Dr. S.S. Misra Memorial Award

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UNDERSTANDING THE MOLECULAR MECHANISM OF CANCER PREVENTION BY PHYTOMOLECULES

ABSTRACT

Approximately more than 60% of drugs used in today's health care are originated from natural source. Majority are from plant kingdom, suggesting that plants are potential source of therapeutic/health beneficial molecules. In this direction, there is a constant effort to identify pharmacologically effective molecules from all types of plants, which include those used in diet. Diet being complex matrix of several plant ingredients along with numerous excipients, understanding the role of individual ingredient or compound is critical. In this direction, my research is focused on understanding the mechanism of cancer prevention by terpenoids and flavonoids, which are abundant in plants used in diet. My research has demonstrated how terpenoids (more than 20 mono and triterpenoids) can selectively induce apoptosis in cancer cells. This was elucidated by understanding the influence of these molecules on multiple pathways viz., intrinsic /extrinsic apoptosis, cell signalLing, anti-inflammatory, anti-angiogenesis etc., at both genomic and proteomic level. Further, to identify the best molecule among closely related compounds, structural activity relation of different flavonoids was elucidated using colon cancer cells. Results suggest that Apigenin and Quercetagetin are most effective inhibitors of colon cancer. Additionally, I have also elucidated the mechanism of colon cancer cells inhibition by Berberine, most commonly found alkaloid. Highlights of the above studies will be discussed in the presentation.