ParisTech

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RESEARCH TOPIC FOR THE PARISTECH/CSC PHD PROGRAM

Field: Chemistry, Physical Chemistry and Chemical Engineering

Subfield: Chemistry

Title: Development of new iodine(III) compounds for antibiotic applications

ParisTech School: Chimie ParisTech | PSL

Advisor(s) Name: Kevin Cariou
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Research group/Lab: Institute of Chemistry for Life Sciences
(Lab/Advisor website): www.gassergroup.com

Short description of possible research topics for a PhD:

Resistant bacteria are becoming a worldwide threat and, unless solutions are found, global projections for 2050 lead to an estimate of 10 million deaths per year that would be attributable to antimicrobial resistance. This situation dictates the development of new antibiotics that can overcome the resistances associated with all existing treatments. *To explore uncharted chemical space in the area of antibiotics, this project aims at designing and synthesizing hypervalent iodine(III) compounds as antibacterial or anti-resistance compounds.*

Required background of the student:

The applicant should have strong theoretical and practical background in organic chemistry. Mastery of purification and analysis (NMR, MS, IR, etc.) techniques is mandatory as well as excellent written and oral communication skills and the ability to work as part of a team. The applicant must be fluent in English since it is the language spoken in the Gasser group. Practical knowledge in biochemistry would be an asset.

A list of 5 (max.) representative publications of the group:

Hypervalent iodine:
1. Habert, L.; **Cariou, K.*** *Angew. Chem. Int. Ed.*, **2020**, *just accepted*, https://doi.org/10.1002/anie.202009175;
2. Peilleron, L.; Retailleau, P.; **Cariou, K.*** *Adv. Synth. Cat.* **2019***; 361*, 1753–1769
Antibiotic compounds:
3. Romero, E.; Oueslati, S.; Benchekroun, M.; D'Hollander, A. C. A.; Ventre S.; Vijayakumar, K.; Minard, C.; Exilie, C.; Tlili, L.; Retailleau, P.; Zavala, A.. Eliséee, E.; Selwa, E.. Nguyen, L. Pruvost, A.; Naas, T.;* Iorga, B.;* Dodd, R. H.; **Cariou, K.*** **2020**, *preprint: DOI: 10.26434/chemrxiv.11897157*