

# Translational myology and mobility medicine at the Spring Padua Muscle Days, March 28-30, 2019–Euganei Hills and Padova, Italy

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## Abstract

The Interdepartmental Research Centre of Myology (CIR-Myo), University of Padova, Italy, the A&C M-C Foundation for Translational Myology, Padova, Italy and PAGEpress, organized the 2019SpringPaduaMuscleDays: Translational Myology and Mobility Medicine, an International Conference held March 28-30, 2019 in Euganei Hills and Padova (Italy) with the help of an international team of Organizers, i.e., Helmut Kern, Jonathan C. Jarvis, Viviana Moresi, Marco Narici, Feliciano Protasi, Marco Sandri and Ugo Carraro. Presentations of Three Physiology Lectures and of the seven Sessions (I: Spinal Cord Neuromodulation and h-bFES in SCI; II: Muscle epigenetics in aging and myopathies; III: Experimental approaches in animal models; IV: Face and Voice Rejuvenation; V: Muscle Imaging; VI: Official Meeting of the EU Center of Active Aging; VII: Early Rehabilitation after knee and hip replacement) were of very high levels and were following by constructive discussions. During the three days and evenings, Speakers and Attendees, in particular young attendees, had the chance to exchange further information and design potential collaborations. A half-century tradition of skeletal muscles studies, started with a research on fever, is thus continuing under the auspices of CIR-Myo, A&C M-C Foundation for Translational Myology, Padova, Italy and the European Journal of Translational Myology (EJTM). Furthermore, during the Meeting were also discussed the contents of an EJTM Special, that will be dedicated to Muscle Fascia, an under looked topic, which merits more attention. The abstracts of the 2019SpPMD, e-printed in the Myology News of EJTM 29, 2019 Volume, are excellent examples of translational research in Myology, Mobility and Medicine. Thanks to the high scientific profiles of the researchers and clinicians who are eager to present results at the PaduaMuscleDays, this was true for the past and it will be true in future events.

Myologists working in Padua (Italy) were able to continue a tradition of skeletal muscle studies started years ago with the aim to explain if skeletal muscle is responsible of fever by burning bacterial toxins [1]. This may sound very strange today, but known results on effects of cytokines and myokines on inflammation of nerves, muscles, joints and bones may attract new researchers [2]. Such a long term tradition evolved in the institution of the Interdepartmental Research Center of Myology of the University of Padova (CIR-Myo), in the organization of the PaduaMuscleDays (PMD), a series of International Conferences organized in Euganei Hills (Padova), Italy and in the publication of Basic and Applied Myology (BAM) (retitled from 2010 European Journal of Translational Myology - EJTM). This year an Ejtm Special Guest Edited by Carla Stecco and Raffaele De Caro will be dedicated to Muscle Fascia, an under looked topic that merits more attention. For many years the fasciae have been considered by anatomists only as a “white envelope for the muscles”, that is generally removed in anatomical tables, to recognize muscle nerves and vessels. This is one of the reasons that different descriptions of the fasciae exist. On the other hand, in the last years the fasciae and their properties are becoming of central importance to clinicians practicing in various conventional and alternative therapies. The results from the worldwide research activities constitute a body of significant and important data, but this clinical interest is not supported by in-depth comprehension to how integrate the new knowledge about fasciae with the classical biomechanical models based on muscles, tendons and bones. To close this gap an Ejtm Special on “Muscle Fascia” will be published September 30, 2019. Its many aims are to point attention to several

open questions: How fasciae and muscles interact during movement? Have the fascia a role in posture? How the various fasciae may appear under Colour Ultrasound, MRI, and CT scans? What is the percentage of elastic fibres within fasciae? Are innervation of fasciae playing a role in proprioception and in motor coordination? [3-23]. Answers to these questions will add to the many tools of the rehabilitation strategies [24].

This year the 2019Spring PaduaMuscleDays: Translational Myology and Mobility Medicine were held in Euganei Hills and Padova March 28-30, 2019. The backbone of the 2019SpPMD program is presented in Figure 1. The cryptic subtitle (Translational Myology and Mobility Medicine), may have attracted not only the core group of researchers that gathered year after year to Padova, but some new speakers filled the sessions. As to the concept of Mobility Medicine, it is worth stressing that Mobility can be a Medicine, but also that in too many diseases there is an impaired mobility that influence the patients' quality of life. The Thursday March 28, morning Session I (Spinal Cord Neuromodulation and hbFES in SCI, Kern H, Carraro U, Chairs) was opened by Claudia A. Angeli, Kentucky Spinal Cord Injury Research Center Louisville, KY, USA, who presented “Epidural Stimulation for the restoration of function following motor complete

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**2019Spring PaduaMuscleDays, March 28 – 30, Montegrotto and Padova, Italy**

## Translational Myology and Mobility Medicine

**Euganei Hills, Padova (Italy), March 28 - 30, 2019**

**Hotel Augustus, Montegrotto, Euganei Hills (Padova), Italy & University of Padova Botanical Garden, Padova, Italy**

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Organizers: Ugo Carraro, Helmut Kern, Jonathan C. Jarvis, Viviana Moresi, Marco Narici, Feliciano Protasi, Marco Sandri





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**THURSDAY March 28, 2019** **Hotel Augustus, Montegrotto, Euganei Hills, (Padova), Italy**

**10.00 SESSION I: Spinal Cord Neuromodulation and hbFES in SCI, Kern H, Carraro U, Chairs**

**10.00 Epidural Stimulation for the restoration of function following motor complete spinal cord injury, Claudia A. Angeli, Kentucky Spinal Cord Injury Research Center Louisville, KY, US**

**14.00 SESSION II: Muscle epigenetics in aging and myopathies, Moresi V, Zampieri S, Chairs**

**14.00 Lifestyle-related muscle epigenetic memory: mechanisms and biomedical relevance, Viviana Moresi, Rome Sapienza University, ItalyLecture: Lifestyle-related muscle epigenetic memory: mechanisms and biomedical relevance, Moresi V, Rome, Italy**

**16.30 Session III: Experimental approaches in animal models, Jarvis JC, Chair**

**16.30 The ERG1a K<sup>+</sup> channel increases calpain activity in C2C12 myotubes and mouse skeletal muscle, Amber Pond, Southern Illinois University, IL, US**

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**FRIDAY March 29, 2019** **Aula Emiciclo, Orto Botanico, Padova, Italy**

**8.50 Three Physiology Lectures, Sandri M, Carraro U, Introduction**

**9.00 Clay Armstrong, Penn University, Philadelphia, Pa, USA**

**9.30 Lars Larson, Karolinska, Stockholm, Sweden**

**10.00 Carlo Reggiani, University of Padova, Italy**

**10.30 Session IV – Face and Voice Rejuvenation, Jarvis JC, Chair**

**15.00 Session V – Muscle Imaging, Protasi F, Narici M, Chairs**

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**SATURDAY March 30, 2019** **Hotel Augustus, Montegrotto, Euganei Hills, (Padova), Italy**

**9.00 Official Meeting of the EU Center of Active Aging (CAA) Helmut Kern, Dusan Hamar, Chairs**

**14.00 Early Rehabilitation after knee and hip replacement (Early Reha), Helmut Kern, Sascha Sajer, Chairs**

**16.45 Round Table on contributions of basic scientists to CAA and Early Reha, Kern H, Chair**  
Antonio Musarò, Feliciano Protasi, Marco Sandri, Sandra Zampieri, Giovanna Albertin, Nejc Sarabon, Ugo Carraro

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Figure 1. Leaflet of the 2019 Spring Padua Muscle Days

spinal cord injury”, a new exciting development for thoracic-level SCI patients [23]. The Thursday March 28 afternoon Session II (Muscle epigenetics in aging and myopathies, Moresi V, Zampieri S, Chairs) saw Viviana Moresi as the first speaker, presenting “Lifestyle-related muscle epigenetic memory: mechanisms and biomedical relevance”. The Thursday March 28 afternoon Session III (Experimental approaches in animal models, Jarvis JC and Mayr W, Chairs) was opened by the presentation “The ERG1a K<sup>+</sup> channel increases calpain activity in C2C12 myotubes and mouse skeletal muscle” by Amber Pond,

Southern Illinois University, IL, USA. On Friday March 29, 2019 the second 2019SpPMD was held in the *Aula Emiciclo*, of the *Orto Botanico*, of the Padova University. Three Physiology Lectures, introduced by Marco Sandri, by Clay Armstrong, Penn University, Philadelphia, Pa, USA, Lars Larson, Karolinska, Stockholm, Sweden and Carlo Reggiani, University of Padova, Italy opened the Morning sessions. Whatever the names of physiology sub-specialization these speakers represented, they showed that quantitative evaluations of dynamic events of contraction machineries (action potential, E-C coupling, contractile

proteins and energy metabolism of muscle fibers) are prerequisites of solid results in Myology and Mobility Medicine. Then, followed the morning and afternoon Sessions of Friday, March 29, Session IV (Face and Voice Rejuvenation, Jarvis JC, Chair) and Session V (Muscle Imaging, Protasi F, Narici M, Chairs). The afternoon of Friday March 29, 2019 ended with the guided visit of the Historical Botanical Garden of the University of Padova. Founded in 1545 by the Venetian Republic, it is the world's oldest academic botanical garden that is still in its original location. The garden is known for its special collections and historical design. It was devoted to the growth of medicinal plants, that produced natural remedies, and to teach students to recognize genuine medicinal plants. An after-dinner Guided Visit to Posters ended this very long PaduaMuscleDay. Saturday March 30, 2019 the meeting was held once again in the Conference Hall of Hotel Augustus, Euganei Hills, (Padova), Italy. The morning session was dedicated to the Official Meeting of the EU Center of Active Aging (CAA), Helmut Kern, Dusan Hamar, Chairs, while the afternoon was dedicated to the Session: Early Rehabilitation after knee and hip replacement (Early Reha), Helmut Kern, Sascha Sajer, Chairs. A Round Table on contributions of basic scientists to CAA and Early Reha, Kern H, Chair, with Antonio Musarò, Feliciano Protasi, Marco Sandri, Sandra Zampieri, Giovanna Albertin, Andrea Porzionato, Nejc Sarabon and Ugo Carraro, closed the 2019Spring PaduaMuscleDays. As for the past PaduaMuscleDays [4-44], the abstracts of 2019SpPMD cover translational research involving physical, pharmacological and cellular strategies to maintain or recover structure and function of skeletal muscles, of the patients' mobility, and to treat many more medical problems. The researches attained the high level needed to attract support by Granting Agencies and approval by Ethical Committees as well as by Editors of high impact journals. Many of the abstracts' contents, indeed, are mature to be translated into clinical applications [45]. This often happened in the past [46-48], occurred during this year event [49-51], and will be true in future Padua Muscle Days.

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## Ethical publication statement

Author confirms that he has read the Journal's position on issues involved in ethical publication and affirms that this report is consistent with those guidelines.

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