

Motor Control: Spinal Circuits and Beyond

University of St Andrews, June 20-23, 2023

Day 1: Tuesday, June 20

12:00	Arrival & Check-in	Medical Science Building
5:00	Conference Organizers	Opening Remarks
5:25	TBD	Introduction
5:30	Martyn Goulding (Salk Institute)	Opening Talk
6:30	Reception (Drinks & Canapes)	Medical Sciences Building

Day 2: Wednesday, June 21

Session # 1: Neuronal Diversity & Development

9:00	Chairs Jay Bikoff & Lora Sweeney	Introduction
9:05	Robert Brian Roome (NINDS)	An embryonic atlas of spinal cord neurons post-neurogenesis
9:20	Andreas Sanger (FAU Erlangen-Nuremberg)	About time - Neuronal subtype specification of spinal projection and motor neurons by a common temporal sequence
9:35	Ying Zhang (Dalhousie University)	Embryonic temporal-spatial delineation of excitatory spinal interneuron diversity
9:50	Jeremy Dasen (New York University)	Molecular Determinants of Spinal Neurons Important for Fast Locomotion
10:05	Polyxeni Philippidou (Case Western Reserve University)	Multifaceted cadherin functions sculpt respiratory motor circuit connectivity
10:20	David Vijatovic (Institute of Science and Technology)	Neural diversity scales up with behavioral complexity during the Xenopus frog metamorphosis
10:35	Coffee & tea	Medical Sciences Building Cafe

Session # 2: Motoneuron Diseases

11:05	Chairs Ilary Allodi & Sam Pfaff	Introduction
11:10	Roser Montaña-Rosell (University of Copenhagen)	Spinal inhibitory neurons degenerate before motor neurons and excitatory neurons in a mouse model of ALS
11:25	Francesco Roselli (Ulm University)	Functionalized intrabody reveals Inhibitory synapses contribute to motoneuron vulnerability in ALS mouse model
11:40	Claire Francesca Meehan (University of Copenhagen)	TDP-43 pathology drives reversible hyperactivity and structural changes in axon initial segments and nodes of Ranvier of spinal motoneurons in the ΔNLS TDP-43 mouse model of Amyotrophic Lateral Sclerosis
11:55	Travis Rotterman (Georgia Institute of Technology)	Central degeneration of monosynaptic connectivity between muscle afferents and motoneurons in Charcot-Marie-Tooth Disease
12:30	Lunch	Medical Sciences Building

Session # 3: Ascending & Descending Control

2:30	Chairs Julien Bouvier & Simon Sharples	Introduction
2:35	Ian Duguid (University of Edinburgh)	Corticospinal neurons in efficient response control and movement coordination
2:50	Benjamin Fait (Rockefeller University)	A class of bilateral corticospinal neurons induces symmetric movements
3:05	Jared Cregg (University of Copenhagen)	Basal ganglia-spinal cord pathway that commands locomotor gait asymmetries
3:20	Coffee & tea	Medical Sciences Building Cafe
3:50	Eiman Azim (Salk Institute)	Functional Organization of cerebellar inputs for dextrous forelimb movement
4:05	Rune Berg (University of Copenhagen)	Spinal population dynamics during PPN-induced movement arrest
4:20	Martin Carbo-Tano (Paris Brain Institute)	The mesencephalic locomotor region recruits distributed V2a reticulospinal neurons to drive forward locomotion
4:35	Andrea Giorgi (CNRS Paris-Saclay)	Functional contribution of different V2a reticulospinal populations to the kinematics of locomotor turning
5:00	Posters, Drinks & Canapes	Medical Sciences Building
8:30	Bonfire	East Sands

Day 3: Thursday, June 22

Session # 4: Sensorimotor Integration

9:00	Chairs: Ellie Heckscher & Vivian Mushahwar	Introduction
9:05	Chris Dallmann (University of Washington)	Context-dependent presynaptic inhibition of leg proprioception in <i>Drosophila</i>
9:20	Pierce Mullen (University of St Andrews)	Sensorimotor Integration in the Zebrafish Inferior Olive during Motor Adaptation
9:35	Kazuhiko Seki (National Institute of Neuroscience, NCNP)	Centrally generated presynaptic inhibition selectively modulates proprioceptive and tactile reafferent signals at the spinal cord of behaving monkeys
9:50	Corinna Gebehart (Champalimaud Foundation)	Lateral Connectivity and Network Synchronization in the Sensorimotor Network of the Stick Insect Leg
10:05	David Acton (Salk Institute)	Merkel cells register surface topology to facilitate skilled locomotion
10:20	Coffee & tea	Medical Sciences Building Cafe
11:00	Valentina Saccomanno (University of St Andrews)	Brainstem control of state-dependent motor response reversal
11:15	Simon M. Danner (Drexel University)	Spinal circuits for sensorimotor integration during locomotion: insights from neuromechanical modelling
11:30	Charlotte Bichara (Nerf – VIB)	Electrophysiological signatures of sensorimotor adaptation in the spinal cord
11:45	David Bennett (University of Alberta)	Spinal cord stimulation induces a plateau potential in sensory axons
12:00	Kajana Satkunendrarajah (Medical College of Wisconsin)	Neuromodulation of sensory cortical-locomotor pathway to restore movement after spinal cord injury
12:15	Alex Laliberte (University of Ottawa)	dI3 interneurons modulate hindlimb sensorimotor function after spinal cord injury
12:30	Lunch & Posters (Mentors/Mentees)	Medical Sciences Building
3:00	Coffee & tea	Medical Sciences Building Cafe
3:30	Free/Active Time – Hiking, Golf	
5:00	Whisky Tasting	Hotel Du Vin Ballroom

Day 4: Friday, June 23

Session # 5: Rhythm & Pattern Generation

9:00	Chairs Frédéric Brocard & Maarten Zwart	Introduction
9:05	Christopher Del Negro (William & Mary)	Role of NaV 1.6-mediated persistent sodium current and bursting-pacemaker properties in breathing rhythm generation
9:20	Shayna Singh (Drexel University)	Postnatal development of 'rhythmogenic' currents in spinal Shox2 interneurons
9:35	Michael Jay (Northwestern University)	Spinal basis of direction control during locomotion in larval zebrafish
9:50	Olivia Mistretta (Emory University)	Role of the Foxp2-V1 clade in limb coordination using neonatal air-stepping
10:05	Graziana Gatto (University Hospital of Cologne)	Deciphering the spinal circuit architecture driving muscle coordination during rhythmic movements
10:20	Vivian Mushahwar (University of Alberta)	Deciphering Spinal Networks through Neuromodulation

10:35 **Coffee & tea**

Medical Sciences Building Cafe

Session # 6: Motor Output

11:05	Chairs Vatsala Thirumalai & Pavan Ramdya	Introduction
11:10	Laskaro Zagoraiou (Athens Academy)	CART peptidergic modulation of motor output
11:25	Giulia Benedetta Calabrese (University of St Andrews)	Spinal cholinergic modulation of breathing
11:40	Aref Zarin (Texas A&M University)	Neuromuscular Basis of Drosophila Larval Escape Behavior
11:55	Jonathan Booth (University of St Andrews)	Ground Reaction Forces of Freely Behaving Drosophila Larvae Revealed by Elastic Resonators
12:30	Lunch & Posters	Medical Sciences Building
2:30	Coffee & tea	Medical Sciences Building Cafe

Session # 7: Premotor and Propriospinal Circuits

3:00	Chairs Dave McLean & Martyn Goulding	Introduction
3:05	Jasper Phelps (Brain Mind Institute)	Synaptic resolution connectome reconstruction of motor neurons and premotor circuits in adult <i>Drosophila</i>
3:20	Elisa Toscano (Max Delbrück Centre for Molecular Medicine)	Characterization of propriospinal neurons in the mouse spinal cord
3:35	Rémi Ronzano (University College London)	Spinal premotor interneurons controlling antagonistic muscles are spatially intermingled
3:50	David Magnuson (University of Louisville)	Supraspinal oversight vs spinal autonomy: context-specific disruption of interlimb coordination
4:05	Saul Bello-Rojas (Washington University)	Defining the postsynaptic targets of V2a neurons in spinal cord
4:20	Meeting Organizers	Closing Remarks
6:00	Reception (Full Registration Only)	Upper College Hall, St Salvator's Quadrangle
7:00	Dinner (Full Registration Only)	Lower College Hall, St Salvator's Quadrangle
9:30	Ceilidh (Full Registration Only)	Upper College Hall, St Salvator's Quadrangle