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Recent advances in antitumour berberine

Berberine is an isoquinoline quaternary plant alkaloid which has been used in the Ayurvedic and Chinese medicines since hundreds of years1. The diverse pharmacological properties exhibited by berberine not only indicate that the alkaloid has a definite potential in a wide spectrum of clinical applications, but also that it represents an attractive natural lead compound by providing a biologically interesting skeleton for the introduction of chemical modifications in search for more selective and specific medical indications2,3. Anticancer properties of berberine have also been reported4 and our studies identified berberine as a novel, non specific inhibitor of the nascent synthesis of some proteins, supposedly acting as a RNA silencing agent. In normal cells, signaling transduction pathways converge into several components of translational machinery. However, these components are often deregulated in cancer cells making the translated proteins becoming oncogenic. Accordingly, the appreciation of the differences in mRNA translational control between normal cells and cancerous cells makes it a possible therapeutic opportunity against cancer.

In this respect we discovered novel 13-(di)arylalkyl berberine derivatives with improved anticancer properties5-11. Several of the new berberine derivatives show remarkable antiproliferative effects on a variety of human cancer cell lines which either acquired resistance or are normally refractory to chemotherapy.

Although the precise molecular basis of the biological activities of berberine is still debated, at least for the anticancer activity we present new informations and data regarding downregulation of cancer related protein expression as the putative major biological effect of this class of compounds which is exploitable for clinical applications. These new derivatives are believed to have the property to bind to oligonucleotides and to function as selecting suppressors of protein synthesis.

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Biography

Graduated from Milan University, PhD from Southampton University, over 35yr experience in the pharmaceutical industrial setting. Backgrounds in organic synthetic chemistry, process research chemistry, and therapeutic chemistry. Growing positions in Farmitalia Carlo Erba R&D where PL achieved the goal of discovering Exemestane, launched in the global market under the name Aromasin™ for breast cancer therapy, and the clinical follow-on candidate Minamestane, as well as provinding the relative manufacturing chemical technology. As Vice-president for Chemistry in Menarini Ricerche, PL fostered the discovery of Sabarubicin, a 3rd generation antitumour anthracycline presently in advanced clinical studies. He acted as a consultant for the pharmacompany IBI G.Lorenzini and the French start up biotech Chrysalon. He founded his own small biotech company, Naxospharma, which has been the recipient of research grants from several national and European funding agencies, and co-founded Aesis Therapeutics, a start up shell company aimed at developing Naxospharma's findings. Inventor of over 70 patents in Medicinal and Process Chemistry, author and co-author of over 150 research papers, reviews, abstracts, invited lectures and seminars. Teaching appointments at Universities, Master courses & Specialist Schools. Member of several scientific societies.

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