

Symposium 12: Old brains, new insights

Theme: Neurodegenerative disorders and ageing

Supported by a research donation from the Centre for Speech, Language and the Brain, University of Cambridge

Tuesday 11th April, 9:00 – 10:40

Recent years have seen several exciting advances in our understanding of neurocognitive ageing and this symposium brings together several leaders in the field responsible for those gains.

Anna Christina Nobre will show that contrary to a common view of cognitive ageing, selective attention can be preserved with age and may act as a means to bolster cognition. Using magnetoencephalography data from a large group of older individuals, she will show that individual differences in short-term memory correlate with neural markers of top-down control and that flexible attention mechanisms are consistently preserved, even in the context of memory deficits.

Karen Campbell will argue that our understanding of neurocognitive ageing may be tainted by the way we assess it. Cognitive tasks often include several demands external to the cognitive function of interest. Examining neural network reactivity during task-free language comprehension and a movie watching paradigm, she will demonstrate the advantage of naturalistic stimuli in determining the ageing brain's true capacity.

Alireza Salami will demonstrate the necessity of longitudinal data in determining the true effect of age on the human connectome. Most, if not all, existing evidence showing an association between abnormal functional connectivity and cognitive decline in ageing is based on cross-sectional data. He will present recent findings of longitudinal changes in the functional connectome over 6 years and their association to episodic memory decline.

Finally, Douglas Garrett will show that within-person brain signal variability offers highly predictive and complementary views of ageing brain function. Contrary to traditional theoretical expectations of age-related increases in 'neural noise', he will show that older, poorer performing brains often exhibit less signal variability, suggesting that ageing could instead be re-conceived of as a generalized process of increasing system rigidity and loss of dynamic range.

Chair: Prof Lorraine Tyler (University of Cambridge) and Dr Karen Campbell (Brock University, Canada)

Speaker 1: Professor Anna Christina Nobre (University of Oxford)

'Nimble forgetfulness in healthy ageing'

Speaker 2: Dr Karen Campbell (Brock, Canada)

'Finding the ageing brain's natural capacity'

Speaker 3: Dr Alireza Salami (Karolinska Institute, Sweden)

'Longitudinal evidence for reconfiguration of functional brain connectome across the human lifespan'

Speaker 4: Dr Douglas Garrett (University College London and The Max Planck Institute, Germany)

'Constrained moment-to-moment brain signal variability as a principled marker of the aging brain'