Chemické Listy

Editorial

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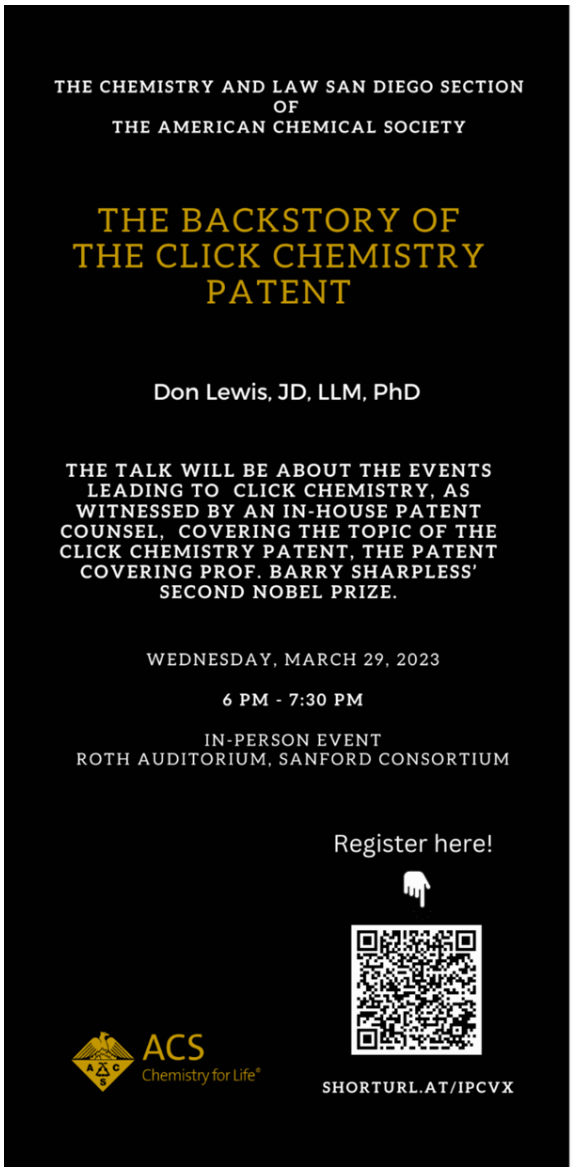
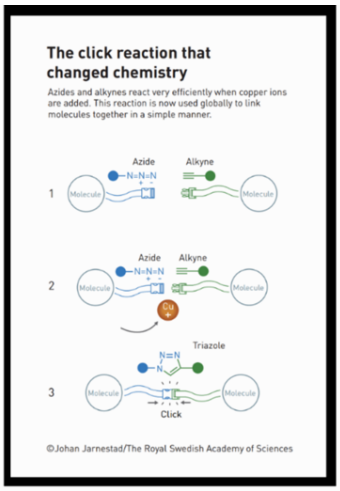
How to make sure that you will get the Nobel Prize

You work hard and maybe you don't even think about the fact that you may one day be awarded the Nobel Prize in Chemistry (or in something else, but you are the chemist, so you should primarily focus on your field of work). However, there is a chance that you will get it. Besides trying to get a great idea which would guarantee you the nomination, you should follow several steps which may help you to get closer to this goal. All the steps which we will describe here have been proven to be very useful.

First, write something which may describe a concept of a reaction which would be extremely specific and applicable for a lot of situations. Coin a name for this reaction, for example "click reaction". Then, let your worker bees (it helps if you already have a lot of people working for you) try to find something in that line of research. Send your people to a chemical conference (very important). Especially those happening in the same town in which your labs are based, to carefully study everything present-





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ed there, lectures, posters, and all. You may come too, just check how diligently your people are working. If they see something worth trying in your lab, make sure that they test it right away and at the same time completely forget where they saw it in the first place. If it works in their hands in your lab, apply for a patent on that reaction.

This is basically the story[1] of the Nobel Prize in chemistry 2022. The laboratory of Barry Sharpless, Nobel Prize winner of 2001, was working on a concept of "Click Chemistry". Sharpless presented this concept first in a meeting of The American Chemical Society in 1999 and later published it in 2001 in Angewandte Chemie[2]. The American team idea was based on the premise that instead of carbon-carbon bond formation for the creation of new potentially important molecules, it would be more reasonable to use heteroatom-carbon bond formation not exactly mimicking the biologically active molecule, but instead making similar and more simply creatable molecule. This way of thinking was prompted by a concept of combinatorial chemistry pioneered by several labs in the early 1990's. The Huisgen reaction[3] creating triazole moiety from azide and alkyne was one of the suggested candidates of this chemical concept.

On the other side of the Atlantic, in the laboratory of Morten Meldal, the crucial discovery was made as a side product of their research. However, the applicability of the copper(I) catalyzed reaction was immediately recognized by Meldal and its successful application for solid phase synthesis of modified peptide libraries was presented at symposium[4] in San Diego in the summer of 2001. At that point the author of this article got involved in this story for the first time as he became a co-editor of the proceedings of that symposium. Untypically, the proceedings book was published in the same year as the symposium, therefore, this reaction was published in 2001.

The first two journal publications[5,6] of this prototypical "click reaction" appeared in 2002 (by Meldal's and Sharpless's groups) and Scripps Institute applied for the patent of this reaction in 2002 as well. After that I was involved again, this time writing an affidavit for the patent office stating that the chemistry of Cu(I) catalyzed azide-alkyne reaction was really presented in the summer of 2001 and published in the proceedings book. It obviously created the "prior art" situation, and the patent was not supposed to be issued. However, after abandoning the original filing of 2002 and filing again in 2003, and a lot of back and forth with the patent office, the patent[7] was issued in 2008.

Conveniently, the publication from 2001 is not listed as the prior art publication. Only the later 2002 publication of Meldal[5] is given (actually added by patent examiner). Listening to the presentation of the Scripps' lawyer, describing the story of patenting, during his lecture in March 2023 was quite elucidating and admitted that the Meldal's poster might have been the inspiration to the "discovery" of this click reaction.

So, now you know how to proceed to have a chance of the next Nobel Prize in Chemistry. Maybe having a good lawyer by your side is also a good idea.

Michal Lebl

REFERENCES

1. Sharpless B., Meldal M., Bertozzi C.: Chemie in Unserer Zeit *56*, 394 (2022).
2. Kolb H. C., Finn M. G., Sharpless K. B.: Angew. Chem. Int. Ed. *40*, 2004 (2001).
3. Huisgen R., Szeimies G., Möbius L.: Chemische Berichte *100*, 2494 (1967).
4. Tornoe C. V., Meldal M.: *Peptidotriazoles: Copper(I)-Catalyzed 1,3-Dipolar Cycloadditions on Solid-Phase*, in proceedings *Peptides: The Wave of the Future* (Lebl M., Houghten R. A., Eds.), p. 263. American Peptide Society, San Diego 2001.
5. Tornoe C. W., Christensen C., Meldal M.: J. Org. Chem. *67*, 3057 (2002).
6. Rostovtsev V. V., Green L. G., Fokin V. V., Sharpless K. B.: Angew. Chem. Int. Ed. *41*, 2596 (2002).
7. Sharpless K. B., Fokin V., Rostovtsev V. A., Green L., Himo F.: US 7,375,234 B2 (2008).