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Science Is a Family Affair

It's Saturday morning in Cincinnati. Most teenagers are probably sleeping in, talking on the phone or heading for the mall. Most moms are working, shopping or cleaning house. Lauren Gendrew, 13, and her mother, Gwen Gendrew, are separating plant pigments using thin-layer chromatography, as are Rebecca Ransohoff, 12, and her mother, Cindy Ransohoff.

They participate in the University of Cincinnati College of Medicine's Saturday Science Academy, an enrichment program for seventh- and eighth-graders from the city's public schools, supported by a grant from HHMI. One Saturday morning a month throughout the school year and twice monthly over the summer, 30 middle-school students congregate at the university's massive medical sciences building across the street from Cincinnati Children's Hospital Medical Center. Each brings an adult "science partner"—a parent, relative, teacher or family friend—to share their hands-on lab experiences.

One lab explores the science of color. The Saturday scientists apply a mixture of concentrated pigments extracted from a variety of plants to a thin-layer chromatography strip, a plastic strip coated with silica gel. When a strip is dipped in a mixture of acetone, alcohol and ether, the pigments move up it by capillary action, the same way plants move water from their roots up to their leaves. The teams of students and adults also study bioluminescence, replicating in a test tube the light produced by fireflies, all under the guiding hands of Lance Barton, Ben Wilkins and Lyndsay Schaeffer, graduate student teaching assistants.

Barton is a graduate student in immunology; Wilkins is an M.D./Ph.D. student in developmental biology; and Schaeffer is a microbiology graduate student. "This is about more than just leaves," says Barton. "We talk about what color is, the different types of color, what makes color in plants and animals. It's about color in the world we live in."

Barton's Saturday Science Academy experience inspired him to teach a science course for non-majors at a local college, and he has already accepted a teaching job at Austin College, a liberal arts institution in Sherman, Texas. "My graduate director calls me the department's own science experiment," Barton says with a grin as he recalls the resistance his Saturday teaching duties initially engendered in his research-centered department.

Wilkins knows how significant a role he, Barton and Schaeffer may play in their Saturday students' lives. "All the things I like are things a good teacher got me excited about," he explains, "and all the things I don't like are things I was taught badly."

When they aren't exploring the complexities of color, the Saturday scientists study DNA, building DNA molecules out of toothpicks and gumdrops and learning how DNA can be used to solve crimes. They learn embryology by hatching fertile chicken eggs. Some Saturdays get more clinical, including mock surgery on a foam "stomach" to remove an embedded Tootsie Roll.

While the middle schoolers and their adult partners conduct experiments, there's day care for younger siblings in a room nearby, enabling single parents and others with child-care needs to participate. Many of this year's students started in Saturday Science Academy day-care. "I always wondered what the big kids were doing in that other room," says Michael Strickland. Now he knows.

Watching the teens and their parents working in the lab, it's hard to tell who is having more fun. "I love doing experiments," says Lauren, who followed her older sisters, Amber and Tiffani, into the program. Tiffani, 17, has participated in two other science programs for high school students. She gets a kick out of wearing her lab coat when she rides a city bus from school to the University of Cincinnati Medical Center. With the white coat and an armful of books, "people think I'm a medical student or maybe even a doctor," she reports.

Lauren's mother, Gwen, doesn't mind giving up Saturday mornings to work in a lab with her daughter. "Even though the science is way out of our league, it's taught on our level," she observes. "It's about everyday life."

Adds Becca's mother, Cindy, "We learn a lot more than science here. We share our cultural differences, and it's surprising how much we have in common." Three times a year, the parents also meet separately from their children with a psychiatrist and a psychologist, to discuss issues such as motivating teenagers and promoting good adolescent health habits.

Roberta Handwerger, director of the Saturday Science Academy, calls the program intervention as well as enrichment. "We're trying to keep all kinds of kids in school," she explains. "Our kids and families are diverse in every way: economically, racially, ethnically. Some are children of doctors and scientists; others have low-income single parents. A couple of Hispanic kids brought relatives who don't speak English, and the kids translated the lab activities for them."

The intervention seems to be working. In a city school system where only about one out of four students completes high school, the graduation rate for Saturday Science Academy students since 1994 exceeds 90 percent.