

3T Magnetic Resonance Imaging (MRI)

<https://search.labfacilities.wur.nl/SearchDetail.aspx?deviceid=a2214817-878a-4eb8-95b8-54e5b1892ff9>

Brand

Siemens

Type

3T Magnetom Verio



Contact

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Organisation

Other

Description

Shared Research Facilities offers the use of a state-of-the-art high-field MRI scanner (3T Siemens Magnetom Verio) for structural and functional MRI (fMRI). This MRI scanner can be used for (clinical) diagnostics as well as fundamental or applied research. All body parts can be visualised in 3D or even 4D (3D in time). Dedicated coils are available for various body parts. Our MRI scanner is located at the Gelderse Vallei Hospital in Ede.

Magnetic resonance imaging (MRI) is a potent and versatile, non-invasive imaging technique which yields structural (anatomical) as well as functional images of (parts of) the human body. This is achieved by combining a strong magnetic field with radiofrequency pulses.

Technical Details

Available coils

- 12-channel head coil
- 32-channel head coil
- Body/spine coil
- Knee coil
- Ankle coil
- Wrist coil
- Endo-rectal coil

Applications

Specialised clinical diagnostics using anatomical MRI and / or functional neuroimaging.

Fundamental and applied research:

- Functional neuroimaging:
- Brain responses (functional MRI / fMRI), in particular brain responses to food cues like pictures of foods, taste and smell. For this application, ancillary equipment such as an olfactometer, gustometer and projector is available.
- Brain perfusion/blood flow (Cerebral Blood Flow, CBF), a measure of brain activity. This is measured by means of Arterial Spin Labelling (ASL), i.e., without the use of magnetic contrast agents.
- Anatomical MRI, for example:
- Soft tissue anatomy.
- Body fat distribution (total % body fat, visceral adipose tissue) obtained from structural (T1-weighted) images or fat-selective techniques.
- Determination of liver fat percentage by water-fat separation with the so-called Dixon technique or MR Spectroscopy (MRS).
- Determination of muscle fat content.

Complementary Techniques

Stimuli for functional MRI studies

- Visual stimulation: high quality presentation (via back-projection) from our stimulus PC or a laptop. This enables one to have subjects perform different tasks while being scanned. E.g., neuropsychological tasks, reward tasks, product evaluation, product choice. In addition several MRI-compatible (optical) button boxes are available, among others for obtaining subjective ratings (VAS scores) or reaction times. For this rear projection, a mirror is mounted on the head coil, which gives the participant a stable visual experience.

- Taste stimulation (gustometer)

- Odour stimulation (olfactometer)

- Audio / sound stimulation: MRI-compatible headphones of MR Confon that can be used in combination with the Siemens 12 and 64-channel head coils. The maximum sound pressure level is around 90 dB with frequency range from 300 to 12000 Hz. Intended for use in functional neuroimaging studies employing sound/speech or video stimuli.