

Anticancer noscapinoids: Synthesis to nanomedicine

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Most of the currently available anticancer drugs exert variety of side effects, pose resistance and thereby limit their clinical usefulness. Our group is therefore, actively engaged in design and development of plant derived chemotherapeutic drugs with limited toxicity and lack of drug resistance. Noscapine, a naturally occurring phthalideisoquinoline alkaloid obtained from opium, is a potent cough suppressant being used by the society from long decades. We reported that noscapine causes cell cycle arrest in G2/M phase and promote tumor regression in prostate, breast, brain and lung cancer. Our findings further support that analogues of noscapine synthesized in our laboratory like 9-bromonoscapine, reduced bromonoscapine and 9-aminonoscapine were also 5 to 40-fold more active than parent compound, noscapine. However, physicochemical and biopharmaceutical limitations of noscapine such as short plasma half-life and high ED₅₀~300-500 mg/kg body weight pose obstacles in fabrication of commercially active formulations for the better management of cancer. Therefore, we developed soluble inclusion complex of noscapine with β -CD (β -Cyclodextrin) and enhanced solubility up to 10-fold and oral bioavailability up to 2-fold. The plasma half-life was improved by customizing long circulating stealth gelatin nanoparticles of noscapine. Thus, we presented that noscapinoids will play a pivotal role in the future chemotherapy of cancer.

Biography

Ramesh Chandra is a creator, performer, builder of Institutions of Higher Learning, distinguished scientist and an outstanding researcher in the field of Chemical/ Biomedical Sciences. He is the Founder Director of the Dr. B. R. Ambedkar Center for Biomedical Research at the University of Delhi and has been the Vice-Chancellor of the Bundelkhand University, Jhansi (1999-2005) as well as the President of the Indian Chemical Society (2004-06) and Member, Planning Commission, Government of U.P., India. Professor Chandra shows deep commitment to the cause of higher education and research and possesses in ample measure, quality of dynamic leadership and a vision required to build academic institutions. Chandra started his research career at the University of Delhi thereafter, went to The New York Hospital-Cornell University Medical Center and the Rockefeller University, New York and State University of New York at Stony Brook. He conducted advanced research at the Harvard University Medical School-Massachusetts General Hospital, jointly at MIT, Cambridge USA. Over the last 33 years, he has contributed largely in the field of Chemical Sciences and particularly in New Drug Discovery and Development as well as Drug Metabolism for the development of drugs for physiological jaundice/ Neonatal Jaundice and breast cancer, diabetes and hypertension. He has supervised over 75 Ph. D., published over 200 original Scientific Research Papers in International journals of repute and have several patents to his credit. He is recipient of several professional national/ international recognitions and Fellow of The Royal Society of Chemistry, UK; and a member of several International Scientific Societies. He has been a member of the Governing Council, BOG, Executive/ Academic Councils of several Universities/ Institutions, Consultant and Advisor to the various multinational companies, and Director of PSU's. He is a prolific writer and displays extraordinary flair for writing on themes particularly to Higher Education.

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