



Ned Browning

# MSU

# Students

## Excel with DNA Machine

### By Bob Ratliff

Several students at Mississippi State University are excelling in a field that did not even exist when they were born.

In a program that combines the fields of biology, chemistry, physics and engineering, MSU biological engineering and biochemistry and molecular biology students are constructing DNA “machines” to do jobs at the genetic level. “Synthetic biology” is the term used for the new field of study that emerged in the late 1990s.

A team of these students brought home a bronze medal from the International Genetically Engineered Machine (iGEM) competition held Nov. 3-4 at the Massachusetts Institute of Technology.

“This was the second year for us to compete,” said team adviser Filip To, a Mississippi Agricultural and Forestry Experiment Station engineer in the Department of Agricultural and Biological Engineering. “Last year, our team received an honorable mention. This year, they competed with world-class teams from 54 prestigious universities from around the world and brought home a medal. This puts us in the same league with schools like Virginia Tech, Penn State, Michigan and Rice.”

The MSU entry in the 2007 iGEM competition was a method to quickly determine how plants make oil. The team’s design includes a fluorescent protein that can be tracked using ultraviolet light to discover a genetic pathway.

This new field of science, To said, has tremendous potential for agriculture and other applications, including the development of new energy sources.

“The work our students and research scientists are doing is helping develop standardized ‘parts’ that can be used in genetic engineering in ways similar to how transistors were used in the development of electronics in the 1950s,” he said. “This is a very young science, fewer than 10 years old, which makes our students early pioneers of this exciting new field of knowledge.”

Students on the MSU team came back from the iGEM competition with new ideas about applications for genetic engineering.

“It’s called a competition, but the main point of iGEM is providing opportunities to share ideas,” said team member Scott Tran, a senior biological engineering major from Flora.

The competition helps expand knowledge about applications for genetic engineering, said biological engineering sophomore Sam Pote of Starkville.

“Since this field is so new, if we learn something while working on our project, it’s a new discovery that can be shared with everyone,” he said.

In addition to Tran and Pote, members of the 2007 MSU team included biological engineering majors Lauren Beatty of Newton, Joseph Chen of Starkville, Robert Morris of Olive Branch and Caleb Dulaney of Collinsville, and biochemistry majors James Kastrantas of Biloxi and Victor Ho of Starkville. Professor of biochemistry and molecular biology Din-Pow Ma helped advise the team. Members of the MSU Synthetic Biology Club also assisted with the project.

Preparing Mississippi State University’s entry for the 2007 International Genetically Engineered Machine competition are Din-Pow Ma (left), professor of biochemistry and molecular biology; Victor Ho, biochemistry doctoral student; and Filip To, professor of agricultural and biological engineering.