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Media Contacts:
Elizabeth Cho
Siemens
917-622-2413
elizabeth.cho@siemens.com

Charmion Kinder
Discovery Education
240-274-2173
Charmion_Kinder@Discovery.com

MICHIGAN, ILLINOIS STUDENTS WIN REGIONAL SIEMENS COMPETITION AT THE UNIVERSITY OF NOTRE DAME

Regional Winners Move on to Final Phase of Competition: National Finals in Washington, D.C.
Neil Wary (Elmhurst, IL) Wins Top Individual Honors;
Brandon Zhu and Daniel Zhang (Midland, MI) Win Top Team Honors

ISELIN, NJ, November 6, 2017 –Three students have been named National Finalists in the Siemens Competition in Math, Science & Technology after earning top spots in one of two regional competitions that took place this past weekend. The Competition is the nation's premier science research competition for high school students and seeks to promote excellence by encouraging students to undertake individual or team research projects. For more information go to: www.siemens-foundation.org

Neil Wary of Elmhurst, IL, earned top individual honors and a $3,000 scholarship for using CRISPR/Cas9 to investigate a rare life-threatening genetic disease called CHARGE syndrome. **Brandon Zhu** and **Daniel Zhang**, both of Midland, MI, shared the $6,000 team scholarship for research in the development of controlled-release drug therapies, which could increase the effectiveness, and decrease the side effects of pharmaceuticals. They were among 101 students overall selected to compete in regional competitions across the country this month out of a pool of more than 1,860 projects submitted for the competition.

These regional winners now move to the final phase of the Siemens Competition to present their work at the National Finals in Washington, D.C., December 4-5, 2017, where $500,000 in scholarships will be awarded, including two top prizes of $100,000.

The students presented their research this weekend to a panel of judges at The University of Notre Dame, host of the Region Three Finals.

"These high school students are doing complex graduate student level research," said David Etzwiler, CEO of the Siemens Foundation. "We're proud to support them and to further their efforts to improve our world."

The Siemens Competition, launched in 1999 by the Siemens Foundation, was established to increase access to higher education for students who are gifted in STEM and is based on the culture of

innovation, research and educational support that is the hallmark of Siemens. The competition, administered by Discovery Education, develops a pipeline for the nation's most promising scientists, engineers and mathematicians.

The Winning Individual for Region Three
Neil Wary, a senior from the Illinois Mathematics and Science Academy in Aurora, IL, won the individual category and a $3,000 scholarship for his project titled, "Connecting the Chromatin Remodeler CHD7 in the Regulation of CHARGE Syndrome and Autism."

Neil's project used a groundbreaking new gene-editing tool called CRISPR/Cas9 to investigate a rare life-threatening genetic disease called CHARGE syndrome. CHARGE affects many areas of the body, and is characterized by impairments in vision and the central nervous system, heart defects, blockages of the nasal passages, growth retardation, genital abnormalities, ear anomalies and sometimes deafness. Children with CHARGE often experience delays in development and communication, as well as behavioral difficulties including autism.

Often, the difficulty with studying human diseases is recreating them in the lab. Using CRISPR, Neil developed a "disease-in-a-dish" model of CHARGE, recreating the genetic disorder in a petri dish to better understand it and to study potential treatments. Using the method, he discovered a unique link between the genetic mutations that cause CHARGE and blood vessel dysfunctions associated with heart and other vascular features that characterize the syndrome. The research could one day lay the groundwork for treating the disease.

"Neil Wary's devotion to studying CHARGE syndrome—a life-threatening genetic disorder—was truly admirable," said Dr. Pinar Zorlutuna, assistant professor in the Department of Aerospace and Mechanical engineering at Notre Dame University. "From designing his genetic model to conducting the experiment using the CRISPR gene-editing tool, Neil has done great work in discovering what could be a significant link between vascular dysfunctions and this devastating disease."

Neil has always been passionate about biology, stating a belief that it helps "us learn more about ourselves, and how to live a better life. There are a lot of things we can't control in our lives, but our own health and body shouldn't be one of them." One of his proudest accomplishments is having his research on epigenetic and regenerative biology published in the peer-reviewed scientific journal, *PLOS ONE*. When he grows up, Neil hopes to become a physician and scientist. Neil is the director of his school's STEM outreach program, which has developed a mentoring program and created curricula for workshops and summer camps. Outside of school, Neil plays the violin in the Chicago Youth Symphony Orchestra.

Neil Wary's mentor is Dr. Kishore Wary at the University of Illinois at Chicago.

The Winning Team for Region Three
Brandon Zhu and Daniel Zhang, both of Midland, MI, won the team category and will share a $6,000 scholarship for their project titled "Release of Active Pharmaceuticals Using Capped Hyperbranched Polyesters."

In the long-term, the research could be applicable in the development of controlled-release drug therapies, to increase the effectiveness, and decrease the side effects of many pharmaceuticals. All medications have side effects, but when released into the body in a slower and steadier manner, there

are a number of benefits, including decreased toxicity, increased effectiveness, and less frequent dosing. Brandon and Daniel's research involves an early-stage method using what's called "polymer drug conjugates" to regulate the release of certain pharmaceutical compounds. They're interested in how this method could be applied using common medications such as: naproxen for pain relief; salicylic acid, a common acne treatment; and hydrocortisone, used to treat a variety of skin conditions.

"The drug delivery pipeline is long and complicated, but the research of Brandon Zhu and Daniel Zhang is a significant first step," said Dr. Haifeng Gao, an associate professor in the Department of Chemistry and Biochemistry at the University of Notre Dame. "These students have come up with important scientific questions --and demonstrated their findings well--regarding how to regulate the release of drug therapies in the human body, which is critical to making sure that medications are both safe and effective."

Brandon, a senior at Herbert Henry Dow High School in Midland, MI, grew up surrounded by STEM and recalls listening to his father talk about his own latest research. He knew from a young age that he would one day pursue his own career in the sciences and finds himself drawn to the human aspect of working as a physician, but also to making new scientific discoveries that will change the world for the better. Brandon spends his time volunteering with his student council, Big Brother Big Sister, and Key Club. One of his proudest moments was winning the prestigious A.H. Nickless Innovation Award, bringing $20,000 to his high school for STEM. In his spare time, Brandon also plays competitive soccer and basketball and his personal role model is NBA pro Jeremy Lin.

Daniel, also a senior at Herbert Henry Dow High School in Midland, MI, has enjoyed the challenge of STEM subjects—from chemistry to biology to math to computer science—for as long as he can remember. An AP Scholar with distinction and top honor roll student, Daniel is a member of his school's robotics team and plays the violin. He also plays varsity tennis, for which he recently won state individual and team titles. His role model is his older brother, Steven, who has always been hardworking, kind, and is never afraid to try new things like dancing.

The team's mentor is Dr. Patrick Smith of Michigan State University.

Regional Finalists

The remaining regional finalists each received a $1,000 scholarship.

Regional Finalists in the individual category were:

- **Haran Kumar**, Parkway West High School, Ballwin, MO
- **Nabeel Quryshi,** University School of Milwaukee, Milwaukee, WI
- **Suraj Srinivasan,** Strongsville High School, Strongsville, OH
- **Julia Wang**, Ladue Horton Watkins High School, Saint Louis, MO

Team Regional Finalists were:

- **Sai Anantapantula,** Northville High School, Northville, MI and **Arav Agarwal**, International Academy Central, Bloomfield Hills, MI
- **Kane Breuer**, New Albany High School, New Albany, OH and **Thomas Breuer**, New Albany High School, New Albany, OH

- **Hanson Hao**, Illinois Mathematics and Science Academy, Aurora, IL and **Claudia Zhu**, Illinois Mathematics and Science Academy, Aurora, IL
- **Freddie Zhao**, Troy High School, Troy, MI **, Spencer Liu**, Troy High School, Troy, MI, and **Chittesh Thavamani**, Troy High School, Troy, MI

The Siemens Competition

For the 2017 Siemens Competition, 1,860 projects were submitted for consideration. 491 students were named Semifinalists from which 101 were named Regional Finalists. For the regional finals, the students present their research in a closed, online forum, and entries are judged by esteemed scientific experts at six leading research universities which host the regional competitions: Massachusetts Institute of Technology (November 4); University of Notre Dame (November 4); The University of Texas at Austin (November 11); California Institute of Technology (November 11); and Georgia Institute of Technology (November 18); and Carnegie Mellon University (November 18).

Winners of the regional events will advance to the National Finals to be held at The George Washington University in Washington, D.C., December 4-5, 2017, where $500,000 in scholarships will be awarded, including the two top prizes of $100,000 and one of the most prestigious science honors awarded to high school students in the country today.

The winners of each regional weekend will be announced at 12 noon (ET) on the following Monday at ***http://siemensusa.synapticdigital.com/US/Siemens-Foundation***.

For up-to-date news and announcements about the Regional Competitions and the National Finals, follow us on Twitter @SFoundation and Instagram @SiemensFdn (#siemenscomp) and like us on Facebook at SiemensFoundation.

Interviews, video and photos available by visiting http://siemensusa.synapticdigital.com/US/Siemens-Foundation.

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The Siemens Foundation has invested more than $100 million in the United States to advance workforce development and education initiatives in science, technology, engineering and math. The Siemens Foundation's mission is inspired by the culture of innovation, research and continuous learning that is the hallmark of Siemens' companies. Together, the programs at the Siemens Foundation are helping close the opportunity gap for young people in the U.S. when it comes to STEM careers, and igniting and sustaining today's STEM workforce and tomorrow's scientists and engineers. For further information, visit www.siemens-foundation.org or follow us on Twitter @sfoundation or Instagram @SiemensFdn

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