Harvesting Sunlight with Organic Dyes

David Nicewicz
Assistant Professor, Chemistry

CURRENT RESEARCH

Creating new chemical reactions that have incredible applications

Plants are some of the most remarkable and important organisms on the planet for a single reason: photosynthesis. Through the uptake of carbon dioxide and with a bit of sunlight and the right catalysts, they make the carbohydrates and oxygen necessary for life on the planet. Inspired by the fantastic engineering of Mother Nature, Dr. David Nicewicz of the University of North Carolina at Chapel Hill, hopes to create new chemical reactions that produce the chemicals and materials that are indispensable to modern life in a more environmentally conscious and cost-effective manner. Dr. Nicewicz develops simple organic dyes that are able to harvest sunlight and convert it to chemical energy to catalyze completely new chemical reactions, in much the same way plant life does. In contrast to researchers that work to capture energy created by the sun, Dr. Nicewicz's research team creates dyes that simply aid the process of moving electrons between two otherwise inert reactants, to facilitate completely new chemical processes.

Dr. Nicewicz's research has the ability to transform the way in which scientists make a great deal of important chemicals that are used on a range of scales, from large scale commodity chemicals to pharmaceuticals, to materials. The new chemical transformations Dr. Nicewicz's laboratory has developed are already being used in drug discovery processes in pharmaceuticals, and many other potential applications are possible. Incredibly, Dr. Nicewicz is able to accomplish all of these processes using purely organic catalyst systems which have the potential benefit of lower costs to consumers and more environmentally friendly products. Dr. Nicewicz's group is one of just a handful that are working in...

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AFFILIATION

University of North Carolina Chapel Hill

EDUCATION

- Ph.D., in Organic Chemistry, 2006 , University of North Carolina at Chapel Hill
- M.S., in Organic Chemistry, 2002 , University of North Carolina at Charlotte
- B.S., Cum Laude in Chemistry, 2000 , University of North Carolina at Charlotte

AWARDS

- NSF Career Award, 2014-2019
- Amgen Young Investigator Award, 2014
- Boehringer Ingelheim New Investigator Award, 2013
- Packard Fellowship in Science & Engineering, 2012
- Thieme Chemistry Journal Award, 2012

RESEARCH AREAS

Environment, Ecology

FUNDING REQUEST

Your contributions will support the continued research of Dr. David Nicewicz as he creates new chemical reactions that are more efficient and cost-effective as well as having incredible applications ranging from biomedical devices to consumer products. Your donations will fund the additional $250K per year required for a robust team of graduate students and postdocs. In choosing to donate, you will be a part of creating environmentally friendly and efficient solutions to our everyday lives!