Meet...

Shannon Stahl

CHEMIST, *Madison, Wisconsin*

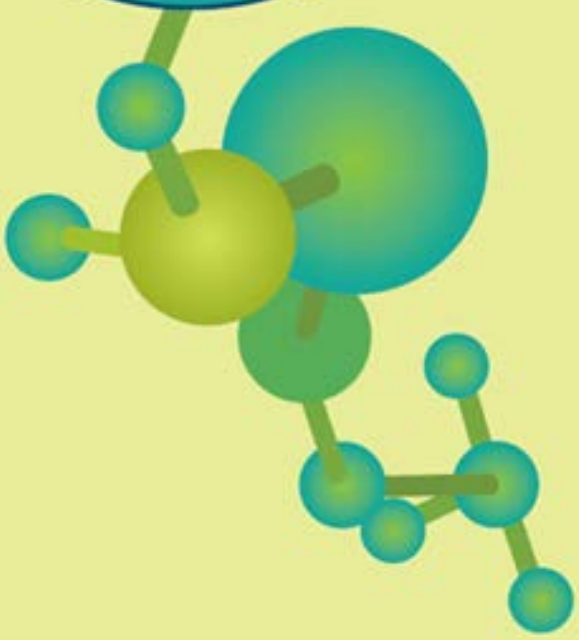
BORN IN
Des Plaines, Illinois

JOB SITE
University of Wisconsin-Madison

HOBBIES
Spending time outdoors in Madison (running, biking, sledding), preferably with my wife and 4-year-old daughter.

FAVORITE SPORTS TEAMS
I've always been a Chicago Cubs fan - it's been a painful existence, but it has provided excellent conditioning for a career in research; I typically follow Wisconsin football and basketball for consolation.

HIDDEN TALENTS
Playing with children under 5 yrs old.



What He's Doing

Shannon Stahl's natural fascination with one of the most temperamental elements on earth—oxygen—could lead to safe and greener ways to produce drugs. His mission is to reduce the environmental impact of the pharmaceutical industry, which generates proportionately more waste than some other sectors of the chemical industry.

The combination of organic chemicals and oxygen gas can result in fire or an explosion. This behavior can be highly beneficial if one wants to cook food on a gas stove, but it can create hazards when oxygen is used in the chemical industry. "A major challenge in synthetic chemistry is to achieve control over the reactivity of oxygen," Stahl says.

Scientists in the pharmaceutical industry usually have considered oxygen too dangerous for large-scale industrial purposes. But Stahl's work on the chemistry of oxygen has now caught their attention. By elucidating how oxygen interacts with catalysts in a process called aerobic oxidation, Stahl is devising ways to combine oxygen and organic chemicals to make drugs without causing combustion. These processes will minimize the impact of pharmaceutical synthesis on the environment. "It looks like oxygen will be a practical chemical to use in making pharmaceuticals," he says.

> "I have a fundamental curiosity about one of the most fascinating molecules in nature."

His Findings

Stahl is looking for catalysts that help to combine oxygen with molecules in oxidation reactions, producing water rather than undesirable byproducts. Using the element called palladium as the catalyst, he has developed a method for adding nitrogen to compounds or removing hydrogen from them—important steps for drug discovery, development and production.

But before the method could be adopted by the pharmaceutical industry, Stahl needed to find a way to make the process safe and efficient outside the small-scale conditions of a laboratory. Recently, he has teamed with a pharmaceutical company to develop large-scale methods for this chemistry. "We've demonstrated that the fundamental science we've developed can be implemented at a pharmaceutically relevant scale," he says.

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NIH National Institute of General Medical Sciences