

UNDERGRADUATE RESEARCH

Since its inception in 2000, the Undergraduate Summer Research Internship Program at the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) has enriched the education of more than 600 students, introducing hands-on scientific inquiry that supplements and illuminates classroom learning.

About 50 student interns participate in the program every summer by working with faculty on a broad spectrum of UF/IFAS research projects. All projects are conducted under the auspices of the Florida Agricultural Experiment Station, including basic and applied science investigations that result in the development of new crop varieties and consumer products, and improvement of rural economic conditions and recreational opportunities.

Research internships train students to conduct scientific procedures and carry out responsibilities that contribute to scientific discovery. Though the work can be demanding, rewards include enhanced self-confidence, greater familiarity with laboratory procedures and field work, and an impressive academic credential that often helps participants secure desirable jobs or gain admission to graduate programs.

NATURAL
RESOURCES



AGRICULTURE



HUMAN
SYSTEMS



Ongoing Research



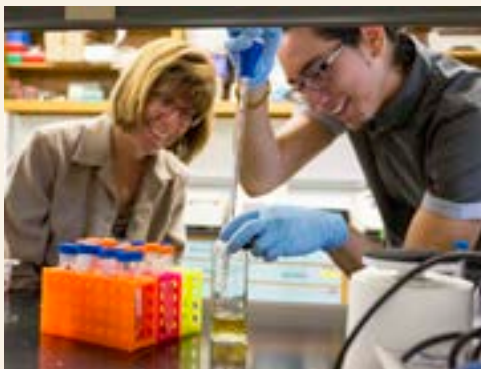
IMPROVED PEST CONTROL

Gel-based baits are widely used to control the German cockroach, *Blattella germanica*, but in recent years, isolated populations have developed aversions to popular baits, necessitating new formulations. One undergraduate researcher took part in a series of experiments to explore the insect's feeding preferences with professor Philip Koehler of the UF/IFAS Entomology and Nematology Department. The student documented the amount of time roaches spent consuming current and proposed baits. He collected specimens, videotaped the insects sampling multiple baits, and then cross-referenced feeding time with mortality to determine which products killed roaches fastest. The student learned to design experiments, write in academic style, and give presentations to manufacturers of pest-management products to inform their development of next-generation baits.



MARINE HABITAT STEWARDSHIP

In Hillsborough County, a youth angling program relies on a 4-acre man-made, saltwater pond for its activities. Program managers need to know whether the pond is attracting game fish such as snook and red drum from nearby Tampa Bay, a question addressed by undergraduate interns supervised by Joshua Patterson, an assistant professor stationed at The Florida Aquarium's Center for Conservation. The interns were responsible for assessing baitfish populations in the pond, data that Patterson needed to predict the presence of larger game fish and potential youth angling success. The interns pulled seines through the water twice weekly, cataloging the captured fish by species. The students became adept at fish identification and learned the fundamentals of wildlife population surveying, contributing to the development and justification of future pond management decisions.



EXTREME MICROBES

Microorganisms native to extreme habitats can be harnessed for industrial processes. The objective investigated by one undergraduate intern working with Julie Maupin-Furlow, a professor with the UF/IFAS Department of Microbiology and Cell Science, was to optimize salt-tolerant microbes, such as *Haloferax volcanii*, for use in biofuel production. The intern sought to isolate strains of these microbes that could thrive in high levels of protein-degrading chemicals typically used when producing biofuels. After tagging DNA sequences in selected *H. volcanii* strains, the intern exposed the microbes to sodium hypochlorite, a common bleaching agent, and discovered genetic alterations that enabled the microbes to thrive under severe oxidizing conditions. Besides learning to operate instruments that map DNA sequences, the student facilitated development of more efficient practices for producing biofuels, using microbes as biocatalysts.

Research with Impact



VALUE OF RECREATIONAL INVESTMENTS

Florida's government builds and maintains recreational facilities for public use and local economy stimulation, often in rural areas. One intern who was interested in natural resource policy examined the recreational use of a Florida river system with Xiang Bi, an assistant professor with the UF/IFAS Food and Resource Economics Department. The intern was tasked with evaluating economic benefits attributable to the river and related, state-supported infrastructure at popular destinations. He analyzed survey data to identify amenities that visitors enjoyed most and estimated how much they were willing to pay for improved environmental and infrastructure quality. Not only was the student trained to determine the value of environmental goods and services, the project generated important data on economic returns that justify public investments in rural recreational facilities.



TEA VARIETY ANALYSIS

Tea is one of the world's most widely consumed beverages, produced by steeping *Camellia sinensis* leaves in heated water. To investigate the origins of black tea's characteristic aroma and flavor, one undergraduate intern worked with Yu Wang, an assistant professor at the UF/IFAS Citrus Research and Education Center. The student determined which sensory qualities in prepared black tea are intrinsic to tea leaves and which arise during processing. The student led volunteers through taste panels, analyzed chemical components of black tea aroma with a gas chromatograph and measured the concentrations of materials in tea aroma using an olfactometer. She learned to operate some of the most vital analytical instruments in flavor and aroma chemistry; findings may contribute to the development of improved tea varieties and processing methods.



BUILDING ORGANIZATIONAL CAPACITY

Many elderly Floridians rely on nonprofit organizations for home and community-based social services, but previous research has found that these nonprofits often lack the organizational capacity to provide quality service efficiently and effectively. An undergraduate intern helped Mthusami Kumaran, an assistant professor in the UF/IFAS Family, Youth and Community Sciences Department, develop a capacity-building "tool kit" to improve organizational management. She also contributed to a series of EDIS documents and organized data collected from interviews with 40 nonprofit leaders in Florida and Arkansas. Besides developing her ability to manage and interpret large amounts of data, the student engaged in an applied research project that will help non-profits better serve Florida's senior citizens.



VISUAL REMOTE SENSING

Using remote sensing devices to detect variation in plant foliage characteristics is a promising method to help growers map projected yields and treat nutrient deficiencies and disease symptoms more efficiently. One undergraduate intern helped Daniel Lee, a professor with the UF/IFAS Department of Agricultural and Biological Engineering, to evaluate several systems that could offer real-time information. After learning technical background on remote sensing and conducting a scientific literature review on the use of its capability for yield mapping, the student developed and executed field tests to evaluate several attributes of new systems that had not been investigated previously. The intern learned to operate remote-control cameras and write programming software that support Lee's overall effort of developing a practical system that delivers results in real time.

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