

Saving Science

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THREE STUDENTS'
JOURNEY TO CURING
ALZHEIMERS



While Cooper Hanley '21, Liam Barnes '20 and Cosmo Mitchell's '20 Science Research Seminar Project seems like something out of a science fiction novel, the science they are doing is very much real.

And could be the beginnings of a cure for Alzheimers. "My grandmother was diagnosed with Alzheimers and I decided to dedicate myself to search for a cure," Hanley said.

After joining Science Research Seminar (a project-based science class), Hanley started to research what sort of experiment he wanted to conduct, when he stumbled upon recent cancer research used with the same gold nanoparticles he would later utilize.

Hanley, Barnes and Mitchell twisted this idea and decided to use a similar technique, but to target Alzheimers.

"We're trying to stop Alzheimers from forming by destroying a protein that's critical to it," Barnes said. "We are using gold nanoparticles to try to denature the protein that is believed to cause Alzheimers."

"What makes the gold nanoparticles so special is that they have this ability when you shine infrared light to them, they'll start to vibrate and heat up, and we're using that heat to basically destroy proteins which are characteristic of Alzheimer's disease," Hanley said.

Using a wooden box decked out with wires, cables and a light, the three tried to attach gold nanoparticles to a certain protein to prevent it from splitting. While there are a few theories for the origins of Alzheimers, one is that the splitting of a certain protein causes the disease.

Aided by the graduate students at the University of Colorado and Dr. Kaar, the three have been going to the lab every week to continue their research.

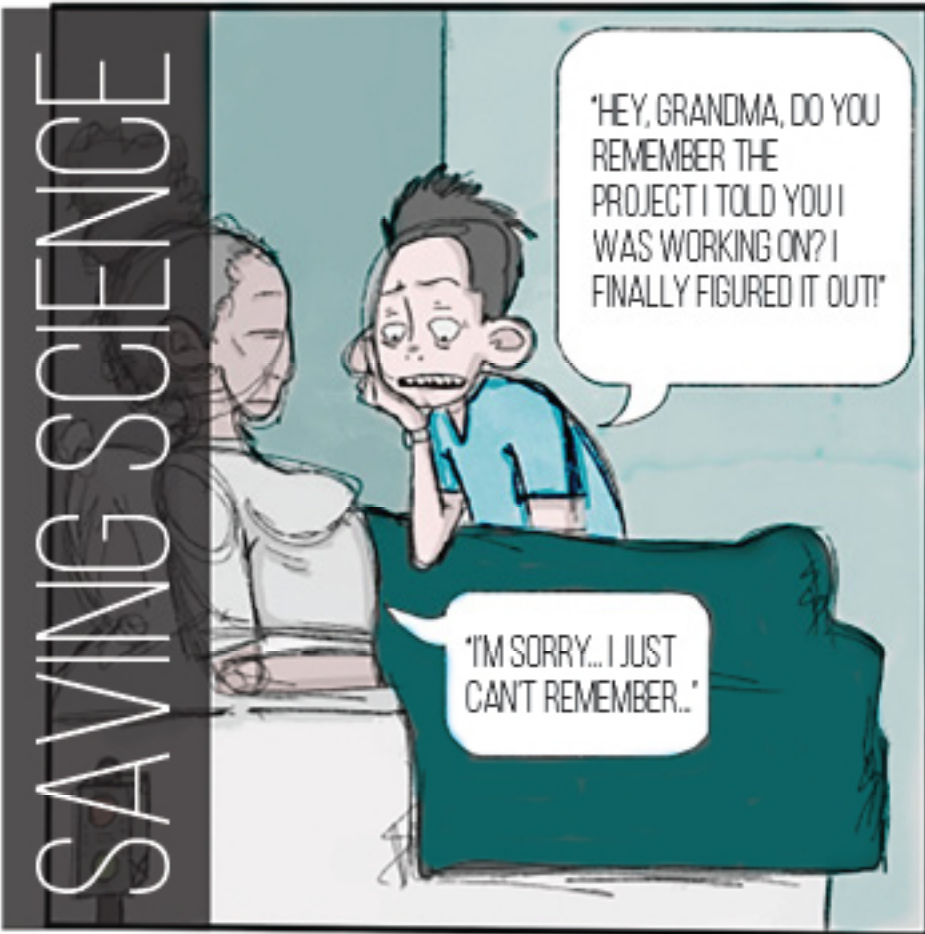
While the boys see much room for growth, the three have been greatly rewarded by professionals in the field. At the Science Fair (that all Science Research Seminar Students attended) in February, the three qualified to go to Internationals in Anaheim this May.

"We ended up winning first place in chemistry, and we were sent straight to the international science fair," Mitchell said.

While this is a large step forward medically, especially for a group of high school students, there is still years of research to be conducted.

"We would need to do tests on a neuron and make sure that using the gold nanoparticles doesn't hurt anything around the enzyme when they're activated," Barnes said. "Then we would move on to doing so in mice."

Barnes says that this crucial step is still a couple of years off, as more initial testing needs to be done first.



COOPER'S GRANDMOTHER HAS ALZHEIMERS, A CURRENTLY UNCURABLE DISEASE. COOPER WISHED HE COULD DO SOMETHING TO HELP, BUT DIDN'T KNOW HOW.

AND THEN THE PERFECT OPPORTUNITY AROSE: SCIENCE RESEARCH SEMINAR. COOPER JOINED THE CLASS AND BEGAN HIS RESEARCH. HE FOUND SOMETHING PROMISING: RESEARCH ON HOW GOLD NANOPARTICLES HAD BEEN USED TO TRY AND CURE CANCER. HE WONDERED IF HE COULD USE THE SAME THING TO REMOVE THE PROTEIN THAT CAUSES ALZHEIMERS.



COOPER KNEW HE NEEDED HELP IN ORDER TO BRING HIS PROJECT TO LIFE. HE NEEDED A TEAM. SO HE CALLED ON HIS FRIENDS FROM TENNIS, LIAM AND COSMO, TO GET THE JOB DONE.

AFTER WEEKS OF SIGNING PAPERS AND CLEARANCE FORMS, THEY WERE FINALLY ABLE TO GET INTO A REAL LAB. WITH THE HELP OF DR. KAAR, THE THREE STARTED THEIR RESEARCH IN A LAB AT UNIVERSITY OF COLORADO BOULDER. COOPER'S VISION WAS BEGINNING TO FORM.



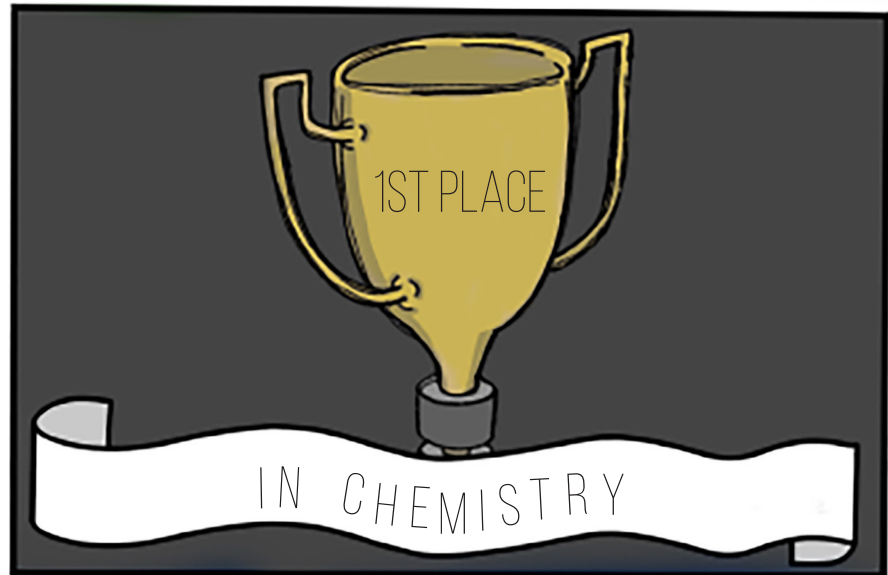
THE TESTS BEGAN. THEY TOOK A CARDBOARD BOX AND CUT TWO SMALL INSERTS TO THREAD WIRES THROUGH AND TAPED A LAMP TO THE TOP OF THE BOX. THE THREE CROWDED AROUND THE EXPERIMENT. THEY HOPED WITH THE RIGHT WAVELENGTH OF LIGHT, THEY COULD ATTACH THE GOLD NANOPARTICLE TO THE PROTEIN TO PREVENT IT FROM SPLITTING.



THEY BASED THEIR EXPERIMENT OFF OF THE THEORY THAT ALZHEIMERS IS CAUSED BY THE SPLITTING OF A SPECIFIC PROTEIN. HOWEVER, BASED ON RESEARCH DONE WITH GOLD NANOPARTICLES AND CANCER, THE BOYS BELIEVED THEY COULD PREVENT THE PROTEIN FROM SPLITTING.



LIAM, COOPER AND COSMO FINALLY FELT THEY HAD FOUND SOMETHING. IN THEIR TRIALS, THE GOLD NANOPARTICLES WERE ABLE TO STRIP AWAY THE PROTEIN THAT CAUSES ALZHEIMERS, JUST AS THEY HAD HOPED. IT HADN'T BEEN TESTED ON RATS OR PEOPLE, BUT IT WAS MERELY THE BEGINNING OF THEIR JOURNEY. EVEN THOUGH THEIR RESEARCH WASN'T FINISHED, THE THREE BOYS TOOK THEIR PROJECT TO THE SCIENCE FAIR. ON THE DAY OF THE EVENT, THE BUILDING FILLED WITH STUDENTS FROM ACROSS THE STATE. THE BOYS SET UP THEIR POSTER, TOOK A DEEP BREATH, AND BEGAN. THEY RECEIVED THE RESULTS A FEW DAYS LATER.



THE THREE BOYS DON'T KNOW WHAT THE FUTURE HOLDS, BUT THEY QUALIFIED TO GO TO THE INTERNATIONAL SCIENCE FAIR IN CALIFORNIA. WHILE THE EVENT WAS POSTPONED DUE TO CONCERNS WITH COVID-19, THE BOYS HOPE TO EVENTUALLY GO TO INTERNATIONALS.