BIOGRAPHY

Fazlul H. Sarkar, Ph.D. is a professor of pathology at Karmanos Cancer Center, Wayne State University School of Medicine with a track-record of cancer research for 30 years. His research is focused on understanding the role of a "master" transcription factor, NF-κB and the regulation of its upstream and downstream signaling molecules in solid tumors. Moreover, his focused research has also been directed toward elucidating the molecular mechanisms of action of "natural agents" and synthetic small molecules for cancer prevention and therapy. He has done a tremendous amount of work *in vitro* and *in vivo*, documenting that several "natural agents" could be useful for chemopreventive research. Most importantly, his work has led to the discovery of the role of chemopreventive agents in sensitization of cancer cells (reversal of drug-resistance) to conventional therapeutics (chemo-radiotherapy). He is one of the pioneers in developing natural agents such as Isoflavones, Curcumin and Indole compounds like DIM (B-DIM) for clinical use, and his basic science research findings led to the initiation of multiple Clinical Trials in breast, pancreas and prostate cancers at the Karmanos Cancer Institute. He is a perfect example of a true translational researcher bringing his laboratory research findings into clinical practice. Dr. Sarkar is also involved in several collaborative projects including breast, lung and pancreatic cancer for both pre-clinical and phase II clinical trials with other scientists within the institution as well as collaborative work with basic scientists and physician scientists at the MD Anderson Cancer Center. He has published over 350 original scientific articles and written more than 50 review articles and book chapters. He has been continuously funded by NCI, NIH and the Department of Defense (DOD). Dr. Sarkar has trained numerous pre-doctoral and post-doctoral students throughout his last 30 years of cancer research career. In addition, Dr. Sarkar has served and still serving on a number of departmental, university and national committees, and continues to serve both NIH and DOD study sections including NIH program projects, SPORE grants and Cancer Center Core grants (site visit) for many NCI-designated Comprehensive Cancer Center. He serves in an important role as a Senior Editor of the journal "Molecular Cancer Therapeutics" and Associate Editor and in the Editorial board of many biomedical journals.

EDITORIAL PERSPECTIVES

A series of thirteen articles has been assembled for the theme "Recent Trends in Anti-Cancer Drug Discovery" for the journal of "Mini Reviews in Medicinal Chemistry (MRMC)". These articles are uniquely focused on anti-cancer drugs especially those that are either derived from "natural sources", i.e., "natural agents" or their synthetic analogs and/or novel synthetic and targeted agents with anti-cancer activity. These articles represent "state-of-our-knowledge" on emerging concepts in drug discovery which are intimately linked with the biology of cancer cells at large. This thematic issue is published as volume 10 in two parts, the first part is published as issue 5 and the second part is published as issue 6.

The first in this series is from the laboratory of Dr. Anant whose article is focused on **"**Cancer Stem Cells: a novel paradigm for cancer prevention and treatment", which is an emerging area in cancer research especially because targeted killing of cancer stem-like cells are imperative toward achieving complete eradication of tumors. In addition to the discussion on the role of cancer stem-like cells in drug development and therapy, the authors have also described the role of natural agents in targeted killing of cancer stem-like cells for cancer prevention and therapy. The next article is from the laboratory of the editor, Dr. Sarkar of this thematic issue of MRMC who provided the perspectives on chemopreventive and therapeutic potential of curcumin analogs in medicinal chemistry. Although naturally found "Curcumin" has been extensively investigated, the lack of systemic as well as target tissue bioavailability of curcumin limits its application in humans. Therefore, many approaches has been taken in recent years for improving the bioavailability of curcumin including novel synthesis of its structural analog, which has been described in this article focusing on prevention of tumor progression and/or treatments of human malignancies.

Following this two lead articles, several articles have been dedicated on natural agents and targeted agents. The article from the laboratory of Dr. Kumar entitled "Natural products: Potential for developing *Phellodendron amurense* bark extract for prostate cancer management" describing the utility of natural products in modulating critical signaling pathways for effective cancer prevention with special emphasis on prostate cancer, and their potential translational benefit. The next article is from the laboratory of Dr. Chen whose focus has been on the "Pharmacological Exploitation of Indole-3-Carbinol (I3C) to Develop Potent Antitumor Agents" describing what is known as the biological targets of I3C and its metabolite diindoylmethane, and also focused on the development of novel classes of indole derivatives as anti-tumor agents with improved potency and distinct mechanisms. Subsequently, the article from the laboratory of Dr. Ahmed entitled **"**Search for New and Novel Chemotherapeutics for the Treatment of Human Malignancies**"** provided glimpses on types of current chemotherapeutic agents based on their action of inhibition, and the new molecules that are being developed based on the scaffolds such as pyrrolo[2,1-*c*][1,4]benzodiazepines, podophyllotoxins, benzothiadiazine 1,1-dioxides, naphthalimides and monastrol across the world as well as in the author's own laboratory. Following the description of the above mentioned scaffold, the article resulted from active collaboration between the laboratories of Drs. Baruah and Padhye summarized what is known regarding benzoquinone compounds in their article entitled "Perspectives on Medicinal Properties of Benzoquinone Compounds".

The next article by the laboratories of Drs. Dawson and Fontana have provided comprehensive knowledge on peptidomimetics and other classes of retinoid-derived molecules in their article entitled "Peptidomimetic, 1-Adamantyl-Substituted, and Flex-Het Classes of Retinoid-Derived Molecules: Structure–Activity Relationships and Retinoid Receptor-Independent

Anticancer Activities". In this article, the authors have described cell-cycle arrest and apoptosis mediated mechanisms, and the structure–activity relationships and potential for clinical translation of their compounds as anticancer therapeutics. The article from the laboratory of Dr. Maru have summarized what is known on the potential value of black tea polyphenol in their article entitled "Black tea polyphenols-mediated in vivo cellular responses during carcinogenesis" followed by an interesting article by Dr. Roy who described the utility of novel agents for breast and uterine cancers in their article entitled "Progesterone receptor agonists and antagonists as anticancer agents".

It is becoming increasingly clear that novel agents must be developed for targeted treatment of human malignancies. To that end, the article entitled "MDM2 Inhibitors for Pancreatic Cancer Therapy" from the laboratory of Dr. Mohammad have demonstrated novel inhibitors of MDM2 toward the activation of p53 tumor suppressor gene as a tool for the killing of tumor cells harboring wild-type p53 protein. This has been followed by cyclin-dependent kinase targeting agents for cancer therapy in a comprehensive article from the laboratory of Dr. Pietzsch entitled "Cyclin-dependent kinase 4/6 (Cdk4/6) inhibitors: perspectives in cancer therapy and imaging". The potential of Cdk4/6 inhibitors, particularly, pyrido[2,3-*d*]pyrimidine derivatives, as both anti-cancer drugs and ^{124}I- and ^{18}F-radiolabeled tracers for cancer imaging using positron emission tomography has been elegantly discussed.

The last two articles for this theme issue has been focused on the structural basis for the specificity of a series of "natural agents" and the challenges on the bioavailability of most of the "natural agents" that are collectively called phenolic compounds. Dr. Venkatraman has described what is known on the "state-of-our-knowledge" on the biology and specificity of natural agents in their article entitled "Specificity in the Interaction of Natural Products with their Target Proteins- A Biochemical and Structural Insight". The most valuable information as to the bioavailability of phenolic compounds has been elegantly described by Dr. Hu in his article "Bioavailability Challenges Associated with Development of Anti-Cancer Phenolics" as a concluding article. This article reminding us all that immediately after *in vitro* testing of either "natural agents" or their synthetic analog, they must be investigated thoroughly for their bioavailability prior to moving forward in launching animal studies, which are required prior to the ultimate test of any agents for the prevention and/or treatment of human malignancies in order to fully appreciate the value of "Medicinal Chemistry" and the challenging role of dedicated scientists in this field of cutting-edge research. It is hoped that this thematic issue of the MRMC containing "state-of-the-art" knowledge on the role of "natural agents", their synthetic analog and novel targeted agents, will open newer avenues for optimal design of agents that could be useful in serving the humanity toward prevention and/or treatment of human malignancies in the future to eradicate cancer from our society.

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