Day 1: Tuesday, July 8

8:00 AM - 8:45 AM | Registration, Morning Networking, Coffee & Light Breakfast, Poster Setup

8:45 AM - 9:00 AM | Welcome Remarks

9:00 AM – 10:00 AM | Introductory Session – *Perspectives on Motoneuron Techniques and Physiology Throughout the Years*

Speakers: CJ Heckman & Roger Enoka

10:00 AM - 10:30 AM | Rapid fire talks

Chair: Sophie Jenz

10:30 AM – 11:00 AM | Coffee Break & posters

11:00 AM - 12:30 PM | Session I – **ALS 1**

Chair: **TBD**

1) ***Alicia Dubinski*** (Montreal) – Selective, stress-induced motor neuron loss correlates with TDP-43 translocation in vivo
2) ***Rachael Jones*** (Newcastle) – A Macaque Model of Motor Neurone Disease
3) ***Gabriel Trajano*** (Brisbane) – Motoneuron recruitment-derecruitment hysteresis is reduces over time in weaker, but not stronger, muscles in people living with ALS
4) ***Ying Zhang*** (Halifax) – Activity Dependent Changes of ALS Patient-Derived iPSC Motor Neurons
5) ***Sherif M. Elbasiouny*** (Dayton) – Identification of Electrophysiological Markers for Early ALS Diagnosis

12:30 PM – 2:00 PM | Lunch break & hikes nearby

2:00 PM – 3:30 PM | Session II – **Movement & Plasticity**

Chair: Kevin Power

1) ***Daniel Basile*** (London) – Investigating motor unit firing rates during arm cycling in humans
2) ***Kaitlyn Sutton*** (St. John's) – Implications of Modifying Motoneuron Excitability on the Proprioceptive Sense of Force
3) ***Piotr Krutki*** (Poznan) – Endurance vs. Strength Training – Differential Changes in Proprioceptive Input from Muscle Spindles To Slow and Fast Motoneurons

4) ***Sophie Jenz*** (Chicago) – Well-Behaved Motor Units Rarely Make History – The Challenging Task of Quantifying Female Motor Output Across the Menstrual Cycle
5) ***Eduardo Martinez-Valdes*** (Birmingham) – Attenuated corticospinal excitation and inhibition during fatigue limit spinal motoneuron firing responses at task failure in sustained submaximal contractions

3:30 PM – 4:00 PM | Coffee Break & posters

4:00 PM – 5:30 PM | Session III – **Cellular Mechanisms of Motoneuron Firing**
Chair: Monica Gorassini

1) ***Dave Bennett*** (Edmonton) – The dark secrets of experimental measures of motoneuron PICs and self-sustained firing
2) ***Simon Sharples*** (Cincinnati) – Spinal neurons with a biophysical signature consistent with a gamma motoneuron identity emerge during the third week of postnatal development in mice
3) ***Melissa Fajardo*** (Chicago) – Modelling Human Motoneuron Firing Patterns Through Parameter Manipulations of Afterhyperpolarization Time Constants and Voltage Thresholds for Persistent Inward Current Activation
4) ***Keith Fenrich*** (Edmonton) – Resolving motoneuron subcellular dynamics with optical imaging
5) ***Robin Rohlén*** (Umeå) – Double discharges in response to fast onset of synaptic input

5:30 PM - 7:30 PM | Poster Social

Day 2: Wednesday, July 9

8:00 AM - 8:30 AM | Morning Networking, Coffee & light breakfast

8:30 AM - 10:00 AM | Session IV – **Brainstem Motor Control in Health and Disease**
Chair: Ralph Fregosi

1) ***Ralph Fregosi*** (Tucson) – Influence of developmental nicotine exposure and environmental heat stress on XIIMN properties and neural drive to tongue muscles
2) ***Teresa Pitts*** (Columbia) – Increased laryngeal activity post-cervical spinal cord injury: acute to chronic models of cervical hemisection

3) ***Jane Butler*** (Sydney) – Motor unit recruitment and rate coding strategies in human genioglossus; insights from flow limited breathing in obstructive sleep apnoea
4) ***Mark Bellingham*** (Brisbane) – Neonatal Riluzole Treatment Blocks Early Motoneuron Hyperexcitability and Dendritic Alteration, and Delays Neuromotor Deficits and Motoneuron Death in hSOD1G93A Mice
5) ***Michael Frazure*** (Tucson) – Varied Calcium Sensitivity Underlies Functional Specialization of Hypoglossal Motoneurons Innervating the Superior Longitudinalis and Genioglossus Tongue Muscles

10:00 AM – 10:30 AM | Coffee Break & posters

10:30 AM – 12:00 PM | Session V - **Computational Tools for Motor Unit Identification and Analysis, and Their Translation in Motor Diseases**

Chair: Francesco Negro

1) ***Hélio Cabral*** (Brescia) – Low-dimensional Control of Motor Unit Activity During the Acquisition of a New Motor Skill Task
2) ***Christopher Thompson*** (Philadelphia) – Resting State Activity of Lumbar Spinal Interneurons: Keeping the Motoneurons Warm through Distributed and Functionally Coupled Subpopulations
3) ***Utku Yavuz*** (Enschede) – Motor Unit Reflex Probability Distribution to Determine Spinal Motoneuron Adaptation
4) ***Leonardo Abdala Elias*** (Campinas) – Sources of Common Inputs to Triceps Surae Motor Nuclei: Insights from a Multiscale Neuromuscular Model
5) ***Laura McPherson*** (St. Louis) – Heterogeneity of Pathophysiological Voluntary Motor Commands in People with Multiple Sclerosis

12:00 PM – 12:30 PM | Light Lunch & posters

12:30 PM – 2:00 PM | Session VI – **Acute Intermittent Hypoxia and Other Therapeutics**

Chair: Simon Gandevia

1) ***Alexandria Marciante*** (Gainesville) – Adenosinergic Regulation of Intermittent Hypoxia-Induced Phrenic Motor Plasticity
2) ***Jason Mateika*** (Detroit) – Mild Intermittent Hypoxia, Respiratory Plasticity and Sleep Apnea
3) ***Milap Sandhu*** (Chicago) – Intermittent Hypoxia Induced Plasticity for Motor Recovery and Neurorehabilitation
4) ***Marcin Bączyk*** (Poznan) – The Impact of Anodal and Cathodal TsDCS on Passive Membrane and Firing Properties of Spinal Motoneurons in SOD1 G93A Mice

5) ***Simon Gandevia*** (Sydney) – Added transcutaneous spinal stimulation to locomotor training does not improve walking in spinal cord injury: an international double-blinded randomised sham-controlled trial

(Afternoon free for networking, sightseeing, or optional activities)

3:30-7:00 PM | OPTIONAL (fee required): Gatherall's puffin & whale watching boat tour
******limited to the first 100 people who sign-up******

Day 3: Thursday, July 10

8:00 AM – 9:00 AM | Morning Networking, Coffee & light breakfast

9:00 AM - 10:30 AM | Session VII – **Computational Approaches to Study Motoneurons**
Chair: Kelvin Jones

1) ***Andy Fuglevand*** (Tucson) – A Population Model of Motor Units – What's Missing?
2) ***Jakob Škarabot*** (Loughborough) – Estimating mechanisms of gain control from motor unit discharge patterns across contraction intensities
3) ***Drew Beauchamp*** (Pittsburgh) – In Silico Framework for Exploring the Input-Output Dynamics of Spinal Motoneurons
4) ***Martin Zaback*** (Philadelphia) – The recruitment portrait: A time-series estimate of motor unit recruitment
5) ***Tim Howells*** (Sydney) – A Simple but Effective Model of Axonal Excitability. Modelling the Node of Ranvier and its Adjacent Internode

10:30 AM – 11:00 AM | Coffee Break & posters

11:00 AM - 12:30 PM | Session VIII – **Motor Impairments 1**
Chair: **TBD**

1) ***Alex Benedetto*** (Chicago) – Intermuscular differences in motor unit firing parameters to predict muscle strength after spinal cord injury
2) ***Bradley Heit*** (Chicago) – Life extension, motoneuronal excitability, and ambient glutamate: the role of system xc- in amyotrophic lateral sclerosis
3) ***Kim Dhillon*** (London) – Disordered Postnatal Maturation of Hindlimb Motor Units in a Mouse Model of DYT-TOR1A

4) ***Elizabeth Wright-Jin*** (Wilmington) – Novel two-hit mouse model of neonatal hypoxic ischemic encephalopathy results in developmental delays, long-term motor deficits, and decreased brain volume
5) ***Kamil Grycz*** (Poznan) – Synaptic Excitation-transcription Uncoupling in Motoneurons May Play an Essential Role in Amyotrophic Lateral Sclerosis (ALS) Pathophysiology

12:30 PM - 1:30 PM | Lunch Break & posters

1:30 PM – 3:00 PM | Session IX – **ALS 2**
Chair: Rob Brownstone

1) ***John Ravits*** (San Diego) – Cellular vulnerability and prion-like spread in amyotrophic lateral sclerosis: Update
2) ***Michael Benatar*** (Miami) – MMI as a prodromal syndrome in ALS: frequency and relevance to phenoconversion
3) ***Filipe Nascimento*** (London) – Spinal microcircuit adaptations in early-stage ALS: bridging insights from mice to humans
4) ***Monica Gorassini*** (Edmonton) – Electrophysiological Biomarkers of ALS that may Precede or Follow Motoneuron Degeneration Before the Occurrence of Muscle Weakness
5) ***Kelvin Jones*** (Edmonton) – Evaluating the Utility of Nerve Excitability and CMAP Scan Biomarkers in ALS: Diagnostic, Prognostic, and Predictive Insights

3:00 PM – 5:30 PM | **ALS roundtable** (***Sponsored by Project ALS and ALS Canada***)

6:00 PM – 7:00 PM | Happy Hour @ the Wharf

7:00 PM - Midnight | Newfoundland Kitchen Party @ Quidi Vidi Brewery

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Day 4: Friday, July 11

8:00 AM - 9:00 AM | Morning Networking, Coffee & light breakfast

9:00 AM - 10:30 AM | Session X – Neuromuscular Junctions in Health and Disease/Injury

Chair: Kathy Quinlan

1) ***Robert Akins*** (Wilmington) – Dysmorphic Neuromuscular Junctions in Spastic Cerebral Palsy
2) ***Emily Reedich*** (Kingston) – Motor Unit Development in a Rabbit Model of Cerebral Palsy
3) ***Richard Robitaille*** (Montreal) – Neuromuscular Junction as Therapeutic Target in ALS
4) ***Wen-Cheng Xiong*** (Cleveland) – Muscular Swedish mutant APP in neuromuscular junction maintenance and Alzheimer's disease development
5) ***W. David Arnold*** (Columbia) – Neuromuscular Junction Transmission Failure in Sarcopenia

10:30 AM - 11:00 PM | Coffee Break

11:00 AM – 12:30 PM | Session XI – Neural Constraints That Govern Motor Unit Activity in Humans

Chair: Alessandro Del Vecchio & Dario Farina

1) ***Natalia Cónsul*** (London) – Neuromodulation increases the flexibility of motoneuron control
2) ***Devon Rohlf*** (Erlangen) – Precise Decoding of Spared Neural Control in the Paralyzed Human Hand Using Multiple Muscle Implants
3) ***Ciara Gibbs*** (London) – Behavioural and Neural Constraints on Motor Control
4) ***Nikolaos Varvariotis*** (Thessaloniki) – Decoding the Bilateral Force Deficit During Dorsiflexion: Insights from Motor Unit Activity and the Off-Direction Force
5) ***Marius Osswald*** (Erlangen) – Structured higher-dimensional common synaptic inputs dictate violations in size principle

12:30 PM - 1:30 PM | Lunch Break

1:30 PM – 3:00 PM | Session XII – Inputs to Motoneurons

Chair: Andrew Fuglevand

1) ***Kazuhiko Seki*** (Tokyo) – Spinal and cortical premotor control of primate hand muscles in precision grip
2) ***Andrew Miri*** (Chicago) – Motor Cortical Influence During Ethological Motor Behavior
3) ***Andrew Pruszynski*** (London) – Sensory Expectations Shape Neural Population Dynamics in Motor Circuits
4) ***Gorkem Ozyurt*** (London) – Spinal motoneuron interconnectivity forms circuits that facilitate forceful tasks

5) ***Francois Dernoncourt*** (Nice) – Behavior of Large Populations of Motor Units: What Does it Reveal About the Neural Circuits Involved in Movement Generation?

3:00 PM – 3:30 PM | Coffee Break

3:30 PM – 4:45 PM | Session XIII - **Motor Impairments 2**
Chair: Duane Button

1) ***Xin Yu*** (Chicago) – Asymmetrical voluntary neural drive in triceps surae muscles during plantarflexion in chronic stroke survivors
2) ***Kathy Quinlan*** (Kingston) – Primary afferent depolarization and hyperreflexia in cerebral palsy
3) ***Daniela Souza de Oliveira*** (Erlangen) – Leveraging residual motor unit activity after spinal cord injury
4) ***Valentin Goreau*** (Nantes) – Effect of joint position on alpha-motoneuron persistent inward currents in humans with and without spinal cord injury
5) ***Timothée Popesco*** (Lausanne) – Persistent Inward Current Decline Following Electrically-induced Muscle Cramps

4:45 PM – 5:00 PM | Closing Remarks & Future Directions

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