

## International MotoNeuron Meeting 2014: Detailed Program

*Subject to change*

### Day 1: Monday, June 16

8:00 AM - 8:15 AM

**Welcome**

Rob Brownstone, Dalhousie University

#### Session 1: Motoneuron and Motor Unit Firing I

8:15 AM - 8:30 AM

**Introduction**

CJ Heckman, Northwestern University

8:30 AM - 8:55 AM

***Cooperative gating by clustered voltage-gated Cav1.3 channels enhances inward currents in neurons***

Marc Binder, University of Washington School of Medicine

8:55 AM - 9:20 AM

***The subprimary range and force generation in the cat.***

Hans Hultborn, University of Copenhagen

9:20 AM - 9:40 AM

***The bistable lumbar motoneuron: a four-stroke engine in producing plateau potentials***

Frédéric Brocard, Institut de Neurosciences de la Timone. CNRS - Aix Marseille University

9:40 AM - 9:55 AM

***Action potential threshold of motoneurons during fictive scratch and swim***

Aidas Alaburda, Vilnius University

9:55 AM – 10:15 AM

**Coffee Break**

10:15 AM - 10:30 AM

***Memory in spinal motoneurons***

Michael Johnson, Northwestern University Feinberg School of Medicine

10:30 AM - 10:45 AM

***Time course of human motoneuron recovery from sustained activity at a constant firing rate***

Martin Héroux, Neuroscience Research Australia

**10:45 AM – 11:00 AM**

***Inhibitory Post-synaptic Potentials in Standing***

Jayne Garland, University of British Columbia

**11 AM - 11:20 AM**

***Double discharges and afterhyperpolarization in human motoneurons***

Maria Piotrkiewicz, Nalecz Inst Biocybern Biomedical Eng Polish  
Academy of Sciences

**11:20 AM - 11:40 AM**

**Discussion**

**11:40 AM – 2:00 PM**

**Lunch and Posters**

**Session 2: Motoneuron and Motor Unit Plasticity**

**2:00 PM - 2:15 PM**

**Introduction**

Jorn Hounsgaard, University of Copenhagen

**2:15 PM - 2:40 PM**

***Principles governing the subthreshold input-to-output properties of  
motoneurons - the view from the dendritic tree***

Ken Rose, Queen's University

**2:40 PM – 3:00 PM**

***Homeostatic plasticity in motoneurons from mice with glycine receptor  
mutations***

Bob Callister, University of Newcastle

**3:00 PM - 3:15 PM**

***The effects of passive cycling following a spinal transection on  
serotonin receptor mRNA expression in hindlimb flexor and extensor  
alpha-motoneurons***

Jeremy Chopek, University of Manitoba

**3:15 PM - 3:30 PM**

***How plastic is the motoneurone axon initial segment?***

Claire Meehan, Copenhagen University

**3:30 PM - 3:45 PM**

***Time-related changes of motoneuron properties after chronic compensatory muscle overload***

Piotr Krutki, University School of Physical Education

**3:45 PM – 4:00 PM**

**Coffee Break**

**4:00 PM - 4:25 PM**

***Hebbian plasticity in the spinal cord?***

Andrew Fuglevand, University of Arizona, College of Medicine

**4:25 PM - 4:50 PM**

***The recurrent discharge of human motoneurons is reduced by voluntary but not antidromic activation***

Simon Gandevia, Neuroscience Research Australia

**4:50 PM - 5:05 PM**

***Daily use of hand muscles with and without spinal cord injury***

Christine Thomas, University of Miami

**5:05 PM - 5:20 PM**

***Motoneurons keep calm and carry on: Pain during fatigue does not change the excitability of motoneurons of the leg***

David Kennedy, Neuroscience Research Australia and University of New South Wales

**5:20 PM – 5:40 PM**

**Discussion**

## **Day 2: Tuesday, June 17**

**8 AM - 8:15 AM**

Perspective: ***Opportunities for therapeutic development in ALS***

Lucie Buijn, The ALS Association

### **Session 3: Motoneurons and ALS**

**8:15 AM - 8:30 AM**

**Introduction**

John Ravits, UC San Diego

- 8:30 AM - 8:50 AM**      ***Hypervigilant regulation as ALS-cause: evidence from ALS patients and transgenic mouse models***  
Cassie Mitchell, Georgia Institute of Technology
- 8:50 AM - 9:10 AM**      ***Mechanisms of ALS mutant FUS mediated motor neuron degeneration: evidence for a toxic gain of function in a novel mouse model of disease***  
Neil Shneider, Columbia University Medical Center
- 9:10 AM - 9:30 AM**      ***Mechanical, electrical and molecular properties of mouse motor unit subtypes***  
Marin Manuel, CNRS UMR 8119
- 9:30 AM - 9:55 AM**      ***Is motoneuron hyperexcitability harmful in ALS?***  
Daniel Zytnicki, Paris Descartes University
- 9:55 AM – 10:15 AM**      **Coffee break**
- 10:15 AM - 10:30 AM**      ***Sex specific contributions to altered motoneuron size in SOD1G93A ALS mouse model***  
Katharina Quinlan, Northwestern University Feinberg School of Medicine
- 10:30 AM - 10:45 AM**      ***Chemogenetics and high-sensitivity performance test reveal new excitation-dependent and intrinsic vulnerability mechanisms in ALS mouse model***  
Francesco Roselli, Friedrich Miescher Institute
- 10:45 AM – 11:00 AM**      ***Vibration-induced H-reflex inhibition is suppressed in ALS: A biomarker for upper motor neuron dysfunction?***  
Michael Lee, Neuroscience Research Australia
- 11:00 AM – 11:15 AM**      ***Sensorimotor impairment in Amyotrophic Lateral Sclerosis (ALS)***  
Sina Sangari, UPMC univ Paris 6

**11:15 AM - 11:30 AM**      ***Human iPSC-derived motoneurons harbouring TDP-43 or C9orf72 ALS mutations are dysfunctional despite maintaining viability***  
Anna Claire Devlin, School of Psychology and Neuroscience, University of St Andrews

**11:30 AM – 11:50 AM**      **Discussion**

**11:50 AM – 2:00 PM**      **Lunch and posters**

#### **Session 4: Development and Diversity of Motoneurons**

**2:00 PM - 2:15 PM**      **Introduction**  
Sam Pfaff, Salk Institute

**2:15 PM - 2:35 PM**      ***A shared requirement for POU3F1 in distally projecting motor neurons enables innervation of muscles critical to respiration and grasping***  
Kevin Kanning, Columbia University

**2:35 PM - 2:55 PM**      ***Fine tuning the final common path: molecular pathways driving motor neuron functional diversification and plasticity***  
Till Marquardt, European Neuroscience Institute

**2:55 PM - 3:15 PM**      ***Development of electrical and morphological properties of lumbar motoneurons in the mouse***  
Jacques Durand, CNRS & AMU UMR7289

**3:15 PM - 3:30 PM**      ***Functional organization of spinal motor neurons revealed by ensemble imaging***  
Timothy Machado, Columbia University

**3:30 PM – 3:45 PM**      **Coffee Break**

**3:45 PM - 4 PM**      ***Number, size and distribution of motoneurons in motor nucleus of male and female rat medial gastrocnemius***  
Jan Celichowski, University School of Physical Education in Poznan

- 4 PM - 4:15 PM**                      ***Signalling through MuSK and the acetylcholine receptor mediate the retention of neuromuscular connections***  
William Phillips, The University of Sydney
- 4:15 PM - 4:30 PM**                      ***Loss of  $\beta$ 2-laminin alters calcium sensitivity and voltage gated calcium channel maturation of neurotransmission at the neuromuscular junction***  
Peter Noakes, The University of Queensland
- 4:30 PM - 4:45 PM**                      ***Spinal neuron identity and survival in the absence of neurosecretion***  
Chris Law, Institut de recherches cliniques de Montréal
- 4:45 PM – 5:00 PM**                      ***Mechanisms of cholinergic synapse formation in mouse spinal cord***  
Kuo-Fen Lee, The Salk Institute
- 5:00 PM – 5:20 PM**                      **Dicsussion**
- 6:30 PM**                                      **Dinner and evening presentation – Pier 21**  
***Bus transporstation available from theLord Nelson. Otherwise a 20 minute walk along the seafront prominade***
- Historical Talk by Douglas Stuart, Univertsity of Arizona  
***William c. Gibson (1913-2009): a neurologist/psychiatrist of many talents***

### **Day 3: Wednesday, June 18**

#### **Session 5: Motoneuron and Motor Unit Pathophysiology**

- 8 AM - 8:15 AM**                              **Introduction**  
Inge Zijdewind, University Medical Center Groningen
- 8:15 AM - 8:40 AM**                              ***Non-cell autonomous mechanisms induce dysfunction of motor neurons in a mouse model of Spinal Muscular Atrophy***  
George Mentis, Columbia University

- 8:40 AM – 9:00 AM**      ***Mutations in glycyl-tRNA synthetase that cause peripheral neuropathy CMT2D create a neomorphic protein that antagonizes VEGF-Nrp1 signaling***  
Sam Pfaff, Salk Institute
- 9:00 AM - 9:15 AM**      ***'Roid 'Rage - The mechanism of neurosteroid-mediated excitation of motor neurons***  
Mark Bellingham, University of Queensland
- 9:15 AM - 9:30 AM**      ***Mechanisms regulating axonal transport and motor neuron degeneration***  
Yong-Chao Ma, Northwestern University Feinberg School of Medicine
- 9:30 AM - 9:45 AM**      ***Motor unit number estimation and functional tasks***  
Stephane Baudry, Université Libre de Bruxelles
- 9:45 AM – 10:05 AM**      **Coffee break**
- 10:05 AM - 10:20 AM**      ***Spinal plasticity in stroke patients after botulinum neurotoxin A injection in ankle plantarflexors***  
veronique Marchand-Pauvert, Inserm
- 10:20 AM - 10:35 AM**      ***Anomalous EMG-force relations during stretch reflex responses in stroke survivors***  
Nina Suresh, Rehabilitation Institute of Chicago
- 10:35 AM - 10:50 AM**      ***Mechanisms of spasticity in cerebral palsy***  
Monica Gorassini, University of Alberta
- 10:50 AM - 11:05 AM**      ***Evidence of systemic depolarization & prolonged Ia EPSP in  $\alpha$  motoneurons of hemispheric stroke survivors***  
Matthieu Chardon, Northwestern University

- 11:05 AM - 11:15 AM**      ***Contradictions in motoneurone discharge behaviour after stroke: comparing activity from the more-affected side, less-affected side and healthy subjects***  
Penelope McNulty, Neuroscience Research Australia
- 11:15 AM - 11:30 AM**      ***Optogenetic control of muscle contraction attenuates denervation atrophy: who needs motor neurons?***  
Victor Rafuse, Dalhousie University
- 11:30 AM – 11:50 AM**      **Discussion**
- 11:50 AM – 12:00 PM**      **Business Meeting**
- 12:00 PM – 12:10 PM**      **Group Photo**
- 1:00 PM – 16:30 PM**      **Peggy’s Cove tour (optional, pre-registration required)**  
**Please see the Social Events and Excursions webpage for further details**

## **Day 4: Thursday, June 19**

### **Session 6: Motoneurons and Motor Units in Circuits**

- 8:00 AM - 8:15 AM**      **Introduction**  
Martyn Goulding, , The Salk Institute
- 8:15 AM - 8:40 AM**      ***Sensorimotor control circuits in dragonfly prey capture***  
Anthony Leonardo, HHMI
- 8:40 AM - 9:05 AM**      ***Inhibition, burstlets and percolation: role in generating respiratory drive to motoneurons***  
Jack Feldman, UCLA
- 9:05 AM - 9:25 AM**      ***Motoneurons, orchestrated by modular clocks or global networks?***  
Jorn Hounsgaard, University of Copenhagen



- 9:25 AM - 9:40 AM**      ***En passant axonal inhibition far from the presynaptic terminal, produced by 5-HT<sub>1D</sub> receptors on sensory afferents.***  
David Bennett, University of Alberta
- 9:40 AM - 9:55 AM**      ***Group Ia reciprocal excitation between ankle antagonists in a plantigrade animal***  
Adam Deardorff, Wright State University
- 9:55 AM – 10:15 AM**      **Coffee break**
- 10:15 AM - 10:40 AM**      ***Modulation of Motoneuron firing by recurrent inhibition in adult rat in vivo***  
Timothy Cope, Wright State University
- 10:40 AM - 11:05 AM**      ***A new method to determine reflex latency induced by high rate stimulation of the nervous system***  
Kemal Turker, Koc University
- 11:05 AM - 11:20 AM**      ***Effects induced by motor cortex anodal transcranial direct current stimulation on wrist muscles in stroke patients***  
Alexandra Lackmy-Vallee, INSERM, CNRS, UPMC
- 11:20 AM - 11:35 AM**      ***Motor unit firing patterns during abnormal multi-joint coupling in chronic hemiparetic stroke***  
Laura Miller, Northwestern University
- 11:35 AM – 11:55 PM**      **Discussion**
- 11:55 AM – 2:00 PM**      **Lunch and posters**

**Session 7: Motoneuron and Motor Unit Firing II**

