Nucleolipids & Metals ions : Towards Sensing and Decontamination

Nucleolipids are biomimetic synthetic molecules. Like their natural analogues (Acetyl-CoA, Tunicamycin…), these hybrid compounds consist of a hydrophilic part (nucleoside and/or nucleotide) and a hydrophobic part (aliphatic chain). Due their amphiphilic properties, they can self-assemble into various structures (fibers, liposomes…).[1,2] Thanks to their low toxicity, they have been used in many fields, ranging from cell culture scaffold to drug delivery.[3,4]

In order to aim further applications, we explored the interactions between nucleolipids and metal ions. Using a specific nucleolipids, we demonstrated their ability to coordinate and detect silver ions in water even at very low concentrations.[2] Moreover, we show that nucleolipids supramolecular assemblies can be used to detect other metal ions using fluorescence. To gain insight into metal coordination to these structures, we focused on how supramolecular assemblies of nucleolipids impact metal ions coordination with special emphasis for toxic metal ions. Using UV-visible spectroscopy, we determined the stoichiometry and affinity of nucleolipids supramolecular assemblies for metal ions. We demonstrated how reduction of entropy, due spontaneous self-organization of nucleolipids, enhance metal ions affinities compared to nucleosides. We also investigate the ability of nucleolipids-based hydro- and oleogel to decontaminate water soiled with mercury ions.

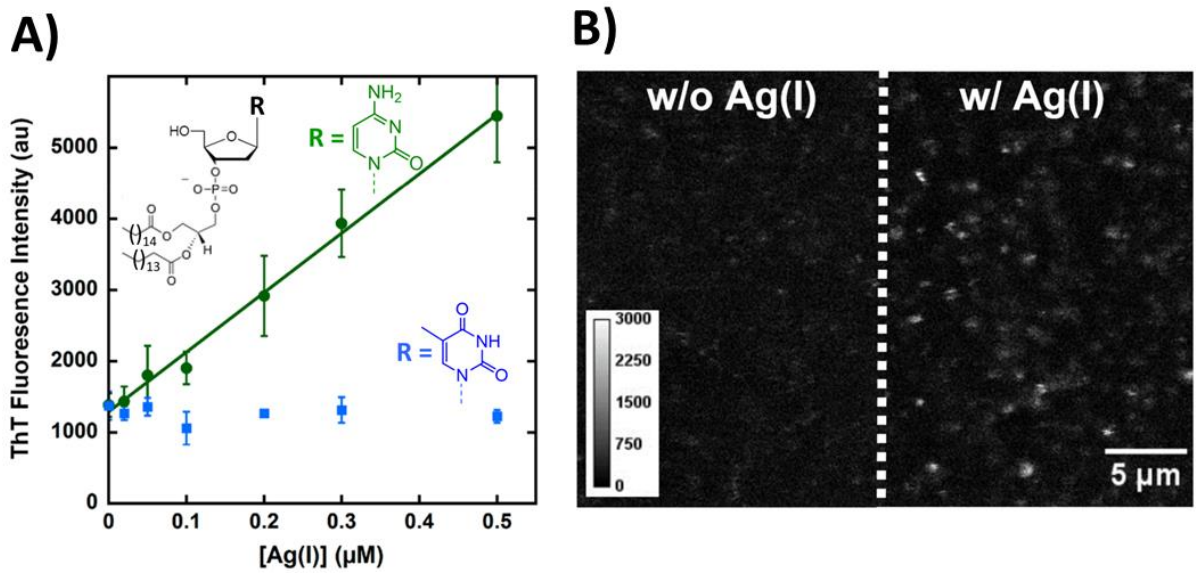

Figure 1 : A) Thioflavin T (ThT) fluorescence increase with [Ag(I)] in presence of diC_{16}-dC (green) but not with diC_{16}-dT (blue) monitored on plate reader. **B)** Confocal image of ThT-diC_{16}-dC vesicles in presence (right) or absence (left) of Ag(I).

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3. Latxague L, Ramin MA, Appavoo A, Berto P et al., *Angew. Chem. Int. Ed. Engl.* **2015**, 54, 15, 4517-21.
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