

EMBO Workshop

Skeletal Muscle Development, Metabolism & Repair during Homeostasis and Disease

12 - 17 October 2024 | Catania, Sicily



ORGANIZERS

Mary Baylies
Graziella Messina
Rémi Mounier
Marco Sandri

INVITED SPEAKERS

Thomas Braun
Jeff Chamberlain
Bénédicte Chazaud
Giulio Cossu
Colin Crist
Karyn Esser
Joana Esteves De Lima
Jérôme Feige

Penney Gilbert
David Glass
David Goldhamer
Gabrielle Kardon
Rob Krauss
Pascal Maire
Doug Millay
Naomi Moris

Norbert Perrimon
Olivier Pourquié
Lorenzo Puri
April Pyle
Vanina Romanello
Jorge Ruas
Markus Ruegg
Florence Ruggiero

Vittorio Sartorelli
Isabella Scionti
Frank Schnorrer
Shahragim Tajbakhsh
Emilie Vénéreau
Huating Wang
Zhenguo Wu

KEYNOTE SPEAKERS

Eric Olson
Thomas Rando



SCIENTIFIC PROGRAM

ATOUTCOM

GENERAL ORGANIZATION

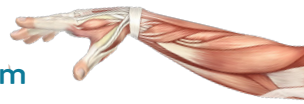
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EMBO Workshop

Skeletal Muscle Development, Metabolism & Repair during Homeostasis and Disease

12 - 17 October 2024 | Catania, Sicily

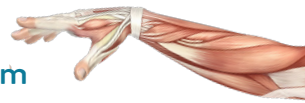


SATURDAY 12TH OCTOBER 2024 - Day 1 -

17:00 - 19:00 *Participant welcome*

19:00 - 21:00 *Welcome cocktail with foods*





SUNDAY 13TH OCTOBER 2024

- Day 2 -

08:00 – 09:30 *Breakfast*

09:45 – 10:00 Conference Opening
Mary Baylies, Graziella Messina, Rémi Mounier, Marco Sandri
Organizers

10:00 – 12:10 • Session 1

Myofiber formation and homeostasis in development, physiology and diseases

Chairs: Simon Hughes & Silvia Brunelli

10:00 – 10:30 Biochemical mechanisms of myoblast fusion
Doug Millay

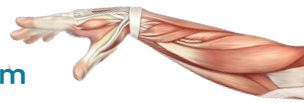
10:30 – 11:00 Complex regulation of the fast Myh gene locus
and of the fast subtypes muscle phenotypes
Pascal Maire

11:00 – 11:20 OC 1 – Large Maf transcription factors govern
the specification of fast type IIb myofibers
Shunya Sadaki

11:20 – 11:40 OC 2 – Motoneuron signaling regulates nuclear size
scaling and DNA content in *Drosophila* muscle fibers
Stefanie Windner

11:40 – 12:10 Biomechanics of sarcomere assembly and growth
Frank Schnorrer

12:10 – 14:00 *Lunch break*



SUNDAY 13TH OCTOBER 2024

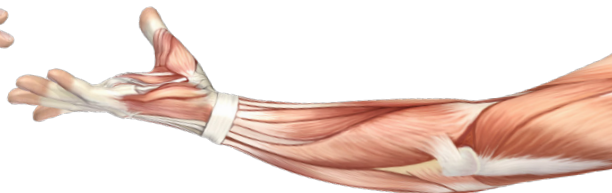
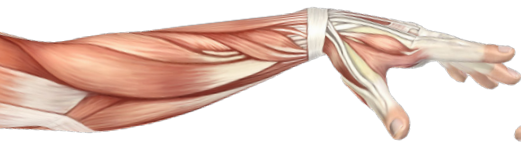
- Day 2 -

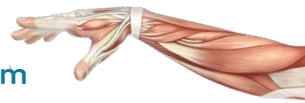
14:00 – 16:10 • SESSION 2

New technical advances and models

Chairs: Hiu Tung Tom Cheung & Rita Perlingeiro

- 14:00 – 14:30 Deconstructing human skeletal muscle development in vitro
Olivier Pourquié
- 14:30 – 15:00 Human organoids to study the fundamental principles of embryonic cell fate coordination during development
Naomi Moris
- 15:00 – 15:30 Modelling and interrogating complex muscle biology in a dish
Penney Gilbert
- 15:30 – 15:50 OC 3 – Spatial multi-omics in whole skeletal muscle reveals complex tissue architecture
Clara Martinez Mir
- 15:50 – 16:10 OC 4 – Study the human neuromuscular system pathophysiology using tissue engineering neuromuscular organoids
Anna Urciuolo





SUNDAY 13TH OCTOBER 2024

- Day 3 -

16:10 – 16:30 Flash talks 1 – *Chair: Peggy Lafuste*

- FT 1 – Targeting muscle stem cells for permanent correction of dystrophin expression in Duchenne muscular dystrophy
Niclas Bengtsson
- FT 2 – Unconventional roles for Histone Deacetylase 4 in Duchenne Muscular Dystrophy
Viviana Moresi
- FT 3 – A molecular pathway for cancer cachexia-induced muscle atrophy revealed at single nucleus resolution
Ning Liu
- FT 4 – Chemotherapy induces muscle wasting by disrupting chromatin signaling and epigenetic function of the SET1/MLL histone methyltransferase
Arnab Nayak
- FT 5 – Deciphering the regulatory pathways in skeletal muscle lineage organized by the YAPI/TAZ-TEAD transcriptional network
Said Hashemolhosseini
- FT 6 – Modelling scaled-down 3D engineered skeletal muscle using advanced microfabrication pipelines
Eugenia Carraro
- FT 7 – Progressive cardiomyopathy with intercalated disc disorganization in a rat model of Becker muscular dystrophy
Valentina Taglietti

16:30 – 17:15 *Coffee Break*



SUNDAY 13TH OCTOBER 2024

- Day 2 -

17:15 – 18:15

KEYNOTE LECTURE

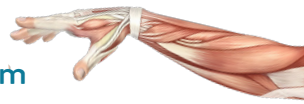
Identification of novel regulators of satellite cell quiescence and self-renewal

Thomas Rando

18:15 – 18:35

Flash talks 2 – *Chair: Lucas Waltzer*

- FT 8 – Exposing myoblast-to-myofiber fusion dynamics using real-time Assay
Sharon Havusha-Laufer
- FT 9 – Elucidating the role of sarcalumenin in sarcoplasmic reticulum structure– function
Ilan Zemski
- FT 10 – Neuromuscular electrical stimulation training induces myonuclear accretion and hypertrophy in mice without overt signs of muscle damage
Julien Gondin
- FT 11 – Enhancing drug testing for Duchenne Muscular Dystrophy through Organ-on- Chip platform with integrated nanoplasmonic biosensors for myotube damage monitoring
Juanma Fernandez-Costa
- FT 12 – The boron transporter NaBC1: a new mechanotransducer in muscle
Patricia Rico
- FT 13 – Unravelling the role of MK5 in the regulation of skeletal muscle biology
Carlos Acosta
- FT 14 – Transient CripsR/Cas9-mediated gene targeting in vivo: a versatile model to systematically investigate muscle stem cell regulators
Alireza Ghasemizadeh



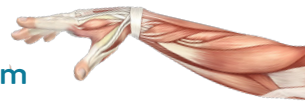
SUNDAY 13TH OCTOBER 2024 - Day 2 -

18:35 – 19:00 *Free time*

19:00 – 21:00 *Dinner on site*

21:00 Poster Session 1 with snacks and drinks





MONDAY 14TH OCTOBER 2024

- Day 3 -

08:00 - 09:00 *Meet-the-speaker sessions & Breakfast*

09:00 - 10:20 • SESSION 3

Muscle cell organelles in development, physiology and diseases

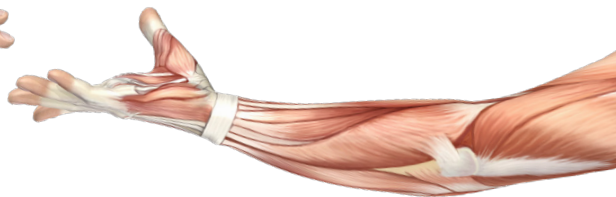
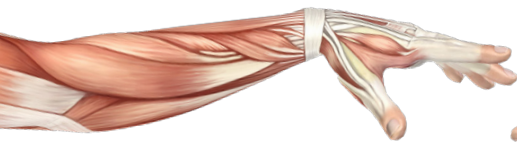
Chairs: Ori Avinoam & Liu Ning

09:00 - 09:30 Molecular and nutritional regulation of sarcopenia
Jerome Feige

09:30 - 10:00 Peroxisome biology and skeletal muscle homeostasis
Vanina Romanello

10:00 - 10:20 OC 5 - Arp2/3 together with cortical actin control
T-tubule growth and triad formation in skeletal muscle
Ana Raquel Pereira

10:20 - 10:50 *Coffee Break*





MONDAY 14TH OCTOBER 2024

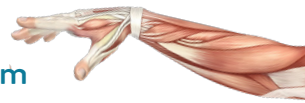
- Day 3 -

10:50 – 13:00 • SESSION 4

Cellular landscape in muscle during development, homeostasis, regeneration, and diseases

Chairs: Peter Currie & Joel Chamberlain

- 10:50 – 11:20 Inflammation during normal and pathological skeletal muscle regeneration
Bénédicte Chazaud
- 11:20 – 11:40 OC 6 – Deciphering the senescent cell and macrophage dialogue in muscle regeneration
Marielle Saclier
- 11:40 – 12:10 How the extracellular matrix shapes the neuromuscular system (and vice-versa): Lessons from a tiny fish
Florence Ruggiero
- 12:10 – 12:30 OC 7 – Mesenchymal stromal cells as regional organizers in organogenesis and regeneration
Sigmar Stricker
- 12:30 – 13:00 Cellular dynamics of Muscle Regeneration
Gabrielle Kardon
- 13:00 – 14:30 *Lunch break – This lunch is offered by*  **REGENXBIO**



MONDAY 14TH OCTOBER 2024

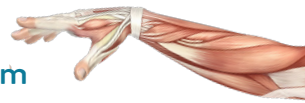
- Day 3 -

14:30 – 16:10 • SESSION 5 (Part 1)

Stem cells in development, homeostasis, regeneration, and diseases

Chairs: Foteini Mourkioti & Peter Zammit

- 14:30 – 15:00 Regulation of muscle stem cell quiescence and activation by niche-derived signals
Rob Krauss
- 15:00 – 15:20 OC 8 – The role of Calcitonin receptor in muscle stem cells of exercising mice
So-Ichiro Fukada
- 15:20 – 15:40 OC 9 – Nedd4-1 loss impairs mitochondrial network remodeling and autophagy during adult myogenesis
Vicente Bustos
- 15:40 – 16:10 Lack of limb muscle development in mice lacking the CTCF code for chromatin accessibility
Colin Crist
- 16:10 – 16:40 Flash talks 3 – *Chair: Luca Madaro*
- FT 15 – A self-sustained quiescence muscle stem cell niche triggered by Notch signalling
Eleni Chryostomou
 - FT 16 – The epigenetic enzyme TET controls adult muscle progenitor fate independently of its enzymatic activity
Vincent Gerdy
 - FT 17 – Characterization of LAMA2-RD molecular pathomechanisms and novel disease biomarkers by muscle transcriptome analysis of patients with partial and complete laminin-alpha2 deficiency
Veronica Pini



MONDAY 14TH OCTOBER 2024

- Day 3 -

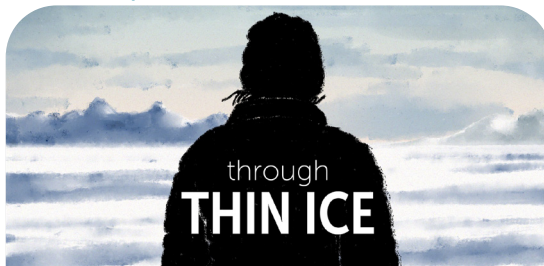
- 16:10 – 16:40 Flash talks 3 (*continuation*) – Chair: Luca Madaro
- FT 18 – BET inhibitors rewire lipid metabolism in the aged skeletal muscle
Silvia Gaino
 - FT 19 – Optogenetic induction of mechanical muscle stress identifies myosin regulatory ubiquitin ligase NHL-1
Karen-Carolyn Bauer
 - FT 20 – Elucidation of the mechanisms underlying muscle integrity supported by heterogeneity of mesenchymal progenitors
Akiyoshi Uezumi
 - FT 21 – Capturing myonuclei turnover: lineage tracing of muscle stem cell nuclei and pre-existing myonuclei in homeostasis
Nour El Khazen

16:40 – 17:30 *Coffee Break*

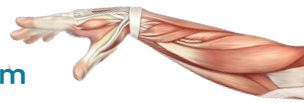
17:30 – 20:00 Poster Session 2 with drinks

20:00 – 22:00 *Dinner on site*

22:15 *Conference room: Documentary film “Through Thin Ice” directed by Gabrielle Kardon*



Along the shores of the Great Salt Lake, a scientist's twilight run is upended when her dog plunges through rare lake ice, catalyzing a desperate series of choices.



TUESDAY 15TH OCTOBER 2024

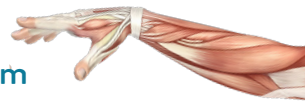
- Day 4 -

08:00 - 09:00 *Meet-the-speaker sessions & Breakfast*

09:00 - 10:50 • SESSION 5 *(Part 2)* **Stem cells in development, homeostasis, regeneration, and diseases**

Chairs: Fred Relaix & Dawn D. Cornelison

- 09:00 - 09:30 Dynamics of stem and niche cell interactions in normal and pathological states
Shahragim Tajbakhsh
- 09:30 - 10:00 Plasticity in genomic deposition of H3.3 by DAXX and HIRA underlies myoblast identity
Joana Esteves De Lima
- 10:00 - 10:20 OC 10 - Muscular dystrophy in humans and mice due to defective muscle stem cell maintenance caused by mutations in the Notch ligand JAG2 gene
Atsushi Asakura
- 10:20 - 10:50 The mechanistic insights into the role of Paxbp1 in early activation of adult muscle satellite cells
Zhenguo Wu
- 10:50 - 11:20 *Coffee Break*



TUESDAY 15TH OCTOBER 2024

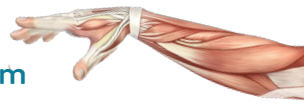
- Day 4 -

11:20 – 13:00 • SESSION 6

Inter-organ signaling in development, physiology, and diseases

Chairs: Aaron Johnson & Gabriella Minchiotti

- 11:20 – 11:50 Muscle circadian clock and aging, loss of time of day homeostasis
Karyn Esser
- 11:50 – 12:20 A journey with HMGB1 protein in skeletal muscle: From homeostasis to muscular dystrophy
Emilie Vénéreau
- 12:20 – 12:40 OC 11 - Nerve activity inhibits mTORC1-dependent protein synthesis in skeletal muscle
Bert Blaauw
- 12:40 – 13:00 OC 12 - Enhancement of muscle and motor abilities initiated by tendons through mechanosensor gene polymorphisms: athlete giftedness and genetics
Hiroshi Asahara
- 13:00 – 14:30 *Lunch break*
- 14:30 – 20:00 *Social Event*
Visit of Mount Etna or visit of Taormina (registered person only)
- 20:00 – 22:00 *Dinner on site*



WEDNESDAY 16TH OCTOBER 2024

- Day 5 -

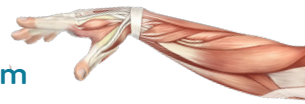
08:30 - 09:30 *Meet-the-speaker sessions & Breakfast*

09:30 - 11:25 • SESSION 7

Stem cell therapies

Chairs: Nathalie Didier & Kyba Michael

- 09:30 - 10:00 Human myogenesis guides development of human pluripotent stem cell derived satellite cell generation
April Pyle
- 10:00 - 10:20 OC 13 - Magnetic field-driven targeting of exosomes modulates immune and metabolic changes in dystrophic muscle
Yvan Torrente
- 10:20 - 10:40 OC 14 - Unraveling muscle fibrosis: the role of fibro-adipogenic progenitors and extracellular matrix composition in various myopathies
Capucine Trollet
- 10:40 - 11:10 Enhancing efficacy and affordability of ex vivo gene therapy for DMD
Giulio Cossu
- 11:10 - 11:25 IP - Industry oral presentation
Robust exon skipping and dystrophin production with Endosomal Escape Vehicle (EEV™)
Oligonucleotide conjugates in preclinical models of Duchenne muscular dystrophy
Mahasweta Girgenrath



WEDNESDAY 16TH OCTOBER 2024

- Day 5 -

11:25 - 11:45 Flash talks 4 - *Chair: Jean-François Briand*

- FT 22 - Interrogating Rho GTPase-Mediated homeostasis, mechanotransduction and repair in skeletal muscle
Ed Battey
- FT 23 - Engineered 3D muscles based on innovative biomimetic hydrogels for modeling neuromuscular disorders and predicting the efficacy of new therapeutics
Nathalie Didier
- FT 24 - Using Single Nuclei RNA-seq to find new targets during aging: Perlecan identified as a regulator of MuSC niche
Pauline Garcia
- FT 25 - Investigating drosophila embryonic myogenesis by Muscle-Specific-Single Nuclei-RNA-Sequencing
Guillaume Junion
- FT 26 - Mineralocorticoid receptor signaling regulates cellular cross-talk within the skeletal muscle microenvironment in muscular dystrophy and wound healing
Jill Rafael-Fortney
- FT 27 - A Drosophila model for muscle stem cell analysis: the Him gene is essential for adult muscle function and muscle stem cell maintenance
Michael Taylor
- FT 28 - Maf transcription factor activates fast muscle genes and prevents atrophy in response to denervation
Matthieu Dos Santos

11:45 - 14:00 *Lunch break*

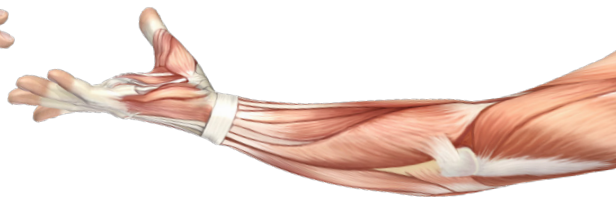
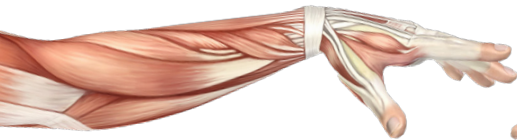


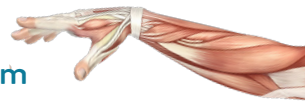
WEDNESDAY 16TH OCTOBER 2024 - Day 5 -

14:00 – 15:50 • SESSION 8 *(Part 1)* **Post-transcriptional regulation in development, physiology and diseases**

Chairs: Vincent Gache & Carmen Birchmeier

- 14:00 – 14:30 Regulation of MuSC quiescence and renewal
by metabolic processes
Thomas Braun
- 14:30 – 15:00 Role of epigenetic modifiers in muscle stem cell fate
Isabella Scionti
- 15:00 – 15:20 OC 15 - Multimodal single cell profiling of Duchenne
muscular dystrophy
Lorenzo Giordani
- 15:20 – 15:50 Epigenetics of skeletal myogenesis
Vittorio Sartorelli
- 15:50 – 16:30 *Coffee Break*





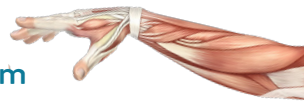
WEDNESDAY 16TH OCTOBER 2024

- Day 5 -

16:30 – 18:10 • SESSION 8 *(Part 2)* Post-transcriptional regulation in development, physiology and diseases

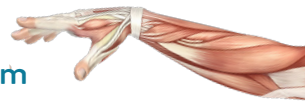
Chairs: Cesare Gargioli & Barbara Gayraud-Morel

- 16:30 – 17:00 Control of gene expression by 3D genome organization in skeletal muscle cells in health and disease conditions
Lorenzo Puri
- 17:00 – 17:20 OC 16 – Oxidised microRNAs – novel mechanism of muscle wasting and therapeutic potential
Katarzyna Goljanek-Whysall
- 17:20 – 17:40 OC 17 – Mitochondrial protein import stress unbalances proteostasis in the cytosol and causes progressive muscle atrophy
Nicholas Brennan
- 17:40 – 18:10 Intrinsic and extrinsic regulation of muscle stem cell aging
Huating Wang
- 18:10 – 18:40 Flash talks 5 – *Chair: Thomas Laumonier*
- FT 29 – Sarcopenic obesity in the elderly: a dysfunctional crosstalk between tissues?
Clara Sciorati
 - FT 30 – Recapitulating cranial myogenesis with a novel stem cell-based embryo model
Giada Mura
 - FT 31 – Mechanical sensing of contractile damage by filamin orchestrates muscle repair in *Drosophila*
Nicanor González-Moralez



WEDNESDAY 16TH OCTOBER 2024 - Day 5 -

- 18:10 – 18:40 Flash talks 5 (*continuation*) – Chair: Thomas Laumonier
- FT 32 – Spatial mapping of immune system drivers of NMJ degeneration in aging
Beatrice Silvestri
 - FT 33 – Advanced human neuromuscular organoids model spinal muscular atrophy
Ines Lahmann
 - FT 34 – Spatial muscle stem cell niche profiling uncovers tcf as a critical regulator for building adult MuSC pools
Josephine Bageritz
 - FT 35 – Transcriptional impact of new myofiber content donated by MuSCs through myonuclear accretion
Anita Kneppers
- 19:00 – 21:00 *Dinner on site*
- 21:00 Poster Session 3 with drinks



THURSDAY 17TH OCTOBER 2024

- Day 6 -

08:30 - 09:30 *Meet-the-speaker sessions & Breakfast*

09:30 - 11:20 • SESSION 9

Mechanisms of muscle fiber atrophy in aging and diseases

Chairs: Hugo Olguin & Julia Von Maltzahn

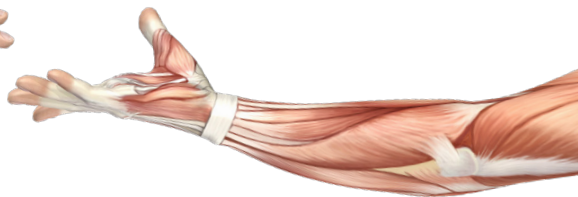
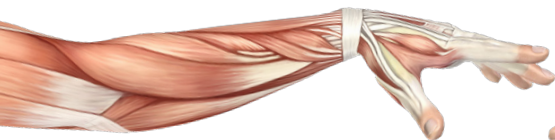
09:30 - 10:00 Molecular mechanisms perturbing skeletal muscle during aging
David Glass

10:00 - 10:30 The ambivalent role of growth signals in aging skeletal muscle
Markus Ruegg

10:30 - 10:50 OC 18 - Dissecting gene network and cellular landscape
in cancer cachexia
Roberta Sartori

10:50 - 11:20 Cachexia in *Drosophila*: A focus on muscles
Norbert Perrimon

11:20 - 14:00 *Lunch break*





THURSDAY 17TH OCTOBER 2024

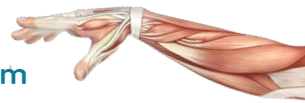
- Day 6 -

14:00 – 15:50 • SESSION 10

Mechanisms and new treatments for muscle diseases

Chairs: Francesco Saverio Tedesco & Lucia Latella

- 14:00 – 14:30 Reversal of fibrosis and increased muscle regeneration using structurally-enhanced dystrophins
Jeff Chamberlain
- 14:30 – 15:00 Regulation of sarcomere assembly by an unsuspected E3 ligase: Implications for the diagnostic of congenital myopathies
Jorge Ruas
- 15:00 – 15:20 OC 19 - Evaluating a novel fluorinated compound for Nfix inhibition in muscular dystrophies
Raffaele Epis
- 15:20 – 15:50 The cellular basis of heterotopic ossification of skeletal muscle
David Goldhamer
- 15:50 – 16:30 *Coffee Break*
- 16:30 – 17:30 **KEYNOTE LECTURE**
Muscle making and muscle breaking
Eric Olson
- 17:30 – 18:30 *Awards & Closing Remarks*
- 19:00 – 21:00 *Gala dinner (departure the next day)*



SPEAKERS

Thomas BRAUN - *Max Planck Institute, Freiburg, Germany*

Jeffrey CHAMBERLAIN - *University of Washington School of Medicine, Seattle, WA, USA*

Bénédicte CHAZAUD - *Institut NeuroMyoGène, Lyon, France*

Giulio COSSU - *University of Manchester, Manchester, UK*

Colin CRIST - *McGill University, Montreal, Canada*

Karyn ESSER - *University of Florida, Gainesville, USA*

Joana ESTEVES DE LIMA - *Faculté de Médecine Paris-Est Créteil, Créteil, France*

Jérôme FEIGE - *Nestlé Institute of Health Sciences S.A., Lausanne, Switzerland*

Penney GILBERT - *Institute of Biomedical Engineering, Toronto, Canada*

David GLASS - *Regeneron Pharmaceuticals, New York, USA*

David GOLDHAMER - *University of Connecticut, Storrs, USA*

Gabrielle KARDON - *University of Utah, Salt Lake City, USA*

Robert S. KRAUSS - *Icahn School of Medicine at Mount Sinai, New York, USA*

Pascal MAIRE - *Institut Cochin, Paris, France*

Douglas MILLAY - *University of Cincinnati, Cincinnati, USA*

Naomi MORIS - *The Francis Crick Institute, London, UK, London, UK*

Eric OLSON - *UT Southwestern Medical Center, Dallas, USA*

Norbert PERRIMON - *Harvard Medical School, Boston, USA*

Olivier POURQUIÉ - *Harvard Medical School, Boston, USA*

Lorenzo PURI - *Sanford Burnham Prebys, San Diego, USA*

April PYLE - *University of California Los Angeles, Los Angeles, USA*

Thomas RANDO - *University of California Los Angeles, Los Angeles, USA*

Vanina ROMANELLO - *University of Padova, Padova, Italy*



SPEAKERS

Jorge RUAS - *University of Michigan, Ann Arbor, USA*

Markus RUEGG - *University of Basel, Basel, Switzerland*

Florence RUGGIERO - *Institut de Génomique Fonctionnelle de Lyon, Lyon, France*

Vittorio SARTORELLI - *National Institute of Arthritis and Musculoskeletal
and Skin Diseases, Washington, USA*

Frank SCHNORRER - *Institut de Biologie de Développement de Marseille Luminy,
Marseille, France*

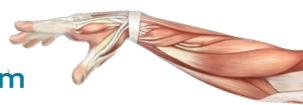
Isabella SCIONTI - *Institut NeuroMyoGène, Lyon, France*

Shahragim TAJBAKHSH - *Institut Pasteur, Paris, France*

Emilie VENEREAU - *San Raffaele Scientific Institute, Milan, Italy*

Huating WANG - *The Chinese University of Hong Kong, Hong Kong, China*

Zhenguo WU - *The Hong Kong University of Science and Technology, Hong Kong, China*



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INSTITUTIONAL PARTNERS



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12 - 17 October 2024 | Catania, Sicily

