

Natural products-inspired discovery and development of novel anti-microbial, anti-inflammatory and antiplatelet agents

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Abstract

We have extensively worked on several plant species and isolated a large number of novel compounds belonging to different classes (alkaloids, polyphenols, steroids, amides, terpenoids, etc.). Several of these compounds have shown interesting biological activities, remarkable of them has been our extensive work on polyphenol acetates leading to the discovery of a fundamental biochemical pathway involving acetyl CoA-independent enzymatic protein acetylation. Our seminal investigations have highlighted the unique biochemical and pharmacological action of polyphenol acetates. These act as the substrates for the well-known protein calreticulin and transfer acetyl groups to certain receptor enzymes, such as cytochrome P-450 linked mixed function oxidases (MFO), NADPH cytochrome c reductase, Nitric Oxide Synthase (NOS), protein kinase c (PKC) and glutathione S-transferase (GST) resulting in modulation of their catalytic activities. The purified enzyme from buffalo liver in the presence of 7,8-diacetoxy-4 methylcoumarin (DAMC) and several other polyphenol acetates was found to significantly enhance the NOS activity in human platelets and caused significant vasorelaxation. These polyphenol acetates and several natural products were also found to lower PKC levels and suppress the ICAM-1 and VCAM-1 expression, and were found to be good anti-inflammatory & anti-asthmatic agents. Further, acetyl polyphenols and several other classes of natural products were also found to be excellent inhibitors of chemical and radiation induced clastogenicity, and antifungal agents against various deadly fungal infections viz. botulism and aspergillosis.

Biography

Virinder S Parmar has completed his BSc Honors, MSc and PhD from the University of Delhi (India), and has worked for nearly 10 years as a Post-doctoral/Visiting Scientist at Cornell University, Harvard University, University of Massachusetts Lowell (UML), NYU-Poly and MIT (USA); the University of Basel (Switzerland) and the Imperial College of Science, Technology and Medicine (London, UK). He is currently a Faculty member in the Department of Chemistry and Environmental Science at Medgar Evers College, The City University of New York (Brooklyn, New York, USA). He has been a Faculty at St. Stephen's College and the University of Delhi (India) for 44 years, he was recently retired as Full Professor of Chemistry and has served as Head of the Department of Chemistry and as Chairman of the Board of Research Studies, and Provost of Gwyer Hall at this University.

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