

The Ejtm Special “Translational myology beyond the denervated muscle”

The Issue Vol. 24 (1), 2014 of the Journal of Translational Myology/Basic Applied Myology was the first to belong to the *Ejtm Specials on “The long-term denervated muscle”*. This series was dedicated to pioneers and followers of biology, physiology, pathology, therapy and rehabilitation of the permanent denervated muscle, in particular to the physical approaches for the diagnosis and treatments in those cases in which the hope for reinnervation is lost or very poor. Although some study may be found in the literature of the Nineteenth Century,¹ it was in the 1940s that the study of events occurring in denervated muscle fibers emerged as a topic distinct from the more clinical relevant studies of nerve regeneration and muscle reinnervation.²⁻⁴ During the following twenty years, the reports increased in numbers year after year. Finally in 1962 the book edited by Ernest Gutmann summarized previous knowledge from biology to rehabilitation by electrical stimulation and opened the modern era of “*The Denervated Muscle*”.⁵ Three pioneers of the modern studies are contributing to the Ejtm Specials and/or lectured at the 2014Spring PaduaMuscleDays: Bruce M. Carlson, Terje Lømo and Clara Franzini-Armstrong.⁶⁻¹³ The collection of Abstracts of the 2014Spring PaduaMuscleDays, the majority concerning neuromodulation of long-term denervated muscles, closes the first issue of the Ejtm Specials on the long-term denervated muscle.¹⁴⁻²⁷ The Helmut Kern’s *Habilitation Thesis (1995)* filled the Ejtm-BAM volume 24 (2), 2014.²⁸ This Ejtm-BAM volume 24 (3), 2014 complete the first series of Ejtm/BAM Specials with an issue that is more properly designed “*Translational myology beyond the denervated muscle*” containing also some interesting articles that are of more broad interests.²⁹⁻³⁶

1. Schiff M. Direct observations of denervated muscle. Arch Physiol Heilk 1851;10:579–93.
2. Tower SS, Bodian D, Howe H. Fibrillation in skeletal muscle in relation to denervation and to inactivation without denervation. J Neurophysiol 1941;4:388–401.
3. Gutmann E, Sanders FK. Recovery of fibre numbers and diameters in the regeneration of peripheral nerves. J Physiol 1943;101:489-518
4. Gutmann E, Guttmann L. The effect of galvanic exercise on denervated and re-innervated muscles in the rabbit. J Neurol Psychiatry 1944;7:7-17
5. Gutmann E, ed. The denervated muscle. Pub. House of the Czechoslovak Academy of Sciences, 1962.
6. Bruce M. Carlson. The biology of long-term denervated skeletal muscle. Eur J Trans Myol - Basic Appl Myol 2014;24: 5-11.
7. Lømo T, Rosenthal J. Control of ACh sensitivity by muscle activity in the rat. J Physiol 1972;221:493–513.
8. Lømo T, Westgaard RH, Dahl HA. Contractile properties of muscle: control by pattern of muscle activity in the rat. Proc R Soc Lond, B, Biol Sci 1974;187:99–103.
9. Westgaard, RH, Influence of activity on the passive electrical properties of denervated soleus muscle fibres in the rat. J Physiol (Lond) 1975; 251:683-97.
10. Lømo T. The response of denervated muscle to long-term stimulation (1985, revisited here in 2014). Eur J Trans Myol - Basic Appl Myol 2014;24:13-9.
11. Lømo T, Westgaard RH, Hennig R, Gundersen K. The response of denervated muscle to long-term electrical stimulation. Eur J Trans Myol - Basic Appl Myol 2014;24:21-5.
12. Bliss TV, Lømo T. Long-lasting potentiation of synaptic transmission in the dentate area of the anaesthetized rabbit following stimulation of the perforant path. J. Physiol 1973;232:331–56.
13. Clara Franzini-Armstrong. Structure-function relationships in skeletal muscles. Lessons from ultrastructure. Eur J Trans Myol - Basic Appl Myol 2014;24:71.
14. Boncompagni S, Loy RE, Dirksen RT Franzini-Armstrong C. The 14895T mutation in the type 1 ryanodine receptor induces fiber-type specific alterations in skeletal muscle that mimic premature aging. Aging Cell 2010;9:958-970.
15. Boncompagni S, Thomas M, Lopez JR, et al. Triadin/Junctin double null mouse reveals a differential role for triadin and junctin in anchoring CASQ to the jSR and regulating Ca²⁺ homeostasis. PLoS ONE 2012;7:e39962.
16. Boncompagni S, Kern H, Rossini K, et al. Structural differentiation of skeletal muscle fibers in the absence of innervation in humans. Proc Natl Acad Sci U S A 2007;104:19339-44.
17. Pellegrino C, Franzini C. An electron microscope study of denervation atrophy in red and white skeletal muscle fibers. J Cell Biol 1963;17:327-49.
18. Kern H, Carraro U. Home-based Functional Electrical Stimulation for long-term denervated human muscle: History, basics, results and perspectives of the Vienna Rehabilitation Strategy. Eur J Trans Myol - Basic Appl Myol 2014;24:27-40.
19. Gargiulo P, Helgason T, Ramon C, et al. CT and MRI assessment and characterization using segmentation and 3D modeling techniques: applications to muscle, bone and brain. Eur J Trans Myol - Basic Appl Myol 2014;24:55-62.
20. Pond A, Marcante A, Zanato R, et al. “History, mechanisms and clinical value of fibrillation analyses in muscle denervation and reinnervation by Single Fiber EMG and Dynamic Echomyography. Eur J Trans Myol - Basic Appl Myol 2014;24:41-54.
21. Marcante A, Zanato R, Ferrero M, et al. Recovery of Tetanic Contractility of Denervated Muscle: A Step Toward a Walking Aid for Foot Drop. Biomed Tech (Berl). 2013 Sep 7. pii: /j/bmte.2013.58.issue-s1-A/bmt-2013-4016/bmt-2013-4016.xml. doi: 10.1515/bmt-2013-4016. [Epub ahead of print].

Editorial

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22. Zanato R, Stramare R, Boato N, et al. Dynamic Echomyography Shows That FES in Peripheral Denervation does not Hamper Muscle Reinnervation. Biomed Tech (Berl). 2013 Sep 7.: /j/bmte.2013.58.issue-s1-A/bmt-2013-4034/bmt-2013-4034.xml. doi: 10.1515/bmt-2013-4034. [Epub ahead of print].
23. Mosole S, Carraro U, Kern H, et al. Long-Term High-Level Exercise Promotes Muscle Reinnervation With Age. J Neuropathol Exp Neurol. 2014 Mar 6. [Epub ahead of print]
24. Zampieri S, Pietrangelo L, Loeffler S, et al. Lifelong Physical Exercise Delays Age-Associated Skeletal Muscle Decline. J Gerontol A Biol Sci Med Sci. 2014 Feb 18. [Epub ahead of print].
25. Zampieri S, Valente M, Adami N, et al. Polymyositis, dermatomyositis and malignancy: a further intriguing link. Autoimmun Rev. 2010;9:449-53. doi: 10.1016/j.autrev.2009.12.005. Epub 2009 Dec 22. Review.
26. He WA, Berardi E, Cardillo VM, et al. NF- κ B-mediated Pax7 dysregulation in the muscle microenvironment promotes cancer cachexia. J Clin Invest 2013;123:4821-35.
27. CIR-Myo News: 2014Spring PaduaMuscleDays Abstracts. Eur J Trans Myol - Basic Appl Myol 2014;24:63-70.
28. Kern H. Functional Electrical Stimulation on Paraplegic Patients. [*Funktionelle Elektrostimulation paraplegischer Patienten*]. Eur J Trans Myol - Basic Appl Myol 2014;24:73-156.
29. Roth N, Wiener A, Mizrahi J. Methods for dynamic characterization of the major muscles activating the lower limb joints in cycling motion. Eur J Trans Myol - Basic Appl Myol 2014;24:163-171.
30. Hockerman GH, Dethrow NM, Hameed S, Doran M, Jaeger C, Wang W-H, Pond AL. The Ubr2 gene is expressed in skeletal muscle atrophy as a result of hind limb suspension, but not Merg1a expression alone. Eur J Trans Myol - Basic Appl Myol 2014;24:173-179.
31. Reichel M, Martinek J. Simulation of the electrical field in equine larynx to optimize functional electrical stimulation in denervated musculus cricoarythenoideus dorsalis. Eur J Trans Myol - Basic Appl Myol 2014;24:181-185.
32. Gislason MK, Ingvarsson P, Gargiulo P, Yngvason S, Guðmundsdóttir V, Knútsdóttir S, Helgason Þ. Finite element modelling of the femur bone of a subject suffering from motor neuron lesion subjected to electrical stimulation. Eur J Trans Myol - Basic Appl Myol 2014;24:187-193.
33. Schaefer LV, Torick AH, Matuschek H, Holschneider M, Bittmann FN. Synchronization of muscular oscillations between two subjects during isometric interaction. Eur J Trans Myol - Basic Appl Myol 2014;24:195-202.
34. Veneziani S, Doria C, Falciani L, Castelli CC, Fanò Illic G. Return to competition in a chronic low back pain runner: beyond a therapeutic exercise approach, a case report. Eur J Trans Myol - Basic Appl Myol 2014;24:203-207
35. Hugosdóttir R, Jónasson SÞ, Sigþórsson H, Helgason Þ. Feasibility study of a novel electrode concept for a neuroprosthesis for augmentation of impaired finger functions. Eur J Trans Myol - Basic Appl Myol 2014;24:209-215
36. Costa A, Rossi E, Scicchitano BM, Coletti D, Moresi V, Adamo S. Neurohypophyseal hormones: novel actors of striated muscle development and homeostasis. Eur J Trans Myol - Basic Appl Myol 2014;24:217-225

Ugo Carraro

University of Padua, Italy
ugo.carraro@unipd.it