Molecular magnetism is a fascinating and more than ever active research field. Substantially a molecular magnet is a molecular “aggregate” that at low temperature behaves like a tiny magnet. Lanthanides, thanks to their peculiar electronic structure, play a central role in preparation of this kind of compounds.[1] In addition, coordination of appropriate chiral ligands to these metals, that are also known for their characteristic luminescent properties, lets to prepare compounds potentially able to emit left and right circularly polarized light with different intensities, a phenomenon called circular polarized luminescence (CPL).[2] In this panorama the possibility of coexistence of molecular magnetism and chiroptical properties is really attractive. For this purpose, we propose to use both highly optical active binaphtyl[3] and helicene-[4] based ligands for the design of our coordination complexes involving lanthanide ions. The former family of binaphtyl ligands allow the modulation of the photophysical and magnetic properties depending of the number of chiral centers as well as the aromaticity degree of the ligands.[5] The latter family of helicene ligand was used to strongly modulate the magnetic properties depending if racemic or enantiomerically pure version of the helicene is used as well as the generation of singlet oxygen emission.[6][7]

References: