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REGENERON SCIENCE TALENT SEARCH
2024 SCHOLARS

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2024 SCHOLARS

The Regeneron Science Talent Search (Regeneron STS), a program of Society for Science, is the nation's most prestigious science and math competition for high school seniors. 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 Regeneron STS scholars and their schools are recognized. From that select pool of scholars, 40 student finalists are invited to participate in final judging, display their work to the public, meet with notable scientists and compete for awards, including the top award of $250,000.

ALABAMA

Montgomery

Loveless Academic Magnet Program High School
Rastogi, Rhea, 18
Understanding How the Maternal Epigenetic Reprogramming Function of LSD1
Contributes to Inherited Developmental Disease

ALASKA

Juneau

Thunder Mountain High School
Djajalie, Elizabeth, 18
Quantitative Environmental DNA Metabarcoding for the Enumeration of Pacific Salmon
(*Oncorhynchus* spp.)

ARIZONA

Chandler

BASIS Chandler
Avlani, Harshil, 17
Analyzing the Effect of Mid-Circuit Measurement (MCM) on Spectator Qubits

Hamilton High School
Li, Alexis, 17
BrainSTEAM: A Practical Pipeline for Connectome-Based fMRI Analysis Toward Brain
Disorder Classification

Phoenix

BASIS Phoenix
Mamtani, Bhuvi, 18
Identifying Potential Markers To Combat Afatinib Resistance in Esophageal
Adenocarcinoma

Scottsdale

BASIS Scottsdale
Peddi, Sruti, 17
FloodCast: Real-Time Flood Mapping and Prediction in Southeast Asia Using Remote
Sensing Data

ARKANSAS

Hot Springs

Arkansas School for Mathematics, Sciences & the Arts
Sonputri, Aarohi, 18
Small Molecule Stabilization of the *CARD11* G-Quadruplex Represses Transcription:
Developing a Therapeutic Target for Diffuse Large B-Cell Lymphoma

CALIFORNIA

Atherton

Menlo School
Babel, Noah Kalyn, 17
Stable Equilibria Under Random Fitness and Recombination Rates

Belmont

Carlmont High School
Zhang, Colin, 17
Complete Molecular Structure Prediction From Infrared Spectroscopy Using
Deep Learning

Cupertino

Homestead High School
Chakravarthy, Arnav N., 18
Leveraging Mitochondrial DNA Mutations for Macrophage Lineage Tracing
in Primary Human Tissues

Dublin

Dublin High School
Wu, Richard, 17
BiblioBERT: Sentence Transformer-Based Semantic Recommendation Engine Using Large Language Model-Enhanced Query Segmentation for Personalized Bibliotherapy Recommendations

Eastvale

Eleanor Roosevelt High School
Saxena, Krrishika, 17
Development of a Simple, Affordable Zinc Oxide-Zeolite Chemiresistor VOC Sensor To Detect Colorectal Cancer From the Exhaled Breath: A Solution for the Underserved Communities

Fremont

Mission San Jose High School
Li, Brian Minghan, 18
Intertwining Operators Between Subregular Whittaker Modules for gl_N and Non-Standard Quantizations

Mission San Jose High School
Lin, Felix, 18
Creation of WAL-SEA: The First Shallow-Ocean Multifunctional Remotely Operated Vehicle (ROV) for the Study of Near-Shore Ocean Ecosystems

Hillsborough

Crystal Springs Uplands School
Sun, Katie, 18
Designing a Novel Primer Blocker Using Bioconjugation of Single-Stranded Binding Protein and Oligonucleotides for Improved KRAS Mutation Detection

Irvine

University High School
Ji, Howard, 17
Development of a Novel Autonomous Column-Climbing Robotic System (AutoBot) for Real-Time Detection and Mapping of Surface Cracks on Bridges

University High School
Wu, Julianne, 17
Sex-Related Signaling of the Angiotensin II Pathway in Primary Aortic Smooth Muscle Cells

Woodbridge High School
Hua, Katherine, 17
An AI-Powered Assistive Device for the Visually Impaired

La Canada

La Canada High School
Backer Peral, David Rodrigo, 17
Hot Button: Non-Invasive Approach for Studying Aggressive States

Los Angeles

Geffen Academy at UCLA
Sampath, Rohan, 17
Synthesis and Characterization of PEDOT:Algs — Biomacromolecules for Boosting Hydrogel Conductivity

Mountain House

Mountain House High School
Prawira, Jordan, 17
Pura Aer 2: Dual-Stage, Energy-Efficient, Modular Air Purifier System Inspired by Porifera To Improve Air Quality

Oakland

Bishop O'Dowd High School
Gonzalez, Ethan Ryan, 18
Impact of Electric Fields on Aqueous Phase Contaminants

Palo Alto

Henry M. Gunn High School
Fan, Roger J., 18
Multidisperse Random Sequential Adsorption and Generalizations

Palo Alto High School
Verma, Avi, 17
Novel Neural Network Models for Predicting Mental Health Outcomes in the U.S.
Youth Population

Pleasanton

Amador Valley High School
Joshi, Ishan Milind, 17
Development of a Mycorrhizae-Assisted Plant Microbioelectrochemical Fuel Cell
for Optimized Bioelectricity Production and Copper Sulfate Mycorrhizoremediation

Redwood

Sequoia High School
Liou, Collin, 17
Programmable Multistability and Rigid Flattenability in Origami Cubes by Adding
a Minimal Cut

Sacramento

Mira Loma High School
Srikanth, Hari, 18
Multimodal Computer Vision and Novel Reinforcement Learning for Robot Navigation
in Fires

San Diego

Canyon Crest Academy
Fan, Michelle, 17
A High-Throughput Screening Pipeline Targeting Mitochondrial Energetic Dysfunction
in Patient-Derived Neurons

Del Norte High School
Arora, Aarav, 18
A Mechanistic Basis for the Analysis of SARS-CoV-2 Omicron Variant Severity

Del Norte High School
Zhang, Jocelyn, 18
Novel Photoluminescence Recovery Method of Porous Silicon Quantum Dots
for Bioimaging Application

San Jose

BASIS Independent Silicon Valley
Singh, Sanskriti, 17
CheX-Nomaly: Segmenting Lung Abnormalities From Chest Radiographs
Using Machine Learning

Branham High School
Liang, Eric, 17
Predicting Pedestrian Crosswalk Behavior Using Convolutional Neural Networks

Notre Dame High School
Srinivasan, Maya Gabrielle Aler, 18
Optogenetically Examining Channelrhodopsin and CsChrimson-Stimulated Locomotive
Behavior To Classify "Moonwalker" Stalling in *Drosophila melanogaster*

The Harker School
Lan, Ella Selina, 17
Creating HD-Performer: A Biomedical Waveform Transformer With Two New Attention
Modules, TSA and SPA, for Diabetes Detection

The Harker School
Wei, Michelle, 17
Solving Second-Order Cone Programs Deterministically in Matrix Multiplication Time

The Harker School
Yee, Ella, 18
Identification of Circadian Regulator ARNTL2 and Associated Genes as Novel Biomarkers for Cancer Progression

The Harker School
Zhang, Ryan Ruien, 18
PEDS-AI: A Deep-Learning-Based UAV System for In-Field Insect Species Identification and Pest Early Detection

The Harker School
Zhang, William, 18
A ChatGPT-Based System With Semi-Closed Domain as an Automatic Online Teaching Assistant in Math Education

Valley Christian High School
Wu, Samantha, 18
Effect of Storage Conditions on Small Noncoding RNA Concentrations in Human Milk Using the Size Exclusion Chromatography Method for Extracellular Vesicle Isolation

San Ramon

Dougherty Valley High School
Kolluru, Vaishnavi, 17
Human Milk Immune Complexes Isolated Following Pregnancies Complicated by COVID-19 Infection Contain SARS-CoV-2 Nsp13 Helicase and Biologically Active Factors

Dougherty Valley High School
Zou, Charisse, 17
The Development of a Free-Flying Method To Study the Effect of Neonicotinoids on the Positive Transfer of Learning in the Visual Domain of Honeybees

Saratoga

Saratoga High School
Fung, Esabella Sunshine, 17
A Machine Learning Approach for Assessing Labor Supply to the Online Labor Market

Saratoga High School
Kaya, Zeyneb N., 17
MADLIBS: A Novel Multilingual Data Augmentation Algorithm for Low-Resource Neural Machine Translation

Saratoga High School
Liao, Kyleen, 17
Simulating the Air Quality Impact of Prescribed Fires Using a Graph Neural Network-Based PM2.5 Emissions Forecasting System

Thousand Oaks

Thousand Oaks High School
Moreno, Jr., Ramon, 17
The Influence of Isonicotinamide on the Chronological Lifespan of *Saccharomyces cerevisiae* Strains

Ukiah

Developing Virtue Secondary School
Wang, Katherine Huaizhen, 18
Whole-Genome Variant Detection in Long-Read Sequencing Data From Ultra-Low Input Tumor Samples

Union City   **James Logan High School**
Kolluru, Anoushka, 18
Investigating the Proliferation, Invasion and Resistance to Chemotherapy-Induced
Apoptosis of A549 Lung Cancer Cells in Relation to Synthetic Nicotine Exposure

COLORADO

Boulder   **Fairview High School**
Arthur, Margaret Madeleine, 18
A Novel Phosphosite Localization Approach Using Tandem Phosphoprotein Mass Spectra
and Temporal Dilated Networks

Fairview High School
Cao, Elton, 17
National Ground-Level NO_2 Predictions via Satellite Imagery-Driven Convolutional
Neural Networks

Greenwood Village   **Cherry Creek High School**
Bhavikatti, Neil, 17
On Algorithmic Cache Optimization

Highlands Ranch   **Rock Canyon High School**
Avinash, Aditi, 17
Model Validation and Preclinical Testing of Digestive Enzymes for Gluten Breakdown:
A Move To Cure Gluten Intolerance and Celiac Disease

Lafayette   **Peak to Peak Charter School**
Saini, Amrita, 18
Investigating Hydrogels To Sustain *Pyrocystis fusiformis* for Natural Lighting and Carbon
Dioxide Removal

CONNECTICUT

Greenwich   **Greenwich High School**
Li, Lucy, 17
Footprint Reduction of PET Fiber Waste in Refuse Environments via Non-Toxic
Ideonella sakaiensis Degradation

Greenwich High School
Lin, Audrey, 17
Eco-Friendly Remediation of Polycyclic Aromatic Hydrocarbons in Stormwater
via Magnesium-Infused Calcite Crystal, Supramolecular Hydrogel Scaffolding

Greenwich High School
Park, Naomi, 17
Development and Life Cycle Assessment of a Novel, Multi-Functional Remediation
Framework for the Concurrent Removal of Oceanic Carbon Dioxide and Oil-in-Water
Contaminants

New Canaan   **New Canaan High School**
Huang, Luke, 17
Binary Cellular Analysis: Understanding the Link Between Aging and Mortality Risk

Stamford   **King School**
Kolb, Antonia Maria, 18
DETICKT IT: A Machine Learning-Based Application for Real-Time Tick Identification
and Spatiotemporal Disease Risk Assessment

Wallingford	**Choate Rosemary Hall** **Wu, Isabella, 17** ST-TopoCAN: A Novel Histopathological System for Clinical Prediction With Topology- and Spatial Genome-Informed Deep Learning
Woodbridge	**Amity Regional High School** **Bhattamishra, Aditi, 18** The SFSA Ankle: A Novel Smart Fluidic Servo Actuator With Real-Time Environment Sensing for Low-Cost, Low-Power, High-Efficiency Transtibial Bionics

DELAWARE

Hockessin	**Sanford School** **Kahlon, Amanrai Singh, 17** Enhancing Wearable Gait-Monitoring Systems: Identifying Optimal Kinematic Inputs in Typical Adolescents

FLORIDA

Delray Beach	**American Heritage School Boca-Delray** **Mohanty, Maya, 18** Utilizing *Caulobacter crescentus* To Target the NF-κB-Bcl-2 Pathway and BH3-Only Proteins To Induce Apoptosis in Nasal Squamous Cell Carcinoma
Fort Lauderdale	**Pine Crest School** **Ghanta, Priya, 18** Soluble Plasma Proteins of Tumor Necrosis Factor and Immunoglobulin Superfamilies Reveal New Insights Into Immune Regulation in People With HIV and Opioid Use Disorder
	Pine Crest School **Martoma, Joshua, 18** Predicting Criminal Recidivism With an Ensemble Machine Learning Model Using Logistic Regression, Random Forests and Neural Networks
Gainesville	**Buchholz High School** **Wei, Nathan, 17** Novel Elastomeric Polystyrene via Photopolymerization and Post-Functionalization of Durable Ultra-High Molecular Weight Perfluorostyrene Copolymers
Miami	**Miami Palmetto Senior High School** **You, Sunny, 17** Predicting Future Tropical Cyclone Intensity Using a Convolutional Neural Network and 20 Years of IMERG Satellite Rainfall Data
	School for Advanced Studies — Wolfson **Akerman, Milo, 18** Classification of Poisonous *Russula* Species Using CBAM-Integrated Convolutional Neural Networks and Bayesian Optimization
Ocala	**Vanguard High School** **Shaquib, Rishit Arnav, 17** Bi-Directional Hygiene: Evaluating the Use of Artificial Microbiomes of Commensal Bacteria To Combat Nosocomial Infection

Oviedo

Oviedo High School
Pilacek, Ella, 17
Promoting Attraction of *Apis mellifera* to the Synthetic Scent of the Endangered Orchid *Prosthechea cochleata* Using Pavlovian Conditioning and Direct Feeding Paradigms for Conservation

Plantation

American Heritage School
Federici, Jacob Noah, 18
Mitigation of Decreased Protein Synthesis Under Elevated Carbon Dioxide in *Arabidopsis thaliana* Using Transgenic and Exogenous Approaches

American Heritage School
Mehta, Akansha, 17
Quorum Quenching Potential of Novel Phytochemicals on *Chromobacterium violaceum* Quorum Sensing

American Heritage School
Pulmano, Lorenzo, 17
A Microwave-Based Machine Learning Approach To Predict Eyewall Replacement Cycles

Satellite Beach

Satellite High School
Stout, Lana L., 17
Accelerating Carbon Sequestration Through Olivine Using Direct Mineral Carbonation With Carbonic Acid

Stuart

Martin County High School
Goyal, Nira, 17
Quantification of *Macrophomina phaseolina* Survival After Organic Soil Treatments Under Multiple Temperature Regimes

Tampa

Berkeley Preparatory School
Flitman, Hannah, 18
Exploring Racial Disparities in Auto Insurance Pricing: A Novel Geographical Information Systems Approach to Analyzing Fatality and Rate Discrepancies

Wesley Chapel

Wiregrass Ranch High School
Manjith, Meghna, 18
Preventing Surgical Site Infections: Designing a Novel Post-Surgical Treatment Using Silver Nitrate and Ayurvedic Extracts in Combination With DNA Sequence Analysis

GEORGIA

Alpharetta

Innovation Academy
Zhou, Cyrus Ma, 16
An Acoustic Noise Reduction Hood for Infant MRI

Johns Creek

Johns Creek High School
Dalal, Rohan Keyur, 17
Neuromesodermal Progenitor Cells Give Rise to Blood Through a Myoblast/Hemangioblast Bipotential Intermediate

Martinez

Augusta Preparatory Day School
Huo, Emily Xingbao, 17
Targeting Macrophage Glycolysis Suppresses Kidney Scarring in a Rodent Model

HAWAII

Honolulu

Kamehameha Secondary School
Murata, Madison Rieko Hiilani, 17
Studies on *Gracilaria salicornia*: Zinc Oxide (ZnO) Sunscreen Exposure
and Use as Agricultural Fertilizer

ILLINOIS

Barrington

Barrington Community High School
Zhu, Anthony, 17
Detection of COVID-19 Through a Heptanal Biomarker Using Transition
Metal-Doped Graphene

Chicago

Whitney Young Magnet High School
Agrawal, Nikita, 18
A Novel Approach for Predicting Large Wildfires Using Machine Learning Toward
Environmental Justice via Environmental Remote Sensing and Atmospheric
Reanalysis Data Across the United States

Lincolnshire

Adlai E. Stevenson High School
Agrawal, Shaurya, 17
Combinatorial Optimization and Machine Learning To Predict Optimal Cell-State
Conversion Paths

Adlai E. Stevenson High School
Kovvuri, Srikar, 18
Multifaceted Wildfire-Induced Risk Assessment for Electric Power Grid: An Analytical
Approach With Implications for Resilient Infrastructure

Palatine

William Fremd High School
Gupta, Aditya, 18
Agri-GNN: A Novel Genotypic-Topological Graph Neural Network Framework Built
on GraphSAGE for Optimized Yield Prediction

INDIANA

South Bloomington

Bloomington High School
Choi, Grace Seyoung, 18
Improving Transient Expression of Recombinant Proteins in *Nicotiana benthamiana* Using
Color-Optimized Plastic Mulch Covers

West Lafayette

West Lafayette Junior-Senior High School
Kim, Joshua J., 17
Camouflaged and Biosafe QR Code Bioprinting and Protein Tagging:
Combatting Medicine Counterfeiting

KENTUCKY

Lexington

Paul Laurence Dunbar High School
Vulakh, Joseph Amichai, 17
Positive Traces on Deformations of Kleinian Singularities of Type D

Louisville

duPont Manual Magnet High School
Kar, Shraman, 17
Dynamic Layer Pruning and Quantization Using Proximal Policy Optimization:
A Synergistic Approach for Efficient Deep Learning Models

LOUISIANA

Shreveport

C. E. Byrd High School
Hunter, Leslie Elizabeth, 17
To What Extent Do Pesticides Alter Antioxidant Properties Found Within Rabbiteye Blueberries?

Caddo Parish Magnet High School
Chen, Sophie, 17
Intraoperative Histological Analysis of Squamous Cell Carcinoma Tumor Margins Using a Convolutional Neural Network

MARYLAND

Clarksville

River Hill High School
Tang, Eric, 17
Building Redundancy for Resilient Distributed Optimization

Ellicott City

Centennial High School
Gao, William, 18
Designing a Federated Learning-Driven Collaborative Diagnostic System for Metastatic Breast Cancer: Reducing Long Diagnosis Delays and Improving Patient Survival Outcomes in Developing Countries

Centennial High School
Ghosh, Ishani, 18
Saturated Lipid-Mediated Abrogation of Neurogenesis: A New Paradigm for Therapeutic Implication in Traumatic Brain Injury Among Obese and High Lipid-Indexed People

Poolesville

Poolesville High School
Mathew, Daniel, 17
MiniMesh: Real-Time 5,000-Node Anatomical Human Body Mesh Reconstruction for Portable Devices

Poolesville High School
Stammers, Milo, 18
On Elementary Generation of SL_2 Over Integer Rings of Imaginary Function Fields

Potomac

Winston Churchill High School
Mattikalli, Simran, 17
Deep Learning Segmentation of Hip Radiographs for Guiding Opportunistic Management of Osteoporotic Bone Fractures

Silver Spring

Montgomery Blair High School
Fan, Jonathan Matthew, 18
A Genomic Meta-Data Analysis of Alzheimer's and Related Diseases Reveals New Insights for Future Research

Montgomery Blair High School
Wu, Angela Yue, 18
Calcium-Induced Mitochondrial Sorcin Aggregation: A Model System for Investigating Chaperone Suppression of Protein Aggregation

MASSACHUSETTS

Acton

Acton-Boxborough Regional High School
Erbas, Timucin, 17
Autonomous Precision Rocket Landing Algorithm

Acton-Boxborough Regional High School
Ohara, Haruki, 17
Bio-Physical Sensing of Feeding Patterns on Squid and Applications for Smart Recreational Fishing

Andover

Phillips Academy
Du, Anna Chang, 18
Developing an AI-Enhanced Protocol for Simulating Abiogenesis: Novel Nano-Structured Carbon Materials as a Templatizing Surface for Prebiotic Nucleic Acid Oligomer Formation

Phillips Academy
Kang, Yifan, 18
CNOT-Optimal Circuit Synthesis

Phillips Academy
Li, Arielsie, 18
FlexLizard: A Fast-Running Bipedal Lizard Robot With Optimized Lateral Bending

Belmont

Belmont High School
Meng, Julie, 17
Prevalence of Mental Disorders and Factors Associated With Not Receiving Mental Health Services Among Children With a Mental Disorder in Early Childhood in the United States, 2021−2022

Brookline

Brookline High School
Borodin, Matvey, 18
The Action of the Cactus Group on Arc Diagrams

Cambridge

Cambridge Rindge & Latin School
Mahajan, Alexandra, 17
A Novel Method To Determine Precise Stellar Radii and Temperatures of Low Mass Stars Using *JWST* Transits and Occultations

Dedham

Noble and Greenough School
Gao, Ruohan, 18
Deep Learning-Based Satellite Image Analysis for Predicting the Correlated Density of *Ailanthus altissima*

Groton

Groton School
Ge, Eric 18
An Autonomous Assisted-Feeding Robotic Arm With Computer Vision Capabilities

Hopkinton

Hopkinton High School
Venkatesan, Srilakshmi, 17
Utilizing Hypermagnesemia To Understand the Impact of Neuromuscular Blocking Agents on *Caenorhabditis elegans:* A Safe, Novel Model for Paralytic Drug Testing

Lexington

Lexington High School
Liu, Allison An-Li, 17
Next-Generation Synthetic Receptor Circuits for T-Cell Therapy

Wellesley   **Dana Hall School**
Cao, Gaby, 18
Mining Novel Glaucoma Drug Target Using Disease-Associated Multiomics Between
Ocular Hypertension-Dependent and Independent Pathways

Wellesley Hills   **Wellesley High School**
Song, Alan, 18
Reinforcement Learning-Based Horizontal Scaling for Serverless Systems

Worcester   **Bancroft School**
Xiang, Steven XiPeng, 17
DDR2 and Substrate Stiffness Regulate Cancer Cell Proliferation Through Metabolic
Reprogramming

Massachusetts Academy of Math & Science
Palit, Isabella, 17
Developing 2D and 3D Models of Human Myometrium To Improve Understanding
of Intramural Uterine Leiomyoma Pathology and Study Potential Risk Factors

MICHIGAN

Beverly Hills   **Detroit Country Day School**
Goddla, Vikram Srinivas, 17
Optimal Policy Sparsification and Low-Rank Decomposition for Reinforcement Learning

MINNESOTA

Eden Prairie   **Eden Prairie High School**
Dagade, Yash, 17
SkyWindFarm: Harnessing High-Altitude Wind Power in a Scalable Manner

Rochester   **Mayo High School**
Kapoor, Isha, 18
Overcoming Melphalan Resistance in the Treatment of Multiple Myeloma — Year 2

Woodbury   **Math and Science Academy**
Vishnubhatla, Srikara, 18
An Exploratory Analysis of Mosaic Chromosomal Aberrations in the Canine Genome:
Toward a Comparative Genomics Model

MISSOURI

Chesterfield   **Marquette High School**
Zhao, Jason Ziren, 17
A Machine Learning Based Approach to Monitoring Carpal Tunnel Risk Factors
in High Schoolers Using Desktop Computers in an Office-Like Environment

Columbia   **David H. Hickman High School**
Kannan, Saathvik R., 18
Revolutionizing Cancer Drug Discovery With DrugGen: Identifying a Novel Drug
for DNA Polymerase θ

NEVADA

Reno   **Davidson Academy Online**
Tang, Linus, 17
Extremal Bounds on Peripherality Measures

NEW HAMPSHIRE

Exeter

Phillips Exeter Academy
Bu, Alan, 17
On the Maximum Number of Spanning Trees in a Planar Graph With a Fixed Number of Edges: A Linear-Algebraic Connection

Phillips Exeter Academy
Rajaram, Achyuta, 17
Automatic Discovery of Visual Circuits

Phillips Exeter Academy
Tyagi, Riya, 16
Using Computer Vision To Disentangle Features Enabling AI To Learn Self-Reported Race and Ethnicity From Medical Images

NEW JERSEY

Annadale

North Hunterdon High School
Zhang, Selina, 18
ArTreeficial: A Novel AI-Integrated Solution to Reducing Invasive Spotted Lanternfly Populations

Bridgewater

Bridgewater-Raritan High School
Hao, Gracelynne, 17
Green Synthesis of Black TiO_2 Nanoparticles: A Promising Candidate for Solar-Driven Photocatalytic Water Decontamination

Cherry Hill

Cherry Hill High School East
Liu, Sophia, 17
Global and Personalized Models for Detecting Myocardial Infarction With Wearable Devices

Hackensack

Bergen County Academies
Gupta, Aanya, 17
Initiating Astrocyte to Neuron Transdifferentiation Through MiR-124a: Implications in Neurodegenerative Disease

Bergen County Academies
Kim, Andrea Choo, 17
qPCR Assay for the Detection of *Varroa destructor* in the eDNA of *Apis mellifera* Colonies

Bergen County Academies
Lee, Reia, 17
Analyzing the gKDR-GMM Model's Simulation of *C. elegans* Brain Activity Data and Its Wider Applications in Time-Series Data Analysis

Bergen County Academies
Nuruzzaman, Alfardi, 17
SMAD4 Signaling Pathway's Role on Production of Exosomes and Associated Extracellular Vesicles

Bergen County Academies
Zhou, Maggie, 18
The Effect of Calpastatin on an In Vitro Model of Parkinson's Disease

Lincroft

High Technology High School
Fang, Katherine, 18
Surveying Water Surface and Wetlands Using Cloud-Removed LandSat Data

Livingston

Newark Academy
Li, Aaron, 18
The Dynamics of a Neutrally Buoyant Particle in Laminar Flow

Millburn

Millburn High School
Saha Choudhury, Arjun, 18
MELODY: Exploring the Characteristics of Music That Helps Relieve Stress

Monmouth Junction

South Brunswick High School
Sinha, Ishaan, 17
Characterizing West Nile Virus Dynamics With Explainable Machine Learning

Pennington

Hopewell Valley Central High School
Michaluk, Charlotte Lenore, 17
Innovative Climate Change Emissions Reduction: Cargo Ship Active Vortex Scrubber Sail

Princeton

Princeton International School of Math and Science
Liang, Yiwei, 18
Discovery and Validation of Small Molecule TIGIT Inhibitors for Cancer Immunotherapy

Summit

Kent Place School
Wang, Miranda, 17
A Machine Learning Study of Of Shoreline Change Prediction for United States Coasts

Tenafly

Tenafly High School
Pyo, Cindy, 18
Metabolic Program of Intestinal Stem Cell in Pediatric Development and Inflammatory Bowel Disease

NEW MEXICO

Albuquerque

La Cueva High School
Koushik, Aditya Kiran, 17
ACPLearn: A Deep Neural Network Model To Predict Novel Anticancer Peptides

Los Alamos

Los Alamos High School
Kim, Daniel, 18
Engineered Underwater Vehicle for Ocean Litter Mapping

NEW YORK

Ardsley

Ardsley High School
Khitrov, Kevin, 17
Autophagy in Non-Cell Autonomous Regulation of Adipogenesis

Armonk

Byram Hills High School
Anchin, Lily, 17
Investigating the Immunophenotypic Differences Among T-Cell Acute Lymphoblastic Leukemia Patients of Distinct Subtype, Sex and Race in Efforts To Improve Chimeric Antigen Receptor T-Cell Therapy

Byram Hills High School
Levy, Benjamin Max, 17
Using Machine Learning To Uncover Hidden Linguistic Differences Within Online Mental
Health Disclosures Between Men and Women

Byram Hills High School
Manowitz, Jonathan M., 17
The Use of What Remains: Repurposing Harvest Waste From Romaine Lettuce Cultivation
for Cell-Based Meat Production

Byram Hills High School
Ndocaj, Daniel, 17
Investigating the Potential of Optically Tunable Metasurfaces for Enhanced Detection
of Fluorescent Molecules

Bellmore
John F. Kennedy High School
Schwartz, Claire, 17
The Administration of Sulforaphane via Broccoli Sprouts Ameliorates Parkinson's Disease
Phenotypes in a *Drosophila melanogaster* Model

John F. Kennedy High School
Wasserman, Cole, 18
APC-Mediated Expansion of hPSC-Derived Natural Killer Cells

Bethpage
Bethpage High School
Raghavan, Ankur, 17
The Reduction of Agricultural Water Consumption Through the Utilization of Wireless
Sensor Arrays

Briarcliff Manor
Briarcliff High School
Gupta, Gautam, 17
Predicting Future Internal Migration Patterns Within the United States Resulting
From Shifts in Temperature and Precipitation

Briarcliff High School
Narayanan, Rashmi Rajeev, 17
Understanding Pathological Structures of Pyroglutamate-Modified Amyloid-β (Aβ)
in Alzheimer's Disease

Briarcliff High School
Tsou, Edmund, 17
Language Models as Catalysts in EEG-Based BCI Speller Systems: A Low-Cost Solution
for Paralyzed Patients

Bronx
Bronx High School of Science
D'Halleweyn, Sophie, 17
Alleviating the Energy Crisis: A Novel Multi-Task Machine Learning Algorithm
for Designing Efficient Nanocatalysts To Reduce Industrial Energy Impact

Bronx High School of Science
Hightower, Aiden, 17
Molecular Fusion: A New Methodology for the Rational Design of Novel DNA Motifs
via the DX-Mediated Binding of DNA Tensegrity Triangle Unit Blocks

Bronx High School of Science
Jiang, Melody, 18
Characterizing Effects of Natural Killer Cell Neural Cell Adhesion Molecule 1 Interactions
With Stromal Cells on Natural Killer Cell Development

Bronx High School of Science
Khan, Nema, 17
The Impact of Media Attention to Gun Violence on the Elevation of Mass Shootings:
The Rise of Copycat Shooters

Bronx High School of Science
Kim, Ryan, 17
Exploring the Pathways of c-Maf Endothelial Cell Reprogramming

Bronx High School of Science
Lin, Jonathan, 17
Analysis of Distinctive MicroRNA Conservation Patterns as Markers for Unique MicoRNA
Processing Mechanisms

Bronx High School of Science
Mahairas, Dimitrios, 17
Overcoming Dataset Imbalance Using Light-Weight Vision Transformers With Applications
to Computational Drug Design Derived From Botanical Prototypes During Post-Antibiotic Era

Bronx High School of Science
Roh, Kun-Hyung, 18
Novel Drug Discovery Methodology Using Machine Learning for Gene Expression-Based
Virtual Screening Predicts Novel Compounds To Reverse Alzheimer's Disease With
Applications to Cancer and Longevity by Inhibiting CtBP2 Expression

Bronx High School of Science
Wu, Rachel Marie, 17
Detecting the Effect of Textual Features in Social Media Using an Innovative Machine
Learning Approach With Applications for Managing Public Opinion

Chappaqua
Horace Greeley High School
Cao, Anwen, 17
An Exploration of mTOR in Epstein-Barr Virus: Evaluating the Effect of EBV
Deubiquitinating Enzyme BPLF1 on mTOR Complex 1 and 2

Commack
Commack High School
Zhang, Jonathan, 18
Efficient Differentiation of Sleep-Related Hypermotor Epilepsy and REM-Sleep Behavior
Disorder via Neural Aperiodic Components

Copiague
Walter G. O'Connell Copiague High School
Simmons, Kemmora, 17
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Ward Melville High School
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Glen Head

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North Shore High School
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William A. Shine Great Neck South High School
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William A. Shine Great Neck South High School
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William A. Shine Great Neck South High School
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William A. Shine Great Neck South High School
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William A. Shine Great Neck South High School
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William A. Shine Great Neck South High School
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William A. Shine Great Neck South High School
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Hempstead

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Port Washington

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Paul D. Schreiber High School
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Paul D. Schreiber High School
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Roslyn Heights

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Roslyn High School
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Edgemont High School
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Charles E. Gorton High School
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Raleigh

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Kennett Square
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Merion
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Philadelphia
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Fort Worth
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Houston
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Alexandria

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Thomas Jefferson High School for Science and Technology
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Thomas Jefferson High School for Science and Technology
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Thomas Jefferson High School for Science and Technology
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Thomas Jefferson High School for Science and Technology
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WASHINGTON

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Milwaukee	**University School of Milwaukee** **Wang, Aidan, 18** A Novel Alignment-Free Method for Genome Sequence Comparative Analysis Using Dinucleotides-Based Discrete Fourier Transform

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