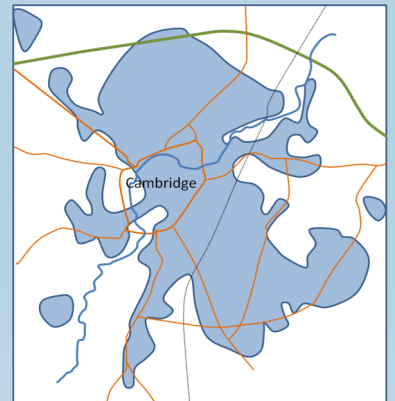


# Cam-CAN Newsletter 2012

## Project updates and achievements

***We'd first like to thank all our participants for taking part in this important research. You have become part of a unique cohort playing a hugely important role in ageing research today and into the future.***

Welcome to the second edition of the Cambridge Centre for Ageing and Neuroscience newsletter. This has been a really productive year for Cam-CAN. The initial phase of the project, where our trained Research Interviewers visit a cross-section of the Cambridge population, including yourself, has gone from strength to strength with our original six interviewers increasing to twenty, and the number of participating GP surgeries reaching thirteen. This is excellent news, meaning most of Cambridge city is included in our catchment area, so giving us the most population representative sample of the city possible. The blue area on the map shows where our invitation letters have been sent.



We have almost reached the half-way milestone for recruiting participants for the second phase of the project, where we collect sets of detailed neuroimaging and cognitive function data. **A lot more data is still needed, particularly in the youngest and oldest age groups, so please do consider continuing with the study if you are invited by our research team.** They will do all they can to fit the appointments into your busy schedule.

Our other priority this year has been the development of novel and robust tools which we can apply when analysing the completed dataset. To help analyse and understand this data, four new post-doctoral researchers will join the team in late 2012/early 2013. As the volume of data grows, and this stage of data collection draws to a close over the coming year, we will be able to work on the data to answer some of the important questions about healthy ageing. These include understanding how age-related neural changes affect cognition across the lifespan, and how 'good' cognition can be maintained with flexible neural adaptation.

We've been delighted to hear from some of you about your experiences in the project, a sample of which we've shared with you in this newsletter. We love to receive feedback so please don't hesitate to get in touch if you have something to say.

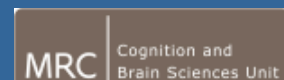
I am very excited about future developments and I look forward to updating you of our progress, and ways in which you can continue to be involved, in the next newsletter.

Professor Lorraine K Tyler  
Principal Investigator

*"The project for me has been very interesting and gave me a small insight into the world of research in Cambridge."* RB

*"I was pleased to receive the Cam-CAN Newsletter and found it very informative. It feels worthwhile to be part of a research project."* RC

Supported by:



## Project facts

What does it take to run a project of this size? Here are a few amazing facts.

Cam-CAN uses the neuroimaging facilities at the MRC Cognition and Brain Sciences Unit which includes one of just eight whole-head MEG facilities in the country!

We aim to study the whole lifespan—the oldest person to have taken part so far is 102 years old!

In visiting participants, our interviewers have driven, cycled and walked over 11,800 miles, which is 101 times around the M25!

Our interviewers and scheduling team have asked over 814,000 questions!

The direct project team has over 343 years combined research experience!

*“The most positive aspect has been the staff. On my two visits I would have been the 2nd or 3rd person. The research assistants came across as keen, helpful and fresh, even though they were going through the same routine. It made me feel valued and willing to co-operate in something so useful.” DC*

## Current topics in ageing research: The race to sequence 100 over 100

As we live longer and the population balance changes, ageing has become a hot research topic. The need to understand how people can live healthier, happier lives as they age has driven the BBSRC and other UK Research Councils as well as private funding bodies to make research on ageing a key priority, in order to understand how we can preserve our physical and mental health. One area of research that has been of growing interest is understanding how our genes determine how successfully we age.

As an indication of the interest in genetic research, the US-based X Prize Foundation has announced a chance for researchers to compete for a \$10m Genomics X Prize by working out the full DNA code of 100 centenarians in just 30 days with a limited budget of \$1000 per genome. Sequencing these “100 over 100” will help researchers understand whether the genetic makeup of very long lived individuals has helped to protect them from disease and death.

*“Always on time. You people made me feel at ease. Everyone was so kind, I could not ask for anything better.” MS*



Given that the first draft of the human genome was announced by the Human Genome Project in 2000 following a ten year research programme, having just 30 days makes this race extremely challenging. However, advancing technology to reduce the financial cost of DNA sequencing is considered a major step toward a possible future scenario where every individual has their entire genetic code mapped for use in disease diagnosis and prevention. You can read about the competition, teams competing and the members of the 100 over 100 group on the X-Prize website: <http://genomics.xprize.org>

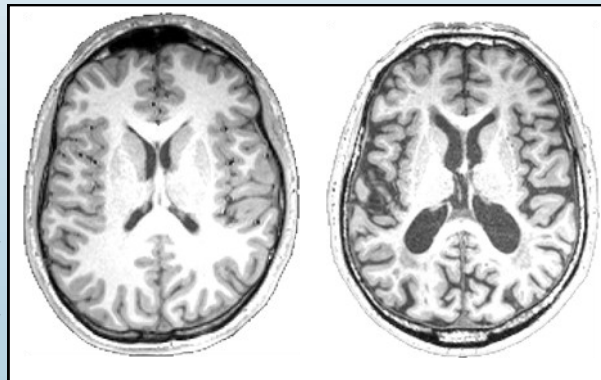
# Your ageing brain—is it all downhill?

One very important measure we get from our participants is an image of what their brain looks like. But why is this important for our understanding of successful ageing?

*“All the people I met were very friendly and helpful. Everything was explained, and although I was mildly apprehensive at first—I needn't have been!” CP*

## Why are we using brain imaging?

When our participants come for MRI scanning sessions we gather different types of data about brain structure. We do this because the weight of recent scientific research suggests that the normal ageing process affects brain structure. You can see the difference between one of our youngest participants on the left, and one of our oldest on the right.



## What are we measuring?

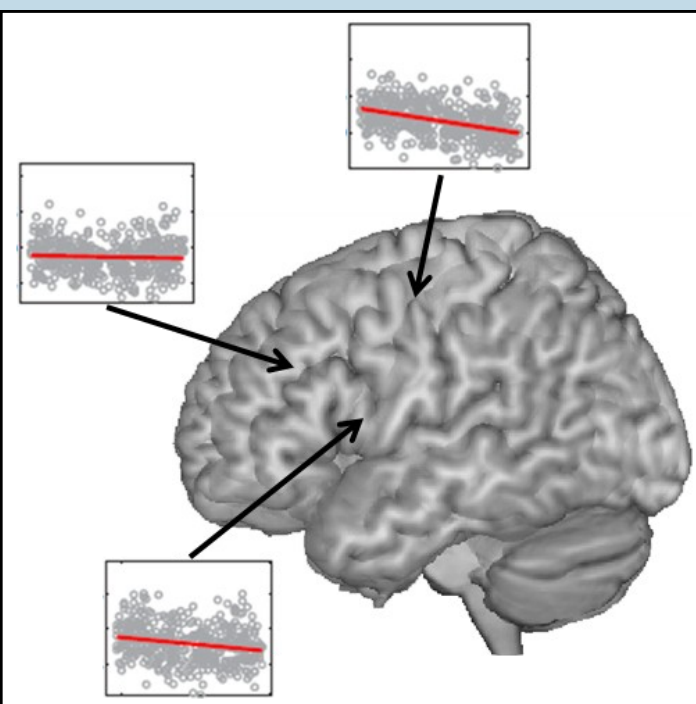
Taking a brain image provides a range of different types of information, including data about the integrity of the **grey matter** (cell bodies) and the **white matter** (axons) which connect different brain regions and allow them to work together. The integrity of both grey matter regions and the white matter connections between them are critical for good cognitive function across the lifespan.

## Is it all downhill?

Although there are reliable declines in both grey matter and white matter volume with age, neural measures are not “all downhill” with age. One important piece of evidence is the huge amount of variability amongst our healthy participants.

*“...my memory is not as bad as I thought! With concentration, more is possible. What an amazing thing the brain is!” GL*

The effect of age on neural structure varies with a number of factors, including the type of tissue, the part of the lifespan being examined, and even the region of the brain.



The figure on the left shows the variation in how age affects the average grey matter integrity in different brain regions: as the red lines show, the degree of decline is less in some brain regions than others.

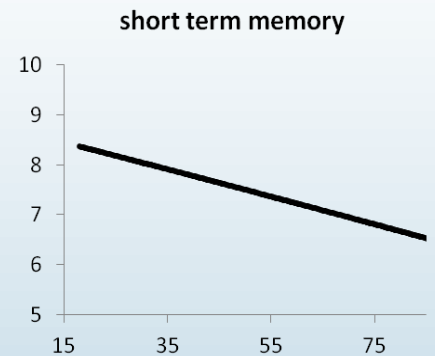
The grey circles on each figure represent individual volunteers. It is clear to see that even when average grey matter declines with age, there is a great deal of individual variation at every age.

*“I was impressed by the technology of the MRI scan and intrigued by some of the tasks: I fancy that I found out something about the limits of my powers of concentration and recall both from the tasks and the home interview (which was very good).” MH*

# We're all in this together: a new perspective on ageing

A key aspect of the Cam-CAN project is that we examine ageing across the adult lifespan, not just during what people think of as "old age". The view of ageing as a development process that unfolds with both positive and negative effects over a number of decades has been gradually replacing a view of ageing as a condition to be held at bay until one day you "get old".

Many research studies focus on the endpoints of adulthood, comparing younger adults with older adults in their 70s or above. However, when studies gather data across the lifespan it becomes clear that both neural and behavioural changes emerge over time. For example, many older adults complain that their short term memory is not what it used to be. Although older adults' short term memory is worse than younger adults' (see figure), the changes to memory are occurring steadily across the lifespan.



A lifespan perspective on ageing means that in the Cam-CAN project all of our participants contribute to our understanding of lifelong health, cognition, and brain function, not just our youngest and oldest participants; this also means our results are relevant for people of all ages as we increase our understanding of adult cognitive development.

*"It is encouraging to be part of such important and widely based research and to know that a number of local GP surgeries are willing to take part." CM*

## Welcoming new members

We are very pleased to welcome Rogier Kievit (top left), Simon Davis (top right), Kamen Tsvetanov (bottom left), and Karen Campbell (bottom right) as new post-doctoral researchers to the project. Each brings expertise in different areas of cognition and methods research and, as a whole, they will form an expert team under the guidance of our Principal and Co-Investigators to analyse the data collected to date, and will take the project into the third testing phase.



Another recent addition to our team is Jaya Hillman, a first-class administrator who replaced Laura Villis in the Cam-CAN office. Jaya is available by phone or e-mail in the project offices and is always pleased to hear from you.

And it's goodbye to Claire Hanley and Beth Parkin, whom some of you will have met at the MRC-CBSU for testing sessions. We're very proud that these two Research Assistants are building on the skills and research experience Cam-CAN has given them to go on to gain further training for their research careers. Both will start neuroscience research PhDs in Autumn 2012; Claire at the University of Cardiff and Beth at University College London. They will be replaced by Sofia Gerbase (left) and Lauren Bates (right).



## Thank you for taking part and please do keep in touch...

We are very grateful for your participation in the Cam-CAN project and for the time you have generously given us. Your contribution to our research is invaluable - we really couldn't do it without you! We hope that you are interested in future stages of the research and are willing to continue your participation.

So that we can keep in touch, please let us know if you have recently changed your contact details or if you have any questions about the research. You can contact us on:

Tel: 01223 766458 or 764414, Fax: 01223 766452

E-mail: [admin@cam-can.com](mailto:admin@cam-can.com), [www.cam-can.com](http://www.cam-can.com)

Cam-CAN, Department of Psychology, University of Cambridge, Downing Street, Cambridge, CB2 3EB.

*Thank you*