

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

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Abstract

We have extensively worked on several medicinally important plants used in the traditional Indian and Chinese systems of medicine, 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 antimicrobial agents against various deadly fungal bacterial infections viz. botulism and aspergillosis.

Biography

Professor Virinder Parmar, born on 2nd November 1948 at Allahabad (India), did B.Sc. ... He has been an awardee of Medals for Excellence in Research from the Chemical Research Society of India (CRSI, Bangalore) for the year 2001 and of the Indian Society of Chemists and Biologists (ISCB, Lucknow) for the year 2009.

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