DEPARTMENT OF MOLECULAR SCIENCE AND NANOSYSTEMS

Seminars of the PhD Programme in Chemistry

Università Ca'Foscari Venezia

Gold Compounds as Prospective Anticancer Drugs

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Room Delta 0A

Abstract

Gold compounds are a class of metallodrugs with great potential for cancer treatment. During the last two decades, a large variety of gold(I) and gold(III) compounds were reported to possess relevant antiproliferative properties in vitro against selected human tumor cell lines, qualifying themselves as excellent candidates for further pharmacological evaluation. The unique chemical properties of the gold center confer very interesting and innovative pharmacological profiles to gold-based metallodrugs. The primary goal of this lecture is to define the state of the art of preclinical studies on a few relevant anticancer gold compounds, carried out either in vitro or in vivo. Particular attention is devoted to the elucidation of the underlying molecular mechanisms. Notably, a few biophysical studies reveal that the interactions of cytotoxic gold compounds with DNA are generally far weaker than those of platinum drugs, implying the occurrence of a substantially different modes of action. A variety of alternative mechanisms are proposed, of which those involving either direct mitochondrial damage or proteasome inhibition or modulation of specific kinases are now highly credited. The overall perspectives on the development of gold compounds as effective anticancer drugs with an innovative mechanism of action will be critically discussed on the basis of the available experimental evidence.

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