UIC UNIVERSITY OF ILLINOIS AT CHICAGO Department of Pathology COLLEGE OF MEDICINE

Marcelo G. Bonini, Ph.D.

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Associate Professor

phone: 312-355-5948

Bio:

I was awarded my Ph.D. in Biochemistry and Molecular Biology in 2004 by the University of Sao Paulo, (Brazil). In 2004 I moved to laboratory of Dr. Ronald P. Mason, at the National Institute of Environmental Health Sciences for my postdoctoral training focused on the understanding of how redox driven reactions affect signaling events relevant for the maintenance of the cellular homeostatic balance and disease. In 2009 I established an independent, multidisciplinary program focused on the identification of redox sensitive pathways involved in tumor progression and metastasis at the University of Illinois at Chicago (my current position).

Clinical and Research Interests:

1. Mitochondrial Redox Control of the Cellular Metabolism

This project is based on the hypothesis that mitochondria dynamically decide whether to utilize available oxygen for ATP production or H2O2 generation. H2O2 egressing from mitochondria initiates redox signaling, generation of oxidants is controlled by sophisticated mechanisms of electron transfer in part controlled by the enzyme manganese superoxide dismutase MnSOD. In cancer, MnSOD is constitutively unregulated and as shown in our studies the levels of MnSOD upregulation parallels tumor stage. By maintaining a steady flow of H2O2 originating in mitochondria MnSOD sustains AMP-activated kinase (AMPK) activity that produces the glycolytic shift that induces tumor cell energetic viability.

?2. S-Nitrosation inhibits Suppressor of Cytokine Signaling-1 (SOCS-1) allowing NF-kB activation in response to TLR4 activation

This project is based on the observation that NOS1 activation in response to TLR4 activation is critical for initiation of NF-kB driven inflammation in macrophages. Our studies showed that NOS1 S-nitrosates, and thereby inhibits SOCS1. In its inhibited state SOCS1 cannot target the transcriptionally active NF-kB subunit p65 to proteasomal degradation allowing for the synthesis of pro inflammatory mediators. These studies indicate that the duration and intensity of signals originating from NOS1 define the course, locality and duration of inflammation.

Education:

2004: PhD (Biochemistry and Molecular Biology) - University of Sao Paulo, Brazil

Awards and Honors:

2011: *Ad. Hoc* Reviewer Department of Defense Army Research Office (DOD/ARO)
2012: *Ad. Hoc* Reviewer North Carolina Biotechnology Center – Biotechnology Research Grant Program
2012: American Heart Association Regular Study Section Member (Molecular Signaling 1 & 2)

2012: NIEHS/NIH study section member ZES1 LWJ-D (SF)
2012: SFRBM – travel award/YIA to Kristine Ansenberger-Fricano
2012: Constance Campbell memorial award from the Illinois symposium on reproductive sciences to Kristine Ansenberger-Fricano.
2013: NIH Study Section Member, DKUS 90C (SIEE) Systemic Injury by Environmental Exposures
2014: UIC/College of Medicine, Faculty of the year (Rising Star), Office of the Vice Chancellor for Faculty Affairs

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