Research Grants for PhD students from the China Scholarship Council

Information Form (please read the guidelines carefully on the website www-csc.utt.fr)

Supervisor's name : Hoarau Given names : Christophe

Status (prof., assistant prof., ...) : Professor

Laboratory : UMR COBRA 6014 Website address : https://www.lab-cobra.fr

Institution : INSA ROUEN NORMANDIE Website address : http://insa-rouen.fr/

Scientific competence of the supervisor:

The supervisor was promoted to professor in 2012 at INSA of Rouen, heading a research group dedicated to 'Catalytic direct functionalization of heterocycles' at the UMR COBRA of Rouen. His research interests lie in transition-metal-catalyzed direct functionalization of heterocycles and applications in fields of natural products, pharmaceutical and materials sciences. He has a strong background in organometallic chemistry focusing in direct C-H and C-CO2H cross-coupling. He has supervised of 15 PhD and 9 postdoctoral fellowships. Scientific production: 65 articles, 2 patents, 2 reviews, 1 chapter book and more than 50 contributions to national and international conferences.

Two major publications in the field proposed for the PhD :

1. Pd-Catalyzed direct C–H functionalization of imidazolones with aryl- and alkenyl halides. Chem. Commun. 2015, 745-748. M. Muselli, C. Baudequin, C. Hoarau* and L. Bischoff*
2. Pd(0)-catalyzed Direct C-H Functionalization of 2-H 4-Benzylidene Imidazolones: Friendly and Large-scale Access to GFP and Kaede protein Fluorophores.

Website address of the personal page : https://www.lab-cobra.fr/equipes/heterocycles/

Supervisor's email : christophe.hoarau@insa-rouen.fr

Description of the research work proposed for a PhD ***Topic # (see list) :*** IV-7

Title : Multimodal fluorogenic molecules for bioimaging and photovoltaic cells

Subject :

Small fluorescent molecules are actively needed to track biochemical or biological phenomena, to design OLED and organic photovoltaic cells. To date, only modest collection of dyes is available for restrictive fluorescence experiments including most popular BODIPY, flurorescein and coumarins. The project deals with the unaddressed design and evaluation of small fluorescent GFP-like platform highly modular in optical properties and group-tagging for a broad spectrum of both biological fluorescence/TEP probes. An in-house fully innovative synthetic strategy was recently developed at Rouen including direct C-H functionalization reactions. Facing the last difficulty of 'hula-twist' phenomena and low quantum yields, the first generation of fluorophores will be covalently rigidified at IRCOF of Rouen and ISCQ of Zaragoza (first academic partner) through late-stage step- and atom-economical palladium-catalyzed direct C-H cross-couplings reactions. Fluorophores will be then evaluated at IST2 de Caen (third academic partner) for innovations in bio-medicinal fluorescence/TEP probes as well as in photovoltaic cells.

Keywords :

organic dyes, fluorescence, bioimaging, photovolotaic cells

Expected collaborations :

Dr Cécile Perrio - IST2 (LDMTEP-Caen-France) Dr

Urriolabeitia Esteban P. ISQCH (CSIC-University of Zaragoza)

Background required from the applicant :

The applicant need a good experience in organic chemistry

Existence of a PDF file detailing the proposal ("yes" or "no") : YES

(see guidelines on the website www-csc.utt.fr)