DESIGN AND SYTHESIS OF NEW ANTICANCER AGENTS

The research activity covers two main points:

a) Synthesis and biological evaluation of antitumor hybrid compounds characterized by the presence of two electrophilic moieties able to act as Michael acceptors with biological nucleophiles.
b) Synthesis of molecules acting as inhibitors of tubulin polymerization. These molecules are heterocyclic derivatives of both the naturally occurring combretastatin A4 (CA-4) and the synthetic phenstatin, which bind tubulin in the same binding site of colchicine. It has been widely demonstrated that inhibition of microtubules formation is often related to the disruption of the vascular microsystem that is implicated in tumor growth. Molecules characterized by the dual activity as tubulin polymerization inhibitors (TPI) and vascular disrupting agents (VDA) have been shown to combat effectively neoplastic processes in experimental models.

GOALS

- Development of new dual-use molecules able to be both selective toward neoplastic cells and active on "multi-drug resistant" (MDR) cells.
- Design, synthesis and preclinical evaluation of molecules with both cytotoxic and VDR activities, as potential antitumor agents featuring drug profiles.

INSTRUMENTS AND METHODS

The compounds will be synthesized with the standard equipment technology for traditional liquid phase synthesis. The chemical structures and purity of the synthesized compounds will be determined by NMR, electrospray mass, UV and IR techniques.

MAIN SUBJECTS

Medicinal chemistry, organic chemistry, pharmacology, molecular biology

RESEARCH GROUP

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COLLABORATIONS

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