

Preface



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Cancer is a widespread and age-old disease, and is one of the leading causes of death world-wide. Notably, cancer causes more deaths than AIDS, tuberculosis and malaria combined, however, the knowledge about the cancer among people at large is limited. This ignorance puts many people or a population at higher risk to develop cancer. It is predicted that, if not controlled timely, cancer will become the deadliest disease in few decades. As the current treatment strategies like chemo- and

radio-therapies have serious side effects, the non-toxic, safe and low cost anticancer strategies are urgently needed. Many phytochemicals are non-toxic, easily available and compatible to our physiological system thus, screening myriad of phytochemicals as anticancer agents will not only be prudent, but can also be a better approach in cancer prevention and treatment. This strategy can find agents that inhibit the process of cancer growth and progression, and therefore may have translational significance providing new insights to one of the deadliest diseases for its prevention and treatment.

Considering the severity of cancer and the potential role of phytochemicals in cancer prevention and therapy, it was our privilege to host the International Conference on “*Recent Advances in Cancer Research: Bench to Bedside*” at Central University of Gujarat (CUG), Gandhinagar. The conference was co-organized by the University of Colorado Denver, USA; University of Pittsburgh, USA; University of Oklahoma, USA; Gujarat Cancer & Research Institute, Ahmedabad; and Gujarat State Biotechnology Mission, Gandhinagar, India, during 19-20 February, 2011. The modern biological strategies to control cancer, and specifically the latest developments for the targeted prevention and treatment of cancer *via* dietary, natural and synthetic agents were addressed. In addition to the advances in basic research, the conference also emphasized the translational aspect of cancer chemoprevention strategies. The technical advances for effective and targeted drug delivery for cancer chemoprevention and therapy were also discussed.

The conference deliberated the potential of phytochemicals such as inositol hexaphosphate (IP6) present in all cereals, legumes and nuts; organo-sulfur compounds including isothiocyanates and phenethyl isothiocyanate from cruciferous vegetables such as *Allium*; acacetin from edible fruits and vegetables; *Rhodiola rosea* extract; etc, as strong anti-cancer and/or cancer chemopreventive agents in various *in vitro* and *in vivo* epithelial cancer models. These agents were found to inhibit the progression of cancer development at different stages. IP6, acacetin and organo-sulfur compounds targeted aberrant cell cycle progression as well as induced apoptotic

cell death in cancer cells. These studies also highlighted the potential role of these dietary chemicals in modifying the risk associated with cancer development. In parallel to compounds having anti-tumor activity, the novel molecular mechanisms or targets were also discussed. Epidermal growth factor receptor (EGFR) in pancreatic cancer, tuberous sclerosis protein 2 (TSC2) and fibroblast growth factor receptor 3/4 (FGFR3/4) in bladder cancer and TGF- β in breast cancer were identified to play a critical role in tumor development. Novel pathways, including bioenergetics driven by mitochondrial DNA and mercapturic acid pathway involving 4-hydroxynoneal (4-HNE) were identified to play an important role in tumor growth and development. The panel realized that more studies are needed in near future to translate these novel findings of cancer chemopreventive agents such as IP6, acacetin and organosulfur compounds, and molecular targets, such as EGFR, TSC2, FGFR3/4, TGF- β and 4-HNE in clinical situation.

The novel ideas and work presented in this conference are bound to influence the research orientation of participants, especially the young researchers which could benefit them at all levels of their career development. Since the area of cancer biology is gaining more attention for cancer control and its prevention, we felt that the deliberations of this conference should reach to the wider section of the researchers. Therefore, it was planned to bring out a special issue on the theme in the *Indian Journal of Experimental Biology* entitled “*Emerging Trends in Cancer Research: Prevention and Therapeutics*”. We appreciate all the scientists for contributing their novel ideas and research work to this special issue. We gratefully thank the Editors, Indian Journal of Experimental Biology, National Institute of Science Communication and Information Resources (CSIR), New Delhi, for their initiative and hard work to bring out this excellent special issue. We trust that this volume will be quite interesting for the researchers/scientists working on prevention and therapeutics in cancer research.

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