

Inspiring Young Scientists

Independent Science Research at Greenwich High School



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The Research Program

- ◆ Students are given course credit to pursue an independent research project of their own choosing.
- ◆ These projects usually take 1 year to complete; students often conduct 1/year for 3 years (differs from NY model).
- ◆ The classes meet 6 times, per 8 day schedule rotation, for only 1 hour.

How Does GHS Research Differ?

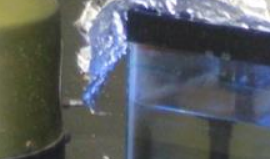
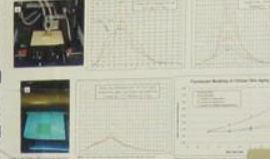
- ◆ Students are encouraged to seek projects in areas/disciplines that interest them most.
- ◆ Students can perform their research here at the high school.
- ◆ Other programs pale in comparison; schools do not have the facilities to allow students to perform their research at school.
- ◆ Instead, students are asked to find outside support in neighboring labs. As such, the originality and ownership of the work is far less.

intel
INTERNATIONAL
SCIENCE
AND
ENGINEER
FAIR

Exploring the Antioxidative Effects of Ergothioneine as a Dermal Protectant

Surface Fluorescence Detection of Chicken Skin Aging/Damage using Ratio of Collagen Types I & IV

Transmission Electron Microscopy of Changes in the Physical Structure of Collagen in Chicken Skin



How is Success Measured in Research?

- Hard work, imagination, independence, and creativity in coming up with an idea, and designing a plan to investigate the research.
- Perseverance in sticking with a project through the usual pitfalls and failures.
- Those students that are fortunate to be successful are encouraged to participate in the local science fair and symposia competitions (mid-March each year).

The Intel Science & Engineering Fair (ISEF)

◆ GHS Science Research students have received:

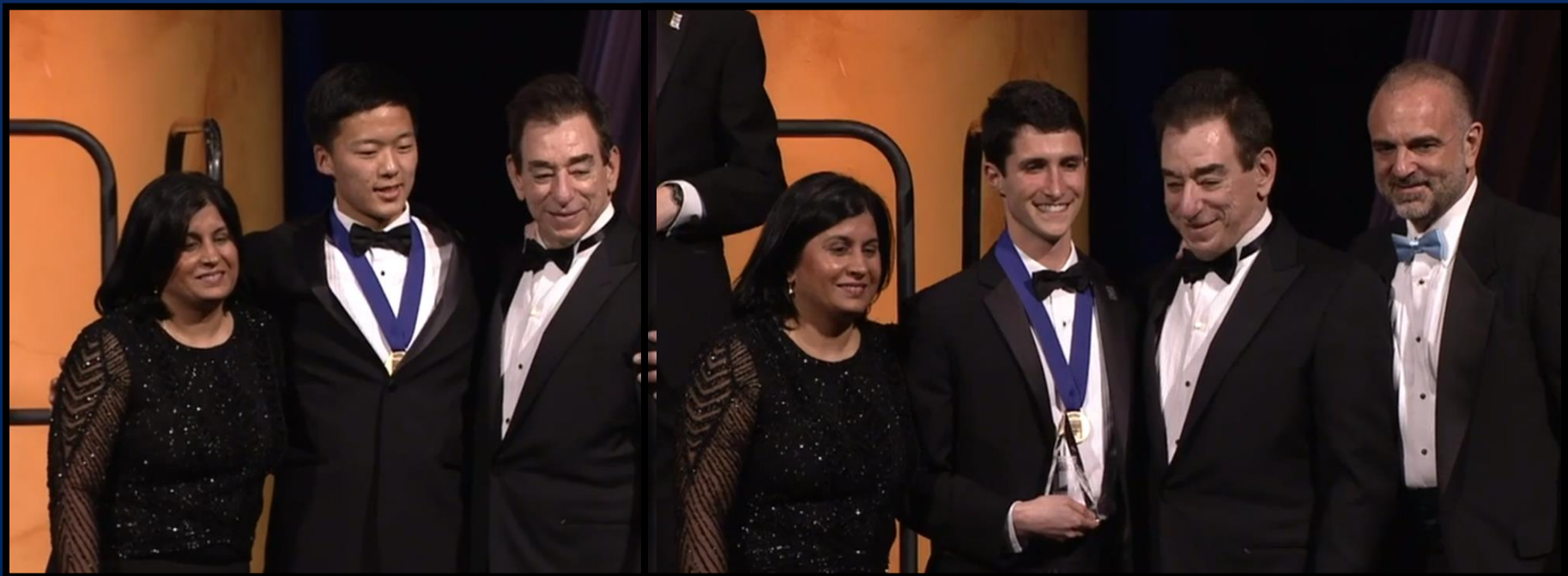
- 35 Finalist Awards
- 8 First Place Awards
- 4 Best of Category Awards
- And Two Grand Prize Award Winners

Compared to neighboring districts:

- 2 Finalists

The ~~Intel~~ (Regeneron) Science Talent Search

- Every year, some 1,600 American **High School Seniors** enter Intel STS with original projects from a wide range of mathematics and science disciplines.
- The field of 1,600 is narrowed to 300 semifinalists, and then to 40 finalists.
- Over the past 6 years, GHS has had 28 Scholars and 4 Finalists;
- Neighboring districts ... 2 scholars, no finalists!



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HOW YOUR WORLD WORKS

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Drones

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The Underdog

Space Rocket

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Superfast

3D Printing

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Precision

Cancer

Treatment

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Pluto!

EXCLUSIVE:
Inside the
KOCH BROTHERS'
Industrial Empire
What do they
actually
do?

THE NEW
ROBOTIC
HAND

That isn't
a hand at all.

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BREAKTHROUGH HIGH

GREENWICH HIGH SCHOOL,
GREENWICH, CONNECTICUT

If science fairs were sport, Greenwich High would be the New York Yankees. In the ten years that Andrew Bramante has been teaching the honors independent science research class there, Greenwich has sent at least one student each year to the Intel International Science and Engineering Fair. This year it sent five.

Two of those students caught our attention. Junior **Olivia Hallisey** (above, left), seventeen, saw how Ebola devastated Africa and created a new test to detect the disease before symptoms develop. By using color change to indicate a positive result, it can be universally understood, and it will cost 97 percent less than existing options. It also doesn't require refrigeration, a handicap of the current tests.

Junior **Margaret Cirino** (above, right), sixteen, developed a water-soluble transporter for medication in your body. It's cornstarch-based, but engineered to have magnetic properties so an external magnet the size of the ones on your refrigerator can guide it to a specific part of the body. For treatments like chemotherapy, this could help reduce harmful side effects.

Bramante says his students are successful because he treats them like adults: "I'm training colleagues, not teaching students."

