

'Rusting' Also Describes How Methamphetamine Harms

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Rochelle Schwartz-Bloom, a Duke University pharmacology professor who left the lab bench to focus on science education, has developed a tactic for keeping students hands in the air at the end of class.

"What does get students' attention?" she and her co-authors asked in their new research article on fostering science literacy. "Sex, drugs and rock-n-roll, of course."

Schwartz-Bloom's team describe in the Sept. 28 issue of the research journal *Science* how they boosted the basic science knowledge of 7,210 high school students by 16 percent. Her team taught high school teachers how to incorporate drug-related topics into biology and chemistry classes in a national experiment.

"I call it 'stealth learning,'" she said in an interview. "The students are having fun picking up facts about things they're interested in. But at the same time they're actually learning basic principles about science."

In an 11-year-old project funded by the National Institute on Drug Abuse (NIDA), Schwartz-Bloom's group has developed a Pharmacology Education Partnership (PEP) involving Duke faculty and high school science teachers from around the United States.

Teachers and their university colleagues have interacted to develop classroom and laboratory activities for six different instruction modules. Each unit "focused on a pharmacological topic that integrated basic

science principles in biology and chemistry with issues from other relevant disciplines such as mathematics, public policy, psychology and social sciences," the authors wrote in Science.

Sample topics dealt with the chemistry of cocaine addiction, how drugs kill nerve cells and how steroids and athletics relate to gene function.

During a sabbatical from Duke, Schwartz-Bloom first tested her instructional concepts on the students of Myra Halpin, a chemistry teacher at the North Carolina School of Science and Mathematics in Durham who is a co-author of the Science report.

While her own high school teacher taught her about oxidation by describing how iron and oxygen combine to create rust, "I'm not going to talk about rust," Schwartz-Bloom told those students. "I'm going to tell you how methamphetamines kill neurons. It's through oxidation, and it's the same reaction."

On another occasion "I talked about the different formulations of cocaine if it's smoked or it's snorted," Schwartz-Bloom recalled. "Of course they were already street-savvy about the fact that you can get addicted more easily if you smoke crack. So I asked them, how can that be? It's the same chemical. We talked the whole hour about that.

"At the end of class they didn't get up when the bell rang. They still had their hands in the air," she said.

The first author of the Science article is Nicole Kwiek, a former graduate student in Duke's Pharmacology program and a post doctoral investigator of Schwartz-Bloom's; she is now an assistant professor in pharmacy and assistant director of science education and outreach at The Ohio State University.

Other authors include Jerome Reiter, a Duke assistant professor of statistical science who recently won an award for undergraduate teaching, and Leanne Hoeffler, Schwartz-Bloom's former project manager who is now a private consultant in Tennessee.

Schwartz-Bloom recently won a Duke Provost's award to establish and direct the new Duke Center for Science Education.

"I'm using the very rigorous research skills I built during 25 years in the laboratory and applying them to science learning," she said.

That career shift began when she and a fellow pharmacology researcher decided to create a 3-D animated video of how nicotine, cocaine and marijuana affect the brain. It turned into an eight-year pilot effort in scientific visualization, supported by the NIDA, that has been aired on television nationwide and widely disseminated since.

"We developed it for high school, but it's now all over the place," she said. "It's being used by police departments and by physicians assistant and nursing programs. It's in libraries and community colleges."

Source: Duke University

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