrument of the National Imaging Facility (NIF; anif.org.au). The system includes a high-performance gradient with multi-receive and multi-transmit radiofrequency capabilities, which further increase sensitivity.

Technical specifications:

- The gradient capabilities on this instrument are 70 mT/m at a slew rate of 200 T/m/s
- Single channel transmit/32 channel receive head coil
- 8 channel transmit/32 channel receive cardiac coil
- Single channel transmit/28 channel knee coil
- Surface coil
- 8 channel transmit/receive $^{19}\text{F}/\text{H}$ body coil designed for lung imaging

Ancillary equipment for the Magnetom 3T and 7T Whole Body MRI:

- Projector for delivery of cognitive paradigms
- Eye tracker
- Simultaneous EEG
- Physiological monitoring/recording
- Motion capture cameras
- Full range of response boxes for fMRI paradigms
- Temperature monitoring/recording
- External ECG recording/trigger



Cardiac imaging at 7 Tesla

Image top: Cerebral blood vessels of a human brain

This is a Flagship instrument of the National Imaging Facility (anif.org.au)

Magnetom Prisma^{fit} 3T Whole Body MRI

CAI has a wide range of coils and software for applications in neurology, cardiology, angiography, oncology, orthopaedics and paediatrics. The laboratory is able to provide tools for cognitive neuroscience studies.

Technical specifications:

- High performance/low acoustic Gradients (80 mT/m with 200 T/m/s Slew rate)
- 64 Channel Head and Neck coil
- 20 Channel head and Neck coil
- 32 Channel Spine array coil
- 18 Channel body matrix coil
- 4 Channel flex coil – small and Large
- 15 Channel Knee coil

Biograph Horizon PET/CT Large Bore Scanner

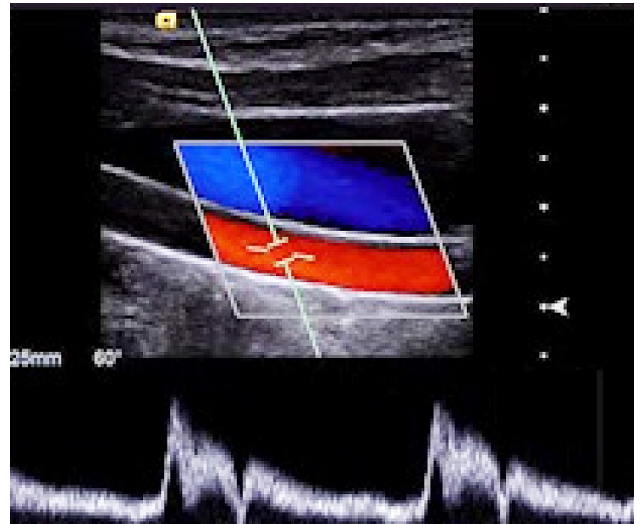
Combining X-Ray Computed Tomography (CT) and Positron Emission Tomography (PET) scanners, this instrument enables registration and fusion of physiologic and anatomic information. The CT component is capable of providing three-dimensional computed tomography images. The PET scanner measures the distribution of PET radiopharmaceuticals. CAI has comprehensive cyclotron and radiochemistry facilities for the production of PET radiopharmaceuticals. The Biograph Horizon scanner system is equipped with Siemens multi-modality software, *syngo*. The scanner forms part of an ACRF Facility for human microdosing studies using molecular imaging.

Technical specifications:

- 700 mm CT-16/32 Slice
- PET axial Field of view (FOV) of 164 mm
- Time of Flight (TOF) reconstruction capability
- UltraHD+PET³ + TrueV (combination of technologies that offers the potential for short scan time and PET scans).
- CT Safire (CT iterative reconstruction for up to 60% lower dose)
- Respiratory gating option



The CAI Biograph Horizon PET/CT Large Bore Scanner



Carotid artery ultrasound

Acuson S3000 Ultrasound

The high performance Siemens/Acuson S3000 Ultrasound can be used for a variety of studies including long structures such as tendons, nerves and blood vessels, fetal monitoring, the assessment of musculoskeletal structures, heart valve function, blood flow velocity and direction and organ perfusion.

Technical specifications:

- B-mode, colour and pulsed wave Doppler, power Doppler, harmonic imaging
- Spatial compounding in B mode, colour and power Doppler
- Capability of multimodal review – for example to compare the ultrasound image to that of MRI/CT/PET on the same screen
- Panoramic imaging of 240cm in length
- Off line transfer and data processing
- Elastography capabilities to assess tissue stiffness. This system is capable of real time voxel placement and shear wave velocity estimation, as well as the generation of corresponding colour coded tissue stiffness map



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