Secteur des Sciences et Technologies

Invitation à la soutenance publique de thèse de

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Master bioingénieur : chimie et bio-industries à finalité spécialisée

Pour l'obtention du grade de Docteur en sciences

« Development of iridium$^{III}$-based sensitizers for oxygen-independent phototherapy and solar energy conversion »

qui se déroulera
**le vendredi 18 octobre 2019 à 16h**
**Auditoire LAVO 51**
**Place Louis Pasteur, 1**
**1348 Louvain-la-Neuve**

**Membres du jury :**

Prof. Benjamin Elias (UCLouvain), promoteur
Prof. Jean-François Gohy (UCLouvain), président
Prof. Christine Dupont (UCLouvain), secrétaire
Prof. Sophie Hermans (UCLouvain)
Prof. Anabelle Decottignies (UCLouvain)
Dr. Murielle Chavarot-Kerlidou (Univ. Grenoble Alpes, France)
Prof. Andrée Kirsch-De Mesmaeker (ULB, Belgique)

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In photochemistry, the early 2000s have marked the beginning of the success story of iridium. Thanks to their exceptional optoelectronic properties and their great photostability, iridium$^{III}$-based compounds have emerged as promising light-emitting and light-sensitive materials.

Actually, iridium$^{III}$ is characterized by the unique capacity to accommodate up to three carbometalated bonds to give mono-, bis- or tris-cyclometalated complexes. Consequently, a wide variety of spectroelectrochemical properties are available, depending on the number of Ir-C bonds formed. Nevertheless, these properties may also be fine-tuned by modifying the chemical structure of the ligands chelated onto the metal center.

Herein, we report on the synthesis of a novel family of trifluoromethyl-substituted bis-cyclometalated Ir$^{III}$ complexes with an increased photo-oxidizing power. Our goal was to develop type I sensitizers for oxygen-independent anticancer phototherapy. By modifying the diimine ligand, Ir$^{III}$-based compounds with enhanced visible light absorption have also been obtained. They were studied in order to achieve photo-induced oxidation of halides upon solar excitation. Finally, more fundamental aspects, including the investigation of the primary light-induced processes leading to the final excited state of our complexes, have also been examined.