

## CYCLE DE CONFÉRENCES DE CHIMIE

Avec le concours de : Université Clermont Auvergne  
INP Clermont Auvergne

### Jeudi 29 juin à 16 h

Amphi Rémi (site des Cézeaux)

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### Chiral lanthanide(III) complexes with potential applications in the field of bioimaging and biosensing

In this contribution, the design, the synthesis and the spectroscopic characterization of luminescent and chiral lanthanide(III) complexes are presented. These complexes are characterized by the presence of 1,2-(*R,R* or *S,S*)-cyclohexanediamine (DACH) fragment (Figure 1), which stimulates a circularly polarized luminescence (CPL) stemming from the metal ion. CPL is a chiroptical phenomenon which is gaining increasing interest in materials chemistry and physics thanks to the broad range of possible biological<sup>1</sup> and technological applications, as in the case of the design of organic light emitting diodes (OLEDs) emitting circularly polarized (CP) light.<sup>2</sup>

Both the excitation and emission wavelengths can be easily tuned by properly choosing both the organic chromophoric *antenna* and the nature of the lanthanide(III). In particular, the excitation wavelength ranges from 270 nm to 320 nm, when N-based heteroaromatic *antennae* are employed (complexes **1** and **2** in Figure 1) and it is located in the NIR spectral region (around 700 nm) by using the extended  $\pi$ -conjugated picolinate *antenna* (complex **3** in Figure 1). As for the emission, by using Tb(III), Sm(III), Eu(III) and Yb(III) it is possible to tune the luminescence wavelength (in the green, red and NIR spectral windows).

Possible optical and chiroptical applications of these molecules in the field of bioimaging<sup>3</sup> and sensing of important bio-analytes<sup>4,5</sup> will be also discussed.

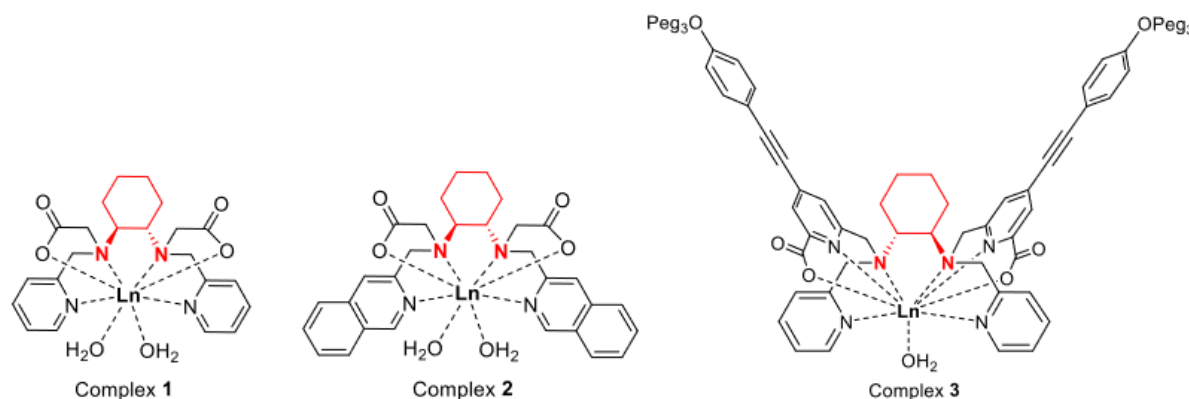


Figure 1. Molecular structure of the complexes discussed in this contribution.

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## References

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- [2] Zinna, F. et al. *Adv. Funct. Mater.* **2017**, 27 (1), 1603719
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- [4] De Rosa, C. et al. *Dalton Trans.*, **2021**, 50, 4700
- [5] Leonzio, M. et al. *New J. Chem.* **2018**, 42 (10), 7931