Lanthanide-based complexes have greatly contributed to the development of molecular magnetism in the last decade and more particularly in the branch of single molecule magnets (SMMs). The main reasons are their large magnetic moments associated to their intrinsic large magnetic anisotropy. We will present an introduction to the molecular building blocks used as well as Ln luminescence and SMMs. Then we will focus on TTF-based lanthanide mononuclear and polynuclear complexes showing luminescence through TTF antenna effect, SMM properties and combination of both SMM, luminescence, redox activity and memory effect in diluted frozen solution.

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