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Polyazaligands as tools for sensing

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The design of receptors able to selectively recognize and bind specific guests is a challenging and dateless target. Due to their easy functionalization and tunable topology, polyaza scaffolds are useful to this purpose, moreover they provide high solubility in aqueous solution.

Both open-chain and macrocyclic compounds could provide favourable properties. On one hand, open-chain polyamine ligands ensure flexibility, allowing for the accommodation of metal cations with different sizes and coordination geometries. Polynuclear complexes can form when the ligand features multiple aza-binding sites, and the distance between the metal centres can be tuned to have them cooperate or not in the formation of the active site [1]. Moreover, a preorganized polyaza-metal complex can become a metallo-receptor for additional guests [2–4]. On the other hand, macrocyclic polyamine ligands ensure high complex stability and selectivity towards the target metal cations, thanks to the preorganization provided by the stiffened system [5]. The insertion in the aza-ligands of chromophores or fluorophores can signal the occurred interaction with the guest [6,7]. The optical active group can be linked to the polyamine through a simple spacer or could be part of the macrocycle, forming a cyclophane [8–10] (Figure 1).

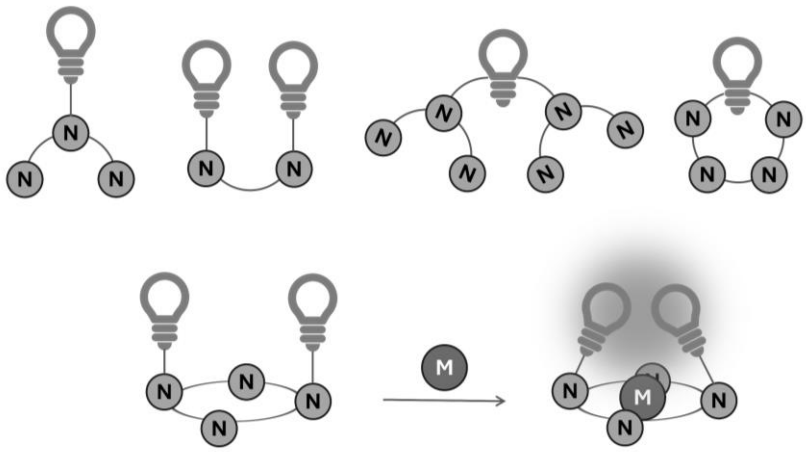

***Figure 1**: Scheme of possible polyaza-ligands and example of metal ion complexation*

Our group has long been working on polyaza-ligands to be used as receptors for guests of different nature. In this contribution, some examples of open-chain, macrocycle or cyclophane polyamine ligands are reported, to show their peculiar behaviour towards selected metal ions.

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