



News Release

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ECBC Helps eCYBERMISSION Finalists Discover the Science inside of Strawberries

Washington — In support of eCYBERMISSION's National Judging and Educational Event (NJEE), Research Microbiologist Lauren McNew from the U.S. Army Edgewood Chemical Biological Center (ECBC) conducted strawberry DNA extraction with 16 finalist teams during Army Labs Day on June 22.

The eCYBERMISSION program is an Army-sponsored, web-based science, technology, engineering and mathematics (STEM) competition. It rewards middle and high school students from across the United States for their innovative and creative approaches to solve problems in their community through the real-world application of STEM concepts.

While vying for national honors, each student can win up to \$8,000 in U.S. Savings Bonds and the first-place team in each grade and region wins an all-expenses-paid trip to the Baltimore-Washington Metropolitan Area.

This year, 59 sixth, seventh, eighth and ninth grade finalists spent a week in Washington, D.C. where they met congressional representatives and toured historic sites. On their fourth day in the capital, student groups rotated through technology stations and experienced solutions developed across the U.S. Army.

In an effort to enthuse the nation's future workforce about science and technology, McNew engaged eCYBERMISSION students and their chaperones in the scientific process of extracting DNA from strawberries. Equipped with protective gloves and safety glasses at individual work stations, regional winners were exposed to a typical research environment and applied laboratory techniques outlined in a protocol.

"In my every day job, I manage a genome sequencing laboratory with equipment that can analyze DNA samples in a very short amount of time," she introduced herself. "Today, we have access to technologies that allow us to characterize and identify genetic strains within hours."

They collectively started pulverizing strawberries in plastic zip-lock bags to expose their cells, added an extraction buffer and filtered out the strawberry slurry to remove large clumps. Then, they mixed ethanol to the solution which caused the DNA to precipitate, as DNA is not soluble in ethanol.

Due to strawberries being octoploid — exhibiting eight sets of genes in each cell — their genetic material becomes visible to the human eye after its extraction.

"Because strawberries have so many more DNA copies per cell than humans, we can see them without any special instrumentation," McNew explained. "We just took loads of DNA and put it in

a tube."

After the actual experiment, she conveyed the importance of clean-up procedures in order to ensure safety and hygiene in a laboratory.

During this activity, students discovered the in-depth science behind a species as simple as a strawberry and are able to repeat this hands-on activity in their kitchen at home.

"This experience had a huge educational value because it provided insight in a vast world that we still haven't entirely discovered," said Anvit Kalra-Lall on the ninth grade winning team "HUGE" from Roslyn High School in New York. "Strawberry DNA extraction taught me that everything has its individual characteristics."

His team researched how to capture kinetic energy generated by walking and created wearable devices that could be fastened to a shoe to capture and store energy.

Lisa Corr and her family had traveled from Iowa to share this week-long experience with daughter Emily Corr, ninth grade student on the "Buzz Busters" team. She highlighted Emily's enthusiasm about the opportunity to extract DNA from strawberries.

"One of the first things my daughter Emily talked about earlier this week was the strawberry DNA extraction," she said. "This is my daughter's third year, and the whole eCYBERMISSION experience has been wonderful."

At the end of the week, ECBC's Director of Program Integration and member of the Senior Executive Service Suzanne Milchling participated in eCYBERMISSION's NJEE awards banquet and discussed project topics with individual team members.

"I am truly impressed with the caliber of students that represent this year's eCYBERMISSION finalists," Milchling said. "The solutions they identified and researched in response to problems in their local community exhibit creative and innovative thinking, essential to tackle current and future challenges. These kids have clearly demonstrated their ability to use scientific inquiry to solve real-world problems as a team and achieved tremendous results in the process."

During the ceremony, the Army presented all regional winners with national honors and announced the first-place winning teams for grades six through nine.

Please find more information about the National Winning Teams at:

http://www.army.mil/article/60602/Army_honors_America_s_children_of_destiny_/

For more information about ECBC, visit <http://www.ecbc.army.mil/>.

ECBC is the Army's principal research and development center for chemical and biological defense technology, engineering and field operations. ECBC has achieved major technological advances for the warfighter and for our national defense, with a long and distinguished history of providing the Armed Forces with quality systems and outstanding customer service. ECBC is a U.S. Army Research, Development and Engineering Command laboratory located at the Edgewood Area of Aberdeen Proving Ground, Maryland. For more information about the Edgewood Chemical Biological Center, please visit our web site at <http://www.ecbc.army.mil/> or call (410) 436-7718.