
Science fair's big winners cover chemo to credit cards | Student projects displayed through tomorrow at park:[1,2,6,7 Edition]

Bruce Lieberman. The San Diego Union - Tribune. San Diego, Calif.: Mar 29, 2003. pg. B.2.1.2

Full Text (862 words)

Copyright SAN DIEGO UNION TRIBUNE PUBLISHING COMPANY Mar 29, 2003

Editions vary

Nicholas Hosein studied an alloy he hopes to use to craft artificial limbs and robots.

David McIntosh wrote an encryption program for credit cards that he estimates will not be broken for 50 years.

Oksana Sergeeva examined the molecular dynamics of a new chemotherapy drug.

Ashley Morris explored whether green algae can be bred to become resistant to an herbicide.

These star high school students were all top winners this week at the 49th annual Greater San Diego Science & Engineering Fair.

They showcased their winning projects at the Balboa Park Activity Center yesterday. Their projects, along with those of 911 other students, will be on display through tomorrow.

A Family Day at the fair is scheduled from 10 a.m. to 5 p.m. today at the center at 2145 Park Blvd. It will feature San Diego Zoo ambassadors, science shows, a scavenger hunt and raffle prizes. The fair is open tomorrow from 10 a.m. to 3 p.m.

At an awards ceremony Thursday evening, judges named 103 students to compete in the California State Science Fair May 19-20 in Los Angeles.

Nicholas, David, Oksana and Ashley were the sweepstakes winners in the fair's senior division. A complete list of winners will appear Wednesday in The San Diego Union-Tribune Quest section.

Ashley won \$2,500 from the Biomedical Research Institute of America and \$2,000 from the Reuben H. Fleet Science Center in her first time entering the fair. A senior at Mount Miguel High School, Ashley, 17, said she hopes to become a lab scientist. She said she has been accepted to the University of California Berkeley, UCLA, UCSD and UC Irvine.

She said she came up with the idea to study resistance to antibiotics after a neighbor told

her that she frequently gets strep throat and has since developed a resistance to antibiotics.

"I was wondering whether there are other situations, other than medical ones, where you can build up resistance," Ashley said.

She spent long hours at the microscope, counting populations of cells and discovering that her hypothesis was true: the algae, exposed to increasing levels of herbicide over time, developed resistance.

David, who won a trip to Taiwan and a \$2,000 prize from the Reuben H. Fleet Science Center, appears to be an accomplished computer programmer even at 16. While an intern last summer at the San Diego Supercomputer Center at the University of California San Diego, he studied sophisticated encryption technology. For the fair, he displayed a program he wrote that can convert a credit card number into a huge block of numbers, and back again.

"Today, people can transmit information over the Internet extremely fast, but that information can be stolen just as quickly," David said.

David, a sophomore at Torrey Pines High School, plays tennis, competes on the debate team and plays classical piano. He hopes to sell his encryption program after he's through showing it off at science fairs.

"It's a marketable program I can use," he said. "It's fast."

Nicholas, a 17-year-old junior at Torrey Pines High School, has participated in the fair two years now. This year, applying concepts learned in his college-level chemistry class, he studied an alloy called Nitinol.

The alloy, a mix of nickel and titanium, is a member of a class of materials known as "shape memory alloys" that can change shape according to changes in light and heat. Nicholas found that when Nitinol was used as a wire in artificial limbs or robots, he had to apply current to keep it stable under changing environmental conditions.

"I'm shooting for MIT, but anything that does robotics, I'll consider that too," he said of his college plans.

"What I want to do is make actual robots, and make them act like humans -- not to the extent you see in movies, of course."

Oksana, a 16-year-old sophomore at Torrey Pines High School, spent long hours at her mother's company in Sorrento Valley studying how new chemotherapy drugs may be able to selectively target cancer cells while not harming normal ones.

Her display at the fair was packed with a dizzying array of charts, graphs and data, and got lots of questions from the judges.

"It took a really long time to explain it all," she said.

Oksana, who runs cross-country and dances ballet, jazz and hip-hop, said she wants to follow in her mother's footsteps as a laboratory scientist.

For their work, Nicholas and Oksana will advance to the 2003 Intel International Science & Engineering Fair May 11-17 in Cleveland -- a competition with students from all 50 states and 40 countries.

Sponsors of the local fair included The San Diego Union-Tribune, Qualcomm, Pfizer, the San Diego County Water Authority, the Biomedical Research Institute of America, the Reuben H. Fleet Science Center, Intel and Balboa Park.

Bruce Lieberman: (619)293-2836; bruce.lieberman@uniontrib.com

[Illustration]

5 PICS; Caption: 1. Samantha Copeland, 11, (left) and Catherine Aylward, 12, examined a project at the Greater San Diego Science & Engineering Fair yesterday at Balboa Park. The sixth-graders were on a field trip to the science fair. 2. Nicholas Hosein 3. David McIntosh 4. Ashley Morris 5. Oksana Sergeeva; Credit: 1. K.C. Alfred / Union-Tribune

Credit: STAFF WRITER

Reproduced with permission of the copyright owner. Further reproduction or distribution is prohibited without permission.

People: Hosein, Nicholas, McIntosh, David, Sergeeva, Oksana, Morris, Ashley
Article types: ANNOUNCEMENT;
Section: LOCAL
Text Word Count 862