

Neurotechnology for Dementia Workshop

The Royal Society's Chicheley Hall | 14th – 16th May 2019

12.00	Arrival, lunch and registration
12.30 – 13.00	Opening Keynote Setting the Challenge: Dementia Care and Technology David Sharp
Day 1 – Tuesday, May 14	
Session I – Dynamic physiological monitoring <i>in vivo</i> Chair: Mathieu Vandembulcke	
13.00-13.35	Alan Urban – Functional ultrasound imaging (fUSi) of intact brain circuit dynamics at large scale
13.35-14.10	Mark Woolrich – Brain network dynamics
14.10-14.45	Simon Schultz – Multiphoton imaging of hippocampal place cell network activity in mouse models of neurodegenerative disease
14.45-15.20	Zoltan Takats – DESI-MS for spatial metabolomics of the brain
15.20-15.45	Coffee break in the Atrium
Session II – Dynamic physiological monitoring <i>in vivo</i> Chair: Paul Matthews	
15.45-16.20	Matthew Brookes – A wearable quantum brain scanner
16.20-16.55	Paul Beard – Photoacoustic imaging for neurodegenerative disease studies
16.55-17.30	George Malliaras – New materials and devices for interfacing with the brain
17.30-18.00	Summary and discussion
18.45	Posters and opening reception in the Wolfson Suite
20.00	Dinner in the Main Hall
21.00	Brain Lecture: NIH and the taxpayer's investment in dementia research Walter Koroshetz introduced by Bart De Strooper
Day 2 – Wednesday, May 15	
Session III – Functional coupling and modulation of large-scale neuronal activity I Chair: Samuel Barnes	
9.25-10.00	Barun Dutta – The Neuropixels Project: Scaling high channel count probes for electrophysiology to the scaling limit!
10.00-10.35	Andrew Jackson – Neural interfaces for monitoring and manipulating network dynamics
10.35-11.10	Marc Aurel Busche – What happens to neural circuits in Alzheimer's disease?
11.10-11.30	Coffee break
Session IV – Functional coupling and modulation of large-scale neuronal activity II - Chair: David Sharp	
11.30-12.05	Shelley Fried – Development of a micro-coil-based cortical visual prosthesis
12.05-12.40	Ben Cox – Ultrasonic neuromodulation
12.40-13.15	Nir Grossman – Temporal interference stimulation

13.15-14.00	Lunch in the Main Hall
Session V – Dynamic assessment of signaling <i>in vitro</i> and <i>in vivo</i> Chair: Seth Love	
14.00-14.35	Ian Gilmore – Metabolic imaging at the single-cell scale using mass spectrometry imaging
14.35-15.10	Patrick Dupont – Is graph theoretical analysis of brain imaging data a useful tool to study neurodegeneration?
15.10-15.45	Oscar Ces – Artificial cells and cellular bionics
15.45-16.05	Coffee break
16.05-16.40	Martyn Boutelle – Measuring dynamic neurochemical changes in the injured brain using microfluidic biosensors
16.40-17.15	Roisin Owens – A bioelectronic <i>in vitro</i> model of the gut-brain axis
17.15-18.15	Keynote Lecture: The design and deployment of bioelectronic platforms for translational neuroscience. Tim Denison introduced by Samuel Barnes
18.15	Posters and reception
19:00	Dinner and poster prizes
20.30	Discussion groups and after dinner drinks
Day 3 – Thursday, May 16	
Session VI – Neural interfaces for monitoring and targeted treatment Chair: Clive Ballard	
9.00-9.35	Dries Braeken – Printing human microcircuits on CMOS chips
9.35-10.10	Chris Grigsby – Bioactive melt electrospun scaffolds for neuronal reprogramming and brain organoids
10.10-10.45	Stephanie Lacour – Soft microfabricated and multimodal neural interfaces
10.45-11.05	Coffee break in the Atrium
11.05-11.40	James Fawcett – Novel cognitive enhancement treatments for dementia
11.40-12.15	Payam Barnaghi – AI and in-home monitoring technologies to improve dementia care
12.15-12.50	Aldo Faisal – Wearable digital biomarkers in-the-wild
12.50-13.35	Lunch in the Atrium
13.35-14.10	Nick Van Helleputte – How wearable health & ubiquitous technology can improve care in patients with dementia: a prospective outlook.
14.10-14.45	Ellie D’Hondt – Exascale computing for the life sciences
14.45-15.45	Keynote Lecture: Neurotechnology for a dynamic and distributed mental state David Borton , introduced by James Fawcett
15.45	Closing remarks and discussion: Paul Matthews, David Sharp and Bart de Strooper
16.00	Workshop close – delegates depart