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**Altruistic decision making focus of NIDA's Addiction Science Award**

*New York high school senior looks at the behavioral economics of intergenerational preferences*

A study of what influences decision making on issues whose consequences will only be felt by future generations won first prize in the annual Addiction Science Awards at this year's Intel International Science and Engineering Fair (ISEF) -- the world's largest science competition for high school students. The Intel ISEF Addiction Science Awards were presented at an awards ceremony Thursday night in Los Angeles. The awards were presented 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.

First place distinction went to Sarah Susie Pak, a 17-year-old senior at Roslyn High School in Roslyn Heights, N.Y., for her project Would You Do It for the Kids? Factors Involved in the Prediction of Intergenerational Preferences. The project was based on well-known phenomenon, called delayed discounting, in which people tend to discount the value of a reward that will be received at a later time vs. an immediate, but smaller, reward. Delayed discounting is abnormally high in people who are addicted to drugs and contributes to their impulsive risk taking behaviors, especially drug use. Pak's project identified generosity and patience as two key interacting factors that increase the likelihood that a person will make altruistic decisions that will primarily help future generations. The senior plans to attend Princeton in the fall.

"Our first place winner took a fresh look at delayed discounting at the social and generational level," said NIDA Director Dr. Nora D. Volkow. "Her studies illuminate aspects of neuroeconomics that are relevant not only to drug abuse and addiction, but that could have far reaching social, ethical, and public health policy implications."

Second place distinction in the Addiction Science Awards went to Darby Kathryn Schumacher, a 15-year-old freshman at the Girls Preparatory School in Chattanooga, Tenn. Her project, Making Heartbeats Go LOKO, investigated the effects of the alcoholic caffeinated beverage branded as Four Loko on the heart rate of the water flea (*Daphnia*). She chose to use this invertebrate model to test the effects of Four Loko not only because *Daphnias* show clear signs of intoxication when exposed to alcohol, but also because their heart rate can be easily monitored through their translucent bodies. She was able to demonstrate that alcohol, a depressant, and caffeine, a stimulant, can lower and boost *Daphnia's* heart rate, respectively. The caffeine content in Four Loko appears to have partially mitigated the depressant effect of the alcohol present in this beverage, supporting the notion that the caffeine in alcoholic energy drinks could mask some of alcohol's behavioral effects, making the user less aware of the true extent of their impairment.

“Ms. Schumacher took a simple model of a nervous system that recreates some of the most basic features of human physiology to show how the combination of a stimulant and a depressant can affect heart function,” said Dr. Susan Weiss, NIDA’s head judge and acting director of the Office of Science Policy and Communications. “She took a systematic and elegant approach to demonstrate why these drinks can be dangerous.” The U.S. Food and Drug Administration issued warning notices to manufacturers of caffeinated alcoholic beverages in November 2010.

Third place went to 16-year-old Yamini T. Naidu, a student at Valley Catholic High School in Beaverton, Ore., for her entry, From Models to Medications: Identification of Medication Leads for Treating Methamphetamine Addiction. Using molecular modeling software that incorporated eye-catching 3D structural illustrations and vivid computer animations, Naidu discovered two potential sites in the methamphetamine binding TAA receptor. Her work predicted that these sites could have the ability to modulate the binding affinity of methamphetamine for this receptor. This work has resulted in the development of several lead compounds that are the subject of pending patents for possible novel medications for methamphetamine addiction. There are currently no medications approved for the treatment of methamphetamine addiction; thus, these lead compounds represent a potentially exciting new development in the addiction treatment field. The sophomore says she became interested in neuroscience after her uncle died of a stroke.

The non-profit organization, Friends of NIDA, partnered with NIDA to sponsor the awards as part of its ongoing support of NIDA research into the causes, consequences, and treatment of drug abuse and addiction.

“We are delighted to see three young women win this year, and we hope these awards encourage them to continue their interest in addiction science,” said Dr. William Dewey, Louis S. and Ruth S. Harris Professor and Chair, Department of Pharmacology and Toxicology, Virginia Commonwealth University, Richmond, and president and chair of the Executive Committee, Friends of NIDA. The awards were judged by Dr. Weiss, NIDA’s Dr. Ruben Baler, and Dr. Walter Ling, a NIDA grantee at the University of California at Los Angeles, which hosted the fair.

This year, about 1,500 students from 63 countries participated in the Intel ISEF competition, coordinated by the Society for Science and the Public, at the Los Angeles Convention Center. The nonprofit organization Society for Science and the Public partners with Intel - along with dozens of other corporate, academic, government and science-focused sponsors - to provide support and awards each year. Winners received cash awards provided by Friends of NIDA in a ceremony, with a \$2,500 scholarship for the first-place honoree. NIDA has developed a special section on its website, which includes other resources on addiction science, to showcase the winning projects and to help science fair entrants understand the criteria for the awards: <http://www.nida.nih.gov/sciencefair>.

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The National Institute on Drug Abuse 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 abuse and addiction. The Institute carries out a large variety of programs to inform policy and improve practice. Fact sheets on

the health effects of drugs of abuse and information on NIDA research and other activities can be found on the NIDA home page at [www.drugabuse.gov](http://www.drugabuse.gov). To order publications in English or Spanish, call NIDA's new *DrugPubs* research dissemination center at 1-877-NIDA-NIH or 240-645-0228 (TDD) or fax or email requests to 240-645-0227 or [drugpubs@nida.nih.gov](mailto:drugpubs@nida.nih.gov). Online ordering is available at <http://drugpubs.drugabuse.gov>. NIDA's new media guide can be found at <http://drugabuse.gov/mediaguide/>.

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