

This year, MU is the only university in the state to earn a prestigious National Science Foundation Presidential Young Investigator Award. And we won two. Assistant Professors Karen Cone, left, and Kathleen Newton were singled out for their past accomplishments and potential contributions. Their plant genetics studies strengthen the plant science field

# Kernel by kernel

Their research may never be front-page news—no miracle cures here. But Drs. Karen Cone and Kathleen Newton have had their share of attention lately. Not only for what they've done, but for what they might do.

This spring, Cone and Newton, assistant professors of biological sciences, were named Presidential Young Investigators for 1988 to 1993. The National Science Foundation award recognizes junior faculty who show potential for significant research accomplishments. The foundation's prize, established in 1983, automatically gives the researchers \$25,000 each year of the award period and then matches up to \$37,500 annually in



private funds. Over the course of the five-year grant, they each could attract as much as \$500,000.

Mizzou is the only university in the state to have a faculty member chosen for the highly competitive award this year. "Having two plant scientists at the same university receive these awards tells us how our program is thought of nationally," Newton says. Two Mizzou engineering professors received the awards in 1984.

This year 1,806 researchers were nominated by their department chairmen; 21 of the 148 winners were women. Recipients represent 59 academic institutions in 26 states.

Cone and Newton will use the award money to continue their re-

By MARY VERMILLION



Larry Boehm photo

search in plant genetics. Both work with corn to study genetics and gene regulation—how genes work together to produce a healthy corn plant. They chose to work with corn because of its economic importance and because much work already has been done on the plant's genetics. "We can take advantage of the knowledge that has gone before," Cone says.

In her Campus test field, Newton cultivates mutant corn. "I grow the worst-looking plants you ever saw," she says. "We have shown that the poor growth of our mutants is due to changes in genes present in mitochondria." Mitochondria are parts of cells that supply chemical energy. If

cells don't have sufficient energy, they grow slowly or die. "Understanding these mutations will help us understand the role these genes play in plant development," Newton says.

Cone focuses on genes that regulate the formation of purple pigments in the kernels and other plant parts of Indian corn. "These pigments are interesting because they are made at a specific time in the development of the corn plant and in specific organs of the plant," she says. "We already know that there are a number of genes involved in the biosynthesis, but we don't yet understand how these genes interact to produce purple pigment."

Her research is an extension of work she began in graduate school.

Cone, who has a bachelor's degree in microbiology from the University of Georgia and a doctorate in biochemistry and genetics from Duke University, finished up postdoctoral work at Brookhaven National Laboratory in Long Island, N.Y., before coming to Mizzou in March. Newton has a bachelor's degree in genetics from the University of California at Berkeley and a doctorate in genetics from Indiana University. She was a research associate at Stanford University before joining the faculty in 1984.

Both were highly recruited by the University and other schools. "Karen and Kathy are top workers in a field that is just beginning," says Dr. Louis Sherman, director of the biological

sciences division. For many years, molecular biologists concentrated on animal sciences. In the 1980s, the techniques first were applied to plants. "We wanted to build in this area, and Kathy and Karen were at the top," Sherman says.

No "super corn" bubbles in their laboratory test tubes, but Newton's ugly corn and Cone's painstaking pigment analysis may be pieces of a much bigger puzzle. "It [their research] eventually could contribute to a global understanding of how all genes are regulated," Cone says.

**A**s with other basic science research projects, their work could trigger countless studies and, perhaps, result in a few benchmark discoveries. But that's a long way down the road, Newton says. "Ninety percent of laboratory work is mundane, but every once in a while you make a discovery that keeps you going," she says. "When someone asks you, 'How will this cure cancer?' You have to say, it won't; not directly, anyway. You work on it because it fascinates you."

Newton's enthusiasm for things scientific comes from an innate curiosity. "All kids are natural scientists," she says. "The sad thing is that so many eventually get turned off to science."

When Newton was 6, her dad, an oil driller, moved the family from California to Iraq. She went to a convent school in England. "That's where I learned that women can run things." When the family returned to southern California, her junior high school science classes were the most challenging.

In her third year of college, she signed up for a study-abroad program in Tuebingen, Germany, enrolling as a biology major and earning her way working in a research laboratory. "We were discovering something new all the time," she remembers. "That's when I decided I wanted to be a researcher."

She returned to the United States, earned her degrees and came to Mizzou.

"Kathy wanted to come to Missouri, but only under the right circumstances," Sherman recalls. "She wanted access to the work that was going on in the College of Agriculture." Newton says the ability to interact with other plant scientists remains an important factor. Columbia's small-town atmos-

phere and the plant program's reputation added to the draw.

Mizzou's plant program, which encompasses agriculture, biological sciences and plant biotechnology, is ideal for a researcher who wants contact with other plant scientists. The program is gaining a national reputation as it attracts top scientists and wins big grants.

The Board of Curators encourages the plant program's multidisciplinary effort. Food for the 21st Century and molecular biology, both spread throughout several divisions, were two of three programs the board chose to achieve national and worldwide eminence by 1995. Food for the 21st Century funds enhanced salary offers for highly recruited plant scientists.

"We said we would be able to hire whomever we wanted if we had the resources, and we have," Sherman says. Cone, who was courted by several universities, is a good example.

"Missouri is a good place to do corn genetics," says Cone, explaining her reasons for choosing Mizzou. "There's also a strong program in molecular biology."

A native of Albany, Ga., Cone still has a slight Southern accent. Despite what she calls a "lousy science education" in high school, she leaned toward science careers as a child. An early interest in medicine was squelched by her dislike of "blood and guts." She enjoys plant science because, "there's always another challenge. It's a real gas when you find out something new. It takes you in all kinds of directions."

**T**he researchers also are teachers. Newton teaches graduate courses, and Cone will start in the spring, but their labs are their best classrooms.

"Kathy is interested in getting people going on their own research," says Columbian Marjorie Hunt, a graduate student in genetics and molecular biology, who has worked more than a year in Newton's lab. "She's not a hands-off adviser."

Cone and Newton juggle lab time with committee work, grant writing and teaching, but they wouldn't trade the hectic pace of academia for an industry job. The students are stimulating, and "you can do what you want to do in academics," Cone says. With that freedom, who knows what they might discover? □

## Plant Programs Entice Superb Faculty to Campus

When Mizzou's interdisciplinary plant molecular biology program ranked No. 1 above the likes of Harvard and Stanford, MU's plant scientists knew they had arrived.

The molecular biology program earned the top billing last fall in a national graduate fellowship competition sponsored by the U.S. Department of Agriculture. MU received \$192,000 in fellowships. Awards and support from the Food for the 21st Century and molecular biology eminence programs are strengthening MU's plant programs' reputations and enticing first-rate scientists to Campus.

"One reason we received the money for those two eminence programs was because the excellence was already there," says Dr. Louis Sherman, director of the biological sciences division. In the 1970s, faculty began bidding for grants to build up the molecular biology research programs, spread throughout the colleges of Agriculture and Arts and Science, and the School of Medicine. Adding fuel to the fire, the Board of Curators in 1985 selected molecular biology and Food for the 21st Century as two of three programs at MU to achieve international eminence by 1995. Neither program received improvement funds this year; they did receive inflationary increases in their operational budgets.

"Resources such as the eminence programs provide more equipment and better space, enabling us to compete with other major institutions for the best talent," Sherman says.

Food for the 21st Century money helped to recruit scientists such as Drs. Karen Cone and John Walker, assistant professors of biological sciences. Both had prestigious research grants in their pockets soon after arriving in Columbia. Walker, who came from a research institute in Canberra, Australia, investigates gene expression of plants.

Another excellent scientist in the biological sciences division is Associate Professor Steve Alexander, a developmental biologist studying fungi. Previously, he was at the Scripps Institute in La Jolla, Calif. Dr. Tom Guilfoyle, a professor of biochemistry, was recruited from the University of Minnesota. His work in plant gene expression is well-known.

The excellence of the faculty and their research hasn't translated to national rankings because of the plant program's unorthodox make-up, Sherman says. "We don't even have a botany department, but we have this extraordinary plant group spread throughout Campus. That ability to cut across department and college lines is one of our strengths."

—*Mary Vermillion*