

Carlo Manno

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Summary

I am a PhD in Biophysics and Physiology highly skilled in microscopy and electrophysiological techniques. My background includes the use of different fluorescence physiological indicators, generation and expression of biosensors, which help us measure the changes in ionic concentration either in the cytosolic side or inside organelles of skeletal muscle fibers. I am interested in understanding the importance of some of the constitutive intracellular proteins involved in the Excitation-Contraction Coupling process and how the modification of them might have an impact in the dynamic changes of the calcium release flux and permeability of the RyR and buffering power of CSQ under different physiological and pathophysiological conditions.

My focus is to transcend in the scientific and technical environment, continuing my professional growth and helping with my knowledge, and competencies to understand the physiological mechanisms of muscle contraction.

Experience

1. – Position (2010-present): **Postdoctoral Research Scientist** in the Department of Molecular Biophysics and Physiology, Section of cellular Signaling at Rush University, School of Medicine. P.I: Eduardo Ríos, PhD. **Topic:** Calcium dynamics in Excitation-Contraction Coupling of skeletal muscle. Translation to muscle diseases.
2. – Position (2009-2010): **Research Scholar**, in the Department of Molecular Biophysics and Physiology, Section of cellular Signaling at Rush University, School of Medicine. P.I: Eduardo Ríos, PhD. **Topic:** Calcium dynamics in Excitation-Contraction Coupling of skeletal muscle.
3. – Position (2005-2010): **Graduate student of Biophysics and Physiology**, Laboratory of Cellular Physiology, Center of Biophysics and Biochemistry. Venezuelan Institute for Scientific Research (IVIC), Caracas Venezuela. Advisor: Carlo Caputo, PhD
4. – Position (Oct.2001-2003): **Int'l visiting fellow**, Laboratory of Cardiac Physiology and Biophysics. Department of Physiology, Texas Tech University Health Sciences Center, Texas US. **Topic:** Mechanical Properties of Cardiac Muscle.
5. – Position (1999-2000): **Internship** in the Center of Physics, IVIC, Caracas, Venezuela. Laboratory of Quantum Optics. **Topic:** Non-linear optics and Calcium Imaging.

6. – Position (1998-1999): **Internship** in the Center of Biophysics and Biochemistry, IVIC, Caracas, Venezuela. Laboratory of Muscle Biophysics. **Topic:** Techniques to study the cardiac physiology (whole Heart).

Teaching Positions:

1. Course: **Animal Physiology**. Position: Instructor (Level I and II) Universidad Central de Venezuela. Caracas, Venezuela Date: 1998-2000 (3 times)
2. Course: **Physical Chemistry**. Position: Instructor. Universidad Central de Venezuela. Caracas, Venezuela Date: 1996-1997

Education

PhD in Biophysics and Physiology, Venezuelan Institute For Scientific Research (IVIC) 2011.

Thesis: "Mechanisms of ionic regulation during skeletal muscle relaxation" Advisor: Carlo Caputo, PhD

Licentiate in Biology. Major: Cell Biology. Institution: Central University of Venezuela (UCV) November 2011.

Thesis: "Pulsed Local Field Fluorescence Microscopy: a new gate in Cardiac Physiology" Advisor: Ariel. L. Escobar, PhD

Fellowships and Honors

- 1.- Travel Scholarship 2012 from Gordon Research Conference on Muscle: Excitation/Contraction Coupling. Les Diablerets, Switzerland.
- 2.- The Biophysical Society and IUPAB International Travel Grant for the 52nd Annual Meeting of the Biophysical Society and 16th IUPAB International Biophysics Congress February 2-6, 2008, in Long Beach, CA.
- 3.- Scholarship from Instituto Venezolano de Investigaciones Científicas (IVIC), 2007-2010
- 4.- Excellence scollarship from Instituto Venezolano de Investigaciones Cientificas , 2003-2007
- 5.- Republica de Venezuela. "Oden José Félix Rivas in its first class" for Academical Achievements in my graduate studies, 2005
- 6.- Universidad Central de Venezuela. Honorable Mention to Licentiate Thesis, 2000

7.- Fellowship from the Universidad Central de Venezuela, 1998-2000

Skills

Electrophysiology techniques (Whole cell patch clamp in either voltage or current clamp mode) of different types of cells, mainly skeletal muscle.

Biochemical and Molecular biology techniques (generation, purification and transfection of calcium Biosensors plasmids in different types of cells).

Microscopy techniques (Confocal, two-photons and Pulsed local field), Optical imaging, Immunofluorescence.

Manual isolation of single skeletal muscle fibers from different animal species (human & murine specifically).

Basic/intermediate skills in the following software: ANSI C/C++, Maple, IDL, Latex, Adobe Illustrator, Adobe Photoshop.

Foreign Languages: Spanish (Native), English, Italian and Portuguese.

Publications

Manno C., Figueroa L., Royer L., Pouvreau S., Volpe P., Nori A., Zhou J., Meissner G., Hamilton S. and Ríos E. (2013) Altered Ca^{2+} concentration, permeability and buffering in the myofiber Ca^{2+} store of a mouse model of malignant hyperthermia. *J Physiol.* 591 4439-4457.

Manno C., Sztretye M., Figueroa L., Allen P. and Rios E. (2013) Dynamic of the calcium buffering properties of the sarcoplasmic reticulum in mouse skeletal muscle. *J. Physiol.* 591.2 pp. 423-442.



Manno C., Figueroa L., Fitts R. and Ríos E. (2012). Confocal imaging of transmembrane voltage by SEER of di-8-ANEPPS. *J. Gen. Physiol.* Vol. 141 No. 3 371-387 **(we were invited to explain the basis of this paper in a video summary section of the JGP: <http://jgp.rupress.org/content/141/6.toc>)**



Manno C., Sztretye M., Figueroa L., Allen P. and Ríos E. (2013). Dynamic measurement of the calcium buffering properties of the sarcoplasmic reticulum in mouse skeletal muscle. *J. Physiol.* 591 (2) 423-442

Re-published by *J Physiol* in a virtual issue (April **2013**) which spans different spatial temporal domains in physiology. Cover Article
http://jp.physoc.org/site/misc/virtual_issues/EB2013_VI.xhtml

Figueroa L., Shkryl V., **Manno C.**, Momotake A., Brum G., Blatter L., Ellis-Davies G. and Ríos E. (2012). Artificial calcium sparks reveal signaling mechanisms in muscle. *J. Gen. Physiol.* 590 (6) 1389-1411. (Cover)

Gracheva E., Cordero-Morales J., González- Carcacía J., Ingolia N., **Manno C.**, Aranguren C., Weissman J., and Julius D. (2011). Ganglion-specific splicing of TRPV1 underlies infrared sensation in vampire bats. *Nature*. Vol. 476 (7358) pp. 88-91.

Royer L., Sztretye M., **Manno C.**, Pouvreau S., Zhou J., Knollmann B., Protasi F., Allen P., and Ríos E. (2010). Paradoxical buffering of calcium by calse questrin demonstrated for the calcium store of skeletal muscle. *J. Gen. Physiol.* Vol. 136 No. 3 325-338.

Mejía-Alvarez R., **Manno C.**, Villalba-Galea C., Fernandez L., Gharbi T., and Escobar A.L. (2003). Pulsed Local Field Fluorescence Microscopy: A New Approach for Measuring Physiological Signals in the Beating Heart. *Pflügers Arch – Eur J Physiol.* 445:747-758.

Abstracts and Meetings

Manno C., Figueroa L., Fitts R. and Ríos E. (2012). Imaging voltage across muscle membranes by SEER of di-8-ANEPPS. Action potential claudicate ion in fatigue. Gordon Research Conference on Muscle: Excitation/Contraction Coupling. Les Diablerets, Switzerland. (Poster).

Manno C., Figueroa L., Fitts R., Griesbeck O. and Ríos E. (2012). Changes of $[Ca^{2+}]$ in SR and Ca^{2+} release flux of mouse skeletal muscle fibers under repetitive stimulation. Gordon Research Conference on Muscle: Excitation/Contraction Coupling. Les Diablerets, Switzerland. (Poster).

Figueroa L., **Manno C.**, Hamilton S. and Ríos E. (2012). Ca^{2+} movements in Y522S RyR1 knock-in mice. Gordon Research Conference on Muscle: Excitation/Contraction Coupling. Les Diablerets, Switzerland. (Poster)

Manno C., Fitts R., Griesbeck O. and Ríos E. (2012). The changes of $[Ca^{2+}]$ in SR and Ca^{2+} release flux during fatiguing activation of mouse skeletal muscle fibers. Abstract submitted for the Biophysical Annual Meeting in San Diego, California, USA. (Poster).

Figueroa L., Shkryl V., Zhou J., **Manno C.**, Momotake A., Brum G., Blatter L., Ellis-Davies G. and Ríos E. (2012).

Quantification of the CICR response to artificial calcium sparks in striated muscle. Abstract submitted for the Biophysical Annual Meeting in San Diego, California, USA. (Poster).

Sztretye M., **Manno C.**, Yi J., Allen P. and Ríos E. (2012). Direct quantification of calsequestrin-dependent buffering in the Ca^{2+} store of skeletal muscle Abstract submitted for the Biophysical Annual Meeting in San Diego, California, USA. (Poster).

Sztretye M., **Manno C.**, Yi J., Allen P. and Ríos E. (2012). Two-edged sword: the Ca^{2+} biosensor D4cpv-calsequestrin restores functionality to calsequestrin-null muscle. Abstract submitted for the Biophysical Annual Meeting in San Diego, California, USA. (Poster).

Manno C., Sztretye M., and Rios E. (2010). Effects of high [BAPTA] inside mice muscle fibers reveal a role of calcium in the termination of voltage-operated calcium release from the SR. Biophysical Annual Meeting in San Francisco California, USA. (Poster).

Manno C., Bolanos P., and Caputo C., (2008). Importance of NCX in the regulation Ca homeostasis in skeletal muscle. Abstract submitted for the Biophysical Annual Meeting in Long Beach California, USA. (Poster).

Manno C., Bolaños P., and Caputo C. (2007). Ionic regulation mechanisms of contraction relaxation during skeletal muscle development. Jornada de Postgrados Integrados (FONACIT). Area de Biología Celular, Universidad Simón Bolívar. (Oral Presentation)

Manno C., Bolaños P., and Caputo C. (2006). Ionic regulation mechanisms of contraction relaxation during skeletal muscle development. Asociación Venezolana para el Avance de la Ciencia (AsoVAC) Acta Científica Venezolana: 57 (Sup. 1).

International Workshop on Membrane Transport in Health and Disease. Margarita Island, Venezuela 19-24 March, 2006. Work title: "Ionic regulation mechanisms of contraction relaxation during skeletal muscle development". Source of support: Centro de Estudios Avanzados. IVIC.

Patch Clamp and Fluorescence techniques. Prof. E Neher. CBB-IVIC, Caracas Venezuela.

Escobar .A L., Ribeiro Costa, R., **Manno, C** , Villalba Galea C, Gharbi T., Fernandez L. Fill M and Mejia Alvarez R (2000). Pulsed local field detection on intact mammalian heart". *Biophys. J.* 78 (1): A578. (Poster).

Administrative

Member of the Faculty Council as an instructor at Rush University Medical Center for the period 2013-2014

Memberships

- 1.- Program for the Promotion of Researchers (PPI) in Venezuela 2005
- 2.- Biophysical Society, since 2007
- 3.- Latin-American Biophysical Society (SOBLA), since 2010