



# WESTERN MASSACHUSETTS Science & Engineering Fair

## High School Regional Fair

March 8, 2024

Western New England University, Springfield, MA

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### Sanofi Grand Prize

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Teagan Chisholm-Godshalk

Sustainable Salads for Small Spaces: The Comparison of *Lactuca sativa* Growth Between Traditional Farming and Aeroponic Growing  
*Westfield High School*  
**ISEF Massachusetts Delegate**

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### First Place

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Kaiwei Yang

Comparison of accuracy and carbon emission of U-Net variations across various optimizers and loss functions  
*Deerfield Academy*  
**AMD Engineering Excellence Award**

Elizabeth Hanechak

Solving the Plastic Problem: The Development of a Three-Microbe System for the Conversion of Plastic Waste into Highly Nutritious Fertilizer and Drinking Water  
*Pope Francis Preparatory School (Springfield)*  
**Northeast Branch of the American Society for Microbiology Award**

Evan Xie

Computational and AI-Assisted Design of Dual-Metal Single-Atom Catalyst for Oxygen Reduction Reaction  
*Deerfield Academy*  
**MA Chemistry & Technology Alliance Award**

Yiming Ding

Three-pronged approach to investigating the development of novel inhibitors targeting KRAS G12C in lung cancer.  
*Berkshire School*  
**WNE Dean of Arts and Sciences Award**

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**Second Place**

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Ruichen	Zhu	Secure Code Generation with Large Language Models <i>Berkshire School</i>
Luke	Bulan	Designing an Economical Multi-Purpose Care Blanket for Neonates Continuation <i>Westfield High School</i> <b>WNE Dean of Engineering Award</b>
Kaitlynn	Goulette	The Effects of LED Lighting on Painted Lady Butterflies <i>Westfield High School</i> <b>Westfield Gas + Electric Power+ Award</b>
Xi	He	Alkylammonium Modified Photosensitizers Achieve Lysosome-Precision Photodynamic Therapy: Implications from Molecular Dynamics Simulations <i>Northfield Mount Hermon School</i>
Maxwell	Wang	Virtual Screening as an Approach to Identify Small-Molecule CD38 inhibitors as a Potential Therapeutic for Alzheimer's Disease <i>Deerfield Academy</i>
Leyi	Su	A Four-degree Freedom Servo Driven and Scoliosis Angle Adaptive Rehabilitation Chair <i>Northfield Mount Hermon School</i>
Lixian	Zhou	A launchable Aerial and Underwater Rotorcraft Robot <i>Northfield Mount Hermon School</i>

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**Third Place**

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Leo	Bulatewicz	Can the Bacteriophage Virus Successfully Eliminate E. Coli Bacterial Cultures? <i>West Springfield High</i>
Isabella	Murdzia	
Ian	Schneider	
Milana	Camilleri	Utilizing the Kirby-Bauer test to ascertain the effectiveness of standard healthcare antibiotics for respiratory infections <i>Westfield High School</i> <b>Massachusetts Life Science Center Award</b>

Lily Yao	Flood Dataset Augmentation with DCGAN <i>Miss Hall's School</i>
Brandon Guyott Justin Romanelli	Designing a Prototype of an After-market Motorized Window Opener <i>Westfield High School</i> <b>Air Force Award</b>
Jiuzhou Chen	Dancing with Math: Using Klein's Quartic for Music Generation <i>Deerfield Academy</i>
Mihir Shenoy Lily Bouyea Logan Szenda	AI-Powered User Carbon Efficiency <i>Amherst Regional High School</i> Comparing Fire Extinguishing Solutions <i>Westfield High School</i>
Junwon Park	Advancing Irrigation Systems: A Novel Self-Regulating Sprinkler Responsive to Plant Signals <i>Willison Northampton School</i>
Arianna Dupuis Allison Rehor	Are Biodegradable Products really more effective than commonly used Plastics? <i>Westfield High School</i>

**All projects listed above receive an automatic entry to the State Science Fair on April 5<sup>th</sup> at Gillette Stadium. Other students are eligible as Direct Entries (2 per school) with teacher support.**

**Participating Schools:**

*Amherst Regional High School*

*Berkshire School*

*Deerfield Academy*

*Hopkins Academy*

*Miss Hall's School*

*Northfield Mount Hermon School*

*Pope Francis Preparatory School*

*Springfield Commonwealth Academy*

*Springfield Honors Academy*

*West Springfield High School*

*Westfield High School*

*Williston Northampton School*

**Congratulations to all student scientists and engineers!**