CHeBA Research Day
Metabolic and Inflammatory Factors

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Context

- NHMRC DRG $904,409
- Investigating the impact of metabolic and inflammatory factors on cognitive function in the elderly
- Add on to 2 MAS & OATS
- March 2008-Dec 2012
- Trollor, Campbell, Samaras, Baune, Brodaty, Wright, Martin, Wen, Baune, Sachdev, Schofield, Draper, Ames, Lee
Overall Aims

Evaluate role of metabolic and inflammatory factors modulating effects of genetic susceptibility, physical health, lifestyle and nutrition on brain ageing.

Discover factors that promote healthy ageing, and identify risk factors.
Objectives

To characterise the contribution of obesity, obesity-related proinflammatory cytokines and the metabolic syndrome to cognitive and imaging markers of ageing.

To evaluate the interactive effect of biomarkers associated with both a ‘proinflammatory state’ and ‘metabolic syndrome’ and other risk factors for dementia.

To identify the metabolic and genetic predictors of arterial stiffness and to examine the cognitive and brain imaging correlates of increased arterial stiffness.

To identify new polymorphisms relating to inflammatory cytokines and examine their interactive effect with a range of vascular, lifestyle and other genetic risk factors for cognitive decline.
**Cohorts**

**The Memory and Ageing Study**
(Brodaty, Sachdev, Draper, Broe and Trollor)

**The Older Australian Twins Study**
(Sachdev, Martin, Ames, Schofield, Brodaty, Wright, Trollor, Wen, Lee)
MAS

- Serum from Wave 1 & 2 (most participants)
  - Inflammatory markers
  - Insulins
- Lab assessments wave 2 (half of the participants)
  - Anthropometric measures
  - CVS: Arterial stiffness, ECG, tilt BP
  - Retinal photography
- Lab assessments wave 3 (aiming for half of the participants)
  - Anthropometric measures
  - CVS: Arterial stiffness, ECG
Assessment

- **Blood Tests:** Fasting glucose & insulin; lipids & lipid peroxidation products, total nitrates, nitric oxide synthase (NOS); inflammatory markers and adipokines: C-reactive protein (CRP), adiponectin, Tumour necrosis factor α (TNF-a), Interleukin assays (IL-1, IL6, IL-8, IL-10, IL-12p70), vascular cell adhesion molecule (VCAM); PAI 1 and serum amyloid A.
- **Genetic Analyses**
- **Arterial Stiffness**
- **Anthropometric Measures:** Free fat and fat mass (bioelectrical impedance analysis); DXA added for wave 3 MAS.
- **ECG**
- **Retinal Photography** (MAS Only)
- **MRI Scans:** Abdominal Fat – still struggling
MAS

- Arterial Stiffness
- Arterial Stiffness & Cognition
- ILP
- retinal vessel calibre, cognitive function & MRI measures
- ECG

- Obesity Review
- Obesity and MCI/Cognition
- DEXA vs BMI & cognition
- 1 thesis

- Normative data
- Cognition MAS
- 2 masters
- Dietary patterns-longitudinal

- Review
- Cross sectional MAS
- MCI subtypes
- MIC 1 cognition & MRI
- Depression
- ILP
- Brain volumes
- DTI
- Cytokine polymorphisms

- Inflammation
- Anthropometric
- Nutritional
- Cardiovascular

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OATS

- Arterial Stiffness
- Dietary preference
- Cognition

- Obesity/body composition
- Genetic vs environmental determinants of inflammation

- Anthropometric
- Nutritional
- Cardiovascular
- Arterial Stiffness
Risk Factor Analyses

Risk Factor

Control variables

Phenotype
Risk Factor Analyses

- Inflammation
- Exercise, diet, cognitive activity
- Age-related outcomes
Resourcing

• Grant Applications:
  – Eg “Defining the role of Inflammation in Depression during Ageing”

• PhD, Masters, ILP students
  – Opportunities
  – Incentives

• Research Streams
Assessments

OATS:
• 199 participants undertook on the CV assessment.
• 12 NSW participants body composition with DEX.

MAS wave 2:
• 530 participants undertook on the CV assessment.

MAS wave 3:
• 121 participants had a CV assessment (75 of these also had their CV assessment done at wave 2).
• 128 had their body composition assessed with DEX.