

Editorial: Launch of Redox Biology; A New Venue for Studies in Translational, Basic And Applied Research In The Fields of Antioxidants, Cell signaling and Redox Therapeutics.

We are proud to announce the launch of the new open access journal **Redox Biology** with over 20 articles encompassing a broad range of topics in our Field. This journal is a joint initiative of the *Society for Free Radicals in Biology and Medicine* (SFRBM) and the *Society of Free Radical Research-Europe* (SFRR-E) and will be a forum for novel research, hypotheses, methods and review articles in redox biology in both health and disease.

We aim to attract articles that will influence the field conceptually, by focused reviews of the literature, or novel research findings. **Redox Biology** is committed to a rapid publication process and to this end Authors will **not be** requested to perform major new experiments in revision but simply to make a clear and succinct novel contribution to the literature which will stimulate the field. We are interested in articles which are provocative, novel and develop interesting concepts with the maximum economy of data to make a point. Articles will be reviewed with careful attention to appropriate interpretation and the high quality of data expected for publications in our field will be maintained.

Concepts in the field are advancing rapidly and having just the right graphic framework for teaching and research presentations can result in hours searching the web for accurate schemes on specific topics. To meet this need we introduce a new format: the **Graphical Redox Reviews**. These reviews will summarize schematically key concepts, established and novel ideas in redox biology which will be accessible to a broad audience and can be freely downloaded as PowerPoint slides for use in teaching or conference presentations with appropriate acknowledgement of the source. We encourage articles which develop new concepts and ideas, hypothesis papers, short communications, full research papers, methods and other formats appropriate for the content. To introduce this new and exciting format we have three articles highlighting novel and new areas of redox biology. The first of these by Sruti Shiva is entitled "**Nitrite: A Physiological Store of Nitric Oxide and Modulator of Mitochondrial Function**" (1). The second by Anna-Liisa Levonen describes the basics of the major signaling pathway that controls levels of endogenous antioxidants in the cell "**The Keap1-Nrf2 pathway: mechanism of activation and dysregulation in cancer**" (2). The third by Jianhua Zhang describes one of the main processes through which cellular damage is repaired „**Autophagy and Mitophagy in Cellular Damage Control**" (3).

In reviewing the over 40 articles in our pipeline several themes are emerging. Not surprisingly, given its historical significance to our field we found that lipid peroxidation-related research is very active and developing new concepts. Three reviews from leaders in our field, Koji Uchida (4), Pippo Poli (5) and Corrinne Spickett (6) set the scene with articles on oxysterols, systems biology of lipid peroxidation products and the detection and chemistry of 4-hydroxynonenal. Lipid radical scavenging antioxidants are not all created equal as elegantly shown in a study by Etsuo Niki (7). Several research articles elaborate the concepts in the reviews. Interestingly, the article from Brad Hill and his group shows a tight regulatory interaction of autophagocytotic processes and lipid peroxidation (8). The lipid peroxidation field continues to develop its impact in pathophysiology and this is exemplified by an article from Tom McIntyre showing how oxidized phospholipids change with aging (9). Determining the role of lipid peroxidation products in human pathophysiology is the next challenge for this field and in a short communication from Allan Butterfield some initial forays in Alzheimers disease have revealed a potential interaction of HNE with lipoic acid (10). Another major area for our field-the mechanisms of action of gaseous mediators are prominently featured. As mentioned above the role of nitrite in biology is reviewed and this is accompanied by a comprehensive discussion of hydrogen sulfide by Shannon Bailey (11). The effects of nitric oxide releasing pro-drugs in relation to cancer are explored (12) and the oxygen dependent effects of NO signaling (13) together with a description of the pathological effects of the combined effects of NO

and other reactive species in endothelial cells (14) make an interesting contrast of concepts in the reactive nitrogen species field.

The role of heme proteins in the pathophysiology of disease is becoming increasingly important and new concepts are explored in a hypothesis-review article by Hare and colleagues that discusses the increasing importance of Met Hemoglobin in the pathophysiology of anemia (15).

The first of our method articles from Wei Li describes the detailed protocols for measuring carotid arterial injury mediated by ferric chloride(16). Mitochondrial redox interactions are another arena in which metalloproteins play a critical role in the pathophysiology of disease. Three articles describe the cellular effects of mitochondrial therapeutics (17), a review the emerging importance of mitochondrial function in CFTR (18) and a research article the role that mitochondrial SOD plays in mitochondrial genomic integrity (REDOX-D-12-00023).

Redox signaling and cell death is represented by an interesting paper suggesting that histone modifications are mediated by oxidative stress(20) and in another paper an exploration of the mechanisms of arsenite toxicity (21). Hydrogen peroxide, its regulation and signaling are linked to PPAR and some of the mechanisms of its interaction with superoxide dismutase are described in papers (22,23).

In addition to unsolicited submissions **Redox Biology** will select special themes each year focusing on an important topic in the field and include a broad range of articles. Each of the themes will have a special handling editor, who will share editorial control with an Editor who will also provide an editorial to introduce the topic. For 2013 these topics are:

- Maintenance of protein homeostasis: protein damage, repair and removal (Tilman Grune)
- Redox Bioenergetics (Victor Darley-Usmar)
- Role of hydrogen peroxide as a signaling molecule (Santiago Lamas)
- Oxidative stress in tissue ischemia/reperfusion (Tak Yee Aw)

So we encourage everyone to submit manuscripts to the named themes and propose themes for the journal.

We hope you find this first series of articles of interest and we welcome your comments. Most importantly, we encourage you to submit your articles for this year and take advantage of no publication charges and the flexible open access format which maximizes the number of readers of your work!

Tilman Grune
Victor Darley-Usmar
(Co-Editors-in-Chief)
Tak Yee Aw
Santiago Lamas
(Associate Editors)

References:

1. S. Shiva: Nitrite: A Physiological Store of Nitric Oxide and Modulator of Mitochondrial Function. REDOX-D-12-00018
2. E. Kansanen; S.M. Kuosmanen; H.M. Leinonen; A.-L. Levonen: The Keap1-Nrf2 pathway: mechanism of activation and dysregulation in cancer. REDOX-D-12-00003
3. J. Zhang: Autophagy and Mitophagy in Cellular Damage Control. REDOX-D-12-00007R1
4. K. Uchida: Redox-derived damage-associated molecular patterns: Ligand function of lipid peroxidation Adducts. REDOX-D-12-00024
5. G. Poli; F. Biasi; G. Leonarduzzi: Oxysterols in the pathogenesis of human major chronic diseases. REDOX-D-12-00021
6. C. M.Spickett: The lipid peroxidation product 4-Hydroxy-2-nonenal: advances in chemistry and analysis. REDOX-D-12-00025
7. K. Nishio; M. Horie; Y. Akazawa; M. Shichiri; H. Iwahasih; Y. Hagihara; Y. Yoshida; E. Niki: Attenuation of lipopolysaccharide (LPS)-induced cytotoxicity by tocopherols and tocotrienols. REDOX-D-12-00006R1
8. P. Haberkettl, B.G. Hill: Oxidized lipids activate autophagy in a JNK-dependent manner by stimulating the endoplasmic reticulum stress response. REDOX-D-12-00002
9. J. Liu, W. Li, R. Chen, T.M. McIntyre: Circulating Biologically Active Oxidized Phospholipids Show On-going and Increased Oxidative Stress in Older Male Mice. REDOX-D-12-00009R1
10. S.S. Hardas; R. Sultana; C. Brackett; L.I. Szweda; M.P. Murphy; D.A. Butterfield: Oxidative Modification of Lipoic Acid by HNE in Alzheimer Disease Brain. REDOX-D-12-00022.
11. A. Stein; S. Bailey: Redox Biology of Hydrogen Sulfide: Implications for Physiology, Pathophysiology, and Pharmacology. REDOX-D-12-00014
12. A.E. Maciag; R.J. Holland; R.Y. Cheng; L.G. Rodriguez; J.E. Saavedra; L.M. Anderson; L.K. Keefer: Nitric oxide-releasing prodrug triggers cancer cell death through deregulation of cellular redox balance. REDOX-D-12-00008R1
13. J.R. Hickok; D. Vasudevan; K. Jablonski; D.D. Thomas: Oxygen dependence of nitric oxide-mediated signaling. REDOX-D-12-00019
14. A.R. Diers; K.A. Broniowska; N. Hogg: Nitrosative stress and redox-cycling agents synergize to cause mitochondrial dysfunction and cell death in endothelial cells. REDOX-D-12-00013R1
15. G.M.T. Hare; A.K. Tsui; J.H. Crawford; R.P. Patel: Is methemoglobin an inert bystander, biomarker or a mediator of oxidative stress- the example of anemia? REDOX-D-12-00034
16. W. Li; T.M. McIntyre; R.L. Silverstein: Ferric chloride-induced murine carotid arterial injury: a model of redox pathology. REDOX-D-12-00010R2
17. C. Reily; T. Mitchell; B. Chacko; G. Benavides; M.P. Murphy; V. Darley-Usmar: Mitochondrially targeted compounds and their impact on cellular bioenergetics. REDOX-D-12-00001R1
18. A.G. Valdivieso; T.A. Santa-Coloma: CFTR ACTIVITY AND MITOCHONDRIAL FUNCTION. REDOX-D-12-00015
19. Anthony R Cyr, BS; Kyle E Brown, MD; Michael L McCormick, PhD; Mitchell C Coleman, PhD; George S Watts, PhD; Bernard W Futscher, PhD; Douglas R Spitz, PhD; Frederick E Domann Maintenance of Mitochondrial Genomic Integrity in the Absence of Manganese Superoxide Dismutase in Mouse Liver Hepatocytes
20. Y.Y. Sanders; H. Liu; X. Zhang; L. Hecker; K. Bernard; L. Desai; G. Liu; V.J. Thannickal: Histone modifications in senescence associated resistance to apoptosis by oxidative stress. REDOX-D-12-00020
21. I. Hamann; L.O. Klotz: Arsenite-induced stress signaling: modulation of the phosphoinositide 3'-kinase / Akt / FoxO signaling cascade. REDOX-D-12-00011R1

22. N. Khoo; S. Hebba; W. Zhao; S.A. Moore; F.E. Domann; M.E. Robbins: Differential Activation of Catalase Expression and Activity by PPAR Agonists: Implications for Astrocyte Protection in Anti-Glioma Therapy. REDOX-D-12-00027R1
23. R.H. Gottfredsen; U.G. Larsen; J.J. Enghild; S.V. Petersen: Hydrogen Peroxide Induce Modifications of Human Extracellular Superoxide Dismutase That Results in Enzyme Inhibition. REDOX-D-12-00035