Young Career Focus: Dr. Sachinkumar G. Modha (Uka Tarsadia University, India)

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. Sachinkumar G. Modha (Uka Tarsadia University, India).

Biographical Sketch

Dr. S. G. Modha

Sachinkumar G. Modha obtained his M.Sc. (organopharmaceutical chemistry) from Saurashtra University, Rajkot, Gujarat (India). He then worked in an organization named Oxygen Healthcare Research Pvt. Ltd. (Contract Research Organization), Ahmedabad, Gujarat (India) for 15 months. After his short stay in the group of Prof. Anamik K. Shah at Saurashtra University he went to Belgium to pursue his doctoral studies at the University of Leuven (KU Leuven) under the supervision of Prof. Erik E. Van der Eycken. After completing his PhD in 2012, he went on to work at the University of Manchester (UK) under the supervision of Prof. Michael F. Greaney as a postdoctoral research associate. In 2016, Sachin obtained the prestigious Alexander von Humboldt postdoctoral fellowship to work with Prof. Thorsten Bach at the Technical University of Munich (Germany), where his stay was extended by one year. He took up a position at Uka Tarsadia University, Bardoli, Gujarat (India) in 2019 as assistant professor.

INTERVIEW

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

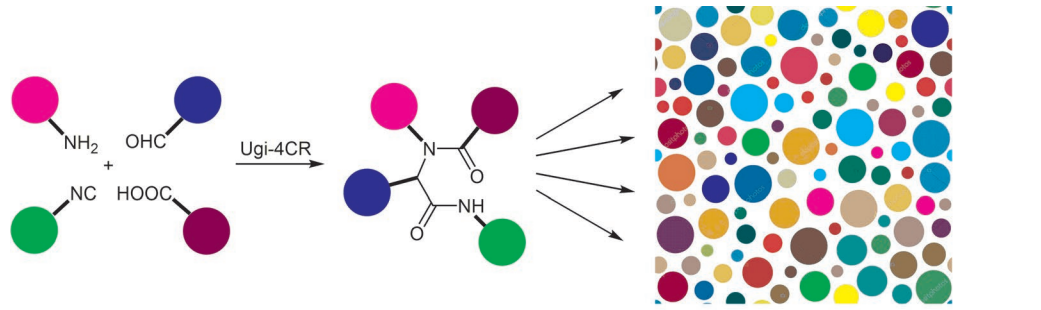
Dr. S. G. Modha I am fascinated by photochemistry. Harnessing the energy from electromagnetic irradiation and using it for chemical transformations that are difficult, if not impossible, to achieve otherwise, is exciting and challenging at the same time. Lots of progress has been seen in the broad field of photochemistry over the last few decades, but still many unanswered questions remain, which motivates me to contribute in this field. At the same time, I am also interested in the development of new atom-economical routes towards interesting organic molecules. In particular, I like multicomponent reactions (general concept shown in Scheme 1) and reactions at room temperature and thus some of my efforts are focused on developing new reactions towards this goal.

SYNFORM *When did you get interested in synthesis?*

Dr. S. G. Modha After completion of my postgraduate studies, I worked in a Contract Research Organization for 15 months. Different projects with reactions of scale as small as 10 mg and as big as 1.4 kg fascinated me. In particular, the idea of synthesizing a molecule which has never been synthesized before gave me goose bumps! Thus, I would say I became interested in synthesis during my work in the industry in 2006–2007.

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

Dr. S. G. Modha Chemistry is divided into more sub-fields than ever before and thus this question is more relevant than ever. As an organic chemist I believe that the time is gone when one could just synthesize new molecules and be happy



A vast library of diversly substituted compounds based on smart design of substrates

with that. One must realize that new molecules without any applications are as good as nothing. On the other hand, if one needs organic molecules, he/she has to go to organic synthesis, and thus demand for organic chemistry is never diminishing. The ever-increasing need for new and better antibiotics to fight multi-drug resistance is one of the most pressing issues suggesting the modern role of organic synthesis to be of high importance. Under the current scenario of COVID-19, I think people and governments alike have understood the importance of science. Hopefully this unfortunate experience will make them realize that funding science should be of highest priority and if that happens then prospects of organic synthesis and science in general are brighter.

SYNFORM *Could you tell us more about your group's areas of research and your aims?*

Dr. S. G. Modha My group's area of research is mainly development of new and improved atom-economical routes under mild reaction conditions. In particular, combination of multicomponent reactions with other atom-economical and sustainable reactions is the broad theme of my group's research. My aim is to open my students towards vast possibilities that organic chemistry brings and how they can contribute to society by developing new and improved chemical reactions. As our knowledge of chemistry and science in general is expanding with each passing day, I aim towards designing alternate reaction pathways which are atom-economical and sustainable for some organic reactions that do not fit into these categories right now.

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

Dr. S. G. Modha Diaryliodonium reagents have been known since 1894, but there were no reports till 2015 wherein both aryls of this reagent were utilized in an organic transformation. As a post-doctoral researcher at School of Chemistry, University of Manchester (UK), I took up this challenge and successfully developed the first pathway towards atom-economical use of diaryliodonium reagents. We reported sequential C- and N-arylation of indole via copper catalysis using just one equivalent of the iodonium reagent (*J. Am. Chem. Soc.* **2015**, *137*, 1416–1419). The most interesting part of this research was that we could utilize an unsymmetrical diaryliodonium reagent and could do selective C- and N-arylation with high selectivity.