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DISCOVER THE POWER OF IDEAS

UNT TAMS students honored by Siemens competition

DENTON (UNT), Texas — Four students from the Texas Academy of Mathematics and Science were named regional finalists in the 2009 Siemens Competition in Math, Science and Technology for research ranging from developing new cancer treatments to making more effective pharmaceutical drugs.

In addition, 14 TAMS students were named semifinalists. The academy has more finalists or semifinalists than any other school in Texas.

The Siemens Competition is the nation's leading original research competition in math, science and technology for high school students.

TAMS students — Sai Achi, Somak Das, Peter Hu and Sahil Khetpal — were among the 14 Texas students and 96 students across the country chosen as regional finalists. They were selected from a pool of 1,348 students nationwide.

Regional finalists will present their research projects at the University of Texas-Austin on Nov. 13 and 14. Finalists will present a poster display of their research and give a 12-minute presentation to a panel of judges.

An individual winner and team winner will be selected from the regional competition, as well as each of the other five regions, to compete in the national finals in December at New York University. The top individual and top group in the finals will receive \$100,000 scholarships. Runners-up receive scholarships ranging from \$10,000 to \$50,000.

Research projects

- Sai Achi, 16, of Kingwood, developed linear free energy relations between a solute molecule and the surrounding solubilizing media using a new innovative methodology. Establishing free-energy relationships could help pharmaceutical chemists more effectively predict chemical reactions of drug molecules and could eventually lead to lower healthcare costs. Achi worked with Dr. William Acree,

professor of chemistry at the University of North Texas. Achi previously attended Kingwood High School in Kingwood.

- Somak Das, 16, of Denton, developed a new, hybrid quantum mechanics method pairing two separate methods to enable accurate thermochemistry for molecular systems larger than 10 non-hydrogen atoms. Understanding the thermodynamic properties of molecules is vital in designing new materials such as drugs. Das worked with Dr. Angela Wilson, associate professor of chemistry and co-director of the Center for Advanced Scientific Computation and Modeling at UNT. Das previously attended Denton High School.
- Peter Hu, 18, of Denton, helped develop a universal biocompatible material for protein drug delivery that maintains a sustained drug release while preventing the protein from degrading inside the human body. Therapeutic proteins are critical to treating many diseases, such as cancer, diabetes and hemophilia with blood clotting factors. Hu worked with Dr. Liping Tang at the University of Texas at Arlington. Before coming to TAMS, he attended Denton High School.
- Sahil Khetpal, 17, of Plano, designed and synthesized a novel carbon nanotube-based drug delivery system for tumor-targeted chemotherapy and thermal ablation of cancer cells. Carbon nanotubes, or hollow cylinders of carbon atoms, have immense potential in the combat against cancer. Because the system is designed to specifically target cancer cells, lowering the severe side effects of conventional chemotherapy. In addition, Khetpal investigated the use of a special carbon nanotube as a means to detect cancer at an earlier stage. Khetpal worked with Dr. Iwao Ojima at Stony Brook University in New York. Before coming to TAMS, he attended Jasper High School in Plano.

TAMS students named semifinalists in the competition were:

Smitha Janardan

Brandon Kiasaleh

Matthew Krenik

Jesse Lou

Ruobing Lu

Alex Mentzelopoulos
Eva Ng
Navaneeth Ravindranath
Jay Shah
Rena Sheng
Katheryn Shi
Tian Tian
Amruth Venkatraman
Kathy Wang

In 2008, TAMS student Wen Chyan won the top prize at Siemens for his work engineering new polymer coatings for biomedical devices that could prevent common, and sometimes deadly, bacterial infections resulting from hospital stays.

TAMS is a two-year residential program at the University of North Texas that allows exceptionally talented students to complete their freshman and sophomore years of college while receiving the equivalent of high school diplomas. Students enroll in the academy following their sophomore year in high school, live in a UNT residence hall and attend UNT classes with college students. After two years, they enroll at UNT or another university to finish their bachelor's degrees.

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