Young Career Focus: Professor Inga Čikotienė (Vilnius University, Lithuania)

Background and Purpose. From time to time SYNFORM 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 Professor Inga Čikotienė (Vilnius University, Lithuania).

Biographical Sketch

Prof. I. Čikotienė

Inga Čikotienė was born in Vilnius (Lithuania) in 1979. She graduated with honors from Vilnius University in 2003 and obtained her PhD in chemistry at Vilnius University in 2006. After postdoctoral work at the Institute of Biotechnology (Lithuania), she returned to her *alma mater* as a lecturer, eventually being promoted to associate professor in 2009 and then to full professor in 2014. Her research interests include organic synthesis, investigations of reaction mechanisms, and medicinal chemistry. She has received several awards including Young Scientist awards and scholarships from Lithuanian Research Council, Lithuanian Academy of Science and Rector of Vilnius University.

INTERVIEW

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

Prof. I. Čikotienė Currently, my group is working on the development of new synthetic methods and the investigation of reaction mechanisms. We are particularly interested in transformations of various functionalized alkynes and their use in the preparation of acyclic, carbocyclic or heterocyclic compounds. Transition-metal catalysis, Lewis acid or electrophilic mediation are generally used as tools for these transformations. Moreover, in some parts we are focusing on medicinal chemistry and the preparation of new antitumor compounds.

SYNFORM *When did you get interested in synthesis?*

Prof. I. Čikotienė During my undergraduate studies I was impressed by the theory of organic synthesis first. Then I joined an organic synthesis laboratory for the preparation of the final thesis for my bachelor's degree and during work in the lab I understood that organic synthesis is a much richer and more elegant area than what is explained in general textbooks. I was impressed first by serendipitous findings during my research and I became curious to explain them all and to go deeper into understanding the reaction mechanisms and factors affecting the unprecedented outcome of some reactions. During my Master's and PhD studies I was allowed to work independently and I am thankful to my former supervisor Dr. A. Brukstus for this possibility. I feel very lucky because I obtained a lot of surprising results in organic synthesis and the ability to explain the atypical reactions and reactivity modes was a great motivation and challenge for me.

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

Prof. I. Čikotienė Organic synthesis is an enormously growing field and it is useful for the preparation of a variety of materials (from natural products and biologically active compounds to chromophores or supramolecular units). New synthetic methods and tools are constantly being developed and may find application in the production of useful materials. A very important point is that organic synthesis is a unique scientific area by itself and is not just the mixing of two reagents with each other. A lot of unexplored areas still exist. I think that both rational design and serendipitous findings will constantly bring some novelties into modern synthetic approaches and understanding of reaction mechanisms. Undoubtedly, organic synthesis will stay important in the future.

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SYNFORM *Your research group is active in the areas of organic synthesis and medicinal chemistry. Could you tell us more about your research and its aims?*

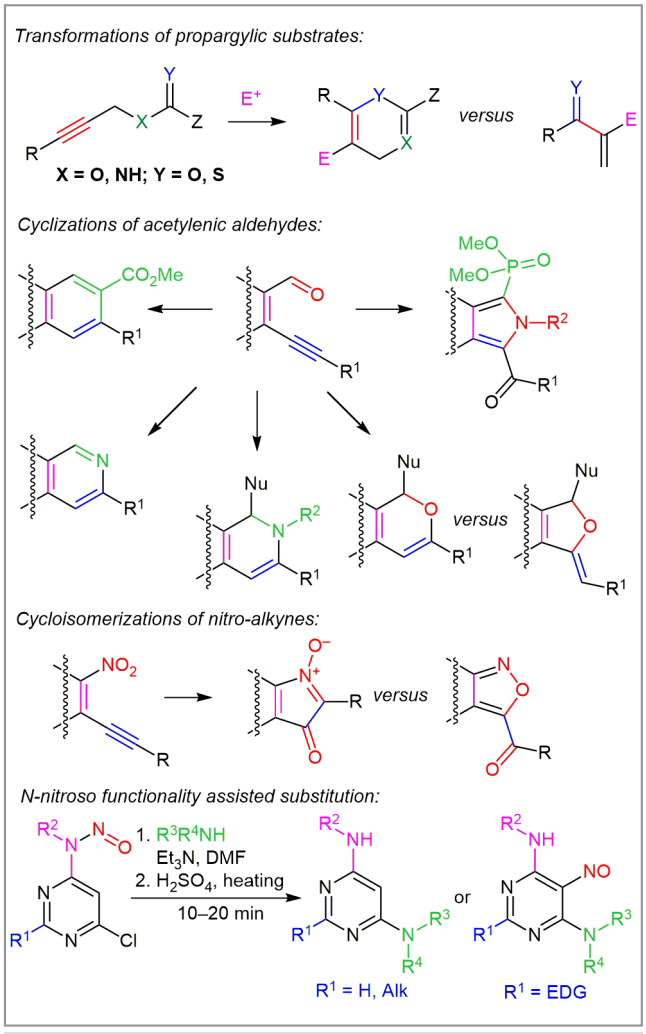
Prof. I. Čikotienė The main focus of our research lies on the development of new synthetic methods and the investigation of reactivity trends of some unsaturated compounds. Most attention is paid to the chemistry of propargylic substrates (esters, ureas, amides, carbamates, etc.) and their electrophile-mediated rearrangements in cyclization processes. Moreover, we have studied different intramolecular cyclizations and multicomponent processes of acetylenic aldehydes and acetylenic nitro compounds. *N*-Nitroso group assisted reactions of azines are also of particular interest. Thus, we are looking for an interesting chemistry and are investigating the synthetic potential of observed transformations. We have explored a number of new methodologies for the preparation of a variety of scaffolds.

We have also established some fruitful collaborations with biochemists, and general biological evaluation of our synthesized compounds using solid tumor or leukemic cancer cells, bacteria and fungi strains have been performed. The most active compounds are taken into more detailed studies and obtained SARs are used for the development of structures.

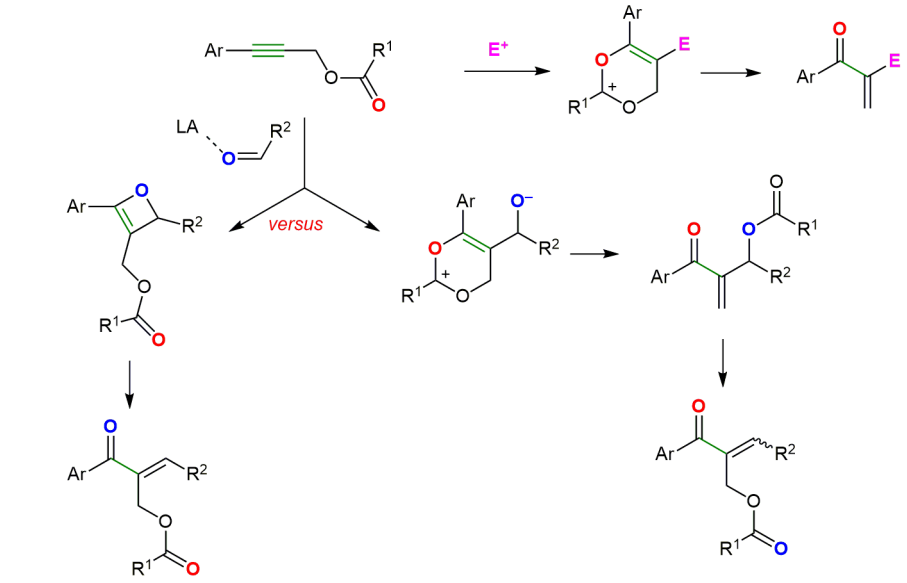
SYNFORM *What is your most important scientific achievement to date and why?*

Prof. I. Čikotienė This is difficult to answer, because each studied reaction has its own charm. One of the most exciting studies was the investigation of electrophile-induced rearrangements of propargylic esters leading to the formation of functionalized enones. We have shown that a 1,3-acyloxy shift in propargylic esters can be induced by some electrophiles (aldehydes, oxocarbenium ions, halonium ions) without the need for transition-metal catalysis.[1,2] However, the reactions between propargylic esters and aldehydes were shown to proceed by either a classical alkyne–carbonyl metathesis route or an unprecedented addition–rearrangement cascade. Depending on the structure of the starting materials and the reaction conditions, the products of these reactions can be Morita–Baylis–Hillman (MBH) adducts that are unavailable by traditional MBH reactions or *E*- and *Z*-enones.[3] Mechanistic studies of these reactions were performed by isotopic labeling experiments.

And of course, I hope that a lot of important achievements lie ahead of me.



Scheme 1



Scheme 2

REFERENCES

(1) I. Karpavičienė, I. Čikotienė *Org. Lett.* **2013**, *15*, 224.
(2) I. Čikotienė *Org. Lett.* **2014**, *16*, 2260.
(3) C. Trujillo, G. Sánchez-Sanz, I. Karpavičienė, U. Jahn, I. Čikotienė, L. Rulíšek *Chem. Eur. J.* **2014**, *20*, 10360.