

STudent REseArch Mobility Programme (STREAM) Project proposal



Host University:
Université Paris-Sud

Field (drop-down list):
Natural sciences, mathematics and statistics

Specified field, subject:
Chemistry

Research project title:
Photochromism & photoswitchable metal complexes

Possible starting month(s):

Sep	Oct	Nov	Dec	Jan	Fev	Mar	Apr	May	Jun	Jul	Aug
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Possible duration in months:

1	2	3	4	5	6	7	8	9	10	11	12
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Alternatively, exact starting and end date: from date to date

Suitable for students in: Bachelor level Master level

Prerequisites:

Restrictions:

Description (maximum 2,000 characters):

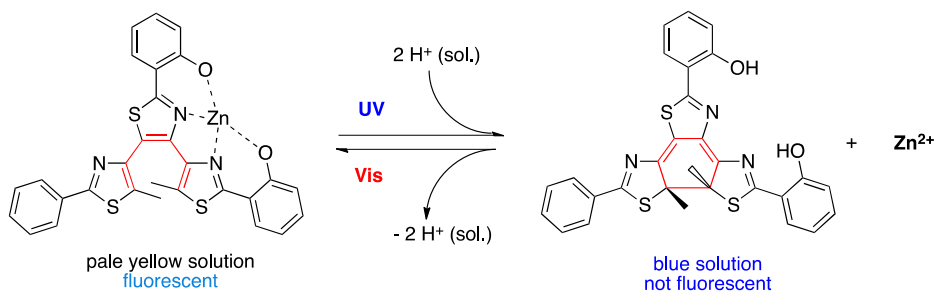
Photochromic molecules, especially diarylethenes, have been widely investigated in the last two decades as molecular switches for the design of various photo-switchable systems.¹

The work of this internship is part of our effort aiming at the design of metal complexes displaying novel photo-responsive behaviors.² We are particularly interested in the way the stability of a metal complex can be photo-modulated in solution by the photochromic reactions of an appropriate diarylethene-based ligand, which allow the *in situ* inter-conversion of the ligand between its two isomeric states having different structures and ligating properties (see Scheme below for example). Such metal complexes are of interest for a broad range of potential applications, particularly in biology where a strict control of the concentration of different metal ions is crucial for the healthy functioning of cells.³



Comprendre le monde,
construire l'avenir





We propose to investigate the impact of some targeted structural modifications of this terthiazole-based photoactive ligand on the stability of the corresponding metal complex in its two isomeric states. The work (between 3-5 months) will involve organic, inorganic syntheses as well as various spectroscopic studies (NMR, UV-Vis, luminescence etc.).

(1) M. Irie, T. Fukaminato, K. Matsuda, S. Kobatake, *Chem. Rev.* **2014**, *114*, 12174.

(2) PhD thesis: "Synthèse et étude de ligands diaryléthènes photochromes de type Salen: compréhension de l'interaction metal-photochrome pour la commutation optique" Juliette Guérin, Université Paris Sud, **2013**.

(3) Mbatia, H. W and Burdette, S. C. *Biochemistry*, **2012**, *51*, 7212.

Faculty and/or Department:

UFR Sciences, ICMMO Chemistry dept.

Contact person, including position:

Séverine Fogel, Head of International Relations

Contact email:

severine.fogel@u-psud.fr

Deadline for nomination to reach host university:

2 months before the starting date

Notification of admission given by the end of:

Within 3 weeks

Additional information: