



**FINAL REPORT**  
**IV MEETING OF THE SOUTH AMERICAN GROUP OF THE**  
**SOCIETY FOR FREE RADICAL BIOLOGY AND MEDICINE**

**Satellite Meeting of the Brazilian Society of Biochemistry  
and Molecular Biology**

**Jun 29 – July 2, 2005**

**Águas de Lindóia, São Paulo - Brazil**

**ORGANIZING COMMITTEE:**

**Virginia B.C. Junqueira**  
**Universidade Federal de São Paulo**

**Hugo P. Monteiro**  
**Universidade Federal de São Paulo**

**Paolo Di Mascio**  
**Universidade de São Paulo**

The “IV MEETING OF THE SOUTH AMERICAN GROUP OF THE SOCIETY FOR FREE RADICAL BIOLOGY AND MEDICINE” was took place with the scientific and strategic support of the Brazilian Society of Biochemistry and Molecular Biology in Águas de Lindóia, State of São Paulo, from June 29<sup>th</sup> to July 2<sup>nd</sup>

The South American Group, part of the Society for Free Radicals Biology & Medicine (SFRBM), is devoted to the study of the Biology and Biochemistry of

Free Radicals. The fourth meeting edition's main goal was to promote the interaction between Biochemistry, Biophysics, Molecular Biology, Nutrition, and Clinical researchers, who are looking for solutions in studying the role of free radicals as well as other reactive species in a variety of physiopathological problems. A second, nonetheless important, goal of the meeting was to stimulate, giving necessary ways and tools, the participation of undergraduate students working as young researchers as well as of those in Master and PhD programs, mostly because the meeting has found a great attendance of international scientific leadership of this area of knowledge.

The Organizing Committee has done a completely positive balance of the meeting as the main goals and specific objectives have been fully accomplished. This evaluation was done according to the numbers and the scientific content developed during the meeting. A detailed analysis of the meeting numbers is the following:

A total of **360 attendees** were distributed as 65% undergraduate, master, and PhD students, followed by 15% pos doc fellowships, and the remaining percentage shared by junior and senior scientists. The great percentage of attendees was from Brazil with an expressive participation of Uruguay (28) and Argentina (16). Chile has been represented by a small, but with high scientific level, number of participants. A total of **164 posters** were presented and discussed throughout the two nights (6 hours total). Posters have been evaluated by a Scientific Committee composed by Luis Videla (president, Chile), J. J. Poderoso (Argentina), Luis Barbeito (Uruguay), Ana Denicola (Uruguay), Jean Cadet (France), Luis S. Neto (Brazil), Glaucia R. Martinez (Brazil), and Giuseppe Poli (Italy). The 20 best posters were awarded by the Committee.

Early in the morning, a Sunrise Free Radical School was coordinated by Dr. Ohara Augusto (Brazil) and Dr. Homero Rubbo (Uruguay) being the major theme selected "NO action in biological systems". Teachers were Alicia Kowaltoski (Brazil), José M. Souza (Uruguay), and Luis S. Neto (Brazil). The massive participation of students and even from senior researchers (total 178 attendees) is the testimony of this Organizing Committee initiative. Certificates of attendance were given to those with 100% frequency.

The meeting program was divided into 11 sections:

SESSION I - BIOLOGICAL CHEMISTRY OF NITRIC OXIDE AND PEROXYNITRITE

SESSION II - ACTION OF REACTIVE SPECIES AND ANTIOXIDANTS IN BIOLOGICAL SYSTEMS

SESSIONS III AND IV - OXIDATIVE STRESS IN COMPARATIVE BIOLOGY

SESSION V - REACTIVE SPECIES AND CELL SIGNALING

SESSIONS VI AND IX - REACTIVE SPECIES IN NEURODEGENERATION AND AGING

SESSION VII - PHARMACOLOGICAL USES OF POLYPHENOLS AND CAROTENOIDS IN COSMIATRY AND GENERAL MEDICINE

SESSION VIII - OXIDATIVE STRESS, METABOLIC DISORDERS AND CHRONIC DISEASES

SESSION X - REDOX REGULATION OF CELL BIOLOGY

SESSION XI - OXIDATIVE AND NITROSATIVE STRESS IN ENDOTHELIAL DAMAGE AND VASCULAR DISEASE

Differently from the previous meetings (99, 01 and 04) when the chemistry and biochemistry of free radicals were the main issues under discussion, this time these areas of knowledge were partially replaced by cellular biology, mainly redox signaling processes. This fact can be evidenced also in the Plenary Conferences. The first one by Anibal Vercesi from UNICAMP, Brazil, was on experimental evidences for the role of oxidative stress generated by mitochondria in the atherogenesis processes in LDL receptor knockout mice.

In the next conference Balz Frei, from the Linus Pauling Institute, USA, described the actions of lipoic acid and desferrioxamine on the inhibition of atherosclerosis progression; he has identified two transcription factors (NFkB and Sp1) which are sensitive to intracellular redox state and to the action of those antioxidant compounds.

From Jean-Marc Zingg, from the University of Bern, Switzerland, we heard that vitamin E (specifically  $\alpha$ -tocopherol) may exert additional antiatherogenic effects unrelated to the vitamin antioxidant properties. These effects are exerted through the control of signaling pathways related to CD36 receptor expression (scavenger receptor for oxidized LDL).

The redox control of signaling pathways by thioredoxin (TRX) was discussed by Dr. Junji Yodoi, from the Virus Research Institute, Kyoto. In his conference Dr. Yodoi described the functions of the protein TBP-2/VDUP1 which is a negative modulator of TRX. High expression of this protein suppresses the growth of T lymphocytes infected with HTLV-1.

Dr. Prof. Joseph Levy, from the University of the Negev, Israel showed the action of carotenoids (lycopene and  $\beta$ -carotene) on the antioxidant responsive element and the transcription factor NrF2. He showed that carotenoids inhibit estrogen-stimulated breast tumor proliferation.

A third aspect related to the redox control of cellular signaling process is the redox post-translational modification of proteins that mediate the signaling process. In his conference, Dr. Harry Ischiropoulos, from the University of Pennsylvania, USA showed that nitration of tyrosine residues in proteins is a specific pos-translational modification that can be associated either with physiological and pathological conditions.

Another oxidative pos-translational protein modification was shown in the conference of Dr. Larry Marnett, from the Vanderbilt University, USA. He showed a number of experimental evidences associating the pos-translational protein modification done by lipid peroxidation products and its consequences to cellular signaling pathways.

The biology and biochemistry of nitric oxide (NO) as a free radical modulating signaling pathways was a recurrent theme in the meeting. From the oral scientific presentations, 20 were dedicated to the many biochemical, physiological, and biological roles of NO. In Session I, 6 presentations discussed NO partition in synthetic membranes, synthesis of nitrated lipids as NO donors in physiological conditions and the role of its derivatives as peroxynitrite as an antioxidant. The signaling role of NO in biology was also discussed in two presentations of Session IV. On Session V, five oral presentations showed many aspects related to cellular signaling processes modulated by NO. Moreover, within Sessions VI to XI, 9 oral communications discussed the regulatory aspects of NO in cellular and vascular biology, in neurobiology and aging.

Reactive oxygen species in biological systems were also extensively debated during the meeting. Historically, chemical and biochemical studies of

those reactive species were the starting point to Brazil's insertion and posterior growth of this broad area of knowledge. Pioneer work from the group of Dr. Giuseppe Cilento, done at the Instituto de Química from Universidade de São Paulo, was essential for the establishment of the area in Brazil. Further work from Dr. Etelvino Bechara (disciple of Dr. Cilento) and from those following Dr. Bechara as Marisa H.G. Medeiros, Hugo P. Monteiro, Pio Colepicolo Neto, and Dulcinéia S.P. Abdalla, as well as the work from Dr. Paolo Di Mascio's group, also from Instituto de Química, are continuing this tradition. From Session II to XI the many aspects of the chemistry, biochemistry, physiology, physiopathology, and cellular biology of reactive oxygen species were discussed in 54 oral presentations.

A special attention has to be made to the participation Of Dr. Alberto Boveris from the Universidad de Buenos Aires, Argentina, who, together with Dr. Cilento, is a pioneer in South America in this area of research. In Session II Dr. Boveris made an overview about the role of free radicals, oxidative stress and antioxidants in biological systems. He was followed by 34 oral presentations that discussed the role of reactive oxygen species in biology and biochemistry of eucariotic and procariotic cells.

The area that investigates free radicals and other reactive species in pathology and toxicology was also present in the meeting. South American senior researchers as Luis Barbeito from Universidad de la Republica, Uruguay, Virginia B. C. Junqueira from Universidade Federal de São Paulo, Brazil, Luis A. Videla from Unviersidade de Chile, Chile, and Juan J. Poderoso from Universidad de Buenos Aires, Argentina, have contributed, directly or through their research groups, with 15 oral presentations when new advances for the understanding of pathology and toxicology of free radicals, were widely discussed.

Although small, the significant advances on the use of antioxidants in Cosmiatry were discussed during the 7 presentations at Session VII of the meeting.

In conclusion, we would like to point out the importance of the information exchange between researchers from basic and applied science, not only between South Americans but also with scientists from abroad. The exchange of ideas, as well as scientific collaboration provided, and will certainly continue

to stimulate, a great improvement in the solution of reactive species problems related to Biology and Medicine.

We hereby have to acknowledge the important financial support provided by the Society for Free Radicals Biology and Medicine, The Linus Pauling Institute, The Oxygen Club of California, and the Brazilian Research Funding Agencies as FAPESP, FINEP, CNPq, and CAPES, as well as from Natura Cosmetics (BR), Laboratórios Baldacci (BR), Marjan Farma (BR), VITÆ-cromatografia em análises clínicas Ltda. (BR), SINC do Brasil, and Bioresearch do Brasil, for the success of this event, which next edition will be organized by Dr. Rafael Radi, in Montevideo, Uruguay, 2007. All this financial support has allowed us to pay for hotel, meals and ground transportation expenses of all student attendees (all classes) and for partial registration of those from Argentina and Uruguay.

As a final acknowledgment we have to thank the Brazilian Society of Biochemistry and Molecular Biology (SBBq) that scientifically supported the meeting. Moreover all technical support was provided by the SBBq Secretariat in the persons of Cynthia S. Bando, Wellington Maruchi, and Arnaldo Casari who worked daily for six months to allow us to have a wonderful time in Águas de Lindóia, and an excellent scientific meeting.

September 30<sup>th</sup>

On the behalf of the Organizing Committee

Virginia Berlanga Campos Junqueira, PhD  
Professor of Geriatrics and Gerontology  
Universidade Federal de São Paulo  
Brazil