Ultra-high field MRI 7T scanner (Cambridge University)

Infrastructure name

Ultra-high field MRI '7T' scanner (Cambridge University)

Institute/location

MRC Cognition and Brain Sciences Unit, Cambridge University, UK

Key contact

Professor J Rowe

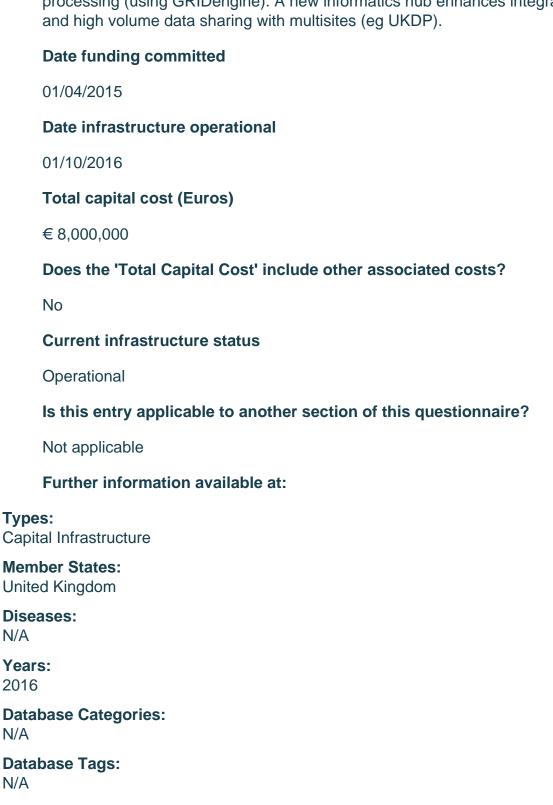**Contact phone number**

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Project/infrastructure description

A new collaborative ultra-high field MRI facility for dementia and neuroscience research. The resolution of 7T MRI will be used to study the pathogenesis of dementia, mechanisms of resilience, and response to therapy in terms of structure (volumetric and diffusion weighted), function (BOLD) and spectroscopy. Sensitivity to iron deposition by quantitative susceptibility mapping is especially relevant to Alzheimer's disease, while structural and functional changes in vasculature will be examined as markers and targets in stoke, dementia and Huntington's disease. We will delineate the aetiological role of small but critical subcortical structures (eg hypothalamus, brainstem nuclei, hippocampal subfields). Columnar and laminar resolution of 7T fMRI will be used to understand the neuronal code, testing the predicted functional dissociations between cortical layers for hierarchical information processing. The cross linking of neurochemistry (MRS) with functional and structural data will reveal mechanisms of individual differences, in health and disorders, and potential stratification of therapeutic strategies. The new facility is part of the UK7T network, to promote knowledge transfer, data sharing, training, and coordinated of magnet supply. WBIC and CBSU have Master Research Agreements with Siemens and costs follow a Siemens 7T review, but tendering is open to all manufacturers. We require a minimum of 70mT/m gradients, 8 channel parallel transmission, 32 channel receiver, multinuclear spectroscopy and high order shimming. WBIC is controlled through a Clinical Radiology Information system to collect and monitor data, research protocols and scheduled transfer to PACS for long term secure storage, and secure access control. The proposed high performance informatics hub (data management plan) proposes to increase UoC data analysis

capacity from 256 to 1024x16 Gb cores, fast user access to data and efficient parallel processing (using GRIDengine). A new informatics hub enhances integration with NHS systems and high volume data sharing with multisites (eg UKDP).

Date funding committed

01/04/2015

Date infrastructure operational

01/10/2016

Total capital cost (Euros)

€ 8,000,000

Does the 'Total Capital Cost' include other associated costs?

No

Current infrastructure status

Operational

Is this entry applicable to another section of this questionnaire?

Not applicable

Further information available at:

Types:
Capital Infrastructure

Member States:
United Kingdom

Diseases:
N/A

Years:
2016

Database Categories:
N/A

Database Tags:
N/A