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## Epigenetics takes center stage with this year's Addiction Science Awards
*NIDA announces awardees at the 2017 Intel International Science and Engineering Fair*

A project applying the science of epigenetics to demonstrate the health dangers of hookah smoke won a first-place Addiction Science Award at the 2017 Intel International Science and Engineering Fair (ISEF)—the world's largest science competition for high school students. The awards are coordinated by the National Institute on Drug Abuse (NIDA), part of the National Institutes of Health, and Friends of NIDA, a coalition that supports NIDA's mission. The Intel ISEF Addiction Science Awards were presented at a ceremony Thursday night at the downtown Convention Center in Los Angeles.

The first and second place awards went to students using epigenetics—how the environment can change gene expression. First place went to 16-year-old Anusha Zaman from the Baton Rouge Magnet High School in Louisiana,



First place winner of the 2017 Addiction Science Award (L to R): Judges Drs. Eric Hayden and Chris Evans, 1st place winner Anusha Zaman, and Judge Dr. Mitchell Wong

for her project, *Epigenetic and Biotransformation Effects of Hookah Smoke Extract on Human Oral Keratinocytes*. The high school sophomore analyzed the effect of wet and dry hookah smoke extracts on epithelial cells taken from inside human mouths. She discovered that hookah smoke induces potentially detrimental cellular responses relevant to inflammation and cancer. Her findings suggest that hookah smoke produces adverse health effects similar to those produced by cigarette smoke.

The second place award went to Nkima Stephenson from Conyers, Georgia, for her project, *Data Analysis of the Epigenetics of Drug and Alcohol Dependence.* The 18-year-old senior from the Rockdale Magnet School for Science and Technology used the GeneWeaver database, which allows a functional analysis across multiple species through homology mapping. Using both human and rodent data, she compared data sets containing genes directly related to alcohol exposure, to sets containing genes modified by environmental influences, but also related to alcohol exposure. In doing so, she identified genetic and environmental factors that could signify a predisposition to addiction. Thanks to her work, the database now contains a more extensive collection of information that could be useful to other researchers studying substance use disorders.

"We are delighted that these students are discovering the potential of epigenetic research to study the effects of drugs on our brain and our body, including those that result in addiction," said NIDA Director Nora D. Volkow, M.D.

Third place went to Kashfia Rahman from Brookings High School in Brookings, South Dakota for her project *The Dynamics of Habituation: A Neural Study of the Effects of Repeated Exposures to Risky Behaviors on Cognitive Control and Emotional Responses in the Adolescent Brain.* The 17-year-old junior used a comprehensive series of measures to test the process of habituation, where the perception of risk decreases incrementally each time the teen is exposed to a decision about a dangerous behavior. She tested many components of risky behaviors and in some subjects even used a portable EEG technology to measure emotional responses. She concluded that repeated risky exposures can desensitize associated negative responses, explaining why teens take risks when they know a behavior is dangerous.

The Friends of NIDA provides funding for the awards as part of its ongoing support of research into the causes, consequences, prevention, and treatment of drug abuse and addiction.

"It is impressive to see so many high-quality projects related to addiction science this year," said William Dewey, Ph.D., president and chair of the Executive Committee, Friends of NIDA, as well as the Louis S. and Ruth S. Harris Professor and chair, Department of Pharmacology and Toxicology, Virginia Commonwealth University, Richmond. "In fact, to recognize as many of these young scientists as possible, we took the unusual step of awarding three Honorable Mentions this year."

Honorable Mentions were awarded to 18-year-old Anuj Gupta from Roslyn High School in Roslyn Heights, New York for *Do Parents Really Know Best? Investigating the Relationship between Perceived Parental Goals and Academic Factors*; Dilge Kocabas (age 17) and Dilara Alev Ortel (age 19) from the Takev Fen Lisesi School in Izmir Narlidere, Turkey for *Illegal Substance Biodetectives: Apta-Liposomes;* and 15-year-old Caleb Martonfi from Tuscumbia High School in Tuscumbia, Missouri fo*r And the Winner Is…Developing a Computer Program to Investigate Neural Competition with Multimodal Stimuli.*

In referring to all of the awardees, Dr. Volkow commented, "It's very gratifying to see the creative contributions that these young researchers are already making to the science of drugs and substance use disorders, including the factors that might underlie vulnerability for drug-taking."

Judges for this year's Addiction Science Awards included three NIDA grantees from the University of California at Los Angeles (UCLA): Drs. Chris Evans, Vivek Shetty, and Mitchell Wong, as well as UCLA neuroscientist Dr. Eric Hayden.

This year, about 1,800 students from more than 75 countries, regions and territories participated in the Intel ISEF competition, coordinated by the Society for Science and the Public. The nonprofit organization partners with Intel—along with dozens of other corporate, academic, government and science-focused sponsors—to provide support and awards each year. Addiction Science winners receive cash awards provided by individual scientists in the field through Friends of NIDA, with a $2,500 scholarship for the first-place honoree, $1,500 for second place and $1,000 for the third-place distinction. NIDA has developed a special section on its website, which includes other resources on addiction science, to highlight the winning projects and to

help science fair entrants understand the criteria for the awards: <u>The NIDA Science Fair Award for Addiction Science</u>.

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**About the National Institute on Drug Abuse (NIDA):** The National Institute on Drug Abuse (NIDA) is a component of the National Institutes of Health, U.S. Department of Health and Human Services. NIDA supports most of the world's research on the health aspects of drug use and addiction. The Institute carries out a large variety of programs to inform policy, improve practice, and advance addiction science. Fact sheets on the health effects of drugs and information on NIDA research and other activities can be found at www.drugabuse.gov, which is now compatible with your smartphone, iPad or tablet. To order publications in English or Spanish, call NIDA's DrugPubs research dissemination center at 1-877-NIDA-NIH or 240-645-0228 (TDD) or email requests to drugpubs@nida.nih.gov. Online ordering is available at drugpubs.drugabuse.gov. NIDA's media guide can be found at www.drugabuse.gov/publications/media-guide/dear-journalist, and its easy-to-read website can be found at www.easyread.drugabuse.gov. You can follow NIDA on Twitter and Facebook.

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