Brain Injury
MedTech Co-operative

NHS
National Institute for Health Research

Functional Neuroimaging & Neurophysiology

MIC Theme 5

Professor Franklin Aigbirhio

The NIHR Brain Injury MedTech Co-operative is a partnership between the Cambridge University Hospitals NHS Foundation Trust and the University of Cambridge

Team

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- **Prof Franklin Aigbirhio (theme lead)** - Director of PET (Radiochemistry) Sciences at WBIC
- **Prof John Aston** - Professor of Statistics at the Statistical Laboratory Cambridge.
- **Dr Istvan Boros** - Head of WBIC Radiopharmaceutical Unit, WBIC
- **Dr Adrian Carpenter** - Director of MRI at the WBIC.
- **Dr Srivas Chennu** - Senior Research Associate, Academic Neurosurgery.
- **Dr Tim Fryer** - Assistant Director of Research and Head of PET Physics at the WBIC
- **Dr Mark Gurnell** - University Senior Lecturer in Endocrinology & Honorary Consultant Physician
- **Prof David Menon** and **Dr Emmanual Stamatakis** - (section Theme 2 NeuroCritical Care)
- **Dr Guy Williams** - Assistant Director of Research and Head of Neuroinformatics at the WBIC

Background

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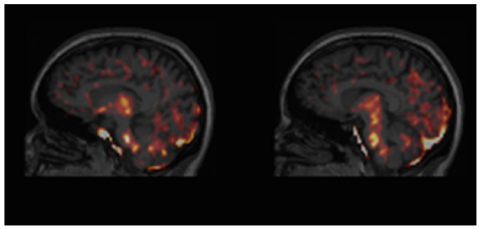
Build on recent major investments (2015, MRC Clinical Research Infrastructure Award/NIHR) in imaging at Cambridge Biomedical Campus: "**Molecular Imaging Centre"** centered at the **Wolfson Brain Imaging Centre**

- GE Signa PET-MR Scanner
- Upgraded Radiopharmaceutical Unit
- Siemens 7T Terra MRI scanner
- Siemens Skyra 3T MRI scanner
- High performance hub for informatics.

GE PET-MR Scanner at WBIC



Imaging Neuroinflammation with [^{11}C]PK11195 PET-MR scan

Strategy

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Year 1

Short-term aims

- Establish quantitative PET-MR imaging methods
- Establish clinical PET imaging of synaptic density
- Install the new neuroinformatic infrastructure
- Initiate 7T MRI imaging
- Conduct safety studies of monitoring equipment at 7T
- Establish EEG-fMR in the Wolfson Brain Imaging Centre
- Pursue fEEG studies of patients with prolonged disorders of consciousness in the community setting

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Year 2-3

Medium-term aims

- Perform evaluation of a novel TSPO PET radiotracer toward human studies – *MRC CiC award*
- First in human clinical trials to establish a novel 18F radiotracer for adrenal imaging – *MRC DPFS award*
- Identify a range of novel compounds as markers of oligomeric beta-sheet structures – *EPSRC grant award*

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Year 4-5

Long-term aims

- Perform preclinical evaluation of a novel radiotracer for imaging CNS progenitor cells
- Develop neuroimaging PET markers for mitochondrial dysfunction.
- Perform human studies with PET markers of oligomeric beta-sheet structures - tau, beta-amyloid, alpha-synuclein

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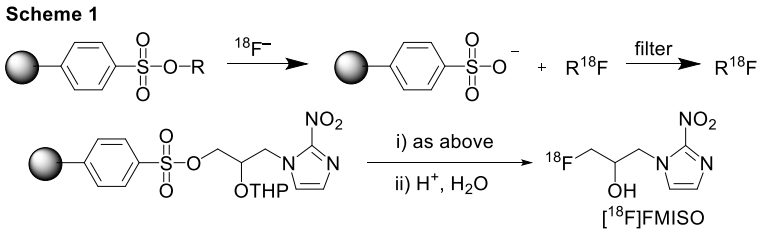
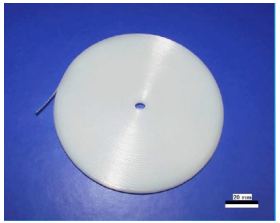
Overarching Aim: Enable wider application of neuroimaging methods

- Simpler Methods for preparation of PET radiotracers



Solid- phase synthesis of radiotracer



Develop a prototype manufacturing module based on flow chemistry using a patented micro capillary film

Collaboration with Prof Nigel Slater Department of Chemical Engineering.

MRC CiC award obtained - aim for MRC DPFS funding for prototype systems

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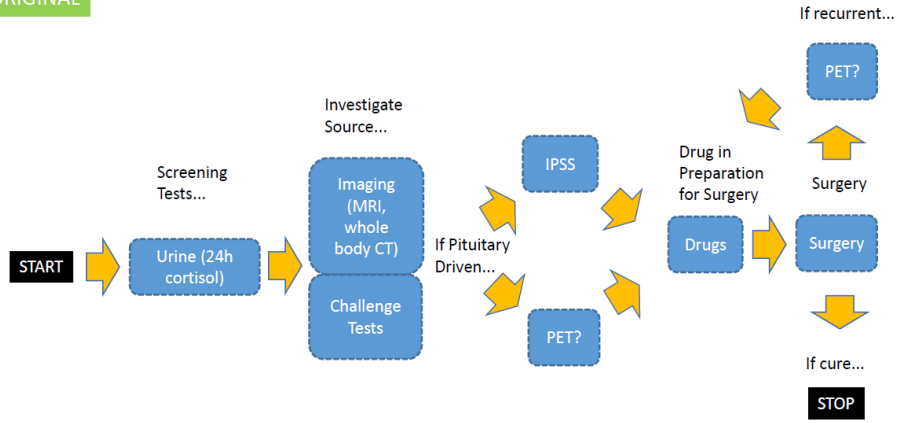
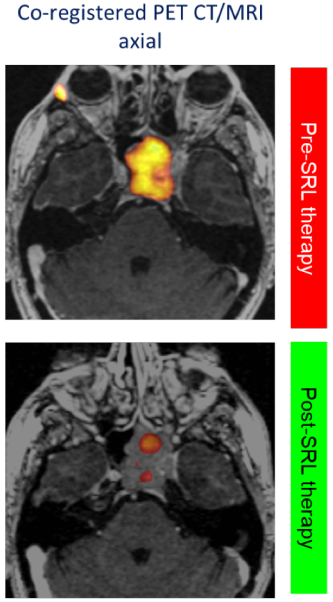
Overarching Aim: Enable wider Application of Neuroimaging methods

- Health Economics Case for Imaging

  With Mark Gurnell, Alonso Pena , John Pickard - Exploring the health economics of PET

ORIGINAL





Pituitary imaging with [^{11}C]MET PET-MR (Mark Gurnell)