



The Dynamics of Motor Control: Circuit Interactions in Health and Disease

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Faculty of Medicine and Health Sciences, University of Barcelona | July 5th, 2026



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YOUNG MOTOR CONTROL SOCIETY

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FENS
Forum 2026
6-10 July 2026 | Barcelona, Spain



PROGRAM

08:30-09:00 **Registration**

09:00-09:10 **Welcome & Opening remarks**, Mercè Masana, Ramón Reig, Roberto Leiras

09:10 **Session 1: Cortico-striatal Architecture and Circuit Mechanisms for Motor Control**

Chair: Mercè Masana, *University of Barcelona (Spain)*

09:10-09:30 **Harsh Kanodia**, *Biozentrum and FMI (Switzerland)*

“Projection-defined modules reveal mouse motor cortex architecture”

09:30-09:50 **Jorge Maldonado Torres**, *Instituto de Neurociencias CSIC-UMH (Spain)*

“Divergent Synaptic Fingerprints of Frontal and Somatomotor Inputs in the Dorsolateral Striatum”

09:50-10:10 **Daniel Ramandi**, *Djavad Mowafaghian Centre for Brain Health (Canada)*

“Cortical and striatal circuit recruitment during a voluntary motor task in a mouse model of Huntington's disease.”

10:10-11:30 **Poster Session I (Posters 1-20) and coffee break**

11:30 **Session 2: Population Dynamics Encoding Movements**

Chair: Ramón Reig, *Instituto de Neurociencias CSIC-UMH (Spain)*

11:30-11:50 **Charlotte Bichara**, *Institute Cellular and Integrative Neurosciences (France)*

“Phase-dependent and anticipatory cortical control of hindlimb locomotion”

11:50-12:10 **Phillip Bokinić**, *Queensland Brain Institute (Australia)*

“Population coding of locomotion by sensory afferent neurons in the awake mouse”

12:10-12:30 **Omar Refy**, *University of Copenhagen (Denmark)*

“Neuraxis-wide population dynamics during voluntary wrist movement in macaque”

12:30-14:00 **Lunch break**

14:00 **Session 3: Descending Pathways for Action Initiation and Execution**

Chair: Roberto Leiras, *University of Copenhagen (Denmark)*

14:00-14:20 **Rémi Ronzano**, *University College London (United Kingdom)*

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- “Spinal circuits encode a map of the trunk to control skin twitches”
- 14:20-14:40 **Giacomo Sitzia**, *University of Copenhagen (Denmark)*
- “A Subthalamic–Brainstem Circuit for Locomotor Initiation”
- 14:40-15:00 **Vanessa Stempel**, *Max Planck Institute for Brain Research (Germany)*
- “Midbrain Circuits for Defensive Behavior Execution”
- 15:00-15:05 **Group Photo**
- 15:05-16:30 **Poster Session II (Posters 21-40) and coffee break**
- 16:30 **Session 4: Spinal Circuits Connectivity in health and disease**
Chair: Lora Sweeney, *Institute of science and technology Austria (Austria)*
- 16:30-16:50 **Sandrina Campos Maçãs**, *University Hospital of Cologne (Germany)*
- “Mapping the connectivity of spinal cord projection neurons”
- 16:50-17:10 **Beck Strohmer**, *University of Copenhagen (Denmark)*
- “Closed-loop proprioceptive feedback in a spinal circuit model of ALS”
- 17:10-17:30 **Patricia del Cerro de Pablo**, *Paris-Saclay Institute of Neuroscience (France)*
- “Plasticity of medullary descending pathways after spinal cord injury and trans-spinal magnetic stimulation”
- 17:30-17:45 **Conclusion and Final remarks**
- 17:45-20:00 **Free time to rest, stretch and network until dinner**
- 20:00-22:30 **Dinner at Restaurant “SAONA Aribau” (only for registered attendees)**
Calle Aribau 131, 08036, Barcelona.
<https://www.gruposaona.com/restaurante/saona-aribau/>

POSTER LIST

- Poster 1: Elias Lunsford (France) - *Uncovering principles in brainstem processing of spatial and directional cues from sensors across the body to motor commands*
- Poster 2: Ninon Peysson (France) - *All-optical mapping of the mesencephalic locomotor region in the larval zebrafish*
- Poster 3: Austin Chuang (USA) - *A Neuromechanical Model Reveals that dI3-to- γ Pathways Provide Spindle Feedback Control of Gait Kinematics and Phase Transitions*
- Poster 4: Laura Bushelli (USA) - *Afferent feedback enables robust sit-to-stand transitions in response to V3 stimulation: a neuromechanical modeling study*
- Poster 5: Simrandeep Kaur Sidhu (Denmark) - *Restoration of Locomotor Function in a Chronic Parkinsonian Mouse Model by Selective Activation of Brainstem Command Neurons*
- Poster 6: Jacinthlyn Sylvia Suresh (Canada) - *Modulation of locomotion and orienting movements by D2 receptor-expressing neurons in the gigantocellular reticular nucleus*
- Poster 7: Xinyu Jia (France) - *All-optical dissection of a spatially organized reticulospinal circuit for locomotor initiation and maintenance*
- Poster 8: Ines Klein (Germany) - *Spinal circuits for locomotor adaptation*
- Poster 9: E. Axel Gorostiza (Germany) - *Symmetry break and leg specific roles during curve walking in *Drosophila**
- Poster 10: Marie Yahia (France) - *A serotonergic sensory-gating pathway for adaptive locomotion*
- Poster 11: Erik Courcelles (Denmark) - *Cortical encoding of aversive-appetitive motivated locomotor movement*
- Poster 12: Manuela Rizzi (UK) - *Spatial transcriptomics reveals distinct molecular signature of motor neurons and interneurons in control and pre-symptomatic stages of an ALS mouse model*
- Poster 13: Katherina Rees (USA) - *Corticospinal Connectivity after Developmental Damage: Circuit Plasticity & Functional Outcomes*
- Poster 14: Mahan Hosseini (Germany) - *AutoGaitA: A versatile quantitative framework for kinematic analyses across species, perturbations and behaviours*
- Poster 15: Nadezhda Evtushenko (Germany) - *Identification of CSF-contacting neurons subtypes in the mouse spinal cord*

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- Poster 16: Maryam Givehchi (Spain) - *Disrupted cAMP dynamics in the secondary motor cortex during sensorimotor and motor learning behaviour in the R6/1 mouse model of Huntington's disease*
- Poster 17: Samuel Fedde (USA) - *Cortico-brainstem pathway compensates for loss of corticospinal output after stroke and spinal cord injury*
- Poster 18: Dominic Falardeau (Canada) - *Exploring the role of the premotor trigeminal complex in masticatory function*
- Poster 19: Prathigna Thambi Jaishankar (France) - *Gene expression mapping of the mesencephalic locomotor region, reticular formation and spinal motor circuits in larval zebrafish*
- Poster 20: Valentina Bova (Spain) - *Contribution of striatal D1-expressing neurons to motor deficits in early and later stages of the Huntington's disease*
- Poster 21: Angus Gray (UK) - *Modelling the Emergence of Asymmetric Motor Deficits in Amyotrophic Lateral Sclerosis Using a Bilateral Spinal Central Pattern Generator*
- Poster 22: Alessia Ricci (Sweden) - *Intrinsic properties of external globus pallidus neurons in dopamine depleted mice*
- Poster 23: Nuria Antolin (Denmark) - *Circuit-level mapping of locomotor network recruitment during neuromodulatory stimulation after spinal cord injury*
- Poster 24: Elizaveta Shegurova (France) - *Interrogating deep brain stimulation circuit activity using focused ultrasound*
- Poster 25: Stephan Dietrich (Denmark) - *Input and Output Connectivity Matrix of Chx10-PPN Neurons Involved in Pause-and-Play Behavior*
- Poster 26: Evgeny Bondarenko (USA) - *Subthreshold oscillations of preBötzinger Complex VGluT2+ neurons enable instantaneous modulation of inspiratory rhythm generation in vivo*
- Poster 27: Evgeny Bondarenko (USA) - *Non-volitional slow breathing training produces persistent reductions in anxiety and stress reactivity via the preBötzinger complex*
- Poster 28: Anna Stuckert (UK) - *Investigating the Early Frontotemporal Dementia Phenotypes in a Mouse Model of TDP-43 Proteinopathy*
- Poster 29: Haohao Wu (Switzerland) - *Encoding fine-grained forelimb movements through molecularly heterogeneous brainstem neurons*
- Poster 30: Madhav Sridharan (Switzerland) - *Midbrain input regulates motor thalamic reticular nucleus activity during skilled forelimb movement*
- Poster 31: Mahalakshmi Dhanasekar (France) - *Cerebrospinal Fluid Noradrenergic Signaling Sustains Motor Arrest through Disruption of Motor Commands*

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- Poster 32: Laurine Moncomble (France) - *Neuronal activation mapping in the spinal cord following high-intensity trans-spinal magnetic stimulation in mice*
- Poster 33: Raimond Clémence (France) - *Study of oligodendrocytes degeneration and study of transspinal repetitive magnetic stimulation in *sod1* mouse model of ALS*
- Poster 34: Manjusha Goli (Canada) - *Fight, Flight, and Firing: Investigating the Effects of Aversive Stimuli on Glutamatergic Cell Activity in the Medial Zona Incerta*
- Poster 35: Andrea Giorgi (France) - *Modular V2a reticulospinal circuits orchestrate distinct kinematic strategies for turning*
- Poster 36: Pauline Neveu (France) - *Low-intensity magnetic stimulation exerts pattern-dependent effects on tissue repair after spinal cord injury*
- Poster 37: Bella Xu Ying (UK) - *Neurons exhibiting anti-motor activity in the *Xenopus laevis* tadpole hindbrain*
- Poster 38: Cameron Burton (UK) - *Coordination of feeding and locomotion behaviors in larval *Drosophila*: a functional connectomic analysis*
- Poster 39: Maarten Zwart (UK) - *The inferior olive transforms upstream sensorimotor errors into cerebellar teaching signals*
- Poster 40: Nicolas Guerout (France) - *Repetitive trans-spinal magnetic stimulation promotes repair in inflammatory spinal cord injury through sex-dependent immune modulation*