



# Monitoring Molecules in Neuroscience 2018

17<sup>th</sup> International Conference, Oxford

## Programme



### Sunday 25th

14:00 – 15:20	<b>Mathematical Institute, Andrew Wiles Building</b> Badge pick-up and coffee
15:20 – 15:25	<b>Welcome to MMiN</b> from Conference Chair (Stephanie Cragg) (L1)
15:25 – 15:30	<b>Welcome from the President of MMiN</b> (L1)
15:30 – 17:30	<b>Opening Symposium 1 - Marianne Fillenz Legacy Plenary Symposium (L1)</b> SPONSORED BY THE DEPARTMENT OF PHYSIOLOGY, ANATOMY AND GENETICS, OXFORD <i>Chair: Martyn Boutelle</i>
	Plenary Symposium in honour of Marianne Fillenz, to include: <b>Martyn Boutelle</b> , Imperial College London, UK "Real-time monitoring of neurochemistry - from grooming responses to human traumatic brain injury" <b>John Lowry</b> , Maynooth University, Ireland "Adventures in electrochemistry: monitoring molecules in real-time to understand brain function" <b>Parry Hashemi</b> , University of South Carolina, USA "Fundamentally novel perspectives on psychiatric diseases with microengineered, electrochemical detection platforms" <b>Charles Marsden</b> , Emeritus Professor, University of Nottingham, UK in discussion with <b>Nigel Maidment</b> , UCLA and <b>Martyn Boutelle</b> Plus other guests
From 17:30	Short walk to the Museum of Natural History (5-10 mins) (See map, or wait in Maths Foyer for a guide to take you the short route)
Until 18:30	Enjoy Museum of Natural History
18:30 – 19:30	<b>Museum of Natural History Lecture Theatre</b> <b>Plenary Lecture - David Attwell</b> , UCL, UK "Control of cerebral and cardiac blood flow by capillary pericytes in health and disease" <i>Chair: David Bannerman</i>
19:30 – 21:00	<b>Museum of Natural History</b> <b>Welcome Reception and Buffet Supper</b>

## Monday 26<sup>th</sup>

09:00 – 10:00	<b>Mathematical Institute, L1</b> <b>Plenary Lecture - Andrew Ewing</b> , Chalmers University, Sweden SPONSORED BY THE INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES "Measuring synaptic vesicles using cellular electrochemistry and nanoscale molecular imaging" <i>Chair: Nicola Sibson</i>	
10:00 – 10:30	Coffee (available in both south and north mezzanines)	
	<b>Symposium 2 (L1)</b> <b>Location Matters: Anatomical and Functional Specialization of Dopamine Signals</b> <i>Dedicated to Dr Jeremy Clark</i> <i>Chairs: Anne Collins, Ingo Willuhn</i>	<b>Symposium 3 (L2)</b> <b>New Advances in Monitoring the Release and Function of Neuropeptides in the Brain</b> <i>Chairs: Leslie Sombers, Paul Slesinger</i>
10:30 – 10:35	Chairs' Introduction	Chairs' Introduction
10:35 – 11:00	<b>Paul Dodson</b> , University of Oxford, UK "Heterogeneity in the encoding of behaviour by midbrain dopamine neurons"	<b>Paul Slesinger</b> , Icahn School of Medicine at Mount Sinai, USA "Development of optical sensors for detecting neuropeptide release <i>in vivo</i> "
11:00 – 11:25	<b>Anne Collins</b> , UCLA, USA "Nucleus accumbens acetylcholine modulates cue-evoked dopamine to regulate cue-motivated reward-seeking"	<b>Leslie Sombers</b> , North Carolina State University, USA "Chasing the Enkephalins: Electrochemical Measurements of Real-Time Opioid Peptide Fluctuations in the Midbrain and Striatum"
11:25 – 11:50	<b>Josh Berke</b> , UCSF, USA "Forebrain dopamine value signals are independent of midbrain dopamine cell firing"	<b>Elyssa Margolis</b> , UCSF, USA "Striking differences in the neuronal actions of endogenous opioid peptides with similar binding profiles"
11:50 – 12:15	<b>Ingo Willuhn</b> , Netherlands Institute for Neuroscience, Netherlands "Regional specificity of striatal dopamine signaling during reward learning"	<b>Lakshmi Devi</b> , Icahn School of Medicine at Mount Sinai, USA "Exploring the mysteries of the endogenous opioid system"
12:15 – 12:30	<b>Julie Fudge</b> , University of Rochester Medical Center, USA "Dopamine and CRF: broadening the view"	<b>Gianluigi Tanda</b> , NIDA, USA "Systemic oxytocin affects the reinforcing and neurochemical effects of methylphenidate"
12:30 – 12:45	<b>Armin Lak</b> , University College London, UK "Projection-specific roles of dopamine neurons in decision making"	<b>Zhenpeng Qin</b> , University of Texas at Dallas, USA "Two-photon uncaging of neuropeptides"
12:45 – 13:45	Lunch (collect from south or north mezzanines)	13:00-13:45 <b>Lunchtime Workshop (L4)</b> "Promoting Equality and Diversity in Science: Panel Discussion with Q&A" <i>Chair: Lauren Burgeno</i>

13:45 – 15:30	<b>Poster Session 1</b> (odd numbers) With coffee	
15:30 – 17:30	<b>Symposium 4 (L1)</b> <b>Gaining Novel Molecular Insights into CNS Disease Processes with Electrochemical Sensors and Biosensors</b> <i>Chairs: Gary Gilmour, John Lowry</i>	<b>Symposium 5 (L2)</b> <b>Neurobiology of Nutrient Selection</b> <i>Chairs: Jaime McCutcheon, Barbara Ferry</i>
15:30 – 15:35	Chairs' Introduction	Chairs' Introduction
15:35 – 16:00	<b>Ilse Smolders</b> , Vrije Universiteit Brussels, Belgium "Chemogenetic modulation of specific brain cell types for monitoring gliotransmitter and neuropeptide release"	<b>Denis Burdakov</b> , The Francis Crick Institute London, UK "Hypothalamic control of action-selection"
16:00 – 16:25	<b>Kelly Allers</b> , Boehringer Ingelheim, Germany "Glutamate Biosensors: an Industry Experience"	<b>Samantha Fortin</b> , University of Illinois at Chicago, USA "Physiological need gates taste-selective phasic dopamine responses in the nucleus accumbens"
16:25 – 16:50	<b>Jack Mellor</b> , University of Bristol, UK "Coordinated acetylcholine release in prefrontal cortex and hippocampus measured by choline biosensors is associated with arousal and reward on distinct timescales"	<b>Stephanie Borgland</b> , University of Calgary, Canada "Acute fasting alters dopamine release in a region and sex-dependent manner"
16:50 – 17:15	<b>Jennifer Li</b> , Eli Lilly & Co. Ltd, UK "The utility of functional connectivity measures in AD mouse models"	<b>Carrie Ferrario</b> , University of Michigan, USA "Oral and gastric sucrose produce alterations in striatal glucose, glutamate, glutamine, and GABA in obesity-prone vs. obesity-resistant rats; implications for obesity"
17:15 – 17:30	<b>Michael Johnson</b> , University of Kansas, USA "Mechanisms of chemotherapy-induced impairments in executive function"	<b>Anna Thinner</b> , University of Frankfurt, Germany "Food-induced changes of acetylcholine in mouse hypothalamus"
17:30	(Closed meeting for the Society Scientific Advisory Board)	
17:30-	Free evening	

## Tuesday 27<sup>th</sup>

09:00 – 10:00	<b>Plenary Lecture - Bitá Moghaddam, OHSU, USA (L1)</b> “Dopamine modulation of prefrontal cortex activity is manifold and operates at multiple temporal and spatial scales” <i>Chair: Sara Jones</i>	
10:00 – 10:30	Coffee (available in both south and north mezzanines)	
	<b>Symposium 6 (L1)</b> <b>Explorations of the Molecular Basis of Psychiatric Illnesses</b> <i>Chair: Liz Tunbridge</i>	<b>Symposium 7 (L2)</b> <b>Exploring Extracellular Space on Different Spatial Scales</b> <i>Chairs: Charles Nicholson, Sabina Hrabetova</i>
10:30 – 10:35	Chair’s Introduction	Chairs’ Introduction
10:35 – 11:00	<b>Marios Panayi</b> , University of Oxford, UK “Glutamatergic dysfunction leads to a hyper-dopaminergic phenotype: Linking dopamine to aberrant salience”	<b>Sabina Hrabetova</b> , SUNY Downstate Medical Center, USA “Exploring the structure of brain extracellular space with diffusion analysis using Real Time Iontophoresis”
11:00 – 11:25	<b>Jeff Dalley</b> , University of Cambridge, UK “Distinct contributions of cortical and subcortical molecules to behavioural impulsivity: beyond the usual suspects”	<b>Charles Nicholson</b> , NYU School of Medicine, USA “Integrative Optical Imaging of macromolecular diffusion reveals origins of structural hindrance in extracellular microenvironment”
11:25 – 11:50	<b>Oliver Howes</b> , MRC London Institute of Medical Sciences (Imperial College), UK “The role of dopamine and glutamate in psychotic disorders: multi-modal clinical and preclinical imaging findings”	<b>Dmitri Rusakov &amp; Kaiyu Zheng</b> , University College London, UK “Measuring nanoscale diffusion in the synaptic cleft and beyond with time-resolved fluorescence anisotropy”
11:50 – 12:15	<b>Simon Lovestone</b> , University of Oxford, UK “Blood protein biomarkers and therapeutics for Alzheimer’s disease”	<b>Juan Varela</b> , University of Cambridge, UK “Super-resolving the nanoscale organisation of the extracellular space of the brain tracking carbon nanotubes”
12:15 – 12:30	<b>Lauren Burgeno</b> , University of Oxford, UK “Diametric changes in striatal dopamine release underlie drug-taking and drug-seeking behaviors”	<b>Robert Colbourn</b> , SUNY Downstate Medical Center, USA “Dynamic volume changes of the brain’s extracellular space underlying seizures”
12:30 – 12:45	<b>Erik Carlson</b> , University of Washington, USA “Genetic dissection of catecholaminergic innervation of the cognitive cerebellum”	<b>Scott Shippy</b> , University of Illinois at Chicago, USA “Miniaturized push-pull perfusion sampling of hippocampal slices”
12:45 – 14:00	Lunch (collect from south or north mezzanines)	13:00-14:00 <b>Publishing Workshop (L4)</b> <b>Paul Bolam</b> , Co-Editor in Chief, <i>EJN</i> , “How a journal handles your submitted papers”

	<p><b>Symposium 8 (L1)</b>  <b><i>In Vitro</i> and <i>In Vivo</i></b>  <b>Single Neuron Approaches to Study Neurodegeneration</b>  <i>Chair:</i>  <i>Marie-Francoise Chesselet</i></p>	<p><b>Symposium 9 (L2)</b>  <b>Nitric Oxide Signaling from Molecule to Brain</b>  <i>Chairs: Stephane Marinesco, Anne Meiller</i></p>	<p><b>Symposium 10 (L3)</b>  <b>Bad Things Happen: The Role of Phasic Dopamine Signaling in Learning About, and Responding to, Negative Stimuli</b>  <i>Chairs: Eleanor Simpson, Mitch Roitman</i></p>
14:00 – 14:05	Chair's Introduction	Chairs' Introduction	Chairs' Introduction
14:05 – 14:30	<p><b>Nader Pourmand</b>, University of California, Santa Cruz, USA  "nanopipette technology for analysis of single living cells and subcellular compartments"</p>	<p><b>Roland Malli</b>, Medical University of Graz, Austria  "Shining Light on Cellular Nitric Oxide and Potassium Signals Using Genetically Encoded Probes"</p>	<p><b>Abigail Kalmbach</b>, Columbia University, USA  "Knowing when to stop: dopamine encoding of inhibitory cues in the ventral striatum"</p>
14:30 – 14:55	<p><b>Steven Finkbeiner</b>, Gladstone Institute, UCSF, USA  "Development of a new biosensor and use of convolutional neural networks to reliably detect cell death <i>in vitro</i> and <i>in vivo</i>"</p>	<p><b>Mark Schoenfish</b>, University of North Carolina, USA  "A durable permselective nitric oxide electrochemical sensor for continuous, in situ monitoring of macrophage activity"</p>	<p><b>Bo Li</b>, Cold Spring Harbour Laboratory, USA  "The amygdala circuits in the regulation of aversive learning"</p>
14:55 – 15:20	<p><b>Genevieve Rougon</b>, CNRS Marseille, France  "Quantitative intravital imaging of the neuroimmune cellular interactions in the pathological CNS"</p>	<p><b>Anne Meiller</b>, Université Claude Bernard, France  "<i>In vivo</i> brain nitric oxide detection using fluorinated xerogel-coated carbon fiber microelectrodes"</p>	<p><b>Erik Oleson</b>, University of Colorado, USA  "A transient dopamine signal represents avoidance value and causally influences the demand to avoid"</p>
15:20 – 15:45	<p><b>Francis Szele</b>, University of Oxford, UK  "Imaging neurogenesis and cancer in the mammalian brain"</p>	<p><b>Anthony West</b>, Rosalind Franklin University, USA  "Nitric oxide signalling in corticostriatal circuits: implications for the treatment of Huntington's disease"</p>	<p><b>Matthew Roesch</b>, University of Maryland, USA  "Dopamine signaling in social contexts: when good and bad things happen to oneself and others"</p>
15:45 – 16:00	<p><b>Charmaine Lang</b>, Oxford Parkinson's Disease Centre, UK  "Single cell sequencing reveals HDAC4 as a regulator of cellular phenotypes in Parkinson's iPSC-derived dopamine neurons"</p>	<p><b>Binyamin Hochner</b>, Hebrew University, Israel  "Long-term potentiation expression and maintenance in the octopus vertical lobe is mediated by long-term elevation in nitric oxide concentration"</p>	<p><b>Evgeny Budygin</b>, Wake Forest School of Medicine, USA  "Exploring phasic changes in striatal dopamine release under the effect of negative stimuli"</p>
16:00 – 17:45	<p><b>Poster Session 2</b> (even numbers)  With drinks</p>		
17:45 – 18:30	<p><b>Open Business Meeting (L1)</b></p>		
18:30	<p>Free evening</p>		

## Wednesday 28<sup>th</sup>

09:00 – 10:00	<p><b>Plenary Lecture - Ann Graybiel, MIT, USA (L1)</b>          SPONSORED BY THE EUROPEAN JOURNAL OF NEUROSCIENCE          “Steps toward identifying functions of the striosome-matrix organization of the striatum”  <i>Chair: Mark Walton</i></p> <hr/> <p>Commencing with award of <b>Poster Prizes</b> (Sponsored by ACS Chemical Neuroscience) and IJMS Young Investigator Prize (Sponsored by International Journal of Molecular Sciences)</p>	
10:00 – 10:30	Coffee (available in both south and north mezzanines)	
	<p><b>Symposium 11 (L1)</b>  <b>A Reversal of Fortune for Peptides and Endocannabinoids: from Poor Cousins to Rich Regulators of Brain Microcircuits</b>  <i>Chairs: Margaret Rice, Anushree Karkhanis</i></p>	<p><b>Symposium 12 (L2)</b>  <b>Towards Microdialysis 2.0 – a Faster, Smaller, Smarter Microdialysis for Neurochemical Monitoring</b>  <i>Chairs: Martyn Boutelle, Steve Weber</i></p>
10:30 – 10:35	Chairs' Introduction	Chairs' Introduction
10:35 – 11:00	<p><b>Rodrigo España</b>, Drexel University, USA          “Hypocretin/Orexin influences dopamine neurotransmission and cocaine-associated behavior”</p>	<p><b>Stephen Weber</b>, University of Pittsburgh, USA          “Improving microdialysis/online liquid chromatography capability: Higher time resolution for dopamine and serotonin and peptide quantitation in dialysate”</p>
11:00 – 11:25	<p><b>Michael Beckstead</b>, Oklahoma Medical Research Foundation, USA          “Actions of the modulatory peptide neurotensin on inhibitory input to midbrain dopaminergic neurons”</p>	<p>11:00 – 11:12 <b>Martin Eysberg</b>, Antec Scientific, Netherlands. “Method development in neurotransmitter analysis to improve selectivity, sensitivity and robustness”</p>
		<p>11:13 – 11:25 <b>Thomas Birngruber</b>, JOANNEUM RESEARCH, Austria. “Cerebral open flow microperfusion – a sampling tool for long-term monitoring of transport across the BBB”</p>
11:25 – 11:50	<p><b>Jyoti Patel</b>, NYU School Med., USA          “Peripheral peptides insulin and leptin target striatal cholinergic interneurons to enhance dopamine release”</p>	<p><b>Anne Andrews</b>, UCLA, USA          “Multiplexed serotonin and dopamine monitoring: Why faster is better v2.0”</p>
11:50 – 12:15	<p><b>Joseph Cheer</b>, University of Maryland School of Medicine, USA          “Endocannabinoids on cortical terminals orchestrate local modulation of dopamine release in the nucleus accumbens”</p>	<p>11:50 – 12:05 <b>Alberto Morales</b>, University of Guadalajara, Mexico. “Glutamate measurement online and at high temporal resolution, using a new microdialysis procedure and an optic device”</p>
12:15 – 12:30	<p><b>Anushree Karkhanis</b>, Wake Forest School of Medicine, USA          “Adolescent social isolation augments kappa opioid receptor function in the nucleus accumbens and basolateral amygdala of rats”</p>	<p>12:05 – 12:30 <b>Robert Kennedy</b>, University of Michigan, USA          “Microfabricated Sampling Probes: Challenges and Opportunities”</p>
12:30 – 13:30	Lunch (collect from south or north mezzanines)	
	<p><b>Symposium 13 (L2)</b>  <b>Expanding the Reach of Voltammetry Beyond Dopamine</b>  <i>Chairs: Jill Venton, Sara Jones</i></p>	<p><b>Symposium 14 (L3)</b>  <b>Co-transmission in the Nervous System: Unlikely Pairing of Dopamine, GABA, Glutamate, and ACh</b>  <i>Chairs: Nicolas Tritsch, Yan-Feng Zhang</i></p>
13:30 – 13:35	Chairs' Introduction	Chairs' Introduction

13:35 – 14:00	<b>Zoe McElligott</b> , UNC Chapel Hill, USA "Optogenetics-assisted fast-scan cyclic voltammetry for the detection of serotonin and norepinephrine"	<b>Jimmy Zhou</b> , Yale University School of Medicine, USA "Co-transmission of classic excitatory and inhibitory neurotransmitters in the retina"
14:00 – 14:25	<b>Kenneth Kishida</b> , Wake Forest School of Medicine, USA "Simultaneous detection of dopamine, serotonin, and norepinephrine using a machine learning-based approach to FSCV"	<b>Louis-Eric Trudeau</b> , University de Montréal, Canada "On the function and regulation of glutamate co-release by dopamine neurons"
14:25 – 14:50	<b>Jill Venton</b> , University of Virginia, USA "Mechanism and function of spontaneous adenosine transients"	<b>Stephen Rayport</b> , Columbia University, USA "Functional connectome mapping of dopamine neuron glutamate co-transmission across the striatum"
14:50 – 15:15	<b>Lanqun Mao</b> , Beijing National Laboratory for Molecular Sciences, China "In vivo electrochemistry to understand physiological roles of ascorbate"	<b>Yan-Feng Zhang</b> , University of Oxford, UK "Assessing GABA co-transmission from dopamine neurons and its function"
15:15 – 15:30	<b>Ernesto Solis</b> , NIDA, USA "Changes in brain oxygen levels induced by heroin and fentanyl: evaluation using high-speed amperometry in freely-moving rats"	<b>Bradley Roberts</b> , University of Oxford, UK "Investigating the implications of GABA co-storage in dopamine axons on dopamine transmission"
15:30 – 16:00	Coffee (available in both south and north mezzanines)	
	<b>Symposium 15 (L2)</b> <b>Molecular Monitoring and Modulation During Fear and Anxiety</b> <i>Chair: Trevor Sharp</i>	<b>Symposium 16 (L3)</b> <b>Pre-degenerative Changes in the Dopaminergic System in Parkinson's Disease</b> <i>Chairs: Sarah Threlfell, Nigel Maidment</i>
16:00 – 16:05	Chair's Introduction	Chairs' Introduction
16:05 – 16:30	<b>Andrew Holmes</b> , National Institute on Alcohol Abuse and Alcoholism, USA "Monitoring and modulating neural circuits during fear"	<b>Sarah Threlfell</b> , University of Oxford, UK "Pre-degenerative deficits in dopamine transmission in an alpha-synuclein mouse model of Parkinson's disease"
16:30 – 16:55	<b>Inga Neumann</b> , University of Regensburg, Germany "Monitoring and chemogenetic manipulation of oxytocin release in distinct brain regions in social behaviour and fear"	<b>Nigel Maidment</b> , UCLA, USA "Probing dopamine transmission in alpha-synuclein and LRRK2 rodent models of Parkinson's disease using microdialysis and FCV"
16:55 – 17:20	<b>Nicolas Singewald</b> , University of Innsbruck, Austria "Molecular monitoring and modulation of dopamine in aberrant fear processing"	<b>Jochen Roeper</b> , Goethe University, Germany "Mutant $\alpha$ -synuclein enhances firing frequencies in dopamine substantia nigra neurons by oxidative impairment of A-type potassium channels"
17:20 – 17:45	<b>David Bannerman</b> , University of Oxford, UK "In vivo measurement of tissue oxygen and neuronal activity during fear behavior: understanding the role of serotonin in emotion"	<b>Thomas Barber</b> , University of Oxford, UK "Multimodal neuroimaging in REM sleep behaviour disorder reveals evidence of prodromal neurodegeneration"
17:45 – 18:00	<b>Changwoo Seo</b> , Cornell University, USA "Environmental valence modulates dorsal raphe serotonin and GABA neural dynamics"	<b>Katherine Brimblecombe</b> , Univ of Oxford, UK "Regulation of L-type calcium channel role in striatal dopamine release: insights for PD"
18:00 – 19:00	Free time	
19:00 – late	<b>Somerville College</b> <b>Drinks Reception (19:00) and Conference Dinner (19:45)</b> (ticketed event) Followed by <b>Duke of Cambridge</b> , til late.	