# Nysmith Students Continue to Excel

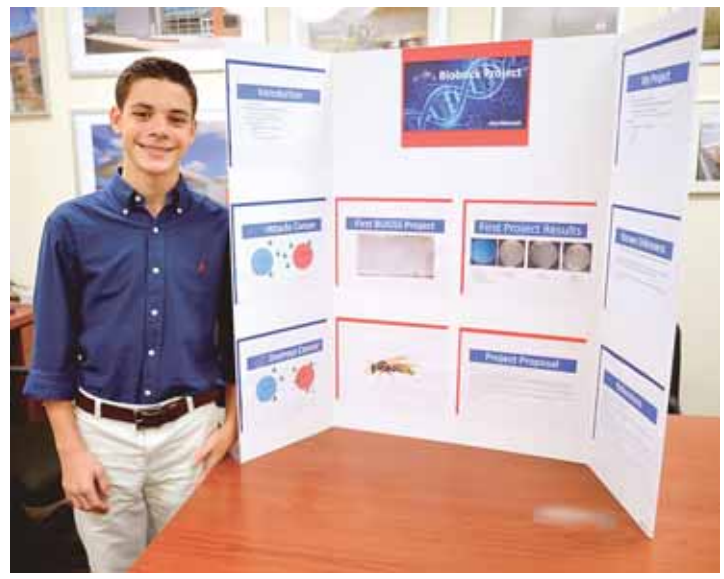
By Andrea Worker
The Connection

The next time you hear someone bemoaning the "state of today's youth," please direct their attention to Kaien Yang of Chantilly and Alex Misiaszek of Ashburn, two 13-year-old students at the Nysmith School for the Gifted in Herndon.

Kaien Yang recently returned with a third place prize from the Discovery Education 3M Young Scientists Challenge. Thousands of students across the country entered, but only 10 young scientists – including Kaien – made the final cut. His prize-winning project? Brilliant in its underlying simplicity, Yang presented a process for creating biodegradable plastic from pumpkins and oil from their seeds. The result has a multitude of problem-solving applications according to Kaien, and apparently the judges agree.


Photos by Andrea Worker/The Connection

**Young scientist and mathematician Kaien Yang of Chantilly is a student at Nysmith School for the Gifted in Herndon. He was also a prize winner at the 2016 Discovery Education 3M Young Scientists Challenge where he entered his project to develop plastics and fuels from pumpkins. "This process solves more than one major environmental problem," he said. "And it can help create jobs around the country and the world." Not to mention that you can make some pretty nifty fashion accessories like the "pumpkin bag" that Kaien is displaying.**



**Alex Misiaszek shows off the board that he uses to explain his possibly ground-breaking cancer fighting treatment. "My work is aimed at injecting a cancer-killing molecule into the cancer cells, making them destroy themselves without harming the healthy cells around them. I'm tired of seeing so many people suffering and dying from cancer." Working with mentors at the Baltimore Underground Science Space, Alex has presented his work before experts from facilities like Johns Hopkins and the Howard Hughes Medical Center where he has received encouragement to continue on his experimental path.**

**USING PUMPKINS** to produce plastic and fuels will significantly reduce pollution, but of equal benefit is that growing the pumpkins and processing them into these materials "can bring jobs to a lot of rural areas in our country, and in other countries where people struggle to find or create work," said Kaien. Pumpkins can expand from a mostly seasonal product, to a year-round source of income, from the farm to the processing plants.

Not content with just tackling world ecology and economy problems, Kaien is also competing in the Broadcom MASTERS (Math, Applied Science, Technology & Engineering for Rising Stars) with only 30 other finalists at the National Geographic Society here in D.C. "iDiagnostic: Invention of an Early Detection Tool for Major Depressive Disorder" is his topic this time.

With this project Kaien went for more of the math versus the science, and looked to benefit the individual first, by developing an algorithm to help diagnose depressive disorders. After devouring 150 research papers on the subject, Kaien went to work "but I hit a wall. My app just didn't work." Of course, he didn't give up. With some mentoring from his Nysmith math teacher, JoMarie Broccoli, he started again, and the result was a test that showed a 94 percent reliability rate when tested against people who have been diagnosed positively for these conditions.

Don't worry if you think that Kaien doesn't leave himself time for some hobbies as well as school work and research and development. "I like to play tennis and the violin," he shared. "They help my brain relax. Then I will become more efficient. It's all fun to me."

Alex Misiaszek's current project is a bit more hush-hush in its details. He's not in an official competition with his work, but instead, is collaborating with folks at the Baltimore Underground Science Space (BUGSS). This unique facility is a place where "people from all walks of life come to learn and practice biotechnology, a laboratory for use by amateur, professional and citizen scientists." For Alex, it represents a place where he can get his hands on equipment and materials he needs in his research and use a variety of tools safely and with supervision.

**SO WHAT'S HE UP TO?** Even at 13 years of age, Alex isn't afraid to take on the scourge of cancer, the disease that billions of dollars and thousands of people have yet to cure – and it's a personal mission for this young scientist. "I'm tired of seeing people I know, people I love, people all over the world suffering and dying from cancer," he said. One of his inspirations that keeps him focused he says is the Taylor Swift charity single "Ronan," about a four-year-old boy who died from neuroblastoma in 2011. "I just want to do something to stop this."

With a "connect the dots" spark from his mom who showed him an article about cancer-fighting abilities in the venom of the Brazilian Wasp, Alex decided to use his seventh grade Nysmith Science Fair project where he inserted synthetic DNA into living E. coli cells, causing them to create a protein that they would not otherwise have been able to create, and combine it with the wasp research. The goal is to develop a treatment where the cancer-fighting molecules are attached to the cancer cells, causing them to self-destruct without damaging the healthy cells around them. "And the process is self-continuing," he added, "the modified organisms would continue to produce the molecules and keep fighting the cancer."

So far, so promising. He presented his early works and findings at a speech attended by researchers from the University of Maryland, Johns Hopkins and the Howard Hughes Medical Center (remember – he's 13!) where the response was overwhelmingly encouraging.

In between his classwork and his private research efforts, Alex is looking ahead to high school and has already started applying at institutions like the Sidwell Friends School and Georgetown Preparatory.

The "state of today's youth?" In pretty good hands like those of Kaien and Alex.

## School Notes

*Send school notes to north@connectionnewspapers.com by noon on Friday.*

**David Clark**, alto sax player, is recognized as a member of the 2017 U.S. Army All-American Marching Band and will receive honorary jacket in front of family, friends, fellow band members and classmates.

Eight students from Fairfax County Public Schools — all attending Thomas Jefferson High School for Science and Technology (TJHSST) — have been named semifinalists in the 2016 Intel Science Talent Search. The students, with their project names, are:

❖ Jake Cui, A Machine Learning Approach to Identifying Ordered Binding Regions on Order-disorder Protein Interfaces.

❖ Tarun Kamath, Marked Decreases in Pediatric and Young Adult Solid Organ Cancer Mortality in the United States Since 1940: Analysis and Hypotheses.

❖ Ava Lakmazaheri, Brain-actuated Robotics: A Logic-based Approach for Multimodal Programming and Operation of Assistive Humanoid Robots.

❖ Austin Mills, Demonstrating the Development of Heavy Metal Resistance in Non-tolerant Multigenerational Brassica rapa.

❖ Kunal Shroff, The Relationship Between Lethality and Genomic Instability in Euploid and Aneuploid Yeast Cells Expressing Pathological Huntingtin.

❖ Matthew Sun, Hyperacute Temporal Resolution with a Neural Population for Biologically Plausible Firing Rate Change Detection.

❖ Jason Wei, Improving Lateral Flow Immunoassay Sensitivity by a Palladium-catalyzed Dye Reaction.

❖ Michael You, Two-degree-of-freedom Bubble Oscillations in Elastic Vessels and its Application in Sonar-induced Marine Mammal Injuries.

The 300 semifinalists were chosen from more than 1,750 entrants and will receive matching awards of $1,000 along with their school.

This is the 75th year of the Science Talent Search, which Intel has sponsored since 1998, providing $1.6 million in awards and scholarships to contestants.

**Snigdha Srivastava** and **Kate Hao**, of Herndon, are on the dean's list at Washington University in St. Louis.

**Adam Zaman**, of Herndon, is on the dean's list for spring 2016 at South Dakota School of Mines and Technology. He is studying mechanical engineering.

**Dinesh Chowdary Inampudi**, of Herndon, graduated with a master of science, May 2016 from the University of New Haven.