Research Doctorate (Ph.D.) in Chemical Sciences
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Project Information

1 - Title

Structural and functional properties of complexes involving natural and synthetic G-quadruplexes

2 - Key words

Cancer, Thrombosis, Crystallography, Calorimetry, Drug-design

3 - Abstract

G-quadruplex (G4) motif is gaining increasingly in importance for its presence in many regulatory sequences of various biological processes. G4 often occurs in hot regions of eukaryotic and prokaryotic genomes and cell-cycle dependent G4 formation has been recently shown in mammalian living cells. Thus, this motif is an intriguing site for the treatment of various pathologies. G4 module is often present in aptamers, therapeutic agents capable to recognize with high affinity and specificity a wide range of biomedically relevant proteins and to modulate their function. The aim of the present project is to study the interactions between G4 regions of human telomeric DNA and several metal compounds, and to unveil the details of the recognition process between duplex-quadruplex bimodular aptamers and human prothrombin. The results are expected to improve our understanding of the role of the G4 organization in different human diseases and, in perspective, to help in the design of new drugs.