In the SURCOOF group, we are interested in the development of new methods for the selective formation of C = C, C-O, C-H or C-F bonds by the way of reactions catalyzed by metals (Ru, Pd, Fe,...) but also by chiral organic additives (organocatalysis). The second main topic concerns the application of these methodologies to the synthesis of natural products possessing biological activities (and more particularly those isolated from the Oceans).

Access to fluorocompounds possessing one single fluorine atom, a CF₃ or a CF₃X group (X = S, O, N) is successfully achieved by the way of anionic, cationic or radical reagents.

Our laboratories located in Raulin Building, have been recently (2009) and nicely refurbished.

ORGANIC AND ORGANOFLUORINE CHEMISTRY

Catalysis plays a crucial role in organic reactions. We have studied for example:

- Tandem metathesis reactions
- Eco-friendly oxidative processes
- Solvent-free Prins reaction
- Powerful synthesis of CF₃ derivatives

NATURAL PRODUCT SYNTHESIS

We have recently achieved the multi-step synthesis of different well-defined target molecules as well as structural analogues which could be tested through the CNRS compounds library.

Bistramide A: In collaboration with the group of Prof. P. Goekjian in Lyon.

Amphiasterin BA and Diospongine A:

TOPICS

PHOTOCHEMISTRY

In the context of sustainable chemistry, photochemical reactions represent attractive processes for the access to uncommon structures (cyclobutanes, oxetanes). Our group has recently developed transannular cycloadditions but also devised enantio- and diastereoselective photo-isomerisations with direct applications in total synthesis.

PET

Syntheses of Positron Emission Tomography (PET) radiotracers for medical imaging are performed with labeled fluorous compounds. Their potential uses for diagnostic of neurodegenerative diseases are evaluated in a close collaboration with CERMEP in Lyon. In particular, our group has recently described the first $^{18}$F labeled PET radiotracers for 5-HT$_7$ receptors imaging.

COLLABORATIONS

We have partnerships with some chemical companies as well as with academic teams in Lyon and in other French universities. A fruitful collaboration with «CERMEP-In vivo imaging» and the «Lyon Neuroscience Research Center» led to the development of new important compounds in the field of medical imaging, in particular for the diagnosis of neurodegenerative diseases.

RECENT PUBLICATIONS

Methodologies:
- Synlett 2011, 2048-2052.

Natural product synthesis:

Fluorine chemistry:

Medical imaging: