Structural Studies of Biomolecules and Parmaceuticals

Research Staff

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Research Interests

Studies of the **structure**, **interactions**, and **structure**/**activity** relations of compounds of pharmacological interest for the diagnosis and/or therapy of various diseases.

Our efforts are focused on two major groups of compounds:

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Bioactive organic compounds designed for targeted pharmacological action either on their own or after suitable labeling/complexation

The activity includes synthesis and/or chemical modification of pharmacophoric molecules, study of their structural characteristics, dynamic properties and interactions with biomolecules, the investigation of their coordination properties to metals, as well as the evaluation of their biological properties in appropriate model systems. In recent years, our interest is directed towards bioactive natural products with special focus on the investigation of new derivatives of curcumin as multi-modal agents for multi- targeted treatment of common ailments.

In an established and ongoing collaboration with the Institute of Nuclear and Radiological Sciences, Energy, Technology and Safety (INRASTES), our group is engaged in the development of novel complexes of rhenium and technetium for the diagnosis and/or therapy of prevailing diseases like cancer and Alzheimer' s disease. Furthermore, in collaboration with the University of Athens dual-targeted anticancer complexes of platinum and palladium are being developed.

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Polypeptides

The activity includes studies with NMR and CD on the conformation and interactions of bioactive peptides with special focus on the *β*-amyloid peptide (*β*-AP) of Alzheimer's disease. A thorough examination of the structural transition of
β
-AP(1-40) to amyloid fibrils - the principal component of amyloid plaques that characterize the disease - and its interactions with compounds, like thioflavin T, oleuropein, curcumin, that may intervene in the toxic aggregation process, has been conducted. In addition, in collaboration with INRASTES, the structure-activity relationship of peptides of the neuroprotective family of Humanin is studied along with the development of specially designed labeled derivatives to be used in the investigation of the mechanism of action of this peptide family.