Current Dementia Research QUB

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Queen's University Belfast is a member of the Russell Group of 24 leading UK research-intensive universities, providing world-class education underpinned by world-class research.

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<table>
<thead>
<tr>
<th>Name</th>
<th>Start date</th>
<th>Duration</th>
<th>Project title</th>
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<tr>
<td>S Graham</td>
<td>2011</td>
<td>36 months</td>
<td>Use of metabolomics in MCI</td>
<td>ARUK</td>
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<td>P Passmore</td>
<td>2014</td>
<td>48 months</td>
<td>AFFECT</td>
<td>Alz Soc/ BHF</td>
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<td>C Neville</td>
<td>2014</td>
<td>36 months</td>
<td>Diet, retinal microvascular health, cognitive decline and dementia risk: the NICOLA and TILDA studies</td>
<td>CARDI (AP &amp; HSC)</td>
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<td>J McHugh</td>
<td>2014</td>
<td>36 months</td>
<td>Social determinants of cognitive decline among older adults in Ireland</td>
<td>CARDI (AP &amp; HSC)</td>
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<tr>
<td>E Cunningham</td>
<td>2012</td>
<td>36 months</td>
<td>Predictors of post-operative delirium</td>
<td>Private</td>
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## Commissioned Research Dementia Care-Successful Applications

<table>
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<tr>
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<td>1</td>
<td>Dr Carole Parsons 2013</td>
<td>QUB</td>
<td>01.01.14</td>
<td>36 months Pain assessment and management for patients with advanced dementia care nearing the end of life</td>
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<td>2</td>
<td>Professor Kevin Brazil 2013</td>
<td>QUB</td>
<td>01.02.14</td>
<td>36 months Promoting informed decision making and effective communication through advance care planning for people with dementia and their family carers</td>
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<td>3</td>
<td>Professor Carmel Hughes 2014</td>
<td>QUB</td>
<td>01.11.14</td>
<td>36 months The development of a comprehensive medicines management approach for persons with dementia</td>
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Approach

- 80 patients sample from Belfast Memory Clinic (40 age-matched controls, 20 MCI and 20 MCI_AD)
- Multivariate analysis to discriminate patients
- Mass spectrometry signatures comprising thousands of ‘unidentified metabolites’
- Five biomarker panel with AUC of 0.93
Publications from Collaboration


- Stewart Graham, Olivier Paul Chevallier; Christopher Elliott; Christian Holscher; Janet Johnston; Bernadette McGuinness; Pat Kehoe; Anthony P Passmore; Brian Green. Untargeted metabolomic analysis of human plasma indicates differentially affected polyamine and L-arginine metabolism in Mild Cognitive Impairment subjects converting to Alzheimer's disease. Submitted PLOS ONE
A randomised controlled trial of calcium channel blockade with Amlodipine For the treatment of subcortical ischaemic vascular dementia

Chief Investigator: Prof Peter Passmore

Clinical Trials Unit: Northern Ireland Clinical Trials Unit (NICTU)
AFFECT

- A multi-centre, randomised, double-blind, placebo-controlled, parallel phase IIb trial of amlodipine in patients with Subcortical Ischaemic Vascular Dementia (SIVD)

- Sponsor: Belfast Health & Social Care Trust (BHSCT)

- Funders: Alzheimer's Society & British Heart Foundation

- Aim to recruit 588 patients aged 50 years or over from the community, outpatient setting

- 4 year trial; 2 year recruitment & 2 year follow-up
Study Aim

- To test the hypothesis that treatment with the calcium channel blockade medication amlodipine for 52 weeks can improve outcomes for patients with SIVD
Study Objectives

• Primary
  – To determine whether amlodipine will confer significant benefit with respect to change in cognitive outcome in people with SIVD, in comparison to placebo over 52 weeks

  Measured by:
  • Vascular Dementia Assessment Scale cognitive subscale (VADAS-cog), change from Baseline to 12 months
Study Objectives

• Secondary
  – To determine whether amlodipine will confer additional benefits on the following secondary outcomes; global impression of change, activities of daily living, neuropsychiatric symptoms and carer burden, in comparison to placebo
  – To determine if amlodipine will be a cost effective treatment for SIVD compared to placebo
Research goal

To determine whether eating fruit and vegetables is associated with retinal microvascular health and cognitive decline and dementia risk in older adults: using the NICOLA and TILDA studies
Methods

- **Study population:**
  - NICOLA: Northern Ireland Cohort for the Longitudinal Study of Ageing
  - TILDA: The Irish LongituDinal Study on Ageing
  - Large, nationally representative, longitudinal studies (>10 yrs)
  - ~ 8500 men/women aged 50 yr +

- **Dietary validation study (novel):**
  - food frequency questionnaire (NICOLA) vs biomarkers of FV intake
  - comparing the multiple pass 24-h dietary recall with a 4-day food diary (ref method) in a NICOLA subsample

- **Measurement of a panel of FV biomarkers**
  (NICOLA and TILDA)

- **Analysis of digital retinal microvascular images (TILDA)**
Methods

• Cognitive measures
  - Mini-mental state examination (MMSE)
  - Montreal cognitive assessment (MoCA)
  - Choice reaction time, sustained attention response time, picture memory test, visual reasoning

• Proposed analyses
  - Cross-sectional (NICOLA)
  - Longitudinal (TILDA)

  Associations between:
  - FV intake and cognitive health (NICOLA) and cognitive decline and dementia (TILDA)
  - FV intake and retinal microvascular health (TILDA)
  - Retinal microvascular parameters and cognitive decline and dementia (TILDA)
Dementia Research- Future

• Active Ageing Collaborative Network-Dementia Registry, Patient Portal, Dementia App. At Business Case
• Retinal photography and optical coherence tomography in MCI
• Cognitive follow-up PRIME cohort
• EEG as a biomarker for dementia
• Mediterranean Diet and MCI
• Vitamin D and MCI/AD
Summary

• Various schools involved in dementia research
• Good infrastructure with NICTU/CRF and Dementia CMG
• Good UK/Ireland collaborations
• Working on strengthening US and Europe collaborations