

Visa, MasterCard... DNA card: What's in your wallet?

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Cody Greenwalt, who is majoring in chemistry at Hiram College in Ohio, is one of many undergraduate students actively involved in scientific research at the college. Credit: Hiram College

Some of us will carry our DNA sequencing data on a pocket-size card

within the next decade, predicts Hiram College biology professor Brad Goodner, Ph.D. Steps in that direction could quicken their pace with a growing number of researchers focused on taking genomics – or sequencing and analysis of an organism's cell DNA content – to the next level. At Hiram, veteran researchers like Goodner might be leading the charge, but students are the force behind it.

Genomics and other research is a mainstay at Hiram, where undergraduate students conduct the kinds of scientific investigations usually only available to graduate students.

One of Hiram's seven Centers of Distinction, the Center for Scientific Engagement was established to facilitate undergraduate research in genomics and other areas of science. All Hiram students who major in the sciences routinely conduct advanced research as part of their coursework.

"It's different than the standard model in which student research opportunities are available only during the summer or on an independent-study basis," explains Goodner, who directs Hiram's Center for Scientific Engagement. Consequently, Hiram students often present their research findings at national conferences and co-author papers published in scientific journals. They even examine local elementary [school](#) students' lunch boxes for contaminants.

Goodner explains that he and his students were called upon by a local television station (for an investigative health report) a few years ago to conduct research on microbial contaminants inside and outside boxed school lunches at three Northeast Ohio schools.

These and other research experiences benefit students in their interviews for medical school, vet school and other graduate-level programs, according to Goodner.

"Other candidates are not likely talking about the research they conducted at the undergraduate level as Hiram students are," Goodner says. "They have something that sets them apart. They have a story. They know what they can do and have the confidence they need to compete."

Those experiences also include outreach research projects where Hiram students in a course such as Microbiology go to regional high schools and engage students in experiments on the prevalence of antibiotic-resistant bacteria in local soil or waterways.

Goodner and his students have even devised a way to self-fund their outreach through the online [Hiram Genomics Store](#). Here, they create customized reagents, data sets and projects, often for middle school, high school and college teachers interested in engaging their students in genomic and microbiological research projects. Made and mailed by Hiram College students as part of their internships, the kits can be tailored to meet school curriculum requirements or special projects. Orders come from all over the nation. One kit might be used to identify microbes in soil samples. Another could test swab samples from fresh chicken or eggs to see if they are contaminated with pathogens such as Salmonella.

"Customers explain what they want to do and we customize their idea in the form of a kit that includes what they need to meet their goals," Goodner explains. "I want to see [students](#) at all ages engaged in the process of [research](#) and for them to realize that they can really do it themselves. I know many of them will get hooked on science for life."

Provided by Hiram College

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