

– Scientific program –

The introductory reviews and the special lecture will last 30 minutes (including 5 min. discussion).
All other talks are scheduled to last 15 minutes (including 3 min. discussion)

Friday 7/09

8:30-8:50: Registration and Coffee

8:55: Welcome

9:00-10:30: Respiratory control of motoneuronal activity - Session given in honor of Peter Kirkwood; Chair: Karin Persson

- Jack Feldman: Are respiratory motoneurons special? **Introductory Review**
- Anna Hudson & Jane Butler: behaviour of human inspiratory motoneurons to voluntary and non-voluntary commands
- Albert J Berger & Johannes van Brederode: GABAergic Control of Hypoglossal Motoneurons
- Peter Kirkwood: Of course respiratory motoneurons are special **Special Lecture**

10:30-11:00: Coffee break

11:00-12:00: Neuromodulation of intrinsic properties; Chair: Hilary Wakefield

- Gareth Miles: Modulation of motoneurons by a spinal cholinergic system
- Stan Nakanishi & Patrick Whelan: Dopaminergic modulation of locomotion.
- David McCrea: Intrinsic spinal mechanisms increase motoneuron excitability during fictive scratch
- Brent Fedirchuk: Evidence of multiple and distinct modulatory mechanisms enhancing spinal motoneuron excitability during motor output

12:00-12:30: General Discussion (Jean-François Perrier)

12:30-13:30: Lunch

13:30-15:00: Poster Session 1 and Coffee

15:00-15:30: Poster discussion (Randy Powers & Jane Butler)

15:30-16:45 Development of the motor unit; Chair: Lissa Herron

- Klas Kullander: Novel markers for motor neurons enable genetic analysis of subpopulation development and function
- Pascal Legendre: Glycine release from radial cells modulates spontaneous activity during early spinal cord development
- Claire Legay: Extracellular matrix and differentiation of the neuromuscular junction
- Evelyne Bloch-Gallego: Development and maintenance of motoneurons: a key role of small GTPases and microtubule associated proteins
- Eric Krejci: Functional and subsynaptic localization of acetylcholinesterase at the neuromuscular junction

16:45-17:15: Coffee break

17:15-18:15: Historical session: Paths of Discovery in Motoneuron Neurobiology;

Chair: Jean-Gael Barbara

- François Clarac and Jean Gael Barbara: Human motor pathologies and the emergence of motoneuronal concepts
- Jacques Duchateau and Roger Enoka: Extracellular recording of human motor unit discharge: origin and insights into the integrated motor system
- Douglas Stuart and Robert Brownstone: The beginning of intracellular recording in mammalian motoneurons: facts and speculations

18:30 - 20:30: Welcome cocktail

8:30-9:45: Firing properties in human subjects (1) Chair: Jennifer Stephenson

- [Simon Gandevia](#): Central fatigue and implications for motoneurone firing **Introductory Review**
- [Janet Taylor](#) & Chris McNeil: Motoneurone excitability with fatigue
- [Lydia Kudina](#) & Regina E. Andreeva: Repetitive Doubling and Plateau Potentials in Human Motoneurons
- [Fiona Bailey](#): Task related variations in the discharge synchrony of human hypoglossal motor units

9:45-10:15: Coffee break

10:15-11:30 Synaptic inputs and motoneuronal excitability Chair: Alain Frigon

- [Rodolfo Delgado-Lezama](#): Control of monosynaptic reflex by GABA_A receptors in the turtle spinal cord
- [Boris Lamotte d'Incamps](#): Recurrent inhibition: simple loop but complex synapses
- [Andrew Fuglevand](#): Comparison of current-injected and synaptically-mediated activation of hypoglossal motor neurons
- [Aidas Alaburda](#): Activation of spinal motoneurons during fictive swim
- [Rune Berg](#): How do we achieve precision in force? New mechanism for gain modulation in spinal motoneurons via Vm-fluctuations.

11:30-12:00: General Discussion (C.J. Heckman)

12:00-13:00: Lunch

13:00-14:30: Poster Session 2 and Coffee

14:30-15:00: Poster discussion (Inge Zijdwind & Roger Enoka)

15:00-16:00: Firing properties in human subjects (2) Chair: Matthew Holmes

- [Maria Piotrkiewicz](#), Lydia Kudina, Regina Andreeva, Dariusz Mlozniak: Recurrent inhibition in motoneurone pools of slow and fast human muscles
- [David F. Collins](#), Cameron S. Mang, Yoshino Okuma: Does the motor cortex contribute to "self-sustained" firing of human motoneurons?
- [Hiske van Duinen](#): control of the extrinsic muscles of the hand
- [Christiane Rossi-Durand](#): Interaction between cognitive and motor tasks: Modulation of human motoneuron activity by a mental arithmetic task

16:00-16:30: Coffee break

16:30-17:30: Adaptations in motoneurons (Training, Chronic Pain, Aging) Chair: Caroline Iglesias

- [Phil Gardiner](#): Alpha-motoneuron adaptations to increased activity, from function to gene expression
- [Katrina Maluf](#): Motor responses to acute psychosocial stress in chronic neck pain
- [Andrew Cresswell](#): Motor unit discharge behaviour during brief and ballistic contractions in young and elderly adults
- [Roger Enoka](#) & Michael A. Pascoe: Discharge characteristics of motor units at recruitment during sustained contractions differ for young and old humans

17:30-18:00: General Discussion (Hans Hultborn)

8:30-9:45: Plasticity in motoneuron properties after peripheral nerve injury Chair: Kevin Power

- Tim Cope: New Lessons from Peripheral Nerve Injury: not just a problem in the periphery
Introductory Review
- Ken Rose: Growth of supernumerary axons from motoneuron dendrites following permanent axotomy
- Francisco Alvarez: Reorganization of Ia afferent synapses on motoneurons after peripheral nerve injuries
- Robert Fyffe: Plasticity in channel expression and localization in motoneurons after peripheral nerve injury

9:45-10:15: Coffee break

10:15-11:30: New techniques to investigate motor unit properties in humans Chair: Katie Gant

- Kemal Turker: Investigation of synaptic inputs to human motoneurons using frequency-based analysis; peristimulus frequencygram
- Jens Bo Nielsen: Estimating recruitment gain of the motoneuronal pool in humans
- Alexandra Lamy & Veronique Marchand-Pauvert: Motoneurone pool properties and TMS in humans
- Zev Rymer & Ping Zhou: Use of novel high density EMG grids to track motoneuron disease
- Francesco Negro & Dario Farina: Sampling issues in correlation analysis between motor unit spike trains

11:30-12:00: General Discussion (Christine Thomas)

12:00: Apéritif with hors d'œuvre.

Afternoon free

19:00-undetermined time: Young researchers' party

8:30-10:00: Cellular basis of motoneuron excitability and firing properties Chair: Estelle Drobac

- Marc Binder: Deconstructing persistent calcium currents in motoneurons: the where, the how and the why **Introductory Review**
- Thomas Hamm: Comparison of discharge properties and persistent inward currents in normal motoneurons and motoneurons following incomplete spinal injury
- Marin Manuel et al.: Fast subthreshold oscillations and sub-primary firing range in adult mouse motoneurons: implications for their motor units
- Marc Davenne: The axon initial segments of mouse motoneurons
- Florence Cotel & Jean-François Perrier: Serotonin induces central fatigue in motoneurons

10:00-10:30: Coffee break

10:30-11:45: Realistic models of motoneurons Chair: Matthieu Chardon

- CJ Heckman: Models of populations of motor units
- Randy Powers: Simulations of abnormal motor unit discharge behavior in spastic muscle.
- Claude Meunier et al: Mechanisms of mixed mode oscillations in mouse spinal motoneurons
- Gwendall LeMasson: Energy unbalance and motoneuron degeneration in ALS
- Bob Lee: Relationship between pathology dynamics and treatment strategies: ALS and SCI case studies.

11:45-12:15: General Discussion (Rob Brownstone)

12:15-13:15: Lunch

13:15-14:30: Poster Session 3 and Coffee

14:30-15:00: Poster discussion (Christiane Rossi-Durand & Kelvin Jones)

15:00-16:30: Motoneuron properties after spinal cord injury and cerebral stroke

Chair: Anna Hudson

- Jonathan Carp: Spinal transection in adult rats alters the intrinsic properties of urethral sphincter motoneurons recorded in vitro
- Christine Thomas, Samuel Beckerman, James Atkison, Jeffrey Winslow, Marine Dididze: Alterations in motoneuron properties with chronic human spinal cord injury.
- Inge Zijdwind, Katie Merritt, Rob Bakels & Christine Thomas: Do additional inputs change voluntary motor unit firing rates after spinal cord injury?
- Rose Katz: Pathophysiology of spinal circuitry following cerebral lesions in humans
- Penelope McNulty: motor units and motor control after stroke
- Jayne Garland: Motoneurone afterhyperpolarization time course in humans following stroke

16:30-17:00: General Discussion (**Paul Hodges**)

17:30: Bus to the meeting Dinner

19:00-23:45: Meeting Dinner

8:30-10:15: Motoneuron diseases (from genetics to pathophysiology) (1) Chair: Amélie Freal

- Bernhard Keller: Novel aspects of motoneuron diseases: from genetics to pathophysiology
Introductory Review
- Judith Melki: Genomics and transcriptomics in motor neuron disease
- Suzie Lefebvre: Cellular functions of the spinal muscular atrophy gene product SMN in RNA metabolism
- Mihai Moldovan: Abnormal motor axon function in the transgenic SOD1 (G127X) mouse model of amyotrophic lateral sclerosis
- Séverine Deforges & Frédéric Charbonnier: Exercise-specific induced neuroprotection in ALS mice.
- Kelvin Jones & Tessa Gordon: Motor unit type and disease progression in the SOD1 mouse model of ALS and strategies for neuroprotection.

10:15-10:45: Coffee break

10:45 - 12:15: Motoneuron diseases (from genetics to pathophysiology) (2) Chair: Walter Babiec

- George Mentis: Altered intrinsic properties and synaptic dysfunction of motor neurons in a mouse model of spinal muscular atrophy
- Cristina Zona: Branched-chain amino acids induce hyperexcitability in motoneurons. Their possible involvement in Amyotrophic Lateral Sclerosis ethiopathology
- Jacques Durand: Postnatal alterations in lumbar motoneurons from SOD1 transgenic mice, an animal model of amyotrophic lateral sclerosis.
- Claire Meehan & Hans Hultborn: In vivo recordings from motoneurons in the SOD mouse
- Daniel Zytnicki: Searching for altered properties of motoneurons in adult SOD1 mice
- Rob Brownstone: In search of lost motoneurons or "A la recherche du motoneurone perdu"

12:15-12:45: General Discussion (Zev Rymer)

12:45-13:45: Lunch

13:45 - 14:45: Final Discussion (Janet Taylor & Jørn Hounsgaard)

14:45 - 15:00: Best posters awards; Announcement of the next meeting