

INQUIRE. INNOVATE. INSPIRE.



2012 Semifinalists



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The Intel Science Talent Search (Intel STS) is the nation's most prestigious pre-college science competition. Alumni of STS have made extraordinary contributions to science and hold more than 100 of the world's most coveted science and math honors, including seven Nobel Prizes and four National Medals of Science. The Intel STS recognizes 300 students and their schools as semifinalists each year to compete for \$1.25 million in awards. From that select pool, 40 student finalists are then invited to Washington, DC in March to participate in final judging, display their work to the public, meet with notable scientists, and compete for the top award of \$100,000.

The semifinalists of the Intel Science Talent Search (Intel STS) 2012 were chosen from among 1,839 entrants representing 497 high schools in 44 states, the District of Columbia, and three overseas schools.

Each of the 300 students named a semifinalist in the Intel STS 2012 will receive a \$1,000 award for his or her outstanding research. Additionally, to recognize excellence in teaching and school support of individual student research, every school will receive an award of \$1,000 for each semifinalist named in the Intel STS 2012. This award is used to further excellence in science, math, and/or engineering education.

Colleges and universities regard the Intel STS semifinalist award to be evidence of exceptional academic promise. Each semifinalist is provided with a certificate of accomplishment, which may be sent with his or her applications for college admission and scholarships. A listing in this book, as well as official publication at www.societyforscience.org/sts, is also documentation of this honor.

Many Intel Science Talent Search projects are the product of a research environment in which scientist mentors dedicate themselves to the intellectual development and technical training of students. The 2012 semifinalists, Intel, and Society for Science & the Public acknowledge with gratitude the guidance, expertise, and patience of the experienced researchers who supported many of these projects.

From this group of 300 Intel STS 2012 semifinalists, 40 finalists will be chosen to attend the Intel Science Talent Institute in Washington, DC from March 8-13, 2012. During their trip to Washington, these finalists will undergo further judging and share \$630,000 in awards.

The 40 Intel STS 2012 finalists will be announced January 25, 2012 and published in *Science News*. Intel STS 2012 semifinalists are listed by high school state, high school city, and high school. An alphabetical list of semifinalists is on pages 23-24.

ALABAMA

Birmingham

The Altamont School

Goli, Rakesh Ram, 17

Exploring the Antibacterial and Anticancer Effects of a Novel Antarctic Bacterial Pigment

ARKANSAS

Hot Springs

Arkansas School for Mathematics, Sciences and the Arts

Watkins, Robert Alan, 17

Form Follows Function: A Venomous Explanation for the Exceptional Allosaurus

CALIFORNIA

Arcadia

Arcadia High School

Li, Jiacheng, 17

Algorithm-Based Fault Tolerance for Cascading Designs via Diagonal Check Values

Cerritos

Gretchen Whitney High School

Saha, Sayoni, 17

A Doll That Looks Like Me: A Study of Self-Concept in Children with Down Syndrome

Cupertino

Monta Vista High School

Hong, James, 18

Google Search Engine Result-Based Semantic Similarity: For Evaluating Chinglish and Chinese-English Machine Translation

Dana Point

Dana Hills High School

Lindeborg, Ryan Dennis, 17

The Effects of Surface Modification of PMMA Scaffolds through Plasma Etching and Different Media on the Proliferation and Migration of Fibroblasts

Davis

Davis Senior High School

Fannjiang, Clara Louisa, 17

Better Images, Fewer Samples: Optimizing Array Configuration for Compressed Sensing in Radio Interferometry

El Segundo

El Segundo High School

Li, Jack Zhihao, 17

Novel pH-responsive Encapsulated Phenylalanine Ammonia Lyase as an Enzyme Replacement Therapy for Phenylketonuria

Fremont

Irvington High School

Hsu, Irving, 18

Systematic Identification of DNA Variants Associated with UV Radiation and Skin Cancers Using a Novel Geographic-Wide Association Study

Mission San Jose High School

Luo, Mo, 17

Recovery of Power MOSFETs

Fullerton

Troy High School

Bhattacharya, Gita, 17

Do They Wake Up When Their Ears Ring? MP3 Listening Behavior and Attitudes of Adolescents

Yao, Leon, 17

A Novel Scheme for Achieving Quasi-Uniform Rate Polarization Scrambling at 752 krad/s

La Jolla	<p><u>La Jolla High School</u> <i>Lehmann, Meredith Paloma, 16</i> The Spread of Epidemics on the US Transportation Network: The Role of Air and Long Distance Auto Travel</p>
Mountain View	<p><u>St. Francis High School</u> <i>Raghvendra, Shubha Srinivas, 17</i> A Microfluidic-Based Single-Cell Analysis Identifies a Critically Depleted Vasculogenic Subpopulation in Diabetic Mesenchymal Stem Cells</p>
Palo Alto	<p><u>Henry M. Gunn High School</u> <i>Pan, Jin, 17</i> A Novel Protein Translation Kinetics Model Supports the Ribosomal Pause Theory</p> <p><i>Wang, Jean, 17</i> A Novel CTC Enumeration Algorithm with Applications in Monitoring Cancer Patient Treatment Responses</p>
Pleasanton	<p><u>Amador Valley High School</u> <i>Yenepalli, Aishwarya Chandar, 17</i> Novel Insights into Genes Involved in the Biosilica Nanofabrication in the Diatom <i>Thalassiosira pseudonana</i></p>
Sacramento	<p><u>Mira Loma High School</u> <i>Nag, Ashish Narain, 17</i> miR-499 Improves Cardiac Differentiation of Induced Pluripotent Stem Cells and Function of Infarcted Mouse Hearts</p>
San Diego	<p><u>San Diego Jewish Academy</u> <i>Goldklang, Matthew, 18</i> Response of Red Tide Dinoflagellate <i>Lingulodinium polyedra</i> to Ocean Acidification</p>
San Jose	<p><u>Bellarmine College Preparatory School</u> <i>Choudhury, Abrar, 17</i> Using Dwarf Spheroidal Satellites as Probes of Galaxy Properties</p> <p><i>Desai, Nikhil Arun, 17</i> Improving Dynamic Range and Membrane Localization of a Fluorescent Voltage Sensor</p> <p><i>Sharan, Saurabh, 18</i> Parameter-Free Graph-Based Nuclear Segmentation in Cellular Images Using Morphological Cues</p> <p><i>Thomas, James Joe, 17</i> A Predictive Model of Alcohol Dependence Based on Genetic and Demographic Factors</p> <p><u>The Harker School</u> <i>Batra, Prag, 17</i> Storage of Active Biological Compounds in Silk Films</p> <p><i>Cheng, Lucy, 17</i> Detailed Chemical Abundance Patterns of Andromeda Dwarf Satellites from Coadded Spectra</p> <p><i>Dalal, Nicole Hitesh, 18</i> Donor and Epitope Specific Variations in Immune Gene Expression in CMV Dextramer Positive CD8 T Cells</p> <p><i>Dasu, Govinda, 17</i> Discovery of 16 Nearby Brown Dwarf Candidates in WISE Preliminary Release Data</p>

Deng, Michelle Rui, 17

An Ontological Bayesian Framework for Context-Specific Navigation and Discovery of Biomedical Knowledge

Gupta, Vishesh, 17

Use of Discretization Approach in Autonomous Control of an Active Extrados/Intrados Camber Morphing Wing

Kosaraju, Revanth Sai, 17

Role of Epidermal Hif-1 α in the Inflammatory and Angiogenic Response to Ischemia in Diabetic Wound Healing

Rangan, Ramya, 17

De Novo Splice Form Discovery from RNA-Seq Data

Rengarajan, Pavitra, 17

Neuroanatomical and Cell Population Abnormalities Found in Mouse Model for Human Chromosome 16p11.2 Deletion

Siegel, Kathryn Iris, 17

Determining the Genetic Target of Drugs Using a Synthetic Lethality Map

Wu, Albert Yuejun, 17

Multi-Net Bayesian Networks for Integrative Genomic Discovery: Application to Epistatic Interactions for HIV

Leland High School

Chow, Ryan Dz-Wei, 17

Pancreatic Cancer Differentiation Markers Identify Risk Groups: Microarray Analysis through Boolean Implication Relationships

Lynbrook High School

Day, Cynthia, 17

Time Complexity and Algorithms for Blue-Red Chomp and its Subgames

Shen, Eric T., 17

Design of Magneto-Nanosensors to Detect Radiation Exposure through Biomarkers

Piedmont Hills High School

Li, Albert Mao, 17

Spatial-Temporal Characterization of OSR1-Cre Expression in the Mouse Prostate

Silver Creek High School

Do, Brian Tshao, 16

Genes on Steroids: Gene Upregulation by Promoter-Targeting Small RNAs in *Caenorhabditis elegans*

San Ramon

Dougherty Valley High School

Zeng, Connie Xiao, 17

Liposome-Based Investigation of X-Ray Physical Enhancement by Gold Nanoparticles

Saratoga

Saratoga High School

Zhang, Alissa Yuan, 17

Molecular Fingerprinting of Glucose with Raman and SERS for Noninvasive Diabetes Monitoring

Temecula

River Springs Charter School

Bianco, Ashley Marie, 17

Screening for Genes Involved in Floral Determinacy in *Arabidopsis thaliana*

COLORADO

Boulder

Fairview High School

McClain, Kathryn Marie, 17

A Study of Audiovisual Coactivation in Noise

Colorado Springs

Rampart High School

Shankar, Rahul, 17

Proteomic Method Development for the Analysis of Tissue Transglutaminase's Role in Cancer Progression

Denver

West High School

Anderson, Isaac Erik, 17

Ubiquitous-X Engine and System

Fort Collins

Rocky Mountain High School

Lynch, Kelli Ann, 18

Irradiation Extermination Part 2: A Portable System to Eliminate Water-Borne Microorganisms

CONNECTICUT

Greenwich

Greenwich High School

Hallisey, William Bennett, 17

Electrified Nanoscale Architecture in Mixed Matrix Membranes as a Means of Rapid Throughput Water Sterilization

Ishizuka, Ryota, 17

Optimization of a Microbial Fuel Cell to Drive a Bioelectrochemically Assisted Wastewater Treatment Reactor

Guilford

Guilford High School

Zhang, Yuning, 18

Isolation and Characterization of Endogenous Kidney Stem Cells

Hamden

Hamden High School

Hu, Yiyuan, 17

Role of MyD88 in DNA Damage Response

Lakeville

Hotchkiss School

Lee, Seung Hyun, 18

On the Steiner Ratio Problem

Wallingford

Choate Rosemary Hall

Shim, Aaron, 17

Calculating Redox Potentials of Organometallic Complexes for Renewable Energy Applications

Woodbridge

Amity Regional High School

Yu, Zizi, 17

Investigating the Hygiene Hypothesis: A Case-Control Study of Food Allergies and Age of Food Allergen Exposure in High School Teenagers

FLORIDA

Boca Raton

Florida Atlantic University High School

Navrazhnykh, Luizetta Vadimovna, 17

Polvyinylpyrrolidone (PVP) Directed Synthesis of Gold Nanoflowers

Fort Lauderdale

Pine Crest School

Nemiroff, Samuel, 18

Risk of Microbial Keratitis from Contaminated Eyewash Stations

Jacksonville	<u>Episcopal High School of Jacksonville</u> Joseph, Andrew Michael, 17 Improving Environmental Stress Tolerance: The Genetic Engineering of the <i>Oryza sativa</i> Plant Carrying the <i>Escherichia coli</i> Genes Producing Trehalose
Orlando	<u>Lake Highland Preparatory School</u> Edwards, Collin Randall, 17 Cellular Therapy Against Ovarian Cancer: Impaired Cytokine-Induced Cytotoxic Activity of Mononuclear Cells from Ovarian Cancer Patients and Umbilical Cord Blood
Osprey	<u>Pine View School</u> Grebe, Anthony Valenti, 18 Correlation of Metrics of Clad Damage by Neutrons in Fast Reactors
Oviedo	<u>Oviedo High School</u> Patel, Neel S., 17 A Four-Year Analysis of Sonifications for Use in Innovative Human-Computer Interfaces
Pinecrest	<u>Miami Palmetto Senior High School</u> Sarkar, Ellora, 17 Development of a Low Cost, Rapid Zinc-Finger Based Assay for the Multiplex Diagnosis of <i>M. tuberculosis</i>
GEORGIA College Park	<u>Woodward Academy</u> Paul, Harrison Richard, 18 Surface Functionalization of Silicon Nitride, Silicon Dioxide, and Silicon Biosensors
Duluth	<u>Northview High School</u> Chen, Sitan, 16 On the Rank Number of Grid Graphs
Savannah	<u>Savannah Arts Academy</u> Lau, Eric, 17 Acoustic Cavitation at the Solid Oxide Electrolysis Cell (SOEC) Cathode Layer for Sustainable Hydrogen Production
HAWAII Honolulu	<u>Kamehameha Secondary School</u> Keahi, Danielle Lyn, 18 Characterization of Cerebellar Phenotype in Mice with Mutated Rreb1
ILLINOIS Aurora	<u>Illinois Mathematics and Science Academy</u> Cao, Yiyun, 17 Regulation and Role of Regulator of G-protein Signaling-1 in Celiac Disease Pathogenesis Kalinich, Adam Orval, 17 Flipping the Winner of a Poset Game Sloan, Rose Neiberg, 16 Stable Expansions of the Integers
Chicago	<u>Ida Crown Jewish Academy</u> Otis, Hannah Gabrielle, 17 Quantification of the Effect of Physical Properties of Microarray Probe and Target Sequences on the Bias in the Estimation of Gene Expression Levels

The University of Chicago Laboratory High School

Radway, Robert Madison, 17

An Investigation of the Nitroethyl and Nitropropyl Radicals: Model Systems for Energetic Materials

Highland Park

Highland Park High School

Svetov, Kellen Jeffrey, 17

Site-Directed Mutagenesis of Glutaredoxin A from *Synechocystis*: A Comparative Structure-Function Analysis

Naperville

Naperville Central High School

Yang, Cassidy, 17

Electrochemical Investigation of the Formation of Polypyrrole on Glassy Carbon and Diamond Powders

Northbrook

Glenbrook North High School

Cotler, Jordan Saul, 17

A Relativistic Orthogonal States Quantum Key Distribution Protocol for Secure Satellite Communication

Skokie

Niles Township West High School

Angelov, Felix Felix, 17

Investigating the Effects of Autoinducer Analogs on Quorum Sensing in *Vibrio harveyi*

INDIANA

Carmel

Carmel High School

Qian, Ray, 17

Fluid Shear Stress Arrests Cell Cycle Progression from G1 to S Phase and Rapidly Activates RhoA GTPase in Osteoblasts

Indianapolis

Park-Tudor School

Chen, Rebecca, 17

Braid Group Representations and Braiding Quantum Gates

Kokomo

Northwestern High School

Barnes, John Tyler, 18

Acid Mine Drainage Remediation: A Novel Approach Phase III

South Bend

John Adams High School

Fein, Eric Edgar, 18

Characterizing Engineered Nanoparticle Adhesion to Soil Minerals: Implications for Environmental Transport and Remediation

West Lafayette

West Lafayette Junior-Senior High School

Prabhu, Anirudh, 17

Lower Bounds for Odd Perfect Numbers

MARYLAND

Bethesda

Landon School

Anderson, Michael Pierce, 17

Differential Cellular miRNA Export from Inflammatory Cells to High-density Lipoproteins

Walt Whitman High School

Tyan, Kevin Shaopin, 17

Impact of Fc Receptor Polymorphisms on the Efficacy of a HER2/neu-Targeting Therapeutic Antibody for the Treatment of Breast Cancer

Walter Johnson High School

Miller, Andrew, 17

Investigation of Thermal Degradation of Ethylene-Vinyl Acetate for Photovoltaic Applications

Clarksville	<u>River Hill High School</u> Wang, Alexander Lee, 17 Flatfield Analysis of Fluorescence Microscope Images
Columbia	<u>Wilde Lake High School</u> Wan, Joe, 17 Expression of Monkeypox Virus E3L Reveals a Stable Truncated Z α Domain
Ijamsville	<u>Urbana High School</u> Zhu, David Yuebao, 17 Systematic Evaluation of Net-Charge of Human Immunoglobulin IgG
Poolesville	<u>Poolesville High School</u> Chen, Peinan, 17 Extending the Phase Diagram of Methane to Extreme Conditions Thukral, Pavleen, 17 Hierarchical Automatic Image Based Human Age Estimation Using Relevance Vector Machine Regression and Multi-Classfier Fusion Zhu, Jack Louis, 17 Analysis of Electrostatic Charge on Small-Arms Projectiles
Rockville	<u>Richard Montgomery High School</u> Xie, Alan Ren, 17 Induction of Pluripotent Stem Cells from the Mouse Lens Epithelium: The First Step in Personalized Cataract Treatment
Silver Spring	<u>Montgomery Blair High School</u> Choudhary-Smith, Lorenzo Joseph, 17 Eliciting Smooth Pursuit in the Absence of Visual Stimulus Jamgochian, Arec Levon, 16 Baryonic Matter in Low Density, 1+1 QCD with Heavy Quark and Large N _c Limits Kaufman, Lori, 18 Experimental Evidence for a High Temperature Iron Isotope Fractionation Koehler, Frederic, 17 Quick and Efficient: Fast Algorithms for Completion Time and Batch Minimization on Multiple Machines Lei, Maureen, 17 Impact of Changes in Future Anthropogenic Aerosol Emissions on Northern Hemispheric Regional Air Quality and Climate Leung, Sherman, 17 Simultaneous Inhibition of SRC and STAT3 as a Novel Therapeutic Strategy for Prostate Cancer Shepherdson, James Lewis, 17 Predicting Gene Expression Using Promoter Sequence Characteristics Zhang, Andrew, 17 Identification of Genes Essential to Mammary Gland Development in Mice by Transcriptome Analysis of Induced Pluripotent Stem Cells

MASSACHUSETTS

Acton	<u>Acton-Boxborough Regional High School</u> He, Xiaoyu, 17 On the Classification of Universal Rotor-Routers
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Andover	<u>Phillips Academy</u> Ballinger, Sean Bozkurt, 17 Enhancing a Hydrogen PEM Fuel Cell Stack with Gold-Dodecanethiolate Core-Shell Nanoparticles Ding, Fengning, 17 Infinitesimal Cherednik Algebras of \mathfrak{gl}_n
Belmont	<u>Belmont High School</u> Kim, Choah, 17 Studying the Cardiovascular Complications of a Human Premature Aging Syndrome in a Petri Dish
Boston	<u>Commonwealth School</u> Shaw, Eloise Mae, 17 Investigating Spontaneous Stem Cell Differentiation Using Polymerization-Activated Cell Sorting
Brookline	<u>Brookline High School</u> Scully, Ziv David, 18 Total Chip Numbers and Motors in the Parallel Chip-Firing Game
Sheffield	<u>Berkshire School</u> Lee, Seyoon, 19 A Novel Inorganic-Organic Hybrid White Light Emitting Diode Based on an InGaN-F8T2 Heterojunction Ni, Peiyun, 18 Biomechanical Significance of Modern Human <i>Mentum Osseum</i> Examined Using Finite Element Analysis in Fossil and Modern Humans
Wellesley Hills	<u>Wellesley High School</u> de Fontnouvelle, Christina Anne-Josiane, 16 Novel Investigation of <i>Fusobacterium nucleatum</i> ssp. <i>nucleatum</i> Autoaggregation as a Mechanism of β -lactam Antibiotic Resistance
MICHIGAN Ann Arbor	<u>Greenhills School</u> Selwa, Katherine Elizabeth, 17 Epigenetic Regulation of Inflammatory Responses
Beverly Hills	<u>Detroit Country Day School</u> Lu, David Chen, 17 On the Conjecture of Conditional Connectivity of the Star Graph
Bloomfield Hills	<u>International Academy</u> Jena, Siddhartha Gautama, 17 Elevated Cholesterol Impairs Water and Gas Transport in Red Blood Cells
Grand Rapids	<u>Catholic Central High School</u> Wojtczak, Jessica Jane, 17 The Effects of Attention Allocation on Emotional Memory as a Function of Wake or Nap Conditions
Okemos	<u>Okemos High School</u> Ballor, JoAnn Patricia, 17 Locomotion in the Eocene Primate <i>Smilodectes gracilis</i> : Climbing or Leaping? He, Philip Cody, 17 A Novel Role of an Actin Capping Protein in Plant Immune Signaling

Port Huron

Port Huron Northern High School

Tumma, Nithin Reddy, 17

Elucidating Pathways in Cancer Pathogenesis: Establishment of Interaction Between TGF- β /Ras Pathways and Identification of gC1qR as an Oncoprotein

MINNESOTA

Arden Hills

Mounds View High School

Mangalick, Keshav Kumar, 17

Genetic Characteristics of Influenza A Viruses in Swine Populations

Minneapolis

Breck School

Damania, Samarth Arbhavesh, 18

A Data-Mining Approach to Identify Factors that Contribute to High Pharmaceutical Drug Costs

Jiao, Yan, 17

Investigating the Association of the Plasmid IncA/C pAR with Multi-antibiotic Resistance in *Escherichia coli*

Plymouth

Wayzata High School

Chen, Evan Matthew, 18

CD24 Induced Muscular Regeneration: Unraveling the Mystery Behind Satellite Cell Differentiation

Ibeling, Duligur Harm, 17

The Metallicity-Dependent Transition between White Dwarfs and Type II Supernovae

Shakopee

Shakopee High School

Qiu, Jeffrey, 18

Development of a Magnetic Phantom for Use in an Optical Atomic Magnetic Moment Detector

MISSOURI

St. Louis

Thomas Jefferson School

Bharadwaj, Maheetha Chandramouli, 16

Utilizing the *dgt* Gene in *Escherichia coli* to Assess the Role of dGTP Pools in Mutagenesis: Possible Implications for Cancer

NEW HAMPSHIRE

Concord

Bishop Brady High School

Murali, Anupa, 17

On the Relationship between the Spin Angle and the Nutation of a Heavy Symmetrical Top

NEW JERSEY

Bridgewater

The Academy for Health and Medical Sciences

Rezchikov, Semen K., 17

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Edison

John P. Stevens High School

Su, Yixian, 17

The Potential Use of Curved Nitinol Stylets for Optimized Robotic Insertion of Perimodiolar Electrode Arrays

Flemington

Hunterdon Central Regional High School

Raj, Tara Lakshmi, 17

Structure-Property-Effectiveness Correlation and Novel Mechanism for Amphiphile-Assisted Biofilm Inhibition

Hackensack

Academy for Medical Science Technology

Iwaoka, George Masanori, 18

Investigating UBM Degradation Products as a Possible Therapeutic Treatment for Regenerative Medicine Using a P19 Cell Model

Kim, EunBe, 18

Tamoxifen: Novel Approach for the Treatment of Estrogen Receptor Negative Cancers

Livingston

Livingston High School

Glatt, Eliana, 17

The Testing Effect is a Robust Cognitive Phenomenon that Improves Memory in Neurologically Impaired MS Patients

McDonald, Brigid, 17

Cation Specific Effects on Surface Tension Properties of *N-Lauroyl* Sarcosinate Surfactants

Millburn

Millburn High School

Ma, Chanthia Chanjuan, 18

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NEW MEXICO

Albuquerque

Albuquerque Academy

Bogdanov, Nikita Michael, 18

Characterizing the Effects of Asteroid Belt Perturbations on the Orbits of the Inner Planets

NEW YORK

Albany

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Picchione, Katherine R., 17

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Armonk

Byram Hills High School

Cannold, Sammi, 17

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Honig, Jesse Aaron, 17

Analyzing the Functional Connectivity of the Default Mode Network and other Regions of Interest Before and After Associative and Item-Specific Memory Encoding

Xu, Aurora, 17

A Reanalysis of Refractive Growth in Pediatric Aphakia and Pseudophakia

Bellmore

John F. Kennedy High School

Gossett, Brett Evan, 17

Are Some Disabilities More Handicapping than Others? A Comparison of Teacher Grading of Children with Medical, Physical and Behavioral Disabilities

Iscowitz, Ross Michael, 17

A Behavioral Analysis of Auditory Decision-Making in Mice

Shulman, Ross Everett, 17

The Impact of Elevated Carbon Dioxide Concentration and Drought on Leaf Nitrogen Content in Soybean

Wellington C. Mepham High School

Siddiqui, Bilal Ahmed, 17

Investigating Endogenous Expression of Indoleamine 2, 3-dioxygenase in Metastatic Melanoma

Brentwood

Brentwood High School - Sonderling Center

Garvey, Samantha Natalie, 17

The Effects of the Physical Environment and Predators on Phenotypic Plasticity in *Geukensia demissa*

Bronx

Bronx High School of Science

Agrawal, Sahil, 17

Assessing the Use of Multiphoton Microscopy Derived Redox Ratios as a Diagnostic Tool for Cancer

Chitti, Bhargava Suved, 17

Modeling Stem Cell Proliferation and Differentiation in Hybrid Spheroid Cultures of Cancer Cells: Toward a New Method of Optimizing and Minimizing Radiation Treatment

Gellman, Michael Sivitz, 17

The Effect of Racial Bias on Learning and Generalizing Same-Race and Cross-Race Associations

Goldman, Danielle, 17

The Role of GABA in the Comorbidity of Adolescent MDD and GAD

Munk, Olivia Margot, 17

Environmental Enrichment Influences Neuronal Structure Well into Adulthood

Syed, Talal, 16

Biomarkers Provide a Necessary but not Sufficient Means of Identifying Breast Cancer Stem Cells: Hybrid Spheroids as a Functional Assay for Cancer Stem Cells

Tan, Qian Kun, 17

Investigation of the Mechanisms Behind Nuchal Edema in Aneuploidic Fetuses

Wang, Catherine, 18

Structural and Functional Studies of Linker Histone H1 in *Drosophila* Development

Buffalo

City Honors School

Moran-Guiati, Nicci Patricia, 17

Effect of Selective Serotonergic Reuptake Inhibitors on Radiation Therapy in Cancer Cells

Chappaqua

Horace Greeley High School

Wertheimer, Davis Wong, 17

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Commack

Commack High School

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Kim, Savina Dine, 17

Cognitive Deficits in Neuropsychiatric Disorders: A Schizophrenia Model Associated with Neuronal Alpha7 Nicotinic Acetylcholine Receptor Localization

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Carbonation in Pervious Concrete: A Novel Study of the Sustainability Benefits of Pervious Concrete

Dix Hills

Half Hollow Hills High School East

Kenagy, Hannah Schaefer, 17

Understanding the Pathogenesis of Acid-Resistant *E. coli*: Computational Modeling of pH-Dependent Conformational Changes in GadB

Half Hollow Hills High School West

Desai, Malini, 17

Electrocatalytic Hydrogenation Methodologies Applied to Components of Pyrolysis Oil

East Setauket

Ward Melville High School

Morra, Rocco Pasquale, 17

Development of a Novel Human Serum Albumin Nanoparticle Formulation for DHA-SB-T-1214

Sato, Anna, 17

A Novel Adsorptive Filtration Approach for the Removal of Radioactive Isotopes of Iodine and Cesium from Water

Sekar, Shubha, 17

On the Usability and Security of Graphical Password Schemes

Xing, Jesse, 17

Synthesis of Diblock Copolymers PEG-PLA for Drug Delivery

Zhou, Jack Jing, 17

Multiplexed Molecular Imaging of Esophageal Cancer Using Molecularly Targeted SERS Nanoparticles and a Novel Endoscopic Probe

Eastchester

Eastchester High School

McGovern, Brian Christopher, 17

Modifying Inappropriate Behaviors in Children with Autism Using Social Stories

Glen Head

North Shore High School

Davani, David John, 17

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Fagin, Lily Madeline, 17

Willful Ignorance: The Tendency to Make Incentive-Compatible Decisions in Ambiguous Environments

Great Neck

John L. Miller Great Neck North High School

Chen, Kristine Y., 17

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Leibowicz, Claire Rebecca, 17

The Neuropsychology of Social Instincts: A Behavioral and Information-Theoretic Analysis of the Cues Involved in Trustworthiness Evaluations

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Reactive Transport Model of Anthropogenic Carbon Sequestration

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Bai, Emily, 18

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Yang, Jeong Yun, 17

Cytotoxicity of Graphene Oxide Nanoribbons on Human Breast Cancer Cells

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Studies of the Mechanism by which Human Prostate Cancer Cell Death Is Induced by Watercress Extract

Hewlett	<p><u>George W. Hewlett High School</u> <i>Donskoy, Patricia Hanna, 17</i> Guardians Who Are the Last to Know: An Investigation of Why Adolescents Choose Not to Report Bullying to Teachers</p>
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