PREFACE

Molecular diagnostics is a dynamic and transformative area of diagnostics, leading to insights in research and treatment in many disease states that are revolutionizing health care. Continuous innovation in technology enhances the performance of molecular diagnostics, that often provide in every stage of care—prevention, detection, diagnosis, treatment, and successful management of health conditions. Integration of diagnostics and therapeutics represents a major new opportunity to emerge as leaders of the medicine, producing increased efficacy and reduced toxicity of pharmaceutical products. In the current landscape for molecular diagnostics, basic, translational, and clinical research toward the identification of **diagnostic and therapeutic** tools for clinical use, the *Indian Journal of Biochemistry and Biophysics* (IJBB), a peer-reviewed SCI-indexed journal of repute from the CSIR-National Institute of Science Communication and Information Resources, New Delhi has came forward to bring out a special issue on the theme "*Molecular Diagnostics and Therapeutics*" .It was a great pleasure in compiling this special issue of IJBB comprising 2 review articles, 1 mini review article and 11 original full research articles dealing with several aspects of free radicals and antioxidants in health and diseases.

Curcumin is the active component of the Indian spice turmeric since time immemorial. The metabolites as well as degradation products of curcumin show less biological efficacies in comparison to whole curcumin. KI Priyadarsini and others have described in their article development of new analogues of curcumin with specific structural modifications that can be adopted to influence its desired anticancer activity. Uttam Das and others have demonstrated pharmacological and biological activities of *T. portulacastrum* in their article "*Trianthema portulacastrum* L.: traditional medicine in healthcare and biology".

Overactive bladder (OAB) is a condition of urinary urgency, usually accompanied by increased daytime frequency and/or nocturia, with urinary incontinence or without, in the absence of urinary tract infection or other detectable diseases. The women suffering from OAB literary feel afraid of going out of home, and develop a nightmare for them. Manidip Pal and Soma Bandyopadhyay discussed on probable biomarkers to identify the condition in their mini review "Biomarkers in Overactive Bladder" so that appropriate care may be addressed to them.

Levodopa is the gold standard for treatment of Parkinson's disease (PD). Genetic polymorphisms in SLC6A3 gene (Solute carrier family 6 member 3/DAT-Dopamine Transporter gene) are shown to have functional impact on levodopa therapeutic response, motor complications of PD and adverse events. Tasneem Fathima and others have investigated the association of SLC6A3 polymorphisms with pharmacokinetics of levodopa and clinical response in PD patients. Emerging evidences also suggest the role of brain-derived neurotrophic factor (BDNF) (Val66Met) polymorphism in PD risk and associated cognitive deficit. Hence, Syed Tazeem Fathima and others investigated the role of BDNF Val66Met in risk of PD development and associated cognitive abnormalities.

Indrani Singha *et al* showed that grape extracts protect against ionizing radiation-induced DNA damage due to its antioxidant properties. Their investigation revealed that anthocyanin present in grape skin was probably involved in radio protective activities through the formation of co-pigmentation with DNA. Anticancer efficacy in Indian honey was established by Amruta Naik and others. In another study, Ganesh Kumar and others have synthesized stable copper nanoparticles using thiosalicylic acid, and assessed its antimicrobial activities against various Gram-negative bacteria.

Chronic exposure to chemical carcinogens can induce persistent inflammatory changes which further augment loss in physiological hormesis of an organism thereby favouring carcinogenesis.

Elizabeth Mahapatra and others have established the crucial role played by inflammation- mediated systemic stress in favouring the development of cervical cancer in a carcinogen-induced *in vivo* model. Development of acquired chemoresistance renders a challenge in breast cancer therapy. Aurora kinases, a family of serine/threonine mitotic kinases play pivotal roles in the acquirement of chemoresistance. Souvick Biswas and others have demonstrated that Phenethyl isothiocyanate reverses chemoresistance by regulating Aurora A and compels breast cancer cells to undergo apoptosis.

Himani *et al*. provided insight into the association of vitamin D receptor polymorphic variants in modulating blood lead level in subjects with occupational exposure. Saha and Das showed that RBC osmotic fragility increases significantly in hypothyroidism, possibility due to increased membrane lipid peroxidation.

Gender-independent detection of cell-free fetal DNA in maternal plasma using RASSF1A/β-actin has curtained off a new dimension regarding its utility to predict the adverse pregnancy outcomes. Saha *et al*. have investigated and evaluated the gender-independent sequence markers from cffDNA as predictive markers for adverse pregnancy outcomes. B Sreenu and others have found that there is a steady decline in serum Anti Mullerian Hormone (AMH) levels, a marker of ovarian function after every five years post - hysterectomy in early age groups (20-30 yr and 31-40 yr) followed by loss of ovarian function in the age group of 40-50 yr. They have revealed that AMH is positively correlated with LH and estradiol and negatively correlated with age, FSH, years since hysterectomy and vitamin D.

I sincerely hope that this special issue which showcases developments in the area of "*Molecular Diagnostics and Therapeutics*", will serve as an important source of information in free radical biology and medicine. Eminent scientists *viz*. Abbas Ali Mahdi, Kalyan Goswami, Najmul Islam, Vijay Kumar Kutala, Prasunpriya Nayak, Tajamul Hussain and others have extended their contribution as reviewers to bring out this special number. I acknowledge all the authors and reviewers for their support. I also express my sincere thanks to the Hon'ble Vice Chancellor of the West Bengal University of Health Sciences and the Principal of College of Medicine & JNM Hospital, WBUHS for guiding this wonderful outcome. Further I extend my gratitude to the Director, Dr Ranjana Agarwal, CSIR-NISCAIR, New Delhi and Shri RS Jayasomu, Editor, IJEB for encouraging this publication. Last but not least, I appreciate the support and extensive work done by the Editor Dr NK Prasanna Kumari and Interns of *Indian Journal of Biochemistry and Biophysics*, in bringing out this excellent issue.

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