

The  
Future  
Is Bright



# INTEL STS 2015 Semifinalists





# 2015 Semifinalists

The Intel Science Talent Search (Intel STS), a program of Society for Science & the Public, 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 distinguished science and math honors, including the Nobel Prize and the National Medal of Science. Each year, 300 Intel STS semifinalists and their schools are recognized. From that select pool of semifinalists, 40 student finalists are invited to Washington, DC in March to participate in final judging, display their work to the public, meet with notable scientists, and compete for three top awards of \$150,000 each.

**ALABAMA**

Madison

**James Clemens High School****Abreo, Joshua Cyril, 17**

Multiscale Simulation of Tumor Growth and Angiogenesis: A Model for Pharmacotherapy Assessment and Drug Discovery

Montgomery

**Loveless Academic Magnet Program High School****Macha, Venkata Viswajit, 17**

A Novel Bioelectronic Chip for Noninvasive, Versatile Cancer Detection

**Loveless Academic Magnet Program High School****Rastogi, Ruchir, 17**

Modulation of Macrophage Phenotype Using Nanoparticle-delivered Gene Therapy for Treatment of Inflammatory Diseases

**ARIZONA**

Scottsdale

**BASIS Scottsdale****Gupta, Anvita, 17**

Computational Drug Discovery for Cancer, Tuberculosis, and Ebola by Targeting Intrinsically Disordered Proteins

**ARKANSAS**

Rogers

**Rogers Heritage School****Low, Emily Morgan, 17**

Synthesis, Structure and Properties of New Coordination Polymer Crystalline Solids

**CALIFORNIA**

Aliso Viejo

**Aliso Niguel High School****Wang, Aileen Feng, 17**

A Novel Cancer Diagnosis Framework Using Optimal Point Region Growing Segmentation and Pseudo-Zernike Moments

Cupertino

**Cupertino High School****Tandon, Tanay, 18**

Topographical Computer Vision Algorithms for Rapid, Low-cost Hematological Diagnostics and Parasite Detection Through Random Forests Classification and Van Leeuwenhoek-type Imaging

**Monta Vista High School****Choudhury, Rohan, 17**

Radiative Feedback as a solution to the Cusp-Core and Star Formation Rate Problems

**Monta Vista High School****Poddar, Aunoy, 18**

Can Yeast be an Effective Model for Chemotherapy?

Cypress

**Oxford Academy****Yoon, Kevin Ji Whan, 18**

Fabrication and Modification of Nanofibers with Superhydrophilic- Superhydrophobic Surface for Membrane Distillation

Danville

**Monte Vista High School****Savor, Rohan Anand, 18**

Regulation of Pancreatic Beta Cell Proliferation and Insulin Secretion by Cinacalcet

<b>Fremont</b>	<b><u>Mission San Jose High School</u></b> <b><i>Shrivastava, Vaishnavi, 17</i></b> A Noninvasive Regenerative Stem Cell Treatment for Osteoporosis through an Injectable Nanocomposite Orthopedic Implant and Low-Intensity Pulsed Ultrasound Stimulation
<b>Irvine</b>	<b><u>Arnold O. Beckman High School</u></b> <b><i>McCleary, Jennifer, 17</i></b> Correlating the Bandgaps of Earth-Abundant Metal Oxides to Photocurrent Generation for Water Splitting Applications
	<b><u>University High School</u></b> <b><i>Mandelstam, Yelena, 17</i></b> Arrangements of Minors in the Totally Positive Grassmannian and Sturmfels' Triangulation
<b>La Canada</b>	<b><u>La Canada High School</u></b> <b><i>Zhai, Alice, 17</i></b> A Multi-Variate Regression Model for Hurricane Economic Loss
<b>Moraga</b>	<b><u>Campolindo High School</u></b> <b><i>Jang, Gyu Bin, 18</i></b> Development of a Navigating and Drilling Spiral Microrobot Actuated by a Magnetic Gradient and Rotating Uniform Magnetic Field to Unclog Blocked Human Blood Vessels
<b>Newport Beach</b>	<b><u>Sage Hill School</u></b> <b><i>Goul, Claire, 18</i></b> Phasor-Fluorescence Lifetime Analysis of Cancer Cell Metabolism During Cell Cycle Progression
<b>Palo Alto</b>	<b><u>Castilleja School</u></b> <b><i>Lall, Kriti, 17</i></b> A Novel Bacteria Strain and Bioreactor for Practical Arsenic Water Bioremediation
	<b><u>Henry M. Gunn High School</u></b> <b><i>Wu, Quinn, 17</i></b> A Fast Marching Trees Motion Planning Approach to the Autonomous Space Taxi: Algorithmic Experiments for Proximity Maneuver and Docking
	<b><u>Palo Alto High School</u></b> <b><i>Chang, Joseph, 17</i></b> On the Primality of Complete Binary Trees
<b>Pleasanton</b>	<b><u>Amador Valley High School</u></b> <b><i>Lee, Jihyeon, 17</i></b> An Enhanced Method for HDR Imaging: Artifact-Free and Optimized for Mobile Devices
<b>Riverside</b>	<b><u>Martin Luther King High School</u></b> <b><i>Keremane, Saumya, 17</i></b> An Eco-friendly RNA Interference-based Insect Control for Management of Citrus Greening Diseases Using a Model System
<b>Rolling Hills Estates</b>	<b><u>Palos Verdes Peninsula High School</u></b> <b><i>Ramayya, Shreya, 17</i></b> Defeating Malaria by Utilizing Difluoromethyl- and Trifluoromethyl-Artemisinins to Interrupt the Life Cycle of Malaria Parasites

**Sacramento****Mira Loma High School****Raju, Karthik, 17****Discovery of a Novel Polypeptide Ligand Targeting  $\alpha6\beta4$ -Expressing Pancreatic Adenocarcinoma Cells****Mira Loma High School****Talwai, Prem, 17****Model Order Reduction of Cell Signalling Pathways: An Investigation of the Invasive Mechanism of Ebola Virus****Sheldon High School****Fong, Ryan Avery, 18****Utility of Induced Pluripotent Stem Cell Derived Endothelial Cells as Pulmonary Arterial Hypertension Models****San Francisco****Lowell High School****Li, Willa, 18****Restoring Nf1-GAP Activity Impairs Blast Colony Formation in Nf1-Deficient Murine Acute Myeloid Leukemia****San Jose****Lynbrook High School****Khare, Somya, 18****Changes in Growth Rate and Cytoskeletal Activity During the Starvation Response in *E. coli*****Lynbrook High School****Navaratna, Nidhi A., 17****Comparative Whole-Genome Analysis of the Lager Yeast *Saccharomyces pastorianus*: Investigating Hybrid Origins and Characteristic Genomic Rearrangements****Lynbrook High School****Pandya, Ruchi, 18****Development of a Carbon Nanofiber Electrode-based Biosensor for Cardiac Health Diagnostics****Lynbrook High School****Tam, Allison, 17****A Localized Approach to Stain Normalization for Optimization of Lung Cancer Models and Other Digital Pathology Modeling Applications****The Harker School****Dixit, Shikhar, 17****Immunomodulation by Human Retinal Pigment Epithelial Cell Line ARPE-19****The Harker School****Jin, Andrew, 17****Shedding Light on Human Evolution: Machine Learning Algorithms for Systematic Genome-wide Discovery and Characterization of Adaptive Mutations****The Harker School****Kuditipudi, Rohith, 18****Network-based Integration of High Throughput Gene Expression and Methylation Data Reveals New Insights into NAFLD Progression**

**The Harker School**

***Lin, David, 17***

Physical Properties and Evolution of Gravitationally Bound Halo Structures in Cosmological Dark Matter Simulations

**The Harker School**

***Liu, Cindy Zang, 17***

Characterizing Novel Binders as Tools for Understanding Chloride Transport Mechanisms

**The Harker School**

***Movva, Neil, 17***

Force Responsive Reconstruction: Characterizing the Morphogenesis of the Periodontal Ligament through Complementary Biomechanical and Histological Study

**The Harker School**

***Reddy, Pranav Gudipally, 17***

An Integrative Computational Approach to Decipher Putative Genomic Drivers of Alzheimer's Disease Susceptibility and Progression

**The Harker School**

***Saklecha, Anokhi, 17***

The Utilization of RGD-coated Gold Nanoprisms and Optical Coherence Tomography to Target  $\alpha_v\beta_3$  Integrin: A Novel Method to Detect Circulating Tumor Cells

**The Harker School**

***Shankar, Nikash, 17***

Encapsulation of Curcumin within Polymeric PLGA-PEG Nanoparticles Protects Neuro2A cells from Beta-Amyloid Induced Cytotoxicity and Improves Bioavailability

**The Harker School**

***Somasundaram, Sriram, 17***

A Novel Design and Evaluation of Chitosan Nanoparticle Ocular Drug Delivery System Using Protein-Ligand Docking Simulations and pH-Dependent Corneal Permeation

**The Harker School**

***Vodrahalli, Kailas, 17***

Improving Concentrated Solar Power Technologies: Planar Optical Waveguides for Transporting Concentrated Light to Enable Efficient Energy Conversion

**The Harker School**

***Wang, Steven Michael, 17***

Computer-Aided Genomic Characterization of Colorectal Cancer Driver Alterations for Oncogenic Transformation of Primary Colon Organoids

**The Harker School**

***Wu, Menghua, 17***

Characteristics of Drug Combination Therapy in Oncology by Analyzing Clinical Trial Data on ClinicalTrials.gov

**The Harker School**

***Yu, Leo, 17***

A Novel Algorithm to Unify CMIP5 Ensemble Climate Models for Optimal Climate Projections

**The Harker School****Zhang, Andrew, 17**

The Dearth of Lithium-Rich Red Giants in Globular Clusters

**San Ramon****Dougherty Valley High School****Chemparathy, Augustine George, 17**Accumulation of the Biodiesel Precursor Triacylglycerol Offsets Oxidative Stress in the Model Alga *Chlamydomonas reinhardtii***Dougherty Valley High School****Prembabu, Saranesh, 17**

Coupled Electric and Magnetic Properties in Artificially-Layered Perovskite Thin Films

**Dougherty Valley High School****Yuan, Gina, 17**

Designing Tablets for Personalized Medicine

**Saratoga****Saratoga High School****Bedekar, Neel, 17**

A Novel Approach to True Random Number Generation in Wearable Computing Environments Using MEMS Sensors

**Saratoga High School****Gupta, Agastya, 17**

An Inexpensive, Global, and Effective Means of Diagnosing Heart Disease via Computer Vision

**COLORADO****Boulder****Fairview High School****Zhang, Jesse, 17**

Effect of the Atlantic Ocean on Sudden Stratospheric Warming

**CONNECTICUT****Greenwich****Greenwich High School****Chojar, Jayson, 17**Effects of Evidence Evaluation Placement on Juror Sensitization to Non Case-Specific New Jersey *Henderson* Instructions**Greenwich High School****Dorian, Kenneth, 18**The Remediation of Heavy Metals from Wastewater Using as *Aspergillus niger* Activated Flow Filter**Greenwich High School****Ma, Andrew, 17**

Temperature-Induced Concurrent Removal and Recovery of Wastewater Ammonia-Nitrogen and Other Volatile Compounds

**Greenwich High School****Matonis, Spencer, 17**

Synthesis of a Block Co-polymer for the Manufacturing of a Biodegradable Monomeric Composite

**Greenwich High School**

***Minichetti, Maxmillian, 17***

A Filamentous Organic Solar Cell-based Piezoelectric Architecture for Commercial, Biomedical, and Industrial Applications

**Greenwich High School**

***Pevsner, Spencer K., 17***

The Creation of Recombinant Proteins through Liquid Syncytial Endosperm Found in Coconut Water

**Greenwich High School**

***Russell, Peter, 17***

Design of a Novel Photo-Sensitized Carbon-based Super-capacitor for Capture and Storage of Solar Energy

**DELAWARE**

Wilmington

**Charter School of Wilmington**

***Xu, David, 17***

Machine Learning-based Prediction of Drug Resistance in Tuberculosis

**Charter School of Wilmington**

***Yan, Emily, 17***

Enabling Wind and Solar Energy: An All-Organic Redox Flow Battery for All Weathers

**FLORIDA**

Fort Lauderdale

**Pine Crest School**

***Houle, Lauren, 17***

Investigation of Autophagy in Huntington's Disease Using a Mutant Huntingtin Knock-in Striatal Cell Line

Jacksonville

**Episcopal High School of Jacksonville**

***Crump, Carly Elizabeth, 18***

Characterization of the Mosquito Host Cell Glycoproteins on the Dengue Virus Envelope During Egress

**Episcopal High School of Jacksonville**

***Martin, Nicholas R., 18***

Piezoelectric Wind Energy Harvesting for Powering Wireless Sensor Nodes Using Flutter and Rotation Induced Vibration

Lutz

**George M. Steinbrenner High School**

***Shaw, Golda, 18***

Development of a Novel Blood-Based Diagnostic for Canine Lymphosarcoma

Orlando

**Lake Highland Preparatory School**

***Li, Catherine J., 18***

In-Fiber Emulsification of Biodegradable Polymers for Drug Delivery

Osprey

**Pine View School**

***Niffenegger, James Salvador, 18***

Electrochemical Characterization of Modified Electrodes with Gold Nanoparticles and rHbl Protein



Pensacola	<p><b><u>Pensacola High School</u></b>  <b><i>Crowdis, Jett Parker, 18</i></b>  The Mechanisms, Factors, and Practicality of Iontophoretic Inactivation of Freshwater Bacteria via Electric Current</p>
Vero Beach	<p><b><u>Vero Beach High School</u></b>  <b><i>MacKay, Evan, 18</i></b>  Distribution and Patterns of Movement of the Weevil <i>Diaprepes abbreviatus</i> in <i>Eucalyptus (Corymbia) torelliana</i>, a Fast-Growing Biofuel Crop</p>
<b>ILLINOIS</b>	
Chicago	<p><b><u>Walter Payton College Preparatory</u></b>  <b><i>Kendrick, Lev Haldar, 17</i></b>  On the Lower Central Series Quotients of a Quotient of a Free Algebra</p>
Deerfield	<p><b><u>Deerfield High School</u></b>  <b><i>Benson, Naomi, 18</i></b>  Near-Shore Tsunami Mitigation as a Function of Increases in Bottom Friction</p>
Glen Ellyn	<p><b><u>Glenbard West High School</u></b>  <b><i>Kalinich, Chaney Christine, 18</i></b>  Profiling Phosphatase Activities in Cell Lysates with Peptide Arrays and SAMDI Mass Spectrometry</p>
Lisle	<p><b><u>Benet Academy</u></b>  <b><i>D'Mello, Ryan, 17</i></b>  A New Result on Gaps Between Integer Points on Elliptic Curves with Coverage of Applications to Cryptography</p>
Palatine	<p><b><u>William Fremd High School</u></b>  <b><i>Tian, Hui, 18</i></b>  Adaptive Music Playback with Awareness of Surroundings</p>
Skokie	<p><b><u>Niles Township West High School</u></b>  <b><i>Reyes, Reyvin Michael, 18</i></b>  The Synthesis of Colicin M Using Cell-Free Protein Synthesis</p>
<b>INDIANA</b>	
Fort Wayne	<p><b><u>Homestead High School</u></b>  <b><i>Meruva, Puneeth Naga Sai Krishna, 17</i></b>  An Integrated Software Platform for Autonomous Control of Hyper-Redundant Modular Robotic Systems using State Estimation and Simultaneous Localization and Mapping</p>
Indianapolis	<p><b><u>Park-Tudor School</u></b>  <b><i>Mirmira, Priya, 18</i></b>  Bisphenol A and Type 2 Diabetes: Genuine Concern or Unnecessary Preoccupation?</p>
Mishawaka	<p><b><u>Penn High School</u></b>  <b><i>Alber, Daniel, 17</i></b>  A Genetic Engineering Strategy for the Production of Cancer-Therapeutic Compound Libraries</p>

## IOWA

Iowa City

**West High School**

***Walling, Abigail Lyn, 17***

Significantly Increasing the Concentration of Cellulosic Ethanol using *Cedecea davisae*

Paullina

**South O'Brien High School**

***Koehlmoos, Eric, 18***

Grass to Gas: Phase III, A Study of Calcium Hydroxide Pretreatment on Increasing Ethanol Yield and DDG Feed Value in Switchgrass and Prairie Cordgrass

## KENTUCKY

Louisville

**duPont Manual Magnet High School**

***Jiang, Allen, 17***

Rapid Prototyping Mobile Platform Diffraction Spectrophotometry

Park Hills

**Notre Dame Academy**

***Kendall, Ellen Katherine, 17***

Copper Removal by Alginate Beads

## MARYLAND

Bethesda

**Walter Johnson High School**

***Van Artsdalen, Kathryn, 17***

Characterizing Magnetospheric States

Clarksville

**River Hill High School**

***Crich, Alexander, 17***

A Novel Tandem Mass Tag-based Mass Spectrometry Approach to Discovering New Urinary Protein Biomarkers for Early and Non-Invasive Detection of Bladder Cancer

**River Hill High School**

***Panigrahi, Atman, 17***

Geometry- and Chemistry-Dependent Heat Generation from Al/Mg/Zr Multilayer Foils for Bioagent Defeat

Ellicott City

**Centennial High School**

***Sun, Mengyuan, 17***

Reverse PubMed Search Algorithm

Owings Mills

**McDonogh School**

***Chen, Jack, 17***

Fabrication of Organic Solar Cells by Multi-Layer Inking and Stamping

Poolesville

**Poolesville High School**

***Padia, Umesh Janak, 17***

The Discovery of a Novel TRH-R1 Agonist: A Drug Candidate for Treating Depression, Parkinson's Disease, and Hypothyroidism

Rockville

**Richard Montgomery High School**

***Tang, Zoey, 17***

A Mammalian Expression System Provides Pure, Soluble and Fully Functional HIV-1 Integrase for Crystal Structural Studies and Reveals Novel Posttranslational Modifications

**Richard Montgomery High School**

***Zhang, Yizhen, 17***

Wiring for "Blue" – Connectome of the S-Cone Photoreceptor in the Outer Retina

## Silver Spring

**Montgomery Blair High School*****Das Sarma, Matthew D., 17***

Absorptive Matchings and the Minimum Vertex Cover with Hard Capacities Problem

**Montgomery Blair High School*****Fan, Michael, 17***Universal Scaling of Hadronic Interactions in Quantum Chromodynamics at Large  $N_c$  with Quarks in the Antisymmetric Representation**Montgomery Blair High School*****Gerard, Francis, 18***

Estimating Prime Power Sums

**Montgomery Blair High School*****Lu, William, 17***Understanding Chromatin Structure Regulation by a Genome-wide, *in vivo* Approach to Identify the H2A. Z Binding Proteins**Montgomery Blair High School*****McGlade, Bennet, 17***

Building Artificial Atoms: Synthesis and Characterization of Octylselenolate Protected Au Nanoparticles

**Montgomery Blair High School*****Neyman, Eric Michael, 18***

Cylindric Young Tableaux and Their Properties

**Montgomery Blair High School*****Pandey, Sachin, 17***

Optimizing Nearest Neighbor Search Methods Using Volume Overlap

**Montgomery Blair High School*****Parikh, Ishaan Manish, 17***

Metabolic Profiling of the Different Sub-Populations of Melanoma Cells

**Montgomery Blair High School*****Salgado, Harini Erangika, 17***

Using Kullback-Leibler Divergence to Study the Effects of Vocal Tract Length Normalization on Dialect Differences in Vowel Speech Samples

**Montgomery Blair High School*****Subramanian, Arjuna, 17***

Assessing Ionization Mechanisms for Organic Compounds at the Gas-Liquid Interface

**Montgomery Blair High School*****Winer, Michael, 18***

Interactions of Electrons and Phonons in a Crystal

**Montgomery Blair High School*****Zhao, Dennis, 17***

Definite Transcript Expression Thresholds Improve Detection Accuracy in RNA-seq Profiling

Towson

**Towson High School**

**Borgia, Eitan, 17**

Characterization of MICAL1, a Monooxygenase Involved in Axon Guidance

## MASSACHUSETTS

Andover

**Phillips Academy**

**Arya, Tejasv, 18**

Inhibition of Ubiquitin Like Pathways in *Leishmania donovani in vitro* Leads to Decreased Macrophage-Parasite Burden ex vivo

**Phillips Academy**

**Gu, Angela, 17**

Inducing Zeroes in Non-negative Matrix Factorization for Cancer Class Discovery and Analysis

**Phillips Academy**

**Venigalla, Abhinav Sai, 17**

Rare Events and Hidden Supersymmetry in Systems away from Equilibrium

Boston

**Boston Latin School**

**Wara, Nafisa Jerin, 17**

Characterization, Optimization, and Development of a *Mycobacterium tuberculosis* Antigen Detection Assay

Brookline

**Brookline High School**

**Xu, Jen, 18**

Polycystin-1 and Ga12 regulate the cleavage of E-cadherin in Kidney Epithelial Cells

Lexington

**Lexington High School**

**Golowich, Noah, 17**

Resolving a Conjecture on Degree of Regularity, with some Novel Structural Results

**Lexington High School**

**Seong, Daniel, 18**

Novel Systematic Prioritization Method and Sensitive Monitoring of Critical Phosphorylation Sites in Huntington's Disease

Newtonville

**Newton North High School**

**Gandhi, Kavish, 17**

Minimal Saturated Subgraphs of the Hypercube

Worcester

**Massachusetts Academy of Math and Science**

**Kumar, Ayush, 18**

The Cytotoxic Effect of *Borrelia burgdorferi*: Lyme Disease Research in a Zebrafish Model

**Massachusetts Academy of Math and Science**

**Michel, Jesse Martin, 18**

Machine Learning Reveals Pan-Cancer Diagnostic Biomarker

**Worcester Academy**

**Chiang, Charles Lee, 17**

Axon Targeting Deficit Established in Olfactory Bulbs of the Ts65Dn Down Syndrome Model

**MICHIGAN**

Beverly Hills

**Detroit Country Day School*****Jasti, Naveen, 17***An Investigation of the p53 Inhibitor MDM2 in the Invertebrate Species  
*Tribolium castaneum***Detroit Country Day School*****Shao, Michael, 18***A Transcriptional Analysis of Heterogeneity in Murine AgRP and MC4R Neurons within the  
Murine Appetite Control Circuit

Bloomfield Hills

**International Academy*****Mukundan, Aditya, 17***

Self-Assembled Nanometer Sized Magnetic Sensors and Arrays for Biomagnetic Imaging

Okemos

**Okemos High School*****MacGuidwin, Scott, 18***

Effects of Homocysteine on Amyloid Poration and Cross-Cooperativity

Walled Lake

**Walled Lake Western High School*****Nandigala, Vipul A., 17***

Methods of Particle Separation in Micro Fluidic Channels

**MINNESOTA**

Duluth

**Duluth East High School*****Renier, Tim, 17***Hand Hygiene Gone Viral? A Study of Student Involvement in a Social Media Campaign as a  
Method of Bringing Hand Hygiene to the Masses

Plymouth

**Wayzata High School*****Dai, Bo, 18***

Predicting RAD51 Working Partners by Random Peptide Phage Display

**Wayzata High School*****Parhi, Rahul, 17***

Reliable Digital Arithmetic Computing Systems in Presence of Faults

Rochester

**John Marshall High School*****Bram, Alanna Megan, 17***Determination of Factors that Impact Clearance of Suspended Particulate  
Matter in Air**Mayo High School*****Campeau, Michelle, 17***Comparative Evaluation of Electrical Strategies for Eradication of *Staphylococcus*  
*epidermidis* Biofilms**MISSOURI**

St. Louis

**Mary Institute and St. Louis Country Day School*****Gornet, James, 18***A Biological Architecture for Emulating a Central Processing Unit Using Serine Integrases  
and Transcription Factors

## NEBRASKA

Omaha

**Millard North High School**

***Subramaniam, Pranav, 18***

A Diffie-Hellman Style Quantum Protocol Using Commuting Rotation Operations

## NEW JERSEY

Demarest

**Northern Valley Regional High School**

***Jeong, Jin Oh, 18***

The Strong Potential of PIP (Prolactin Induced Protein) as Both a Detection and Prognostic Biomarker in Breast Cancer and its Comparative Analyses with ER, PR, HER2, and MKI67

Hackensack

**Academy for Medical Science Technology**

***Choi, Yewoon, 17***

Spent Tealeaves-Chitosan Capsules as Potential New Adsorbent of Copper(II) From Contaminated Wastewater

**Academy for Medical Science Technology**

***Kim, Nicole Jisoo, 17***

Syndecan-1 (SDC1) and Fibroblast Growth Factor 2 (FGF2) May Play a Role in Metastatic Potential of CD30+ Reed Sternberg Hodgkin Lymphoma Cells

**Academy for the Advancement of Science and Technology**

***Eskow, Nicole, 18***

A Novel Use of Valeryl Salicylate in the Inhibition of Chronic Myelogenous Leukemia Cell Proliferation: Targeting STAT6- and PGE<sub>2</sub>-Dependent Mechanisms

**Academy for the Advancement of Science and Technology**

***Kim, Grace Shin Hye, 18***

Elucidating the Impact of Exogenous Exosomes on Astrocytes

**Academy for the Advancement of Science and Technology**

***Sabini, Mark William, 17***

Facile Fabrication of BaTiO<sub>3</sub> Nanogenerator Using Rotational Electrospinning

**Academy for the Advancement of Science and Technology**

***Wan, Tracy Meng, 17***

The Effects of Titanium Dioxide Nanotubes on the Photodegradation of Methyl Orange for Wastewater Decontamination

**Academy for the Advancement of Science and Technology**

***Yu, Justin, 17***

A Novel Approach to Managing Inflammation and Improving Immune Function in Chronic Lymphocytic Leukemia Treatment

**Academy for Visual and Performing Arts**

***Martin, Isabella Helen, 17***

The Effect of Ethoxyquin and Valproic Acid on the Chemotherapy-Induced Degeneration of Astrocytes

Jersey City

**Dr. Ronald E. McNair Academic High School**

***Anandapadmanaban, Eswar, 17***

The ThereNIM: A Touch-less Respiratory Monitor

<b>Lincroft</b>	<p><b><u>High Technology High School</u></b>  <b><i>Joshi, Ananya, 17</i></b>            Targeting Alzheimer's Disease by Designing Peptide Inhibitors of <math>\beta</math>-Amyloid Aggregation</p> <p><b><u>High Technology High School</u></b>  <b><i>Luo, Queenie, 17</i></b>            Shoe Charger for Cell Phones: Generating Sufficient Battery Power Through Everyday Walking</p>
<b>Martinsville</b>	<p><b><u>The Pingry School</u></b>  <b><i>Karuppur, Abhiram, 17</i></b>            The Effect of MEK-Inhibition on the Motility and Protein Expression of Rat Prostate Cancer Cells</p> <p><b><u>The Pingry School</u></b>  <b><i>Shim, Peter C., 17</i></b>            On the Chromatic Number of Some Small-Dimensional Euclidean Spaces</p>
<b>Millburn</b>	<p><b><u>Millburn High School</u></b>  <b><i>Lin, Alexander, 17</i></b>            Approximating the Maximum <math>k</math>-Colorable Subgraph Problem on Dotted Interval Graphs</p>
<b>Plainsboro</b>	<p><b><u>West Windsor-Plainsboro High School North</u></b>  <b><i>Huang, Brice, 17</i></b>            Monomization of Power Ideals and Generalized Parking Functions</p>
<b>Skillman</b>	<p><b><u>Montgomery High School</u></b>  <b><i>Fan, David Jiatian, 17</i></b>            Heart-Tissue Specific Modulation of Rpd3 Protein Expression Controls Heart Function and Stress Resistance in Fruit Flies</p>
<b>Summit</b>	<p><b><u>Kent Place School</u></b>  <b><i>Li, Jessica, 17</i></b>            On the Modeling of Snowflake Growth Using Hexagonal Automata</p>
<b>NEW YORK</b>	
<b>Albany</b>	<p><b><u>The Albany Academies</u></b>  <b><i>Baghel, Ankit Singh, 18</i></b>            Proteasome-Directed Degradation of <math>\alpha</math>-Synuclein via Camelid Nanobodies</p>
<b>Armonk</b>	<p><b><u>Byram Hills High School</u></b>  <b><i>Carlin, Greg, 17</i></b>            The Development of a Query Cost Model for the Weakly Dependent Subquery Optimization of the Stack-Based Query Language</p>
<b>Bellmore</b>	<p><b><u>John F. Kennedy High School</u></b>  <b><i>Brown, Beatrice, 18</i></b>            Forecasting Hurricane Hazards for the Long Island Area</p> <p><b><u>John F. Kennedy High School</u></b>  <b><i>Epstein, Samuel, 18</i></b>            The Effects of the Modulation of TOR Signaling and Microbial Exposure on Feeding Behavior in <i>Drosophila melanogaster</i></p>

**John F. Kennedy High School**

***Shapiro, Justin Daniel, 17***

An Analysis of Corporate Response to Climate Change

**Bronx**

**Bronx High School of Science**

***Dale, Michele Genevieve, 17***

Cognitive Inhibition Training Significantly Improves Selective Attention in Subjects with Poor Attention

**Bronx High School of Science**

***Donheiser, Julia Renée, 17***

Learning Disability and Autism Prevalence in New York State: The Effects of Common Core State Standards Adoption, District Resource Need, and Urbanization

**Bronx High School of Science**

***Khan, Farzana, 17***

Genetic Analysis of Toll-like Receptor Signaling in Neurodevelopment

**Bronx High School of Science**

***Kioulaphides, Sophia, 17***

Mathematical Modeling of Determining the Optimal Parameters for the Highest Possible Learning Efficiency in Artificial Neural Networks

**Bronx High School of Science**

***Liberman, Martin, 17***

Requirement of *nkx2.5* in Heart Development

**Bronx High School of Science**

***Ma, Lily, 19***

Characterizing Ear2 Gene in Alternatively Activated Macrophages and Its Potential Anti-Helminth Property in Helminth Infections

**Bronx High School of Science**

***Marks, Gurion, 17***

The Development of a Novel Fusion Protein to Facilitate Connectomic Analysis of Brain Networks

**Bronx High School of Science**

***Thach, Daniel, 17***

Relationship Between Oceanic Core Complexes and Magnetic Anomalies and Implications for the Marine Magnetic Anomaly Source Layer

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**Midwood High School at Brooklyn College**

***Ben, Charlynn Trish Magdale, 17***

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***Hafez, Omar Amr, 17***

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<b>Cross River</b>	<p><b><u>John Jay High School</u></b>  <b><i>Tobin, Tess Woerner, 17</i></b>  Determining the Superior Pheromone and Essential Oil for the Management of the Highly Invasive Brown Marmorated Stinkbug, <i>Halyomorpha halys</i></p>
<b>Croton-on-Hudson</b>	<p><b><u>Croton-Harmon High School</u></b>  <b><i>Grossman, Emily Mina, 18</i></b>  Assessing the Range of Motion of the Upper Limb in a Modified Box and Block Test</p>
<b>Dix Hills</b>	<p><b><u>Half Hollow Hills High School East</u></b>  <b><i>Edwards, Ben, 17</i></b>  Simulations of Quantum Key Distribution to Investigate the Likelihood of Detecting an Eavesdropper</p>
<b>East Amherst</b>	<p><b><u>Williamsville East High School</u></b>  <b><i>Chin, Felix Tian, 18</i></b>  Detection of Lipid Interactions with Ion Channels in Native-Like Membrane Environments</p>
<b>East Setauket</b>	<p><b><u>Ward Melville High School</u></b>  <b><i>Ju, Jessica, 18</i></b>  Using Python to Apply Phonological Rules for the Transcription of Korean</p> <p><b><u>Ward Melville High School</u></b>  <b><i>Wang, Eric Edward, 18</i></b>  A Novel Approach to Water Desalination: Reverse Osmosis by Fabrication of Graphene Oxide Membranes</p>
<b>Elmont</b>	<p><b><u>Elmont Memorial High School</u></b>  <b><i>Ekeh, Harold, 17</i></b>  The Role of PARP-1 in MeHg-induced Dopaminergic Dysfunction and Mitochondrial DNA Depletion</p>
<b>Flushing</b>	<p><b><u>Townsend Harris High School</u></b>  <b><i>Lee, Yarim, 17</i></b>  Terminating the Progression of Amyloidosis: The Primary Cause of Alzheimer's Disease</p>
<b>Fresh Meadows</b>	<p><b><u>St. Francis Preparatory School</u></b>  <b><i>Correa, Natalie Ann, 17</i></b>  Mastering the Reproductive Biological Clock</p> <p><b><u>St. Francis Preparatory School</u></b>  <b><i>Gopal, Ariana, 18</i></b>  Evidence of Association between Subclinical Psychotic Symptoms and Social Cognitive Dysfunction</p>

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- Garden City Park**            **Mineola High School**  
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- Mineola High School**  
***Ring, Charlotte, 17***  
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- Great Neck**                    **John L. Miller Great Neck North High School**  
***Beeferman, Monica, 18***  
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- John L. Miller Great Neck North High School**  
***Lin, Jessy, 17***  
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- William A. Shine Great Neck South High School**  
***Jang, Robbin, 17***  
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- William A. Shine Great Neck South High School**  
***Zussman, Jay, 17***  
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- Hewlett Bay Park**            **Stella K. Abraham High School for Girls**  
***Radinsky, Ilana, 17***  
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- Jericho**                        **Jericho Senior High School**  
***Li, Ien, 17***  
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- Jericho Senior High School**  
***Zheng, Crystal, 17***  
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- Jericho Senior High School**  
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<b>Latham</b>	<p><b><u>Shaker High School</u></b>  <b>Ali, Muhammad Mujtaba, 17</b>  The Unique and Disease Protective Mutation A2T changes the Dynamics of Amyloid <math>\beta</math>: An REMD Simulation and Solution NMR Study</p>
<b>Lincolndale</b>	<p><b><u>Somers High School</u></b>  <b>Laredo, Dalia, 17</b>  The Development of an Oil Filter that Uses Biowaste as the Sorptive Media</p>
<b>Manhasset</b>	<p><b><u>Manhasset High School</u></b>  <b>Dong, Emma Jing, 17</b>  Custom Multilayered Nanoparticles in Targeted Hyperthermia for Cancer Treatment Using COMSOL Multiphysics Modeling and Near-Infrared Plasmonic Photothermal Therapy</p> <p><b><u>Manhasset High School</u></b>  <b>Kim, Jessica, 18</b>  Enhancing the Power Conversion Efficiency of Inverted Organic Photovoltaics with Gold-Functionalized Reduced Graphene Oxide and Phase-Separated Polymer Morphology</p> <p><b><u>Manhasset High School</u></b>  <b>Yom, Typher, 17</b>  Fabrication of N-Doped Graphene Coated over Silicon Carbide as a Cathode in Improving Metal Air Cells via the Acidic 4-Electron Pathway Oxygen Reduction Reaction</p>
<b>Manlius</b>	<p><b><u>Fayetteville-Manlius High School</u></b>  <b>Khurana, Jay, 18</b>  GESPA: A Novel Bioinformatics Tool for Prediction and Early Diagnosis of Genetic Disease</p>
<b>Montrose</b>	<p><b><u>Hendrick Hudson High School</u></b>  <b>Munitz, Jazz Alexander, 17</b>  Microfluidics-Facilitated Synthesis and Characterization of Apoptosis-Inducing Low-Cost Nanoparticles for Cancer Therapeutics</p>
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<b>New York</b>	<p><b><u>Hunter College High School</u></b>  <b>Firester, Kalina D., 17</b>  The Role of Fatty Acid and Retinol Binding Proteins (FARs) During Host Parasitism by RKN <i>Meloidogyne spp.</i></p> <p><b><u>Hunter College High School</u></b>  <b>Hamerling, Sarah, 17</b>  On the 2- and 3-Dimensional Cylindrical Nonlinear Poisson-Boltzmann Equation</p>

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**Hunter College High School**

***Yu, Glenn, 17***

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**Stuyvesant High School**

***Charnis, Daniel, 18***

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#### The Wellington School

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### Eagleville

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College Station	<u><b>A&amp;M Consolidated High School</b></u> <b>Xie, Jianing, 17</b> Generalized Interatomic Two-Body Potential-Energy Function
Colleyville	<u><b>Colleyville Heritage High School</b></u> <b>Banerjee, Souvik, 17</b> Design of a Novel <i>in situ</i> Raman Spectroscopy Cell for Lithium Ion Batteries

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- Denton**                    **Texas Academy of Mathematics and Science**  
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- Texas Academy of Mathematics and Science**  
***Hashe, Michael Jeffrey, 18***  
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- Texas Academy of Mathematics and Science**  
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- Texas Academy of Mathematics and Science**  
***Jiang, Tiffany, 17***  
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- Texas Academy of Mathematics and Science**  
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- Houston**                    **Carnegie Vanguard High School**  
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**Thomas Jefferson High School for Science and Technology*****Cha, Tim, 17***

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**Bellevue**                    **Interlake High School**  
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**Appleton**                    **Appleton North High School**  
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**Oconomowoc**                    **Oconomowoc High School**  
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## **OVERSEAS SCHOOLS**

### **CHINESE TAIPEI**

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