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TITLE

Novel Anticancer Drugs Copper Based: Structural- activity Correlations, Preclinical Results and Mechanism of Action

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Metal complexes have interest as pharmaceuticals as diagnostic agents or as chemotherapeutic drugs. Some efforts have been done in the development of anticancer agents employing essential metals. An example is the copper (II) compounds known as Casiopeínas[®]. Mentioned compounds have a general formula [Cu(N-N)(X-Y)H₂O]NO₃ where N-N is a diimine (phen or bipy) and X-Y is a bidentate ligand (acac, salal, aminoacidate or peptide). These compounds have shown cytostatic, cytotoxic, and antineoplastic activity in vitro and in vivo. The mechanism of action is still not completely elucidated. However, experimental evidence suggests the interaction of coordination compounds with DNA (nuclear or mitochondrial) and the generation of reactive oxygen species (ROS) as the main action pathways. Induction of apoptosis has been proved to be the main death tumor cell pathway. DNA interaction by several methods, comet assay, AFM, electrophoresis, CD has been done, and the nuclease activity studies of Casiopeínas[®] employing plasmidic DNA (pRSET-B) has been preformed. Results shown that dimethyl phenanthroline ligand in the copper (II) coordination compounds has an extraordinary DNA cleavage capacity when oxygen is present, but increases when ascorbic acid was added and a complete degradation of the plasmidic DNA was observed. Meanwhile for bipyridine compounds the cleavage was reached in longer time, even when ascorbic acid was added, suggesting an important contribution of the diimine structure to the cleavage process, and an intercalation process as the first step for the DNA damage. Some calculations have been done in order to modeling the interaction between Casiopeínas and DNA

Biography

Lena Ruiz-Azuara has completed her Ph.D at the age of 27 years from Edinburgh University and postdoctoral studies from Cambridge University, Chemistry Department. She is the head of Medicinal Inorganic Chemistry Group at UNAM. She has published more than 140 papers in reputed journals and serving as an editorial board member of repute.