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UPCOMING EVENTS

FREE RADICAL SCHOOL WEBINAR

Chemical Biology of Peroxynitrite
April 27, 2011
details on page 3



18TH ANNUAL MEETING

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

SFRBM HEADQUARTERS

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THE RADICAL VIEW

Dean Jones, Ph.D.

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

I have had 4 phases of my scientific career. I am trained in medical biochemistry, nutritional biochemistry and molecular toxicology. I have not strayed far from these roots, initially studying the biochemistry of hypoxia, then glutathione metabolism and transport, followed by mechanisms of cell death (necrosis and apoptosis) and more recently redox systems biology. I have tried to maintain an approach to look at “the big picture”, how all of the details fit together in terms of health and disease. My passion today is driven by the reality that the new -omic tools allow this at a level unimaginable in the past. The ability to measure the oxidation of thousands of specific cysteine residues in proteins means that we have the capability to really understand redox signaling and oxidative stress in complex systems; the ability to quantify thousands of chemicals in a 10-minute analysis means that we can study mechanisms of environmental and dietary health within the context of the ongoing personalized exposures of an individual.



Dean Jones, Ph.D.

DOT: What made you decide to commit to a life of a research scientist and the most important factors that shaped your career?

I committed my life to science at an early age, probably by the time I was 13 years old. While a commitment to research was undefined until much later, some aspect of science, i.e., research, teaching, administration, policy, science history, science communication, pharmaceutical or chemical industry, was always “Plan A”. Although I love nature and painting, in my career plans, “Plan B” and “Plan C” were always some aspect of science. At one time, I planned to retire early to study wildlife and seriously paint, but the time frame for that transition continues to be pushed back as science continues to be a challenge and a delight.

The most important factors shaping my career cannot be simplified easily because there were many important influences. Certainly, my mentors Howard Mason, who taught me how to ask the most fundamental scientific questions, and Sten Orrenius, who taught me how to find scientific answers, were instrumental. I suppose that growing up at the time of Sputnik and the Vietnam war was also critical in that scientific truth superceded politics throughout the political conflicts; despite all, the scientific community functioned as an international family. Throughout my career, I have found the spirited international camaraderie of discovery to be inspiring, addictive and contagious. So I suppose the most important factor shaping my career is being part of the scientific family, dedicated to scholarship and, perhaps more importantly, to health and a sustainable environment.

DOT: What do you consider as your most exciting research discovery?

That resting on the shoulders of others is such a precarious position! In tracking the most fundamental questions, I have found that many of our central dogmas are only iterations of truth based upon available data. In terms of single discovery, I would have to say that finding the redox couples for

continued on page 2

Radical View *continued from page 1*

GSH/GSSG and cysteine/cystine in human plasma to be considerably displaced from equilibrium is probably most exciting. While it took several years for me to believe the result and even longer to understand its meaning, I believe that this finding directs us to a new way to view oxidative stress and, more fundamentally, to the central role of the cysteine proteome in the structural and functional organization of living systems. This led us to discover that mammalian cells regulate extracellular redox to the value of the plasma Cys/CySS redox potential, that protein redox states are not equilibrated to a common buffer, implying a central redox organization, and that subcellular redox compartmentalization is an underlying determinant of cell organization and function.

DOT: What do you think are the seminal conceptual advances that shaped our current understanding of “redox regulation and signaling”? How do you see this field moving forward?

I believe we have already seen a major paradigm shift, but that this has not been recognized nor accepted by many scientists. We are past the monolithic biochemical concepts of “rate-limiting step” and “most abundant” reaction pathway, to an understanding that biochemical systems have built-in shock absorbers and redundancies to allow us to survive and recover from environmental and behavioral challenges. The new –omic technologies and systems biology have already made traditional reductionist hypotheses obsolete; we are thrust into an era with tools to address complex biosystems. Frighteningly, this shows us that definition of the control condition is as important as the response to an experimental manipulation. Thus, the central conceptual advances in redox regulation and signaling pertain to oxidant generation and signaling within the context of thousands of redox sensors; to the dimensional scaling of reaction rates to match spatial geometries; indeed, to the understanding that signaling within complex networks demands network definition. I see this as a seminal advance; traditional approaches to hypothesis testing are limited to the confines of the experimental condition. With global definition of baseline using genomic, gene expression, epigenomic, proteomic and metabolomic approaches, we can begin to address redox regulation and signaling as components of real-life biology.

DOT: What advice would you give to young researchers entering the field given the current funding climate?

My advice is to look forward with a mind to practical advances that can improve humanity. There are an infinite number of questions that can be asked, but few of these are really worthwhile in terms of knowing the answer. Thus, take time to think. This should be at least 10% and perhaps 20% of one’s work week. A single, well-designed experiment is worth many not-so-insightful experiments. I would secondly look at training experience—I suggest that complementary training should include systems biology, network analysis, computational biology, applied biostatistics, bioinformatics or other approaches that allow targeted hypotheses to be interpreted within the context of the real world. We are approaching personalized medicine, and this means that the heterogeneity of humans will be a focus of concern. This can only be done with the power of the information era, so success will come to those adept in information-rich technologies.

DOT: How do you achieve balance between your personal passion for painting and professional passion for science?

When I was a post-doc in Sweden, I learned very quickly that the secret to productivity was efficient time utilization. Work while at work and play while at play. It is a simple but useful way to maintain balance in life. I find that the best research projects require considerable attention so I rotate between activities, doing my best to give 100% attention to one project at a time. While this excludes everything else (annoying editors, friends and colleagues), it allows individual projects to be done effectively. By collaborating with other talented scientists, this takes advantage of individual strengths and maximizes progress. It also means that one has finished projects and can therefore justify time away from work, i.e., time to be focused on play, i.e., painting.

So my painting is really not different from my science, I am just focused on different projects. Taking a canvas and easel to paint by a mountain stream is a luxury, but it mostly requires only a confidence that what I did during the week was worthwhile and complete. There will always be something to do tomorrow and next week, so I reserve tomorrow and next week for those tasks. The beauty of painting in a natural setting is that the “science” brain relaxes, processes and coalesces all those random thoughts while the “artist” brain takes delight in the unexpected sparkle of random sunlight on the canvas. Rarely am I ready to leave the canvas, but rarely am I ready to leave science. I just give them each their own turn.

Interview by Tak Yee Aw, LSU Health Sciences Center

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PRESIDENT'S MESSAGE:

Harry Ischiropoulos, Ph.D.



Harry Ischiropoulos

By the time you read this column, SFRBM will have completed its 2011 Strategic Planning Retreat in Chicago (March 5-6). The purpose of the retreat was to bring together Council members, committee chairs, regular SFRBM members and staff to carefully review our current strategic and business plans and sharpen their focus for the next 3 years. I'd like to personally thank the 28 people who gave up their entire weekend and contributed many important ideas and suggestions to improve the society.

Many thanks to all members that completed the 2011 Member Survey, which provided extremely valuable data with which to review and assess SFRBM's programs and services as well as consider new directions for us to go as an organization. At the retreat a major emphasis was placed on areas where SFRBM has fallen short of expectations and developed plans to address them accordingly. Interactive conversations included:

- *What science and initiatives have members identified as most important for SFRBM moving forward?*
- *Improvements to our journal – Free Radical Biology and Medicine*
- *How do we improve and increase the number of educational opportunities provided for both trainees and senior investigators?*

Please see pages 5-8 for a summary of the Member Survey responses and comments that I think you will find very informative. I will share details on Retreat outcomes in my next President's Message. In the meantime, I welcome SFRBM members who have any concerns, suggestions or input to please contact me at ischirop@mail.med.upenn.edu or (215) 590-5320.

SFRBM's Program Committee has completed their evaluation of all program proposals submitted for the 2011 Annual Meeting in Atlanta and have made the following plenary session selections:

- Redox regulation by Epigenetics
- Oxidative stress in neurodegenerative diseases
- Mitochondria, redox metabolism and cancer biology
- Crosstalk between NO and H₂S signaling

Thanks to all members who submitted proposals and to the committee for their review efforts. Lastly, please consider participating in one of the Society's committees. Active membership participation has been steadily increasing but as always we can use your input and creative ideas. If you're not already on a committee and want to sign up, please contact Audra Stewart, SFRBM's Membership Coordinator, at (317) 205-9482 or via email at astewart@hp-assoc.com.

EMPLOYMENT OPPORTUNITIES

Faculty Position in Environmental Pathology University of Vermont College of Medicine

The Department of Pathology at the University of Vermont College of Medicine seeks an MD or MD/PhD pathologist with fellowship training in a subspecialty area of Surgical Pathology for a tenure track position at the Assistant or Associate Professor level. The applicant must be Board certified (or eligible) in anatomic pathology with subspecialty fellowship training (or have equivalent qualification/experience). The successful applicant will devote 25% of their effort to clinical practice and 75% time to research. We are most interested in individuals with research programs relevant to environmental pathology and carcinogenesis, particularly in the lung.

Postdoctoral Position in Section of Cardiology and The Department of Pharmacology University of Illinois at Chicago

A postdoctoral position is open at the Section of Cardiology and The Department of Pharmacology at the University of Illinois at Chicago. Successful applicants will have demonstrated capacity to conduct conventional biochemical experiments (based on PCR, Western blot, reporter assays, basic microscopy skills, transfection and silencing of proteins of interest) and a reasonable publication records. Previous experience with the investigation of signal transduction pathways, immunology, animal models of disease, NFkB signaling or mass spectrometry are a plus. Being highly motivated and hard working is a must.

Postdoctoral Fellowship in Modeling of Microcirculation in the Department of Biomedical Engineering Johns Hopkins University

Description: Postdoctoral fellowship to conduct research on computational modeling and systems biology of nitric oxide and oxygen transport, signaling pathways, vascular biology and blood flow in microcirculation. Requirements: Ph.D. in biomedical engineering, chemical engineering, biophysics, or equivalent. Strong background and experience in modeling of biological processes. US citizens, permanent residents or holders of an F1/OPT visa with at least six months of work authorization left.

For more details on these positions, including instructions on how to apply, please visit sfrbm.org and click "Employment".

FREE RADICAL SCHOOL VIRTUAL SEMINAR SERIES



Chemical Biology of Peroxynitrite

Wednesday, April 27, 2011

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

Speaker: Gerardo Ferrer-Sueta, Ph.D.

Universidad de la República – Uruguay

Cost: FREE for SFRBM members

Program Overview:

Fundamentals of peroxynitrite chemistry:

- Formation from radicals, decomposition to radicals
- Chemical properties

Chemical kinetics and peroxynitrite reactions relevant to biochemistry:

- Carbon dioxide as a mediator to radical formation
- Thiol/selenol peroxidases as powerful scavengers and signaling intermediates
- Heme proteins and other metal centers

Scavenging by synthetic molecules:

- Kinetics again, good scavengers have to be fast and efficient
- Reduction and isomerization by synthetic molecules

Tracking peroxynitrite in vivo:

- Footprints, pharmacological intervention and attempts to quantitation

About the Speaker:

Dr. Gerardo Ferrer-Sueta is currently Assistant Professor of Biological Physical Chemistry at Universidad de la República in Montevideo. His research interests include peroxynitrite chemical biology and the mechanism of action of thiol peroxidases. Along the past 20 years he has been committed to teaching diverse courses in topics covering General Chemistry, Inorganic Chemistry, Chemical Kinetics, Fundamental Biochemistry, Biochemical Spectroscopy, Enzymology and Inorganic Biochemistry.

Cost:

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

SFRBM 2011 MEMBER SURVEY: HIGHLIGHTS

Member survey was conducted over a three-week period (February 1 – 22, 2011).

RESPONDENT PROFILE

- 180 responses out of a possible 1,750 members (10%)
- The response by member type was:
Senior Investigator – 57%; Postdoc – 13%, Student – 27%, Emeritus – 4%.

VALUE OF SFRBM MEMBERSHIP

- When asked the reason why members retained their SFRBM membership, respondents indicated that:

	Rating Ave	Most Important	High	Moderate	Low	Not Important
Organization most relevant to my research	1.70	46%	42%	9%	2%	1%
Networking and building scientific collaborations	2.08	27%	46%	22%	5%	1%
Access to latest research and developments in field through FRBM (journal)	2.10	28%	43%	21%	7%	1%
Annual Meeting	2.13	30%	37%	23%	9%	1%
Education/professional development for trainees and junior investigators	2.22	25%	42%	23%	7%	4%
Free Radical School webinars	2.80	11%	30%	33%	21%	5%
Subscription to The Dot (newsletter)	3.24	7%	16%	37%	27%	13%

- Respondents indicated that they also belong to other professional organizations, the top 5 being: American Physiological Society (23%), American Society for Biochemistry and Molecular Biology (23%), American Heart Association (20%), American Chemical Society (19%) and American Thoracic Society (13%).

51% of respondents said that SFRBM had a greater value than their membership with these other organizations; 44% indicate SFRBM had a similar value.

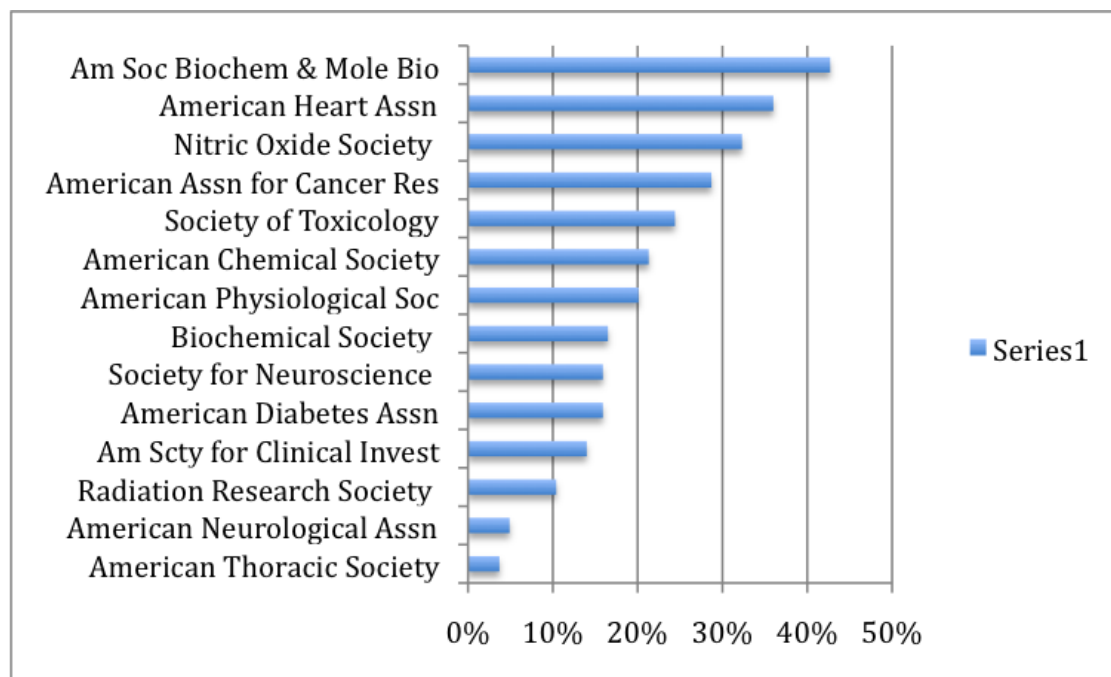
- 56% of respondents indicated that SFRBM was their primary scientific society.

SOCIETY NAME

- 83% of respondents indicated that “Society for Free Radical Biology and Medicine” best reflects the science that the individual is currently involved in and 77% said the name best reflects the current science in the field.
- The most popular choice for an alternative name was Society for Redox Biology and Medicine.

STRATEGIC ALLIANCES

- When asked which of the following groups SFRBM should explore creating a strategic alliance with, respondents answered:



JOURNAL

- 79% of respondents indicated that FRBM does a very good or excellent job of presenting the latest advances in free radical research.
- 60% indicated that they cite one or more articles from FRBM in nearly every one of their publications.
- 43% read FRBM e-only, 24% print version and 34% both.
- When polled whether FRBM should change the journal cover:
 - 41% - "FRBM is the yellow journal – should leave it the way it is"
 - 24% - Cover needs to be more dynamic
 - 21% - I don't care because I read it online
 - 13% - Not sure

EDUCATION & PROFESSIONAL DEVELOPMENT

- 60% indicated that they had attended a Free Radical School virtual seminar or watched an archived version on the website.
- 56% rated the session(s) that they attended or watched as "excellent"; 39% rated it good.
- The most consistent criticism was that some sessions did not offer streaming audio over the internet and some other sound/technical issues.
- Preference of delivery of Free Radical School slides at Annual Meeting
 - 51% - Provide both a printed book and color slides on USB/CD
 - 37% - Provide neither and put all content online for download
 - 12% - Provide only CD/USB with slides

- 40% said they would be interested in a live for virtual session on “How to Deal with the Press” (30% said no, 30% weren’t sure)

ANNUAL MEETING

•For those who have not attended the society’s annual meeting, the date/timing (59%) was identified as the top reason why, followed by cost (49%) and location (28%).

•Asked the reasons that they attend the Annual Meeting, respondents indicated:

Most Important

- >To hear/learn about the latest scientific research (68%)
- >Networking/collaborating opportunities (59%)

Important

- >Professional Development (43%)

- 65% selected Seattle as a preferred location for SFRBM 2014 (over Orlando).



Dr. Lee Ann MacMillan-Crow (L) pictured with her student, Tanecia Mitchell. Mitchell won a Young Investigator Award at SFRBM 2010 in Orlando.

CALL FOR DISCOVERY AWARD APPLICATIONS

SFRBM is now accepting nominations for the Discovery Award, which serves to recognize significant advancements in the field of redox research. The award includes a featured lecture at SFRBM’s 18th Annual Meeting in Atlanta as well as a \$2,500 cash award. Nominations for these awards will be taken through May 6, 2011.

SFRBM Discovery Award

The Discovery Award is for a breakthrough discovery that has had a major impact on the field of free radical biology and medicine. Award winners will be determined by August 1, 2011 upon a vote of the SFRBM Awards Committee. The winner will present a featured plenary lecture at the SFRBM 2011 Annual Meeting in Atlanta, GA USA, in addition to a \$2,500 cash award, paid travel expenses, a bronze medal with stand, and a one page bio and picture prominently displayed in the SFRBM 2011 Abstract/Program book. This information will also be placed on the SFRBM website with a link to the recipient's home webpage. The winner will also be invited to publish a review article for Free Radical Biology and Medicine, SFRBM’s journal, celebrating their scientific contributions and the presentation of this award.



J. David Lambeth, MD, Ph.D.
Emory University
2009 Discovery Award Recipient

Nominations Process

Each submitted nomination should include the following:

- A signed nomination letter by an SFRBM member describing the candidate and their major accomplishment justifying their consideration for this award (self nominations are permitted, but should include a secondary letter of support from an SFRBM member). Please note that nominees do not have to be current SFRBM members.
- Updated CV of candidate.
- A statement that the candidate, if selected, will be present at the SFRBM 2011 Annual Meeting in Atlanta (November 16-20, 2011).

Completed submissions should be received by SFRBM no later than Monday, May 6, 2011. Emailed submissions are required.

MEMBER COMMENTS

Thanks to members who provided narrative comments and suggestions during the survey – we heard you! We asked the question “Tell us at least one thing that we can do better to improve as an association”. Here’s a sampling of what you said:

- More of a SFRBM presence in NIH grants such as study section representation, funding topic emphasis, and policy.
 - Enhance collegiality and collaboration amongst members.
 - Write “position” papers in FRBM.
 - Less altruism - too many leaders are from the same few small groups.
 - Become the premier source of redox biology/research information across all societies.
 - Get more members who are clinician-scientists - we need more visibility in the clinical field.
 - Higher profile invited speakers for Annual Meeting.
 - Increase interactions with and visibility at meetings of other societies.
 - Increase willingness to accept new ideas, even if it doesn't fit with our current chemical concepts. Provide more platforms for discussing new concepts.
 - Mentoring for mid-career scientists, to get more guidance on the trials of running a group and also interviewing for new staff, and what to do when someone is not progressing, no one helps you much with things like that!
 - Provide transitional funding for young investigators moving from postdoctoral position to first independent position.
 - Update the SFRBM web site.
 - Create sub-specialty groups/forums/email lists within the society to facilitate networking and collaboration.
- SFRBM's 2011 Business Plan, created during our planning retreat, includes specific goals to address many of these important issues identified by members. The full plan will be posted shortly on the SFRBM website.



Members of the Finance and Communication Committees meet at the SFRBM Strategic Planning Meeting in Chicago, IL to formulate goals and objectives for 2011.

MEMBER SURVEY DRAWING WINNERS

Congratulations to the following five SFRBM members who completed the 2011 Member Survey and were selected as \$100 USD winners in a random drawing:

Landon Bellavia

Wake Forest University

Fernando Cardoza-Pelaez

University of Montana

Dawn Jin

Health Canada

Jeannette Vasquez-Vivar

Medical College of Wisconsin

Leda Viera

Universidade Federal de Minas Gerais - Brazil

BUILDING A STRONG FOUNDATION

Already this year, member contributions to the SFRBM Foundation have enabled the naming of two Young Investigator Awards (YIAs) honoring Irwin Fridovich and Larry Oberley. SFRBM's Finance & Investment Committee is practicing forward-thinking. They have set a 2011 Foundation fundraising target of \$17,500, which will be invested in our future leaders. The target amount will provide full support for this year's Young Investigator Awards (15 awards of \$500) and Mini-Fellowship (4 awards of \$2,500) programs.

Dr. Neil Hogg is a Professor of Biophysics at the Medical College of Wisconsin. We asked Neil for his perspective on the value that the Young Investigator Awards bring to the Society. Neil was a two-time winner (1993 and 1995), who has gone on to successfully mentor multiple members of his laboratory to become Young Investigator Award winners. Here is what Neil and his current postdoc, Dr. Kasia Broniowska (a winner in 2004, 2006, 2009, 2010), shared with us.



Dr. Neil Hogg pictured with his current postdoc and multiple YIA winner, Dr. Kasia Broniowska.

Dot: From your perspective, how important are the YIA awards to our junior scientists?

Neil Hogg: The young investigator awards given by SFRBM are a tremendous fillip (incentive) for students and post-docs, and I think the size and number of awards currently given is about right. Too many and they lose their luster, too few and the competition is too great. As a past winner myself, I remember how these awards contributed to my gaining confidence that I could 'hack it' in science and also gave me a very strong loyalty to the society and the meeting. I see the same thing in my students and post-docs over the years. There is absolutely nothing like peer recognition for junior scientists to mitigate some of the lingering doubts that they can be successful. I think one of the most important components is the free registration to a future meeting. While I would likely send my students to the meeting anyway, in difficult times this contribution to the travel costs is very welcome, and it build loyalty to the meeting.

Dot: What impact have you seen these awards make on the training experience of the awardee(s) you mentored?

NH: A successful YIA gives the mentor an extra bounce in their step for a considerable time to come. I think for a student the whole experience of presenting a poster/talk at SFRBM and discussing the work with people who they only know from the literature is, in itself, a motivating process. To cap this off with an award is clearly an additional boost. It is hard to know if awards breed success or if success leads to awards, but YIAs have a confidence-building effect that can translate into long-lasting success.

Dot: Do you have any advice for SFRBM junior members who are preparing to compete for the 2011 YIA awards?

NH: The three 'E's. Enthusiasm enthusiasm enthusiasm. Of course you have to put together a clear and understandable poster/presentation and how to do that would take a book. When I judge junior scientists one of the most important issues I look for is if the student has taken ownership of the project and has a visceral excitement about the presented work. Another piece of advice is to not think of it as a defense. You are not at the meeting to defend you work but to explain and discuss it. If you get too defensive, it can be a negative.

Katia Broniowska: First of all, listen to the questions people ask you, whether they have specific or very general questions, and answer accordingly. Secondly, be prepared to talk about your research in a brief but clear way with a realization that your listener may not work in exactly the same field. It means you have to very quickly recognize what the other person knows and does not know and focus on addressing the unknowns. Finally, show that your science is important to you, that you are excited about it and that you enjoy what you do.

SUPPORT THE FOUNDATION

Enhancing SFRBM's Educational, Training & Research Programs

Since SFRBM's inception in 1987, the association has worked to establish a strong professional network, facilitate scientific interaction and develop resources for free-radical researchers and investigators throughout the world. SFRBM has established a 501(c)(3) foundation to ensure continued support for these activities.

The SFRBM Foundation's mission is to foster and support SFRBM's education, training and research programs as well as fund new development and opportunities in these areas.

SFRBM has always demonstrated a strong commitment to supporting members, especially young investigators. Did you know that, since 1995, SFRBM has provided over \$300,000 in Travel and Young Investigator Award support to scientists in early stages of their career?



Did you know that our new Mini-Fellowship program was funded from Foundation donations by SFRBM members just like you?

2010 2nd cycle recipients Luksana Chaiswing and Nikolai Chepelev (left)

The Foundation provides a mechanism by which individual members can give back to the society and support the next generation of scientists so that they may fully realize their professional goals. You can donate to support a specific program or award, to honor the memory of a colleague or leader in our field or as a part of individual estate or tax planning.

Remember that donations are 100% tax deductible. Please fill out the form below or visit www.sfrbm.org and click on "SFRBM Foundation" to make a donation on-line.

2011 HONOR ROLL

PLATINUM (\$500 or more)

Victor Darley-Usmar	UAB
Robert Floyd	Oklahoma Med Res Fnd
Joe McCord	Univ. of Colorado
Daret St. Clair	Univ. of Kentucky
Vascular Biology Section	Boston Univ Med Ctr

GOLD (\$250 - \$499)

Rick Domann	Univ. of Iowa
Ijaz Jamall	Risk-Based Decisions
Albert van der Vliet	Univ. of Vermont

SILVER (\$100 - \$249)

Etelvino Bechara	Univ. of São Paulo
Margaret Briebl	Univ. of Arizona
Garry Buettner	Univ. of Iowa
Marcie Cole	Univ. of Pittsburgh
Brian Day	Natl Jewish & Res Ctr.
Suwimol Jetawattana	Thailand Inst of Nuclear Technology
Eric Kelley	Univ. of Pittsburgh
Lee Ann MacMillan-Crow	Univ. of Arkansas
J. Andres Melendez	Albany Medical College
Hara Mirsa	Virginia College of Osteopathic Medicine
Bulent Mutus	Univ. of Windsor
Sally Nelson	SomaLogic, Inc.
Douglas Spitz	Univ. of Iowa
Dennis Stuehr	Cleveland Clinic Fnd
Jeannette Vasquez-Vivar	Med College of WI

BRONZE (\$25 - \$99)

George Booz	Univ. of Mississippi
Paul Brookes	Univ. of Rochester
Barbara Buckley	USEPA
Garry Buettner	Univ. of Iowa
Nikolai Chepelev	Carleton University
Fong-Fong Chu	City of Hope
Stanley Hazen	Cleveland Clinic Fnd
Sean Lynch	Midwestern University
Ning Pan	UMASS Medical School
Jennifer Streeter	Univ. of Iowa

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supporting education, training & research programs

Your support qualifies as a charitable contribution and is tax deductible for US residents only.
Make an online contribution at: www.sfrbm.org/sfrbmfoundation.php.

Amount: \$25 \$50 \$100 \$250 \$500 Other: \$ _____

Send me an invoice Check enclosed (please make payable to SFRBM Foundation)

Visa MasterCard Credit Card #: _____ Exp. _____

My donation is: _____
Example: general donation, in honor of (please list name), support a Young Investigator Award, support Annual Meeting, Other (please list)

Please complete the information below (please print clearly):

Name: _____

Affiliation: _____

Telephone: _____ Email: _____



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LITERATURE REVIEW

Regulation of mitochondrial glutathione redox status and protein glutathionylation by respiratory substrates. *Garcia, J; Han, D; Sancheti, H; Yap, LP; Kaplowitz, N; Cadenas, E. Journal Biol. Chem. 285: 39646-39654; 2010.*

The centrality of mitochondrial glutathione (mtGSH) in matrix redox homeostasis is well known, but the mechanism of mtGSH regulation remains incompletely understood. In this study, Garcia et al demonstrated that freshly isolated mitochondria from rat brain using conventional percoll gradients and differential centrifugation methods exhibited a highly oxidized basal redox state (low GSH, elevated GSSG and protein mixed disulfides). However, the addition of respiratory substrates that stimulated state 4 (succinate) and state 3 (malate/glutamate+ADP) respiration increased mtGSH by 3 to 6-fold respectively in conjunction with NADH/NADPH-dependent reduction of mtGSSG and S-glutathionylated proteins. Importantly, hydrogen peroxide elicited minimal effect on mtGSH redox status with malate/glutamate (2.4mM each) supplementation whereas extensive protein S-glutathionylation and GSSG formation occurred when mitochondrial respiration was inhibited by rotenone. It is notable that in the absence of respiratory substrates, ATP synthase and succinyl-CoA transferase were susceptible to S-glutathionylation, indicating that these mitochondrial proteins were highly sensitive to post-translational oxidative modification. The overall conclusion was that NADPH generation by respiratory substrates is critical to the maintenance and/or regulation of mtGSH redox status, especially during oxidative stress. This finding underscores the importance of respiratory substrate supplementation in studies of mitochondrial redox status using isolated mitochondria.

Review by Magdalena L. Circu, LSU Health Sciences Center-Shreveport.

A redox switch in angiotensinogen modulates angiotensin release. *Zhou A, Carrell RW, Murphy MP, Wei Z, Yan Y, Stanley PL, Stein PE, Broughton Pipkin F, Read RJ. Nature, 2010; 468:108-111.*

Angiotensin II, an evolutionarily ancient peptide and primary effector of the renin-angiotensin system (RAS), plays a critical role in cardiovascular and body fluid homeostasis. The rate-limiting step in the RAS is renin, a protease enzyme, cleaving ten amino acids from the amino terminus of angiotensinogen to yield angiotensin I, which is, in turn, cleaved to angiotensin II by angiotensin converting enzyme (ACE). In this study, Zhou and colleagues report the crystal structure of angiotensinogen at a resolution of 2.1 ångströms and reveal that the cleavage site (recognized by renin) is inaccessibly buried inside its amino-terminal tail. A conformation change in angiotensinogen induced by the formation of a disulphide bridge upon oxidation of conserved cysteine residues (C18 and C138) exposes the cleavage site and allows for angiotensin I generation. The authors provide evidence that this redox switch in angiotensinogen is clinically relevant as levels of oxidized angiotensinogen were significantly higher in plasma from women with pre-eclampsia, a disorder of increased blood pressure and serum proteins in the urine during pregnancy. In summary, this study demonstrates that generation of angiotensin I requires an oxidative switch of angiotensinogen to its more active disulphide-bridged form. *Review by Matthew C. Zimmerman, University of Nebraska Medical Center.*

Oxidation of histidine residues in copper-zinc superoxide dismutase by bicarbonate-stimulated peroxidase and thiol oxidase activities: pulse EPR and NMR studies. *Chandran K, McCracken J, Peterson FC, Antholine WE, Volkman BF, Kalyanaraman B., Biochemistry, 2010, 49, 10616-10622.*

The paper by K. Chandran et al is a significant contribution to our understanding of the peroxidase activity of the Cu,ZnSOD. Thus, using advanced EPR and NMR methods the authors show that H₂O₂ slowly inactivates this enzyme when HCO₃⁻/CO₂ is absent, while oxidizing a histidine residue at the active site. In contrast, when HCO₃⁻/CO₂ is present, that active site residue is protected and another histidine remote from the active site is then oxidized. This result is in accord with the view that the preferred substrate of the oxidant formed from the reaction of H₂O₂ with the Cu site is CO₂ and that the carbonate radical then formed is freely diffusible and available to cause the oxidation of residues or of exogenous compounds far from the active site. Their data writes “finish” to the proposal that a bound peroxy-monocarbonate is responsible for the CO₂ enhanced peroxidase activity of the Cu,ZnSOD. It also forces us to add the carbonate radical to the pantheon of reactive oxygen species.

Review by Irwin Fridovich, Duke University Medical School.

SFRBM'S 18TH ANNUAL MEETING

NOVEMBER 16-20, 2011

SHERATON ATLANTA HOTEL

ATLANTA, GEORGIA USA



FEATURED PLENARY SESSIONS

Redox Regulation by Epigenetics

The recent progress in understanding of epigenetics has opened up a new layer of complexity in the regulation of gene expression. MicroRNAs and histone modifying enzymes as mediators of epigenetic control are subject to a complex redox-regulation affecting their expression and activity. In this session, the principles of epigenetic control will be outlined and the impact of redox-regulation on epigenetics, and vice versa, will be discussed with a particular focus on microRNAs, histone methylation and histone acetylation.

Oxidative Stress in Neurodegenerative Diseases

Oxidative stress plays a critical role in nervous system disease pathogenesis. Maintenance of balance between oxidants and antioxidants is critical for neuronal survival and glia function. Understanding how specific targets of oxidative stress play a role in neurological diseases are important for design of new therapeutic strategies.

Mitochondria, Redox Metabolism and Cancer Biology

Despite recent advances in mitochondrial research, there remain fundamental unanswered questions... Exactly what proteins do mitochondria contain? How does mitochondrial morphology relate to function? What regulates mitochondrial redox state? How do mitochondria contribute to cancer cell biology? These issues and more will be addressed.

Crosstalk between NO and H₂S Signaling

An emergent area of research involves hydrogen sulfide (H₂S) as a companion gaseous mediator to nitric oxide (NO). Both are ubiquitous cellular signaling molecules with multiple physiological roles, including the regulation of blood pressure, inflammation and neuronal function. There are growing lines of evidence that NO and H₂S interact indirectly through their signaling pathways. The topics that will be discussed include: NO and H₂S-interactions in inflammation; H₂S regulation of NO bioavailability; mechanisms and cytoprotective effects; the Search for an Endothelium-Derived Hyperpolarizing Factor: from NO to H₂S; and NO and H₂S signalling: a common theme from plants to the vasculature.

ORAL PRESENTATIONS FROM SELECTED ABSTRACTS

A number of high-quality abstracts will be chosen from those submitted to the Society for primary authors to give 15-minute oral presentations of their research. Three (3) concurrent sessions will be held each day for a total of 54 cutting-edge research presentations.

SUNRISE FREE RADICAL SCHOOL

The Free Radical School is designed to provide a detailed overview of the basic concepts of free radical chemistry and biology and is targeted towards students, fellows and those wishing to learn about new areas. A faculty of highly respected investigators in free radical research will deliver lectures and provide key literature references in their subject areas.

POSTER SYMPOSIUM

During each day of the Annual Meeting, posters will be on display all day and can be viewed at any time. Each day, two hours of formal presentation time is scheduled for authors to be available to discuss their work with other attendees. 500 posters in 15 research categories will be presented.

TRAVEL & YOUNG INVESTIGATOR AWARDS

SFRBM will give out a total of 35 Travel & Young Investigator Awards in 2011.

SFRBM has secured a special room rate of \$155 per night for meeting attendees. On-line registration information and a full program will be available in April 2011.