

Introducing a New Journal: Free Radicals and Antioxidants

Subhankar Chakraborty¹, M.B.B.S., PhD. and Mueen Ahmed K K², PhD.

¹ Department of Biochemistry and Molecular Biology, University of Nebraska Medical Center, Omaha, NE 68198, USA.

² Department of Phytochemistry, College of Clinical Pharmacy, King Faisal University, Kingdom of Saudi Arabia.

Welcome to a new journal exploring one of the most upcoming areas in the field of free radicals biology and medicine today- *Free radicals and Antioxidants!*

Living organisms are being continuously exposed to a wide array of insults that lead to the production of reactive oxygen species (ROS). Reactive oxygen species serve several physiological functions- they can activate signaling pathways in normal cells that in turn modulate physiological processes like inflammation, apoptosis, regulation of smooth muscle tone and leukocyte adhesion to the vascular endothelium.^[1] The term ROS broadly refers to a family of highly reactive molecules, all of which share one common feature- the presence of oxygen. The ROS family comprises of three types of molecules, those that contain oxygen, termed as oxygen radicals (OH, O₂ and NO), non-radical species (CO, ONOCO²⁻, N₂O₂, NO₂, H₂O₂, ONO²⁻, O₃, HOCl and O₂) and free radicals.^[2] “Free radicals” are defined as atoms, molecules or ions characterized by the presence of unpaired electrons. The latter characteristic makes them highly unstable, extremely reactive chemically and very short-lived^[3]. The ability of oxygen to accept electrons from other molecules to form oxygen free radicals renders ROS highly toxic to living cells. While superoxide and hydrogen peroxide are among the most abundant reactive species generated in living cells, they are only moderately toxic. Hydroxyl radicals (OH), on the other hand, are far less abundant, but highly reactive species believed to be responsible for most of the oxidative damage in aerobic cells. Faced with the barrage of potentially deadly reactive species, aerobically respiring cells have evolved a well-developed system to counteract the damaging effects of ROS- termed as the “antioxidant system”.^[4] The imbalance between the production of ROS and the antioxidant defense mechanisms is called “oxidative stress” and can have several detrimental effects including causing genomic instability, even promote neoplastic transformation.

It is interesting to go back a little bit in history to look at the major developments in the field of free radical

biology. In 1954, Gersham published his theory of free radicals which states that the toxic effects of oxygen are due to the partially reduced forms of oxygen.^[5] Since then, there has been an exponential increase in interest in understanding the role of these reactive oxygen species. A search of the PubMed database using the terms “free radical” and “antioxidant” revealed that particularly since the 1960's, there has been an explosion of literature in the field (**Figure 1** and **Table 1**). In 1956, Harman proposed that free radicals could play a role in the ageing process.^[6] The discovery of Superoxide dismutase in the year 1969 by McCord and Fridovich was a major turning point in free radical research.^[7] With the demonstration by Murad and Mittal that the hydroxyl radical stimulates the formation of the second messenger cyclic guanosine monophosphate (cGMP),^[8] the field of free radicals witnessed an exponential progress. Today, the study of the shifting balance between free radicals and antioxidants and its role in the maintenance of health and development of disease is an area of intense research. In order to provide a platform for scientists to publish novel, exciting findings in the field of free radical biology, we are starting a new journal aimed at publishing original research, insightful reviews and short reports pertaining to the field of free radicals and antioxidants.

Articles submitted to the journal can pertain to attempts at improving our understanding of how free radicals mediate health and disease. The list of diseases that are caused by oxidative stress is ever growing, ranging from benign conditions like coronary heart disease and neurodegenerative conditions to deadly malignancies like pancreatic cancer. Together with an understanding of the basic biology, it is also important to identify ways to translate these observations into clinical use. Hence, articles that demonstrate the utility of either free radical generating or scavenging agents in preclinical and patients are also welcome. Review articles that summarize recent developments in a particular area of free radical biology and medicine will also be considered for publication.

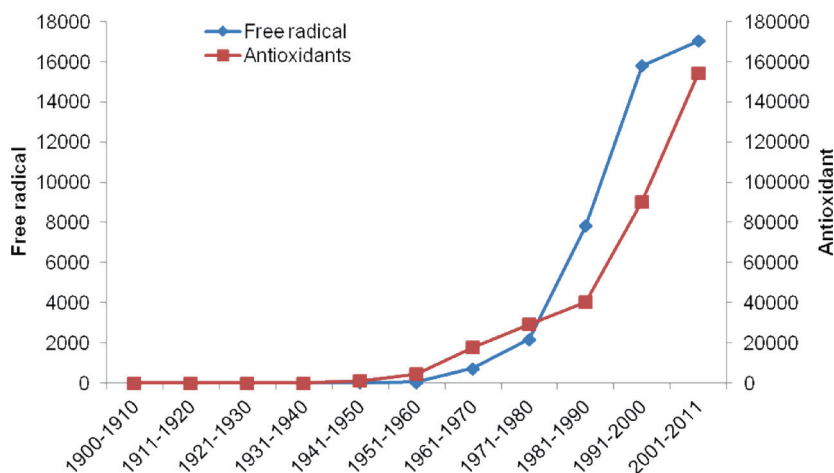


Figure 1. Trend in number of articles indexed in PubMed from 1900-2011 containing the terms “Free radical” or “Antioxidant”. The PubMed database was queried with the terms “free radical” (blue line) or “antioxidant” (red line). All articles containing these terms anywhere in the article were retrieved. The number of published articles per decade starting from 1900 till 2011 was obtained.

Table 1. Results of PubMed Search for articles containing the terms “Free radical” or “Antioxidant” from 1900-2011

Search item	Year range	Number of articles	Search item	Year range	Number of articles
Free radical	1900-1910	1	Antioxidant	1900-1910	0
	1911-1920	1		1911-1920	0
	1921-1930	2		1921-1930	0
	1931-1940	0		1931-1940	0
	1941-1950	17		1941-1950	1154
	1951-1960	41		1951-1960	4526
	1961-1970	726		1961-1970	17824
	1971-1980	2174		1971-1980	29277
	1981-1990	7845		1981-1990	40440
	1991-2000	15814		1991-2000	90462
2001-2011	17064	2001-2011	154589		

Free Radicals and Antioxidants is published by EManuscript Services on behalf of SciBiolMed.Org and Phcog.Net. SciBiolMed.Org is a non-profit network dedicated to research in the field of science, biology and medicine while Pharmacognosy Network (Phcog.net) Worldwide [www.phcog.net] is a non-profit network dedicated to Natural Products Research aimed at developing promising drugs. The network publishes three other journals, including the *Journal of Cardiovascular Disease Research*, *Journal of Natural Science, Biology and Medicine*, *International Journal of Medicine and Public Health* and the *Journal of Pharmaceutical Negative Results*.

As Editors, we believe that through this journal, we work to improve knowledge, promote health, prevent

disease, increase efficacy of therapy and overall seek to better the quality of life. This will be reflected in the articles published in this new journal.

While maintaining our enthusiasm in order to encourage scientific dissemination of information, we are also committed to setting the bar high in terms of the quality of published work. To this end, a fair review system is extremely essential. Thus, every article submitted to the journal will first be screened by the Editor-in-Chief to determine its suitability. Following this, if the article is deemed of interest to the readership of the journal, it will be sent for peer review to at least two reviewers. The journal aims at ensuring a fair yet rapid review process, an open-source policy and rapid turnaround from submission to publication.

The journal has been indeed fortunate to have several leading luminaries in the field of Free Radical Biology on the Editorial Board who will certainly help the journal become a leading authority for information in the fast progressing field of free radicals. In launching this new journal in an exciting and ever growing area of biomedical research, I welcome everyone to join us in our quest at understanding the secrets underlying the biology of free radicals and contribute constructively with suggestions, articles and enthusiasm!

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