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DNA Binding and Biological Activity of Transition Metal Complexes

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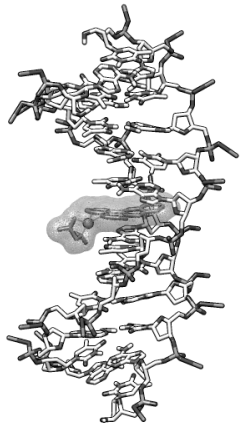
The principal aim of our work is mostly focused on the synthesis of novel transition metal complexes able to non-covalently recognize DNA, using Schiff base, oxadiazole and dipyrydil derivatives as ligands. The coordination geometries of the molecules obtained range from tetracoordinate mononuclear complexes to binuclear metallo-supramolecular assemblies.



For instance, the DNA binding of Ni^{II}, Cu^{II} and Zn^{II} complexes of Salphen[1,2] and oxadiazole[3,4] ligands mainly occurs by intercalation and groove-binding for the former and the latter, respectively. Moreover, Cu^{II} and Zn^{II} heteroleptic complexes of dipyrido[3,2-a:2',3'-c]phenazine (dppz) and amino acids are strong DNA-intercalators. Finally, a 2,7-diazapyrenium binuclear Pt^{II} rectangular box-shaped metallacycle[5] is a major-groove binder that induces DNA coiling.

Interestingly, the DNA binding properties of the complexes find a positive feedback in their *in vitro* biological activity. For example, Cu^{II} complexes of both 1,2,4- and 1,3,4-oxadiazole ligands as well as the Pt^{II} metallacycle reduce the vitality of different human cancer cell lines in a dose- and time-dependent manner.

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