Young Career Focus: Dr. Thomas Poisson (INSA-Rouen, France)

Background and Purpose. SYNFORM regularly meets young up-and-coming researchers who are performing exceptionally well in the arena of organic chemistry and related fields of research, in order to introduce them to the readership. This Young Career Focus presents Dr. Thomas Poisson (INSA-Rouen, France).

Biographical Sketch

Dr. T. Poisson

Dr. Thomas Poisson received his Ph.D. in 2008 from the University of Rouen (France) under the mentorship of Dr. Vincent Levacher, working on the development of new catalytic enantioselective protonation reactions. Then, he joined the group of Professor Shū Kobayashi as a JSPS postdoctoral fellow, working on asymmetric catalysis by using alkaline earth metal complexes (2008–2010, Tokyo University, Japan). In 2010, he joined the group of Professor Magnus Rueping (RWTH Aachen University, Germany) as a postdoctoral fellow working on the design of new photocatalyzed reactions. In September 2011, he was appointed as an Assistant Professor at INSA-Rouen (France), within the group of 'Fluorinated Biomolecules Synthesis'. In 2015, he defended his habilitation and was elected as a Distinguished Junior Fellow of the French Chemical Society (SCF). He received the Young Lecturer Prize (Prix Jeune Enseignant-Chercheur) from the Organic Chemistry Division of the SCF in 2016. In 2017, he received the Thieme Chemistry Journals Award and was nominated Junior Member of the 'Institut Universitaire de France' (IUF).

INTERVIEW

SYNFORM *What is the focus of your current research activity?*

Dr. T. Poisson Our current research interest is dedicated to the development of new methods to build up fluorinated molecules. We have a strong interest in introducing functionalized fluorinated motifs that can be readily modified or that are considered as bioisosters of important functional groups. With that aim, we are focusing on the use of copper or other transition metals to promote or catalyze these transformations. We are also interested in the design of new glycomimetics and in the development of methods to build up chiral fluorinated building blocks.

SYNFORM *When did you get interested in synthesis?*

Dr. T. Poisson I have been interested in chemistry since high school, but my passion for organic chemistry started during my second year at university. At that time, I really understood the power of organic chemistry and chemical synthesis. I realized that organic synthesis was like a Lego game (my favorite toy when I was a child). The fact that chemists can build any molecule and can imagine and design original reactions to get them was fascinating. Then, my passion grew thanks to the wonderful teachers and mentors I met during my education. They had a tremendous impact on my career.

SYNFORM *What do you think about the modern role and prospects of organic synthesis?*

Dr. T. Poisson In my opinion, organic chemistry and particularly organic synthesis is a central science. So, I am pretty confident about the future of organic chemistry; it will continue to play a pivotal role. However, although many impressive achievements have appeared in the last 70 years, organic chemists still need to pursue their efforts. Indeed, societal concerns have changed over the last 30 years. Nowadays, glo-

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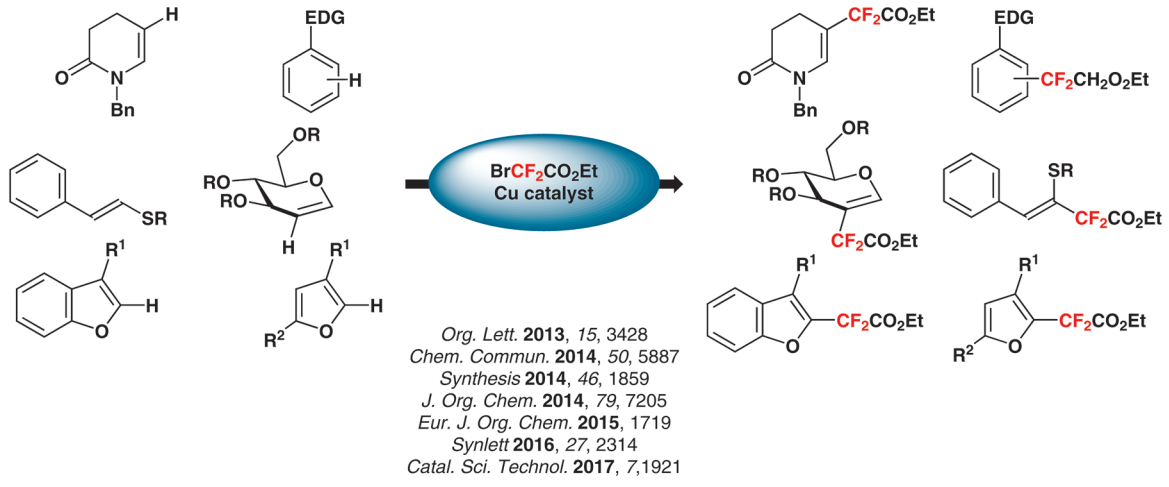
bal warming and aging populations are probably the biggest issues we face. So, we still have a lot of challenges to overcome. For chemists, one of the most important tasks is to make our science more sustainable. With that aim, I believe that the control of selectivity and the development of catalytic and/or green processes will play an important role and will stimulate the community to find original and elegant solutions. I believe our field can contribute to make our planet great again.

SYNFORM *Your research group is active in the area of organofluorine chemistry. Could you tell us more about your research and its aims?*

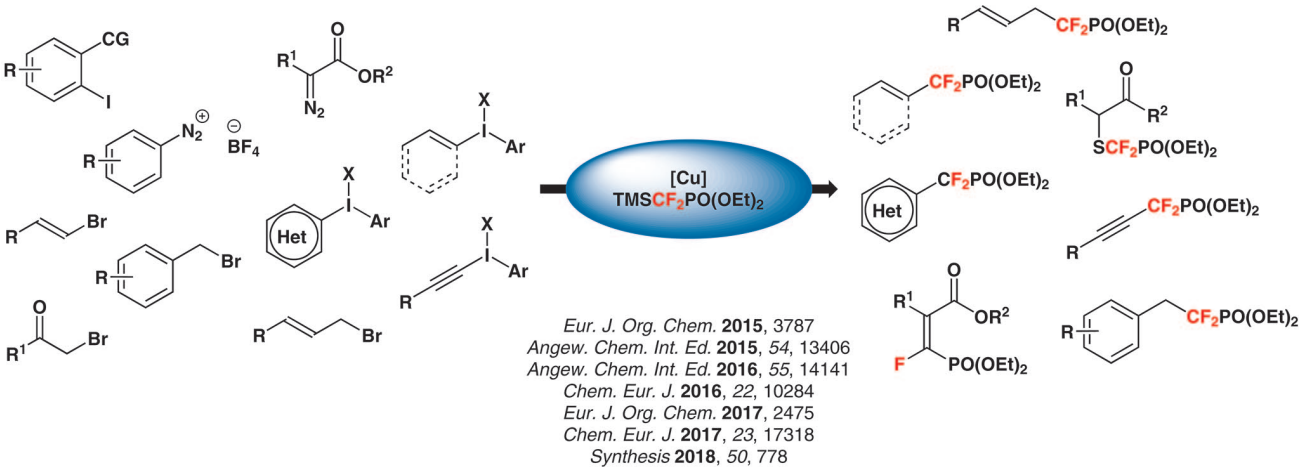
Dr. T. Poisson Organofluorine chemistry is an important research area nowadays. The impact of the fluorine atom on molecules is quite impressive, particularly on bioactive ones. As a result, a plethora of marketed molecules have a fluorine atom or a fluorinated group in their structure. Therefore, organofluorine chemistry plays a key role in the discovery of drugs and agrochemicals. When we started our research program at the end of 2011, we paid attention to underexplored fluorinated motifs, particularly those bearing a functional group. At that time, we noticed that most reports were focusing on the introduction of the CF_3 group or the fluorine atom. In the meantime, new drugs with original fluorinated motifs (e.g. Zioptan®) appeared. So, we tried to bring our modest contribution to that field by developing new methods to access compounds bearing either emergent fluorinated groups or bioisosters of important biological function, like phosphate for instance.

SYNFORM *What is your most important scientific achievement to date and why?*

Dr. T. Poisson So far, our research program is still young, so this is a very difficult question. I am tempted to say that it still lies in the future. So far, our most important paper is the first communication we published in the area of copper catalysis (*Org. Lett.* **2013**, *15*, 3428). This paper was a milestone in our program. Most of our current research projects result from this important paper. Indeed, the method we developed to functionalize glycals with a CF_2CO_2Et group showed us the power of copper as a transition metal for the introduction of a fluorinated motif. Since then, we have been focusing our efforts on copper-based methodologies to build up fluorinated molecules. For us, copper is a fascinating metal and it has many advantages compared to other transition metals (particularly its cost!). However, it is also a very difficult guy to work with! It can exist in four oxidation states and reaction mechanisms are often tricky to determine, but that is what makes it so attractive and motivates us.



Scheme 1


[Cu]
TMSCF2PO(OEt)2
Eur. J. Org. Chem. 2015, 3787
Angew. Chem. Int. Ed. 2015, 54, 13406
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Synthesis 2018, 50, 778

Scheme 2