PREFACE

Indian Scientists have contributed remarkably in the scientific arena of free radical biology, antioxidants and natural products that enhanced our understanding in healthy lifestyle and the molecular pathophysiology of a number of human diseases. *The Society for Free Radical Research (SFRR)-India* promotes research on free radicals and antioxidants with particular reference to medical and industrial importance for the benefit of mankind; and *International Union of Biochemistry & Molecular Biology (IUBMB)* seeks to advance the international molecular life sciences community. SFRR-India held its satellite meeting at the College of Medicine & JNM Hospital, WBUHS, Kalyani (WB), during January 10-11, 2012 in association with IUBMB. The meeting was successful with the participation of renowned scientists, researchers and students from across the country and abroad as well, with generous support from different research funding establishments of Govt of India. The *Indian Journal of Biochemistry and Biophysics* (IJBB), a peer-reviewed journal of repute from the 'National Institute of Science Communication and Information Resources' (NISCAIR), New Delhi, a constituent establishment of 'Council of Scientific & Industrial Research' (CSIR) came forward to bring out a Special issue on the theme "*Free Radicals, Antioxidants and Nutraceuticals in Health, Disease & Radiation Biology*".

It was a great pleasure in compiling this Special issue of IJBB containing 3 review papers, 8 original full research articles and 2 original short communications, dealing with several aspects of free radicals, antioxidants and nutraceuticals. Reactivity of metal-oxyl radicals ($M\text{-}O^{\bullet}$) gives selective oxidized products useful in cellular activities, in contrast to purported indiscriminate cell damage by hydroxyl radicals ($HO^{\bullet}$). In an excellent review, Prof. T Ramasarma expanded vision beyond superoxide and hydroxyl radicals and explored functions of multiple oxygen radicals for their biological relevance. Prof. Ashok K Srivastava and his group reviewed the cardiovascular protective role of curcumin with an emphasis on the molecular basis of its effect. In a third review, Prof. Sajal Chakraboty presented a brief overview on implications of calpains on human health and some diseases. Although initially described as a cytosolic protease, calpains, a family of calcium-dependent cysteine proteases (also known as calcium activated neutral protease (CANP)), have now been found in almost all subcellular locations i.e., from mitochondria to endoplasmic reticulum and from caveolae to Golgi bodies. Prof. Chakraborty highlighted the mechanistic linkage of calpain alteration with a variety of diseases, such as muscular dystrophies, gastropathy, diabetes, Alzheimer's and Parkinson's diseases, atherosclerosis and pulmonary hypertension.

The cholesterol, whether the plasma membrane- and/ or lipid raft-associated, is a critical player in maintaining the vascular endothelial cell (EC) morphology, viability and functions. The use of cyclodextrins as tools to establish the role of cholesterol rafts in cellular functions has become a widely accepted procedure. However, removal of cholesterol by β-cyclodextrin treatment, apparently causes the loss of fluidity of the cell membrane and leakage of vital cellular components, and thus causes barrier dysfunction and loss of cell morphology. In his interesting original research article, Dr. Narasimham L Parinandi offered a safer method of removal of cholesterol, and emphasized the critical nature of membrane- and lipid raft-associated cholesterol in the vascular endothelial cell structural integrity and functions.

Dr. Snehasikta Swarnakar documented the regulation of MMP-2 activity by TIMP-2 during the early phase of endometriosis development and inhibitory action of curcumin. In one study Dr. Vijay Kumar Kutala demonstrated the association of CYP1A1 haplotypes and GSTT1 null variant with CAD risk and that association was attributed to increased oxidative DNA damage. In another study Dr. Kutala et al showed that glutamate carboxypeptidase II (*GCPII*) haplotypes influenced susceptibility to stroke by influencing homocysteine

levels. Dr. Rita Ghosh et al found that $V79^C$ cells, which are derived from V79 cell line through chronic oxidative stress by H_2O_2, exhibited lower sensitivity towards killing by cisplatin through suppression of apoptotic cell death, and revealed that cisplatin resistance was due to inhibition of caspase-dependent apoptotic death pathways. These findings suggest that exogenous caspases may facilitate apoptotic death to sensitize such resistant cells. The communication of signals from irradiated to unexposed neighboring cells which often mediated through factors released from irradiated cells is known as Bystander effect. In a different study, Dr. Rita Ghosh suggested UV-Bystander effect increased viability of cells through induction of antioxidant defense. Towards nutritional aspect, Dr. S. Mukherjee et al revealed that feeding of both grape skin and flesh effectively attenuated the oxidative stress and alterations in immune function and angiogenesis induced by chronic ethanol consumption in mice. Prof. V Balakrishnan had suggested an association between pancreatic exocrine insufficiencies with oxidative stress.

In short communication section, Prof. Surendra Kumar Verma suggested that pro-angiogenic marker galectin-3 (GAL-3) can be used as a immunohistochemical marker in the differential diagnosis of follicular neoplasms of thyroid based on the type of expression. The involvement of aluminum, a non-redox metal, in oxidant imbalance and differences in adaptations to superoxide and peroxide handling capacities (SPHC) in non-neuronal tissues (liver, kidney and testis) and temporal cortex in rats was studied by Prof Prasun Nayak et al. They concluded that aluminum-induced alteration in oxidant handling capacity could be the cause of oxidative stress both in the neuronal and non-neuronal tissues

I sincerely hope that this Special issue will serve as an important source of information that covers the latest trends in biochemical sciences. Eminent scientists Prof. Angelo Azzi, Prof. Nilanjana Maulik, Prof. Sajal Chakraborty, Prof. S. N. Sanyal, Prof. Prasunpriya Nayak, Prof. Vijay Kumar Kutala, Dr. Anjana Munshi, Dr. Vinukonda Govindaiah, Dr. Rita Ghosh, Dr. Sukhes Mukherjee, Dr. Snehasikta Swarnakar and many others extended their co-operation as reviewer to bring out this Special issue. I acknowledge all the authors and reviewers for their contributions and cooperation. I also express my sincere thanks to Prof. Dipankar Bhattacharyya, Principal, COMJNMH, WBUHS, for guiding this wonderful outcome. I also express my gratitude to Dr. Gangan Prathap, the Director, NISCAIR, New Delhi, for his unstinted support in publishing this Special issue of the journal. Last but not least, I appreciate the support and extensive work done by the Editor, Indian Journal of Biochemistry and Biophysics and Ms Bilqeesa Bhat, Research Intern, in bringing out this excellent issue.

Subir Kumar Das
Guest Editor
Indian Journal of Biochemistry and Biophysics,
October, 2012

Professor & Head
Department of Biochemistry
College of Medicine & JNM Hospital,WBUHS
Kalyani, Nadia, West Bengal, India
E-mail: drsubirkdas@gmail.com