



## IN THIS ISSUE

President's Message.....	2
Next FRS Webinar.....	3
FRBM Your Paper Your Way...7	
New Website.....	8
Free Radicals Abroad.....	9
Foundation Honor Roll.....	9
Travel and YIA Awards.....	10
Literature Review.....	11
Business Plan.....	12

## UPCOMING EVENTS

### FREE RADICAL SCHOOL WEBINAR

Glutathione: Protective Roles and Regulation of its Synthesis  
July 27, 2011



### 18TH ANNUAL MEETING

November 16 - 20, 2011  
Sheraton Atlanta Hotel  
Atlanta, GA USA

Abstract Deadline: **Sept. 1**

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## THE RADICAL VIEW

Balz Frei, Ph.D.

*DOT: Tell us a little about your background and current passions in your professional life.*

I was born and raised in Winterthur in the German-speaking part of Switzerland. In 1986, I earned my Ph.D. in biochemistry from the Swiss Federal Institute of Technology in Zurich, got married to my high school sweetheart, and moved to the Bay Area to start a post-doctoral fellowship with Bruce Ames at UC Berkeley. Coming to the US was like being reborn: I didn't know anybody, and nobody knew me, so I started with a clean slate! It was a true eye-opener coming from a traditional, conservative, and "neutral" old world country to the new world of the US Pacific West and the dynamic, open-minded, multi-ethnic Bay Area. The excitement about scientific research in the Ames lab was contagious, and I excelled under Bruce's mentorship, publishing over a dozen papers in 3½ years. In 1990, I landed a job as assistant professor at the Harvard School of Public Health, and at that point decided to stay in the US for good rather than return to Switzerland. In 1994, I moved across town in Boston to take an associate professor position at Boston University School of Medicine, and then in 1997 returned to the West Coast to become director of the Linus Pauling Institute, which had relocated the year before from Palo Alto, CA to Oregon State University in Corvallis, OR.



**Balz Frei, Ph.D.**  
**Linus Pauling Institute**

My current passions in my professional life are to help the faculty, staff, and students in the Linus Pauling Institute be successful and reach their full scientific and professional potential, and to make the Institute an internationally recognized research center on micronutrients, oxidative stress, and chronic disease prevention. In my own lab, we are focusing on atherosclerosis and heart disease, and understanding how antioxidant and, increasingly, anti-inflammatory dietary factors or supplements affect vascular and endothelial function and coronary risk factors. My other passion is to try to make a difference in people's lives by helping them make the right diet and lifestyle choices. I think that we cannot get out of the current health care crisis in this country unless and until we put much more resources and effort into preventive medicine. There is an enormous potential to improve individual and public health and postpone chronic disease through diet and lifestyle, in particular eating a healthful diet, not becoming overweight or obese, abstaining from tobacco use and excessive alcohol consumption, avoiding infections, getting regular medical check-ups, and being physically active and engaging in regular exercise. What exactly a healthful diet is remains a matter of debate and is part of the research we are doing at LPI, but in general we know what we need to do; the question is, how can we implement this knowledge and translate our research findings to the "real" world?

*DOT: What do you feel were the most important factors that shaped your career?*

My father was an MD with his own family practice, and he instilled in me a keen interest in

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## PRESIDENT'S MESSAGE:

Harry Ischiropoulos, Ph.D.

The preparations for our Annual Meeting are near completion. An exciting selection of cutting edge research topics, a pre-meeting workshop on "Lipid Oxidation: An Overview of Methods, Products, and Functional Effects *In Vivo*," as well as many career and professional development sessions have been planned. I am looking forward seeing you in Atlanta.



The Society has also revamped its website with several new features which include:

- New member directory features such as adding more info to your profile like biographies, publications, research expertise, uploading your photo, and links to Facebook and LinkedIn accounts
- Research Forum
- Employment opportunities by research area
- SFRBM's Strategic Plan, Bylaws and Procedures that improve clarity and transparency.
- More information for Young Investigator Awards
- Quick links on pages to allow for easier navigation through website
- Archived list of Free Radical School Presentations from Annual Meetings
- Live Chat Support with SFRBM staff

**Harry Ischiropoulos**

Many thanks to Marcie Cole and SFRBM's Website Committee for their work with the design and content of our Web page.

Another important development that is announced in this issue of DOT is the Your Paper, Your Way submission policy to FRBM (please see page 7 for an announcement from the editor). Adapting to the changing needs in publishing as well as the commitment to position FRBM as the leading journal in the field, this new submission policy is designed to ease the submission burden to the authors.

See page 12 for the Society's 2011 Business Plan which was put together by your leadership during a strategic planning retreat in Chicago this past March. While our Society continues to make significant progress, we also must look and recognize new needs and emerging opportunities. As always please contact me with your concerns, suggestions and ideas.



## FREE RADICAL SCHOOL VIRTUAL SEMINAR SERIES



### Glutathione: Protective Roles and Regulation of its Synthesis

Wednesday, July 27, 2011

1:00 pm Eastern (17:00 GMT/UTC)

Speaker: Henry Forman, Ph.D.

University of California - Merced

Cost: FREE for SFRBM members

#### Program Overview:

##### Protective roles

- Antioxidant – substrate for glutathione peroxidases and peroxiredoxin 6.
- Removal of xenobiotics by conjugation – glutathione S-transferases

##### Regulation of its synthesis

- Synthetic steps - glutamate cysteine ligase and gamma-glutamylcysteine glycine ligase
- Glutamate cysteine ligase kinetics and feedback
- Induction of glutamate cysteine ligase –Nrf2 and AP-1 activation
  - Altered induction in aging and disease

##### Role in cell signaling

- Redox state
- Redox signaling

#### About the Speaker:

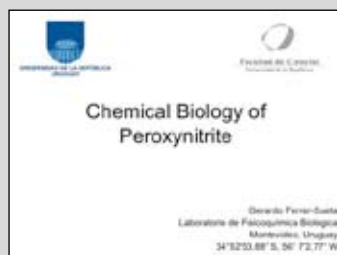
Dr. Henry Forman is a Professor of Biochemistry and Chemistry at the University of California, Merced and Research Professor of Gerontology at the University of Southern California. Dr. Forman's expertise is in the areas of oxidative stress and signal transduction and has published over 200 manuscripts. For over 30 years, his work has largely focused on the role of oxidants in both damage and signaling in the lung. But, he has also participated in numerous investigations of oxidative stress and redox signaling in species ranging from anemones to white shrimp, elephant seals and humans.

#### Cost:

There is no cost for SFRBM members to participate. The webinar is open to SFRBM members only. Visit <http://sfrbm.org/sections/virtuallfreeradicalschooll.php> to register or to view past archived sessions.

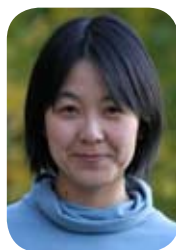
#### LATEST ARCHIVED WEBINAR

Visit the Members Only  
area at [www.sfrbm.org](http://www.sfrbm.org).



## GUO, RYAN RECIPIENTS OF RESEARCH MINI-FELLOWSHIPS

SFRBM is pleased to announce that the first cycle of Research Mini-Fellowships have been awarded to Lilu Guo, Ph.D., Vanderbilt University and Kristen Ryan, University of Colorado – Denver. The mini-fellowships provide additional research training opportunities for young investigators in the field of free radical biology that are not available at their home institution. The program allows young investigators to cultivate collaborative relationships with established scientists, develop novel techniques or methodologies and expand their career development and research opportunities.



#### Lilu Guo, Ph.D.

Vanderbilt University

Research: Air Pouch Model of Inflammation

Training Site: University of Virginia

Mentor: Norbert Leitinger, Ph.D.

Amount Funded: \$2,500



#### Kristen Ryan

University of Colorado - Denver

Research: Oxidative and Nitrosative Protein

Training Site: University of Kansas

Mentor: Christian Schoneich, Ph.D.

Amount Funded: \$2,500

The deadline for the second cycle of mini-fellowship funding is September 15, 2011. For more information, please visit <http://sfrbm.org/sections/fellowships.php>.

## VOLUNTEERS NEEDED

The SFRBM Marketing-Internal Committee is seeking volunteers who would be interested in writing articles and literature reviews for future issues of the *Dot*. The *Dot* is published quarterly in March, June, September and December. If you are interested in assisting with any future issues, please contact Lee Ann MacMillan-Crow at [lmcrow@uams.edu](mailto:lmcrow@uams.edu).

**Radical View** *continued from page 1*

nature and science. As a teenager, I read countless books about evolution and animal behavior. One of my most treasured books was “The Selfish Gene” by Richard Dawkins, which to this day I see as one of the most beautifully written, logical, and at the same time amazingly simple explanations of natural selection and evolution. I chose to study biochemistry because I thought it would get me the closest to understanding life. For my professional career, Bruce Ames was one of the most important influences – he helped me get established in the US as a young scientist and inspired me with his boundless enthusiasm and passion for scientific research. I also was fortunate to collaborate with many excellent scientists during my scientific career, like John F. Keaney, Jr. at Harvard and later Boston University School of Medicine; Jason Morrow at Vanderbilt, who sadly passed away a few years ago; and Roland Stocker, whom I have known for almost 30 years going back to my time as a Ph.D. student in Switzerland. Becoming Director of LPI at Oregon State University also significantly shaped my career, giving me an opportunity to build a research institute almost from scratch. The last 14 years have been an amazing journey for me, and I was again very fortunate to recruit some outstanding scientists to LPI and OSU, including Maret Traber, Joe Beckman, Tory Hagen, Tammy Bray, and Emily Ho. Now, we are looking forward to the opening of the new Linus Pauling Science Center this summer, a dream come true for me after working towards this goal of a state-of-the-art research facility for the Institute ever since I became LPI director in 1997. The new building, which LPI will share with OSU’s Department of Chemistry, will be a working memorial to Linus Pauling, an OSU alum and native Oregonian, continuing his efforts in preventive medicine, micronutrient research, molecular biology, and chemistry.

**DOT: What was your most exciting discovery in research?**

Based on my most cited paper, it’s the discovery that “Ascorbate is an outstanding antioxidant in human blood plasma,” which is the title of a paper I published in 1989 in PNAS. I was a post-doc at the time in the Ames lab, and I was using a novel, chemiluminescence-based HPLC assay to measure lipid hydroperoxides in biological samples. I incubated my own plasma with the aqueous radical generator, AAPH, and then measured the time-dependent oxidation of the endogenous antioxidants, ascorbate, urate, bilirubin, and alpha-tocopherol, and the oxidation of endogenous thiols and lipids, mainly on albumin and in low-density lipoprotein, respectively. What I found was that ascorbate was oxidized first, together with thiols, but without initial oxidation of any of the other endogenous plasma antioxidants. Most interestingly, as long as ascorbate was present in plasma, there was no detectable formation of lipid hydroperoxides. This simple experiment told me that ascorbate was more reactive with aqueous peroxy radicals than any other antioxidant in plasma and also any lipid. Later, I used many other types of oxidative stress, including activated neutrophils, the myeloperoxidase-hydrogen peroxide-chloride system, reagent hypochlorous acid, the gas-phase of cigarette smoke, or redox-active transition metals such as copper or iron, added to either human plasma or isolated low-density lipoprotein, with the same result: Ascorbate was the first line of antioxidant defense in plasma and protected LDL lipids from detectable oxidative damage.

In other experiments that I conducted with Roland Stocker in his lab at the Heart Research Institute in Sydney, we found that ubiquinol-10 forms the first line of antioxidant defense in isolated LDL. These experiments also led to Roland’s subsequent discovery of “tocopherol-mediated peroxidation,” meaning that alpha-tocopherol can act as a radical chain-transfer, rather than chain-terminating, reagent in isolated LDL and the absence of ascorbate. I also was involved in a collaborative effort with Jason Morrow and Jackson Roberts at Vanderbilt showing that  $F_2$ -isoprostanes are elevated in smokers and decreased following smoking cessation. This work showed that  $F_2$ -isoprostanes can be used as a marker of in vivo lipid peroxidation in humans, and was published in a highly-cited paper in the New England Journal of Medicine.

**DOT: How is directing an institute different than running a research program? Or is there a unique advantage of working at LPI?**

My experience and way of directing an institute is quite different from running my own lab. As director, I am concerned about the overall success of the Institute, which means I look out for other faculty and scientists and provide them with the resources and funding they need to successfully pursue their research interests. It’s much less about my own research than the research program of the Institute as a whole. When I first came to the Institute, I felt it was important to formulate a succinct mission statement. This has helped us stay focused as a group and at the same time not lose sight of the big picture, which for us is to understand the role of oxidative and nitrate stress and inflammation in disease causation, and the protective role of micronutrients, phytochemicals, and other dietary factors in disease prevention; as well as to help people lead healthy and productive lives, with a long healthspan, not “just” a long lifespan. Being the director of an Institute also means taking on many administrative duties, such as raising money from private donors and industry, managing a large budget, supervising an administrative staff, being

*continued on page 5*



## NEW SESSIONS FOR SFRBM 2011!

engaged in the Institute's public outreach and education efforts, organizing conferences, etc. What I enjoy about my job is that it is very diverse and involves a lot of personal interactions, including meeting with philanthropic donors who often are highly successful business people, and at the same time I can still devote plenty of time to science and research. I like to travel and represent the Institute to my peers and colleagues, and take pride in the success of the Institute and the fact that all of the faculty I have recruited to LPI in the past 14 years are still with the Institute today. I am also proud of the fact that all laboratories in LPI are NIH-funded, and that we have two program project grants in the Institute, one from NCI on "Comparative Mechanisms of Cancer Chemoprevention" directed by Rod Dashwood, and another one from NCCAM called "Center of Excellence for Research on Complementary and Alternative Medicine Antioxidant Therapies (CERCAT)," which I am directing.

### *DOT: How has science/research changed during your life as a scientist?*

Oh boy, am I that old already? I think the biggest change has been the vast improvement in scientific research tools and the dawn of the "omics" era, which has allowed us to do "big science" and generate enormous amounts of data. The new challenge now has become to interpret all these data and get useful information out of them. The downside is that research has become more methods-driven, and a lot of experiments are done just because they can be done. It has become more difficult in this information age to discern important findings from the not-so-important ones, which, I am afraid, make up a significant portion of the published research literature. I think research used to be mostly about original, novel ideas by creative scientists using the appropriate methods, however simple, to confirm or refute their hypotheses. For example, if you look at the work of Brown and Goldstein that lead to their Nobel Prize in Physiology or Medicine in 1985, much of it is surprisingly simple, yet ingenious. In some of their key papers, all they did was measure HMG-CoA reductase activity in cultured cells, but the experiments were put together in such clever ways that they got a lot of detailed, mechanistic information out of them. In the free radical field, the biggest change has been the paradigm shift from oxidative damage to redox biology, with both important physiological and pathological roles of reactive oxygen species. And, of course, the discovery of nitric oxide as a physiologically relevant gas, which in turn dramatically expanded the field of free radical research.

SFRBM's 18th Annual Meeting in Atlanta, GA this November will kick off with a new special session featuring three cutting-edge presentations from abstracts submitted by members. Additionally, professional development sessions will be offered alongside the perennial favorites.

### **Oral presentations from submitted abstracts**

*3 highest scored abstracts of 500 submitted for meeting*

New for 2011, the SFRBM Annual Meeting will officially kick off with a special session featuring three cutting-edge presentations from submitted attendee abstracts - chosen by SFRBM Student and Postdoc members based on what they want to hear - and a talk from one of SFRBM's Mini Fellowship recipients.

### **How to Promote Academic-Biotechnology Interactions**

*Bruce Freeman, Ph.D., University of Pittsburgh*

This workshop will advise how academic researchers can fill the gap by pursuing individual goals by partnering with foundations, biotech and big pharma.

### **How to Interview and be Interviewed Successfully**

*Victor Darley-Usmar, Ph.D., University of Alabama at Birmingham*

In this workshop we will walk through the job application process, including CV preparations and a mock panel interview. The model will be based on application to a company and we will also discuss interviewing for starting faculty positions. The general principles that apply will be emphasized. We will also demonstrate different interviewing techniques from both the perspective of the interviewer and interviewee.

### **How to Write the Training Plan of a Fellowship Application**

*Paul Brookes, Ph.D., University of Rochester*

In this workshop, we will discuss some specific of the points to be included in a training plan, including cover letters from mentors and Department Chairs. Handouts will be provided.

### **How to Give an Effective Short Presentation**

*Aimee Landar, Ph.D., University of Alabama at Birmingham*

This workshop will outline a process to help you prepare for this type of talk, and will also discuss some techniques for decreasing anxiety.

# 18TH ANNUAL MEETING OF THE SOCIETY FOR FREE RADICAL BIOLOGY AND MEDICINE

Plan to join us during SFRBM's Annual Meeting to be held  
November 16 - 20 in Atlanta, Georgia, USA.



## FEATURED SESSIONS

- ▶ Redox Regulation by Epigenetics
- ▶ Oxidative Stress in Neurodegenerative Diseases
- ▶ Mitochondria, Redox Metabolism and Cancer Biology
- ▶ Crosstalk Between NO and H<sub>2</sub>S Signaling
- ▶ Lipid Oxidation: An Overview of Methods, Products, and Functional Effects In Vivo
- ▶ Sunrise Free Radical School

## ORAL PRESENTATIONS & POSTER SYMPOSIA

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>▶ Adaptative Responses</li> <li>▶ Biological Formation of Reactive Species</li> <li>▶ Biological Regulation by Reactive Oxygen Species</li> <li>▶ Cancer, Cell Proliferation and Death</li> <li>▶ Cardiovascular Redox Biology and Pathology</li> <li>▶ Chemotherapy</li> <li>▶ DNA Damage and its Consequences</li> <li>▶ Free Radical Chemistry and Biochemistry</li> <li>▶ Hydrogen Sulfide Chemistry and Biology</li> <li>▶ Inflammatory Oxidative Signaling and Injury</li> <li>▶ Lipids In Redox Biology</li> <li>▶ Macromolecule Modification</li> </ul> | <ul style="list-style-type: none"> <li>▶ Mitochondria and Cell Proliferation</li> <li>▶ Nitric Oxide Chemistry, Biology and Physiology</li> <li>▶ Novel Therapeutics</li> <li>▶ Protective Enzymes</li> <li>▶ Redox Imaging</li> <li>▶ Redox Signaling</li> <li>▶ Redox Reaction Mechanisms</li> <li>▶ Signal Transduction and Gene Expression</li> <li>▶ Superoxide and Superoxide Dismutases</li> <li>▶ Targeted Antioxidants</li> <li>▶ UV Effects and Atmospheric Pollutants</li> </ul> |
|--|---|

For further details regarding SFRBM 2011, please visit [www.sfrbm.org](http://www.sfrbm.org) and click on the SFRBM 2011 meeting logo. Questions about SFRBM 2011 can be directed to SFRBM via phone (317) 205-9482, fax (317)205-9481 or e-mail at [info@sfrbm.org](mailto:info@sfrbm.org).



# FRBM WELCOMES SFRBM MEMBERS TO YOUR PAPER, YOUR WAY!

Imagine if you could submit your paper to a journal without worrying about formatting the manuscript, including those pesky references, to their exact specifications? Well that's precisely what we are inviting you to do at your society journal, *Free Radical Biology & Medicine (FRBM)*. From now on, we're inviting you to submit 'Your Paper, Your Way.'



**Kelvin J.A. Davies**  
Editor-in-Chief  
*FRBM*

As fellow scientists, the *FRBM* editors wondered why journals make you spend so much time and effort formatting your entire paper for submission, especially when it's a journal with extremely high rejection rates. Although standard formats do make it a little bit easier for editors and reviewers to see everything in the correct style, the reality is that we should be focusing on the quality of science and not the format. For you as an author, the difference is significant. Just think of all the time you have spent doing secretarial formatting work on a paper, only to have it rejected immediately and be forced to repeat the whole process again for the next journal. An easier submission process will not only save you time and effort but might also allow you to achieve faster publication speeds.

In initiating 'Your Paper, Your Way,' *FRBM* is inviting all authors to submit their manuscripts as single PDF files, including all figures, figure legends, and references. Of course, all scientific papers need to include the following key elements: title, abstract, introduction, materials & methods, results, discussion (or results & discussion combined), references, and figures and figure legends. In addition, we are adding two new features to *FRBM* papers, Highlights and Graphical Abstracts (see Instructions to Authors for details), so you may wish to add these sections in your initial submission.

Anyway, just use whatever layout style suits you best (including references). All we ask is that the paper has all the key elements, be legible, and that all figures be of sufficiently high quality to permit proper review. If we don't accept your paper, you will have saved valuable time and effort. If we do accept your paper we will, of course, ask you to format your work to fit the *FRBM* style, but we suspect you won't mind at that point. In addition to the new policy, Elsevier, the publisher of *FRBM*, has also agreed to actually convert any reference style for you at the time of acceptance, as long as your references contain all the normal information, including the paper title.

Naturally, we hope that you will make *FRBM* your first choice for publication, but if your next paper should happen to be rejected by another top-flight journal, don't waste time reorganizing, reformatting, and composing initial inquiry letters; just make a PDF file of the whole thing and send it to us! If you choose to submit your paper in the traditional way, that is not a problem – after all it's your paper.

The Editors and Publisher of *FRBM* think that 'Your Paper, Your Way' represents a return to common sense and a genuine renewed focus on the rights and needs of authors. We trust you will agree, and we look forward to seeing 'Your Papers, Your Way.'

We are interested in your response to 'Your Paper, Your Way.' Feel free to let us have your short comments and brief opinions by e-mailing us at: [frbm@elsevier.com](mailto:frbm@elsevier.com) We will try to publish a collection of such comments in the Journal.

## TOP 3 HOTTEST ARTICLES IN FRBM: JANUARY TO MARCH 2011

1. Oxidative stress, inflammation, and cancer: How are they linked? *Volume 49, Issue 11, December 2010, Pages 1603-1616*  
Reuter, S.; Gupta, S.C.; Chaturved, M.M.; Aggarwal, B.B.
2. Assessment of Antioxidant Capacity in vitro and in vivo. *Volume 49, Issue 4, August 2010, Pages 503-515*  
Niki, E.
3. Oxidative stress, insulin signaling, and diabetes. *Volume 50, Issue 5, March 2011, Pages 567-575*  
Raines, J.L.; Jain, S.K.

# SFRBM LAUNCHES NEW WEBSITE

SFRBM has launched its revamped website, aimed at providing members with a number of valuable new resources right at their fingertips. The site also provides users with a cleaner, more professional look as well as easier navigation throughout the entire site. New features of the website include:

- **Searchable Scientific Collaboration Database** – Members can now post their picture, bio, publications, research interests, current projects and social media pages in our Scientific Collaboration Database. The new online database and searchable directory should foster more scientific collaboration amongst redox researchers all over the world. Members can also opt in to receive a monthly email listing other colleagues indicating similar research interests.
- **Research Forum** – SFRBM's Research Forum is a way for members to post comments about methods, techniques or general questions for which they are looking for input from colleagues. The Research Forum categories are:
  - Aging & Disease
  - Antioxidants & Novel Therapeutics
  - Generation, Action and Metabolism of Reactive Species
  - Cell & Systems Biology

To help keep you up-to-date, SFRBM is introducing the Research Forum Digest. Members receive an email with a short synopsis of any Forum activity – whether new posts or replies to existing posts – with links to provide your own comments and add to the discussion.

- **Free Radical School Presentations** – A complete archive of over 130 Free Radical School, Workshop and Virtual School lectures that have been presented at SFRBM's Annual Meeting over the past 15 years. It is intended to be a source for basic education and reference material for a wide variety of important topics in the field of redox research.
- **Live Chat Support from SFRBM Staff** – Have a question that you want to pose to SFRBM but don't want to email or call? The site includes a new Live Chat feature that allows you to interact with SFRBM staff in real-time.

Other features of the SFRBM website include Leadership Organizational Chart, Strategic Plan and Bylaws, slide show of Young Investigator Award Winners, a user-friendly Employment page to search and submit available positions or job openings and coming soon to the Members Only section, direct access to FRBM articles.

We've also included pictures and slide shows of actual SFRBM members in their lab environments all throughout the site. We want to include your picture as well! Send us a good photo of you in your lab to [info@sfrbm.org](mailto:info@sfrbm.org).



## CREATE YOUR MEMBER/RESEARCH DIRECTORY PROFILE

- Indicate Your Research Categories
- Provide Research Expertise and Project Keywords
- Bio
- Laboratory or research website
- Links recent publications where your research has appeared
- Upload a current photo
- List your LinkedIn and Facebook pages

It only takes a few minutes to complete. Go to [www.sfrbm.org](http://www.sfrbm.org) and log into the Members Only area.

## FREE RADICALS ABROAD

A new model of how translational research is carried out in a medical center is being set up in the city of Kaohsiung in southern Taiwan. Established in 2009 and funded by the Chang Gung Medical Foundation, the Center for Translational Research in Biomedical Sciences at Kaohsiung Chang Gung Memorial Hospital, (a 2,900-bed medical center) aspires to provide a congenial environment where clinical and laboratory scientists can interact freely to generate meaningful research problems and solutions, without the worry of availability of facilities, know-how and funding. Directed by Dr. Samuel H.H. Chan, National Chair Professor of Neuroscience, one of the main research thrusts in this Center is the role of ROS in various pathological processes.



**The core members of the ROS research team in Kaohsiung Chang Gung Memorial Hospital, Kaohsiung, Taiwan**

Dr. Julie Chan, Chair Professor and Division Head of Cardiovascular Medicine, is leading a team (Drs. Kay Wu and Steve Leu) in delineating the signaling cascades that underlie the causal role of ROS in neurogenic hypertension and the remedial actions by the antioxidant mechanisms, including SOD and mitochondrial uncoupling proteins. Dr. Alice Chang, Professor and Division Head of Neuroscience, together with Dr. Samuel Chan and their team (Drs. Y.Y. Poon and Ching-Yi Tsai), is studying the mechanisms that underlie mitochondrial dysfunction and bioenergetic failure, leading to oxidative stress in animal models of brain death.

Dr. Yao-Chung Chuang, Associate Professor and Head of Epilepsy is looking into the role of free radicals in apoptotic cell death in the hippocampus and enhanced atherosclerosis in patients with chronic epilepsy. A new line of study, led by Dr. Yu-Fan Cheng and Dr. Hon-Kan Yip and their team (Drs. Sarah Chua, Chia-Hao Su and Chang-Han Chen), involves application of molecular imaging (MRI, ultrasonograph) to evaluate the role of ROS in liver transplantation, cardiopathies and tumorigenesis by comparing changes in patients and animal models. Through international collaboration, this group is also working with Dr. Jean-Luc Elghozi in Paris, France, Dr. Ima Doinova in Bratislava, Slovakia, and Dr. Jonathan Lindner in Portland, Oregon, USA.

*Article submitted by Dr. Matthew Zimmerman*

## SFRBM FOUNDATION HONOR ROLL

We would like to thank the following members who made donations to the SFRBM Foundation during the first quarter of 2011:

### **GOLD (\$250 - \$499)**

Harry Ischiropoulos	Children's Hospital of Philadelphia Research Institute
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### **SILVER (\$100 - \$249)**

Henry Forman	University of California - Merced
Dawn Jin	Health Canada
Danny Manor	Case Western Reserve University

### **BRONZE (\$25 - \$99)**

Margaret Briehl	University of Arizona
Sean Davies	Vanderbilt University
Dora Il'yasova	Duke University
Aimee Landar	University of Alabama - Birmingham

To make a tax-deductible donation to the Foundation, please visit <http://sfrbm.org/sections/sfrbmfoundation.php>.

## EMPLOYMENT OPPORTUNITY

### **Post-Doctoral Fellow in Mitochondria Ion Channels The University of Rochester**

A post-doctoral fellowship position is available to characterize mitochondrial ion channels involved in protection against hypoxia. To date the project has focused on the molecular identification of mitochondrial potassium channels in both *C. elegans* and mouse (see PMIDs 20185796, 19242645, 18809388). A critical next phase is the electrophysiological characterization of inner membrane ion channels in their native context. To accomplish this goal, the successful candidate will patch-clamp mitoplasts from gene-deleted organisms, including both *C. elegans* and mouse. This interdisciplinary and multiple-PI project will take advantage of local strengths in mitochondrial physiology, ion channel biophysics, and model organism genetics. The ideal candidate will have a PhD in an appropriate discipline and a strong track record with publications in the fields of electrophysiology and/or ion channel biophysics. The University of Rochester is an equal opportunity employer. Candidates from under-represented minorities are especially encouraged to apply.

# TIME TO APPLY FOR TRAVEL & YOUNG INVESTIGATOR AWARDS

SFRBM is pleased to announce the 2011 Young Investigator and Travel awards, part of the significant support given by the Society to young researchers in the field of free radical chemistry, redox biology and antioxidants.

In 2010, **Maria Noel Alvarez**, a Postdoctoral Fellow at the Facultad de Medicina, Universidad de la República, in Montevideo, Uruguay received a Young Investigator Award for her poster "Intraphagosomal Oxidants in the Control of *T. cruzi* Infection: experimental and theoretical analysis in murine and human macrophages."



"We demonstrated that peroxynitrite was generated within the phagosome of activated murine macrophages infected with *Trypanosoma cruzi* trypomastigotes. Peroxynitrite, a product of the reaction between  $O_2^-$ , arising from the activation of NADPH oxidase secondary to internalization of the parasite, and  $\cdot NO$  diffusing from the cytosol, was formed in sufficient amounts to diffuse into the parasite and to cause substantial oxidative damage and cytotoxicity. The effects of peroxynitrite were neutralized by the overexpression of TcCPX in the parasites which facilitated the development of the infection. Assays in human monocyte-derived macrophages also indicated that their infection by trypomastigotes was strongly inhibited when nitric oxide synthase 2 was previously induced and NOX2 activated, with a ~70 % decrease on intracellular parasites. Our data strongly support the idea that the dynamic balance between intraphagosomal oxidant production and the activity of key antioxidant enzymes in the parasite at the onset of the infection is a critical determinant of parasite infectivity."

Doctoral student **Anuli Anyanwu** from the University of Michigan was the recipient of a 2010 Travel Award, and presented her work "Heme oxygenase-1/carbon monoxide protects against pulmonary injury in a neonatal murine model of hyperoxia-induced lung injury" during the Society's Annual Meeting in Orlando.



"My research focuses on the effects of low-doses of exogenous carbon monoxide, a byproduct of hemeoxygenase-1, as a therapeutic modulator for bronchopulmonary dysplasia. To date, there have been no studies examining exogenous CO as a therapeutic modulator for BPD. My recent findings suggest heme oxygenase-1/CO provides protective effects against lung injury in neonates by the inhibition of inflammatory and oxidative stress responses."

In total, 15 outstanding student and postdoc members receive Young Investigator Awards yearly. Each prize includes \$500 cash and a free registration for a subsequent Annual Meeting. Travel Awards include 10 awards at \$1,000 each conferred to postdoc or student members of SFRBM outside of the United States and a further 10 Travel Awards at \$500 each were presented to postdoc and student members in the US.

Travel Award submission deadline is August 15, 2011, while the submission deadline for Young Investigator Awards is September 1, 2011. Students and postdocs interested in the 2011 awards should visit the SFRBM website at <http://sfrbm.org/sections/awards-yi.php> for more information.

## ABSTRACT SUBMISSION NOW AVAILABLE

The deadline for submitting abstracts for SFRBM 2011 is Thursday, September 1, 2011. Please note that submitted abstracts must be previously unpublished work and those submitted for oral presentation consideration will be subject to a double blind review process. Decisions on abstract acceptance will be posted on the SFRBM website during the week of October 5. Please visit <http://www.sfrbm.org/sections/18AnnualMeeting.php> for more information.

# LITERATURE REVIEW

**Loss of Thioredoxin Reductase 1 Renders Tumors Highly Susceptible to Pharmacologic Glutathione Deprivation.** *Mandal PK, Schneider M, Kölle P, Kuhlencordt P, Förster H, Beck H, Bornkamm GW, Conrad M., Cancer Res. 70, 9505-14, 2010.*

Thioredoxin (Trx)-dependent system is one of the main systems maintaining the cellular redox homeostasis, and is involved in DNA synthesis, redox-regulated signal transduction, gene expression, apoptosis as well as cell proliferation. Trx1 and thioredoxin reductase (Trxrd1) are upregulated in numerous cancer cells and Trxrd1 has been reported earlier to play an essential role in tumorigenesis. However, in this paper the authors showed that the genetic ablation of Trxrd1 did not cause any difference in proliferative, clonogenic and tumorigenic potential of tumor cells. Thus far, they revealed that the system is cross-linked to another major antioxidant defense system, glutathione (GSH)-dependent, and to GSH-metabolizing enzymes that are upregulated to compensate for the loss of Trxrd1, maintain the cellular redox status, ensure the survival and the proliferation of the cell. Due to the extensive interplay among these major redox families, Trxrd1<sup>-/-</sup> tumors were highly susceptible to the experimental GSH depletion both in vitro and in vivo. In the light of these findings the authors demonstrated that the effective strategy in suppressing tumor growth would be the concomitant inhibition of those two key antioxidant defense systems.

*Review by Artak Tovmasyan and Ines Batinic-Haberle, Duke University Medical Center.*

**SOD enzymes and their mimics in cancer: pro- vs anti-oxidative mode of action.** *Special Issue of Anti-Cancer Agents in Medicinal Chemistry, Volume 11, Parts I and II (Numbers 2 and 4) 2011, Guest-Edited by Ines-Batinic-Haberle*

The topics covered in this Issue aimed at challenging our thoughts on what is the true mechanism behind the beneficial effects we observe with redox-active enzymes and their mimics, in different in vitro and animal models of diseases, which could help us in treating human diseases more successfully. Over the years a substantial amount of evidence emerged from a number of groups on the anticancer role of MnSOD. While this is true for many cancers, a strong connection between the high levels of MnSOD expression and redox signaling in metastatic disease is discussed in this Issue. In the studies where MnSOD was overexpressed, increased levels of H<sub>2</sub>O<sub>2</sub> were found, which suggests that H<sub>2</sub>O<sub>2</sub> has a major role in metastases. One possibility is that MnSOD overexpression modifies cellular redox environment to indirectly enhance the production of O<sub>2</sub><sup>-</sup> and H<sub>2</sub>O<sub>2</sub>. This Issue contains viewpoints by Irwin Fridovich, Daret St. Clair, Andres Melendez, Garry Buettner, Lee Ann MacMillan-Crow, and John Crow regarding the still controversial role of MnSOD in cancer. More work is needed to gain a profound insight into dichotomous role of MnSOD as a tumor suppressor or oncogene.

Interestingly, the in vivo data on several major classes of SOD mimics and other redox-able compounds (Mn porphyrins, metallocorroles, Mn salens, nitroxides, nitrones, and texaphyrins) presented in this Issue by Batinic-Haberle, Gross, Doctrow, Floyd, Davies and Sessler, provide evidence that those compounds may act as anti-oxidants. Such actions are not unexpected: in order to be potent SOD mimics, like enzymes themselves, during the catalysis of O<sub>2</sub><sup>-</sup> dismutation they must oxidize and reduce superoxide with similar efficacy. Often, the reduction of a synthetic SOD mimic, rather than with O<sub>2</sub><sup>-</sup>, occurs via coupling with cellular reductants (such as ascorbate). The anti-cancer potential of ascorbate, alone or in combination with redox-able compounds, has been explored by different groups (such as Levine and Buettner). The anticancer treatment with quinone, menadione and ascorbate is already employed in clinic. In this Issue, Verrax et al and Batinic-Haberle et al showed clearly that in the presence of cellular reductant ascorbate, quinones and Mn porphyrins may produce reactive species. The data are discussed with relevance to in vivo therapeutic effects of Mn porphyrin-based SOD mimics where they undoubtedly encounter high mM levels of ascorbate. Many of those redox-able compounds inhibit NF-κB, a major transcription factor that controls inflammatory and immune responses. Tome and her group provided an evidence that Mn porphyrin glutathionylates p65 subunit of NF-κB in the presence of H<sub>2</sub>O<sub>2</sub> and glutathione, whereby enhancing anticancer effect of glucocorticoid. More research is needed to show if such action might have been involved in inhibition of HIF-1α and AP-1 by Mn porphyrin also. With diabetes, oxidation of p50 subunit of NF-κB by Mn porphyrin was proposed by Tse et al, resulting in attenuation of diabetes and protection of human islet cells. While the antioxidant effects of Mn porphyrins were observed in diabetes-related studies, their action was pro-oxidative. Thus, the Issue aimed also at warning us to differentiate between the actual mechanisms of action of redox able compounds, and the effects we observe.

The complexity of in vivo systems under normal and pathological conditions on one side, and the complex reactions of redox-active therapeutics on the other side, in particular with respect to mitochondria, makes our research even more challenging.  
*Review by Ines Batinic-Haberle, Duke University Medical Center.*

# SFRBM 2011 BUSINESS PLAN

(Containing Vision Statement & Key Strategic Objectives from 5-Year Strategic Plan 2008-2012)

**Vision Statement:** The Society for Free Radical Biology and Medicine will be the premier forum for redox research and the scientific organization promoting the discovery and exchange of knowledge in the area of free radical chemistry, redox biology and antioxidants.

## EDUCATION & PROFESSIONAL DEVELOPMENT

Descriptor	Strategy / Goal / Action	Committee Responsible	Suggested Completion Date (no later than)
<b>Strategy 1</b>	<b>To provide educational programs for both the lay and scientific communities, catalyze new research and promote professional development.</b>		
<b>2011 Goal</b>	<b>1.1 Execute 4 trainee/new investigator professional development sessions for annual meeting</b>	<b>Education</b>	<b>5/1/11</b>
<b>2011 Goal</b>	<b>1.2 Develop &amp; execute one Opening Doors program at the Annual Meeting.</b>	<b>Women in Science</b>	<b>11/30/11</b>
<b>2011 Goal</b>	<b>1.3 Develop 8 Free Radical School seminars that compliment scientific program.</b>	<b>Free Radical School</b>	<b>5/1/11</b>
Action	1.3.1 Produce a FRS handout for the 2011 meeting with the presentation slides of all speakers, and post the slides on the SFRBM site.	Free Radical School	10/1/11
Action	1.3.2 Audio and video record FRS lectures at the Annual Meeting	Free Radical School	11/20/11
<b>2011 Goal</b>	<b>1.4 Develop 1 pre-meeting workshop for annual meeting.</b>	<b>President</b>	<b>4/15/11</b>
<b>2011 Goal</b>	<b>1.5 Increase mentor/mentee pairs to 60 for mentoring program</b>	<b>Women in Science</b>	<b>12/31/11</b>
Action	1.5.1 Rewrite guidelines for mentoring program	Women in Science & Professional Development	5/15/11
Action	1.5.2 Develop measurement criteria for success of mentoring program	Women in Science & Professional Development	9/1/11
<b>2011 Goal</b>	<b>1.6 Develop a minimum of 8 educational webinars.</b>	<b>Free Radical School/ Website</b>	<b>12/31/11</b>
Action	1.6.1 Deliver 4 quarterly scientific webinars	Free Radical School	12/31/11
Action	1.6.2 Generate 4 webinar recordings from the 2011 FRS talks.	Free Radical School	12/31/11

## RESEARCH & SCIENTIFIC EXCELLENCE

Descriptor	Strategy / Goal / Action	Committee Responsible	Suggested Completion Date (no later than)
<b>Strategy 2</b>	<b>To provide an environment for the exchange of information and technology to promote scientific excellence.</b>		
<b>2011 Goal</b>	<b>2.1 Develop 4 sessions for annual meeting that support scientific excellence</b>	<b>President</b>	<b>4/15/11</b>
Action	2.1.1 Secure minimum of 18 proposal submissions for sessions	President	12/15/11
Action	2.1.2 Establish a standing Program Committee of 18 scientists representing Free Radical researchers worldwide	President	2/1/11
<b>2011 Goal</b>	<b>2.2 Develop a scientific excellence recognition program for young investigators.</b>	<b>YI/Trainees/ Awards-Junior</b>	<b>5/1/11</b>
Action	2.2.1 Fund two cycles of new Mini-Fellowship program	YI/Trainees	12/31/11
Action	2.2.2 Report at annual meeting on progress of Young Investigators network.	YI/Trainees/ Awards-Junior	12/1/11

Action	2.2.3 Select Young Investigator Award and Travel Awards program winners.	Awards – Junior	11/30/11
Action	2.2.4 Write section in SFRBM DOT reminding young investigators about available awards and deadlines	Awards – Junior	5/1/11
Action	2.2.5 Revise selection criteria for young investigator awards and post on SFRBM website.	Awards – Junior	6/1/11
<b>2011 Goal</b>	<b>2.3 Develop a scientific excellence recognition program for Senior investigators.</b>	<b>Awards – Senior</b>	<b>12/1/11</b>
Action	2.3.1 Select Discovery Award recipient.	Awards – Senior	6/1/11
Action	2.3.2 Review FOS Designation process and report to Council at Annual Meeting	Awards – Senior	12/1/11
Action	2.3.3 Report progress on mentoring award procedure/selection at annual meeting.	YI/Trainees/Awards-Senior	12/1/11

## COMMUNICATION & STRATEGIC ALLIANCES

Descriptor	Strategy / Goal / Action	Committee Responsible	Suggested Completion Date (no later than)
<b>Strategy 3</b>	<b>To promote the Society’s reputation and visibility, as well as the interests of its current and potential members, to the scientific community and public.</b>		
<b>2011 Goal</b>	<b>3.1 Distribute \$20K annually to increase visibility membership and recognition with related interests internationally.</b>	<b>Strategic Alliances &amp; Outreach</b>	<b>12/31/11</b>
Action	3.1.1. Conduct a cost benefit analysis of program and report to council at Annual Meeting.	Strategic Alliances & Outreach	12/1/11
<b>2011 Goal</b>	<b>3.2 Secure a minimum of two (2) strategic alliance partners</b>	<b>Strategic Alliances &amp; Outreach</b>	<b>12/31/11</b>
<b>2011 Goal</b>	<b>3.3 Provide editorial content for 25 FRBM Journal issues</b>	<b>Publications</b>	<b>12/31/11</b>
Action	3.3.1 Review and define goals of publications committee	Publications	7/1/11
Action	3.3.2 Review and define appointment process of associate editors & editorial board members (diversity)	Publications	11/1/11
Action	3.3.3 Establish & submit journal subcategory recommendations to Associate Editors	Publication	7/1/11
Action	3.3.4 Conduct feasibility study or survey to determine our ability to increase visibility with funding agencies	Marketing - External	12/1/11
Action	3.3.5 Develop and distribute a minimum of four (4) press releases annually	Marketing - External	12/31/11
<b>2011 Goal</b>	<b>3.4 Redevelop society website to improve the content and exposure of website to members and field</b>	<b>Website</b>	<b>5/1/11</b>
Action	3.4.1 Implement and launch an effective forum on the website	Website	5/1/11
Action	3.4.2 Review the “Employment” section to ensure it is user-friendly with a search tool and an option for members to receive an email when new postings added.	Website	5/1/11
Action	3.4.3 Add links to related societies / organizations (i.e., SOT, nitric oxide society, free radical organizations.)	Website	5/1/11
Action	3.4.4 Transfer the 1995-2007 FR School presentations from the University of Iowa site to the SFRBM site.	Free Radical School	5/1/11
<b>2011 Goal</b>	<b>3.5 Develop mobile web application for society</b>	<b>Website</b>	<b>8/1/11</b>
<b>2011 Goal</b>	<b>3.6 Conduct a feasibility study of hiring an IT Staff member for society and report to council</b>	<b>Website/Finance</b>	<b>7/1/11</b>

Descriptor	Strategy / Goal / Action	Committee Responsible	Suggested Completion Date (no later than)
<b>Strategy 3</b>	<b>To promote the Society's reputation and visibility, as well as the interests of current and potential members, to the scientific community and public.</b>		
2011 Goal	3.6 Develop a society social media strategy for external marketing	Marketing - External	5/1/11
Action	3.6.1 Develop and execute informational video to market society	Marketing – External	12/31/11
Action	3.6.2 Develop a minimum of 4 YouTube videos to promote society	Marketing - External	12/31/11
Action	3.6.3 Publish 4-6 issues of the SFRBM dot in 2011; circulate electronically + archive on website	Marketing – Internal	12/31/11

## ORGANIZATIONAL & MEMBERSHIP DEVELOPMENT

Descriptor	Strategy / Goal / Action	Committee Responsible	Suggested Completion Date (no later than)
<b>Strategy 4</b>	<b>To maintain an infrastructure that supports the operational and membership objectives of the Society.</b>		
2011 Goal	4.1 Promote charitable donations as a mode of supporting the long-term efforts of the society.	Finance/Investments	12/31/11
2011 Goal	4.2 Raise \$30,000 in support for the 2010 meeting.	Fundraising/ Sponsorship	10/1/11
2011 Goal	4.3 Develop a short list of 5 members as candidates for the President-Elect position (election to be held in Summer 2012)	Nominations/ Leadership Development	12/31/11
Action	4.3.1 Develop a database of key contributors to the society (especially younger to mid-level investigators) who might be approached to run for Council	Nominations/ Leadership Development	12/31/11
Action	4.3.2 Recruit 5 individuals who have been traditionally underrepresented in science for leadership positions. Establish a better balance between young and senior researchers in leadership.	Nominations/ Leadership Development	12/31/11
2011 Goal	4.4 Increase the society membership by 3% over 2011 final numbers.	Membership – Recruitment	12/31/11
2011 Goal	4.5 Increase post doc members by 15% over 2011 final numbers.	Membership – Recruitment	12/31/11

2011 Goal	4.6 Secure a minimum of 20 new members outside of the United States	Membership – Recruitment	12/31/11
2011 Goal	4.7 Ensure each council member will send a minimum of ten (10) personal invitations to secure new members	Membership – Recruitment	12/31/11
2011 Goal	4.8 Maintain a minimum of 70% retention	Membership – Retention	12/31/11
Action	4.8.1 Conduct a minimum of one (1) drawing annually for a free membership in each of the student and post doctoral membership categories	Membership – Retention	12/31/11
Action	4.8.2 Launch Institutional Memberships (blanket membership covering multiple students/trainees through one university or institution).	Membership – Retention	10/31/11
2011 Goal	4.9 Develop a recommendation for small institution representation on Council and present to council for approval	Nominations/ Leadership Development	12/1/11