
Zoom Meeting ID: Seniors 2020
RESEARCH
2019-20
THE ONE WHERE THEY WERE QUARANTINED...
Daleep Grewal
Maddie Rubin
Yasin Badawy
Feyi Rufai
Olivia Viruet-Quintero
1/2
Ariella Hakimi
Maddie Groothuis
Nikki Blattman
Jake Stoller
MY BEST FRIEND IS OFF TO...
Makenzie Komack
1/2
Andrew Goldberg
Sophie Fries
Will Borges
Lianna Friedman
Gabby Fries
Seniors
Paige Schultz
Dr. Weseley
Jake Litvack
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Editors

Madeline Groothuis

Madeline Rubin

Assistant Editors

Jake Litvack

Ariella Hakimi

Paige Schultz

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Acknowledgements

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This has been an amazing four years of research, and without all of your, none of it would have been possible!

Senior Spotlight

Yasin Badawy

Everyone knows he is walking into the research center because they can hear his footsteps as he climbs the stairs. He laughs at everything, even if no one else does; his laugh has been described as so creepy, "I wouldn't want to hear it in a dark alleyway" (Anonymous RHS Teacher). Yasin Rezk Badawy (also known as Yasmeen, Rama, Sasquatch, Bigfoot, Weeberway, and Yasneeze) has had an interesting research career during his studies at Roslyn High School.

He jumped into the ring during his first year with a project on public safety, working with Jake[3]; Jake Stoller, Jake Litvak, and Jacob Stein (does Jacob count as Jake? They don't know, they just changed his name to make it fit). The *Extraneous Variables* ultimately presented their research at RAF and submitted a draft edit of their research project, with comments of course, to eCybermission, as opposed to the final paper.

He continued his research endeavors during his sophomore year, where he investigated the effects of straw diameter on consumption with Jake Stoller; both were former survivors of the *Extraneous Variables.* They found extremely significant results ($p<.05$) and answered their question with a question: Does this even matter?

Arguably, Yasin's darkest moment was his betrayal of the Research Program during junior year. He had been feverishly working on his junior year project, which investigated the effects of scent on academic performance, and out of nowhere, he dropped out of the research program. He enjoyed several benefits during this time, including an invaluable free first period and a significant reduction in his workload. However, indulging in his masochist tendencies and seeking redemption from his sins, he returned to the Research Program during his senior year with a project he had developed over the summer. He was destined to make a grand re-entrance. Unfortunately, his mark of shame is that he does not carry his own research mug, given that he was never mugged during his junior year. After four years of high school, he has learned much. Yet sometimes in the course of learning, you leave with more questions than you came in with. These questions are: 1) is he in the research graveyard for 2019, 2) does he count as resurrected, and 3) will he ever have a mug?

Looking frighteningly serious before bursting out in laughter at his own dry, scary humor, Yasin brings an interesting personality to the research community, whether at Roslyn High School or in his future. He hopes to study…something…in the sciences, although his parents keep insisting that he becomes a doctor.

Research Resume

Grade 12--Project Abstract:

Perfluorooctanoic acid accelerates Alzheimer's pathogenesis by stimulating APP production and by inducing both tau and amyloid mediated neurotoxicity

Perfluorooctanoic acid (PFOA) is an industrial chemical that has been used in manufacturing for decades. Through previous research, PFOA has been demonstrated to induce neurotoxicity and apoptosis, which makes it a probable suspect in neurodegenerative diseases such as Alzheimer's disease. Alzheimer's disease is denoted by four hallmark characteristics: accumulation of amyloid-β, hyperphosphorylation of tau, inflammation, and cell death. Several MTT cell viability assays were performed in order to test PFOA's effect on cell death. ELISA tests were performed to measure the effect of PFOA exposure on Alzheimer's disease biomarkers: APP, the main precursor of amyloid-B, and Interleukin-1β and TNF-β cytokines, which are related to inflammation. Consistent with previous research, PFOA was demonstrated to promote cell death. The results also showed that: 1) PFOA worked with Alzheimer's disease characteristic (amyloid-β and tau proteins) to decrease cell survival, 2) significantly increased APP production, and 3) PFOA was shown to change inflammatory cytokine expression, although in an inconsistent fashion. The results of this study suggest that PFOA can contribute to Alzheimer's disease progression by worsening key characteristics and exacerbating neurotoxicity.

- Regional semifinalist, Junior Science and Humanities Symposium:

Summer 2019: Research assistant at SUNY Old Westbury, under Dr. Wei Zhu

Grade 10:

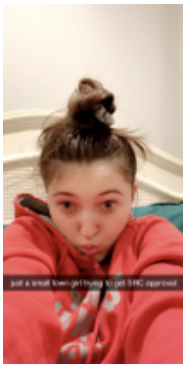
The Hidden Key to Your Diet? How Straw Diameter Affects Consumption

- Honorable Mention, WAC Lighting Research Association Fair
- Published in the Whiteman Journal of Psychology

Grade 9: ***The Effects of Law Enforcement Officers on Individuals' Perceived Danger***

Nikki Blattman

By Makenzie Komack



Picture this: Mr Treubig's 8th grade English class. In the front row sits soon-to-be freshman Nikki Blattman. Dr. Weseley enters with an aura of importance and promises of elite college admissions, bragging rights, and competition. They lock eyes. The room falls silent. Classical music plays in the background. Doves fly. Nikki signs up for research. The rest is history.

Nikki's research career began with a topic near and dear to her heart: sunscreen (no wonder, she is basically transparent). The Fries twins, 1/2 of the Friedman twins, and a lone Blattman, possibly the only frosh research group to all make it to senior year, were ready to Beat the Heat! (pun counter: 1) and test how sunscreen effectiveness varied with storage temperature and type. Although their confidence wavered when they spotted their teacher, Mr. Oggeri, with a copy of *SPSS for Dummies*, they prevailed and won a merit award at RAF as well as an iconic USB from Ecybermission. To this day Nikki will promise anyone and everyone that this victory was due to the great sacrifice of her living room lamp. The shrine to her home's lighting fixtures can still be found in the research lab to this day…seriously, go check it out.

In 10th grade Nikki took natural science novice Makenzie Komack under her wing in order to Erase the Waste! (pun counter: 2). Their hard work and willingness to steal gallons of water from private golf courses and parks culminated in their very scientific and definitely new and unknown conclusion that, surprisingly enough, the environment was in bad shape! Who knew! However, Nikki, being the congressional debate captain that she is, talked circles around the judges all the way to 1st-place wins at the Roslyn Research Fair and RAF.

Intent on never touching Survey Monkey, Nikki flew all the way to, and suffered the altitude sickness of, the University of Colorado, Boulder in order to perform her junior year project in scientific bliss. Her project involved resolving the structure of…um…I don't know. The catchy part was Small Proteins, Large Roles (pun counter: 3), so nothing else really matters, right? At least the judges seem to think so because Nikki locked down a 1st place win at LISEF JV and a 4th place win (and $1,000 cash prize) at the NPSC Health Fair.

Senior year, Nikki headed off to Boston University (near her ex-partner Makenzie who was so close, yet so far at Tufts University) in order to research optimized methods for personalized detection of ctDNA (note: she is very saddened by the death of her pun-streak and regrets it to this day). Beating out some tough competition, most of it stemming from her own senioritis, Nikki made it to the 2nd round of LISEF where she heroically competed despite the coronavirus-hysteria and earned an Honorable Mention and LISEF-branded pen for her efforts.

Nikki's scientific and persuasive talents (did you know she has talked/conned/flirted her way out of ever paying to print her research boards?) will take her far in her college years and beyond. She plans to study on a pre-med track, and hopefully she will not sleep through class like she almost slept through LISEF round 1 and RAF (*both* frosh and sophomore year).

Research Resume

Grade 12 – Project Abstract:
Optimized Methods for Personalized Detection of ctDNA in Plasma
Cell-free circulating tumor DNA (ctDNA) is a potentially valuable biomarker for diagnosis and monitoring of cancer patients via minimally-invasive sample collection. Detection of ctDNA after surgical removal of a primary tumor could indicate recurrence elsewhere in the body. Simple Sensitive Sequencing (SimSenSeq) overcomes challenges of ctDNA detection by using unique molecular barcodes and next-generation sequencing (NGS) to facilitate reduction of sequencing errors and detection of rare mutations (<0.06% MAF). The aim of this project was to create a method for generation of flexible, multiplexed, barcoded NGS libraries for personalized, longitudinal monitoring of ctDNA biomarkers and to compare the uniformity of the multiplexed libraries when amplified in partitions (droplets) as opposed to when amplified in bulk. SimSenSeq was used to introduce the molecular barcodes into target DNA molecules in a single-tube, two-step PCR process. After PCR, the library products were assessed on a fragment analyzer to ensure correct sizing, and qPCR was used to quantify each individual product in the multiplex and to assess uniformity. Separate multiplex samples underwent amplification in partitions and bulk. Two primer panels were tested, and each multiplex resulted in working NGS libraries. Additionally, taking outlying primers into account, each multiplex shows greater uniformity on quantitative PCR when amplified in partitions as opposed to in bulk. Flexible, multiplexed, barcoded NGS libraries could allow for earlier detection of recurrence using less invasive screening techniques. Using a "liquid biopsy," these NGS libraries can screen for individual tumor mutations well before the development of a tumor.

- Honorable Mention, Long Island Science & Engineering Fair

Summer 2019:Research Assistant at Boston University School of Medicine, Dr. Tony Godfrey

Grade 11:
Small Proteins, Large Roles: Resolving the Structure of Small Vasohibin-Binding Protein Using E.Coli Heterologous Expression and Nuclear Magnetic Resonance Spectroscopy
- 1st place, JV Long Island Science & Engineering Fair
- 4th place, NSPC Health Science Competition

Summer 2018: Research Assistant at University of Colorado, Boulder, Dr. Allison Holt

Grade 10:
Erase the Waste! The Use of Daphnia Magna as an Indicator of Pollution and Toxicity in Both Manipulated and Local Surface Waters (with Makenzie Komack)
- 1st place, WAC Lighting Invitational Research Association Fair
- Best in Fair, Roslyn Research Fair

Grade 9:
Beat the Heat! The Effect of Storage Temperature and Type of Sunscreen on Sunscreen Effectiveness (with Sophie Fries, Gabby Fries, Lianna Friedman)
- Merit Award, WAC Lighting Invitational Research Association Fair
- Honorable Mention, Ecybermission

Will Borges

Do you hate when people make weird faces at you? Do you find yourself needing to de-stress? Are you thirsty? Well if you said yes to any of these questions stay tuned because William Borges had one interesting research career at Roslyn.

Will Borges started his research career as a wee freshie, deeply interested in human facial expressions after watching one too many episodes of Lie to Me on Netflix. Driven by a mission to become a human lie detector, Will partnered with Deepak (Cinnamon) Grewal, DSungster (RIP), and SpencerToasty (RIP) to test whether micro expressions had an effect on the doctor patient relationship. After recruiting Toasty's mother to act as a doctor for an experimental stimulus, the boys were one step closer to outperforming polygraphs and becoming masters of emotional deception.

In his sophomore year, the workload started to really pick up. SPSS, Powerpoint presentations, papers, and proposals had him very stressed. Will also noticed that when not passing out from flynap or playing Kahoot those around him were experiencing this stress as well. So did he decide to take up gardening to de--stress? Dancing? Sports? NO. Enter ASMR: a trendy genre of youtube videos where ASMRtists relax viewers through a variety of "Triggers". If you are concerned, so was Dr. Weseley. Nevertheless he followed the rabbit hole of ASMR and managed to complete a time-intensive research project alongside his research partner Toasty (RIP). After several weeks of laboring away after school in the nurse's office, they had a sample size of $N = 12$ people, some pretty interesting conclusions, and a newfound appreciation for zen meditation.

After these two projects, Will was very thirsty. To quench his thirst, he embarked on a junior summer research project at Stony Brook University in water purification. He chemically modified coconut fibers (yummy) to remove harmful dyes from water. Fast forward to senior summer and Will was back at the lab as a Simons Summer Research Fellow, this time modifying jute (the stuff rope is made of) to remove nitrogen from water.

When his thirst was quenched, Will decided to do some more research at Cold Spring Harbor Laboratory as part of the Partners for the Future Program because as they say, "what doesn't kill you makes you stronger." After successfully speed dating his way into a research mentor's heart, he began working on a project to identify the role of a novel tumor suppressor gene in lethal prostate cancer.

Will will be heading to Brown University next fall, where he hopes to pursue a co-concentration in public health and biochemistry. Will hopes to pursue an MD-PhD in his academic future. He wants to focus on research that relates to public health issues, especially those concerning the environment-health nexus. Why is he this ambitious? Will we ever call him Dr. Dr. Borges? Only time will tell…

BROWN

Research Resume

Grade 12-- Project Abstract:

Project Abstract: ***An Innovative Approach to Recover Nitrogen from Wastewater Using Nanostructured Cellulose Sulfate***

Nitrogen water pollution poses a significant threat to the environment and global health. To tackle nitrogen water pollution, industry typically uses an energy intensive multi-step nitrification-denitrification process to convert nitrogen in wastewater to nitrogen gas. This study proposes an innovative approach to remove and recover nitrogen from water using sustainable nanostructured materials. This approach greatly reduces the energy, chemical, and water costs associated with the nitrification-denitrification process. Specifically, cellulose sulfate (CS) materials were synthesized through optimized one-step sulfonation reactions. Reactions yielded nanostructured CS microfibers and CS nanocrystals. Further homogenization of nanostructured CS microfibers yielded CS nanofibers. Each material was characterized using Fourier Transform Infrared Spectroscopy (FTIR), Contact Angle, Scanning Electron Microscopy (SEM) with Energy Dispersive Spectroscopy (EDS), and Zeta Potential. Tests were conducted to gauge whether nitrogen concentration in water affects the nitrogen removal capacity for each nanomaterial. CS materials were tested for reusability using sodium hydroxide regeneration. Relevant practical applications of CS materials were also explored. Nitrogen-loaded CS materials were tested as slow-release fertilizers for sustainable agriculture and as column filters for practical water filtration. Data indicates that nitrogen removal increases with increasing nitrogen concentration for each CS material. Nanoscale materials demonstrated the greatest potential for reusability. The negative surface charge of CS materials remained stable with changing pH, which makes these materials practical for nitrogen removal in the field. Nanostructured CS microfibers reduced nitrogen by 88% in simulated wastewater via column filtration. Lastly, nitrogen-loaded CS as slow-release fertilizers promoted more plant growth than a control without fertilizer.

- Regeneron Science Talent Search Scholar (2020)

The Role of a Novel Tumor Suppressor Gene in Lethal Prostate Cancer

- Cold Spring Harbor Partners for the Future Program Research Intern (2019-2020)

Summer of 2019: Simons Summer Research Fellow at Stony Brook University, Dr. Benjamin Hsiao

Grade 11:*Removal of Hazardous Dyes from Simulated Wastewater Using Nitro-Oxidized Carboxycellulose Nanofibers Extracted from Coconut*

- Poster Presentation at the Materials Research Society Fall Conference (2019)
- 2nd place, WAC Lighting Invitational Research Association Fair
- 10th place, NSPC Health Science Competition
- High Honors, Long Island Science Congress

Summer of 2018: Independent Research Student at Stony Brook University, under Dr. Benjamin Hsiao

Grade 10:*At the Heart of ASMR: A Study into the Effects of Autonomous Sensory Meridian Response (ASMR) on Students* (with Spencer Tsao)

- 2nd place, WAC Lighting Invitational Research Association Fair

Grade 9:*More Than What Meets the Eye: Microexpressions and Their Application Towards the Doctor-Patient Relationship* (with Daleep Grewal, Spencer Tsao, and Daniel Sung)

- eCybermission Research Competition--New York State Honorable Mention (2017)

Lianna Friedman

Lianna Friedman, better known as zebra or zeebs by her research peers, began her research career in 9th grade. You might also know her from her celebrity days as a child actress with aToyota commercial as her claim to fame. Wide-eyed and ambitious, young zebra did not know what her next four years would entail. Her first research endeavor focused on "The effect of sunscreen and storage location on sunscreen effectiveness." With her partners, Nicole Blattman and the iconic research twins, Gabby and Sophie Fries, she became a sunscreen expert. Despite damage to the UV lamp and using plastic wrap to represent human skin, the team succeeded and completed their first research project. The team finished with significant results in addition to 27 bottles of sunscreen.

Lianna completed her sophomore year project with partner Maddie Rubin. The project was titled "The Effect of Resource pH on the Trans-generational Fitness of Drosophila melanogaster - ." It took Lianna a full two weeks to be able to say the word "melanogaster" without the help of her partner, Maddie. At the beginning of experimentation, Lianna and her partner received an email saying simply "all the flies are dead" from Mr. Dispigno. Nevertheless, they persisted. Lianna learned how to sedate flies using flynap to for experimental purposes. The project culminated with significant results, a permanent smell in room 302 of the Research Center, and a funeral for all 300 flies.

Junior year, Lianna chose to study "The Effect of Swearing on the Perception of and Likelihood of Voting for a Candidate." She spent a lot of time discussing with Dr. Weseley and her classmates if it was appropriate to write the words f*ck and sh*t on her board. With a majority vote, it was decided to use asterisks as shown in the previous sentence. While the project was novel, it was highly uncomfortable to present at competitions, and Lianna has determined that a career as a swearing politician is out of the question.

Finally, the summer before senior year Lianna enrolled in the NYU GSTEM program where she conducted a chemical engineering project. Outside the lab she could be seen taking a food tour around the city. In the lab she conducted an experiment titled "Protein Engineered Biomaterials: Ion-mediated Triblock Hydrogels." The highlight of the project for Lianna was getting to take a photoshoot in a bunny suit. Another highlight of the program was putting Lianna in contact with many inspiring and successful women in STEM.

Outside of research, Lianna can be seen 3D printing keychains in the library or at Barbara's Bagels (yes, they know her name and order there). She enjoys running track, watching Netflix, listening to music, and most importantly napping. Lianna is incredibly grateful to have had the opportunity to spend 4 years learning in such a stimulating and challenging program. She would like to thank Dr. Weseley and all those who helped her along the way. In college, she plans to study chemical and biomolecular engineering and plans to use the skills she learned from the Research Program to conduct research in college and beyond.

Research Resume

Grade 11-12 – Project Abstract:

Protein Engineered Biomaterials: Ion-Mediated Triblock Hydrogels

Hydrogels are cross-linked networks routinely used in applications including agriculture, contact lenses, and drug delivery. Typically the hydrogels are made of synthetic block polymers that are non-biodegradable and made of non-natural materials. Protein hydrogels can serve as an alternative to these synthetic block hydrogels. This experiment used a CEC protein made of two distinct self-assembling domains, which allow the protein to bind to small molecules. It also makes it stimuli responsive to temperature, pH, and salt conditions. It was hypothesized that by tuning the hydrogel by adding transition metals, these metals can act as a control module for the softness/ stiffness of the gel.To carry out the experiment, a protein was produced from DNA and then fabricated into a hydrogel by cross-linking with UV exposure. Three samples of hydrogels were used in the tuning process. The control was left in water, another sample was put in zinc and switched to EDTA (ethlenediaminetetraacetic acid) after 24 hours, and another sample was put in EDTA and switched to zinc after 24 hours. The results showed that the gel became smaller, stiffer, and its area decreased when put in zinc from EDTA, while moving from EDTA to zinc had the opposite results. Zinc forms metal coordinated bonds with the histidine tag on the CEC protein, which could have made the gel stiffer, while the EDTA could have stripped away the zinc, reversing the process. The ability to manipulate the hydrogels can impact the rate of drug release when used for drug delivery applications.

Summer 2019: Research Assistant in Dr. Montclare's Lab for protein engineering and molecular design at NYU's Tandon School of Engineering

Grade 11:

The Effect of Swearing on the Perception of and Likelihood of Voting for a Candidate

- 2nd place, WAC Lighting Research Association Fair
- Honors, Long Island Science Congress ("LISC")

Grade 10:

The Effect of Resource pH on the Trans-generational Fitness of drosophila melanogaster (With Maddie Rubin)

- 3rd place, WAC Lighting Research Association Fair
- High Honors, Long Island Science Congress ("LISC")

Grade 9:

Beat the Heat! The Effect of Storage Location and Type of Sunscreen on Sunscreen Effectiveness (With Nicole Blattman, Sophie Fries, and Gabby Fries)

- Merit Award, WAC Lighting Research Association Fair
- Honorable mention, E-cybermission

Gabby Fries

Gabby, often referred to as Gibby by many of her research peers (shoutout Andy), began her career with a once-in-a-research-lifetime experience: a natural science experiment. After a long year of playing “keep it up” with a balloon and meter stick in the Research Center with Mr. Oggeri and struggling through Dr. Weseley’s infamous tests, Gabby was ready for sophomore year

In 10th grade, Gabby discovered from Ms. Pearlman’s AP Psychology course and Mr. Barnett’s AP Statistics course that her heart belonged to psychology. So, she began Phase 2 of her research career with her twin, Sophie, in a project about use of PowerSchool and stress(Note: Please do not tell people that the dreaded one-week portal closure at the end of each quarter was the twin’s brainchild). May I also add that Sophie and Gabby took this project to a competition in La Jolla, California with Dr. Weseley that consisted mostly of admiring California sea lions. - although, to be fair - the twins won 1st Place.

Through completing this project, Gabby discovered her passion: diving deep into the seedy underbelly of Roslyn High School’s obsessively stressed out students. Thus, her junior year project was born. She investigated how students’ lack of breaks throughout the day was related to their perceived stress, negative somatic symptoms, and grades. Essentially, both studies revealed that Roslyn students are crazy.

With the combination of a research education from Dr. Weseley and help from her peers, Gabby is confident that she will continue her research in college (wherever that may be). Long day competitions like LISC, RAF, and NSPC Health Fair (which by the way, 10/10 recommend), have prepared her for the future. She will miss her REX Monday’s, catching up on research logs, the most random talks with Dr. Weseley, and most of all, her research peers.

Research Resume

Grades 11-12 - Project Abstract:

To Free or Not to Free: The Relationship between Students' Use of a Free Period and Perceived Stress, Somatic Symptoms, and Grades

Many students feel extremely stressed, often with school as the cause (Bethune, 2014; Neighmond, 2013). A sharp increase in the number of AP exams administered per year (College Board) reflects students' desire to pack as many challenging courses as possible into their schedules in order to create an impressive resume for college. While this may seem advantageous, it actually may be hurting students. Studies have shown that after working for long periods of time, it is necessary to take breaks to recharge and recover resources (Brummelhuis & Baker, 2012; Grippo 2017; Meijman & Mulder, 2013). Additional research demonstrates that a lack of breaks may have negative impacts on one's health (Hunter & Wu, 2016; Yates, 2011). Despite significant research done in the workforce, there has been almost no research that has explored if students' stress, health, and productivity are worse with no or inadequate breaks. It was hypothesized that compared to students who take a break from work-related activities during the school day, students who do not would report 1) higher levels of perceived stress, 2) more negative somatic symptoms, and 3) worse grades. Analyses of covariance (ANCOVAs) showed that students who engaged in academic-related activities during their free periods had significantly higher perceived stress ($p = .03$), higher grades ($p < .01$), and reported marginally more somatic symptoms ($p = .06$). Additional analyses revealed that, compared to boys, girls were found to report significantly higher perceived stress ($p < .01$) and significantly more somatic symptoms ($p < .01$). However, there was no significant difference found between GPA's of boys and girls. The study suggests that schools should be more cognizant of the potential dangers of what students do during their free periods and how they are handling pressure from school.

- Regional Semifinalist, Junior Science and Humanities Symposium
- Recipient of the NYIT Mini Grant
- 1st Place, Stemanities Research Competition (2019)
- 1st Place, Educational Psychology at the Long Island Psychology Fair (2019)
- 3rd Place, Neurological Surgery P.C. Health Science Competition (2019)
- Published Paper in the *Journal of Secondary Psychological Studies* (2019)

Grade 10:

Too Many Looks at Online Gradebooks: The Relationship between Academic Stress and Extrinsic Motivation and Frequency of Access to Online Gradebooks

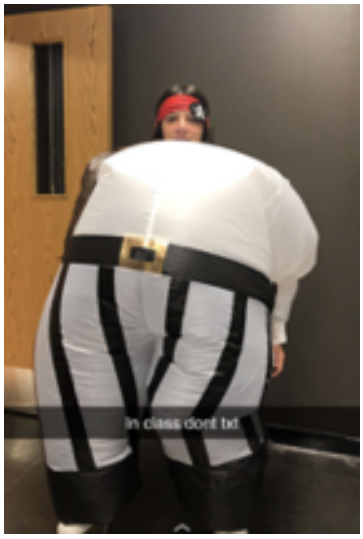
- 2nd Place, WAC Lighting Invitational Science Fair Junior Division (2018)
- Best in Category, High Honors Award, and the Professor L. Chiarenza Award, Long Island Science Congress

Grade 9:

Beat the Heat! The Effect of Type of Sunscreen and Storage Temperature on Effectiveness of Sunscreen

- Honorable Mention, Ecybermission
- Certificate of Merit, WAC Lighting Invitational Science Fair

Sophie Fries



As a young "frosh," Sophie Fries (part of the dynamic "twin duo") began her research career with the prestigious *Beat the Heat*™ squad. After being awarded the respected distinction of "Honorable Mention" by EcyberMission, Sophie (wisely) decided that her days studying the natural sciences were over.

In the following year Sophie and her sister decided to merge brain power and reclaim their status of "wombmates" for a study on PowerSchool and its relationship to stress and motivation. Readers may take this as a formal apology for convincing the school to close down PowerSchool during the last week of every quarter. After passing the factorial design and main effect exam of sophomore year by a very, very slim margin, Sophie decided to take her efforts to LISC (where she and Gabby won several strange awards… Shout out Professor L. Chiarenza).

Continuing on to "He11 Year," Sophie decided to split from her other half and finish her research career examining dating. No, not geological dating: dating as in romantic dating (no, she did not examine how many times Josh has paid the bill over the last two years throughout their relationship for her research study). Sophie attended JV LISEF with the first part in this experiment (however, instead of competing, she spent the entirety of the day playing "heads up" with her fellow competitors).

In the beginning of junior year, Sophie and Gabby seemed to have experienced too much separation anxiety. As a result, they decided to return to their sophomore year project and compete just a few more times. After taking home the "W" in Dr. Weseley's annual PsychFair (may it rest in peace), they decided that they just could not get enough of competing together.

We would like to take this time to confirm certain rumors out there regarding our vacation with Dr. Weseley to La Jolla, California. Yes, we did stalk sea lions. Yes, we did refuse to eat any food that wasn't beige. Yes, we did win the whole competition including vanquishing a student from North Carolina who reported her school had submitted 46 papers. No, we did not share a hotel room and stay up all night gossiping about our research peers.

After spending her entire summer completing the famous Regeneron "tasks," Sophie returned to research to finish her career strong. As a REX Buddy and a Journal Editor, Sophie has contributed to the Research family in more ways than one and will continue to shine in college (if she even goes to college).

Research Resume

Grades 11-12 – Project Abstract:
Dinner's on Me: The Perceived Attractiveness and Compatibility of Men and Women as a Function of Date Initiation and Bill Payment
Over the past few decades, gender equality has increased in hiring, salaries, and political leadership; however, one sector of society still remains wildly traditional – the dating world. Studies have shown that traditional dating scripts dictate that a man should be both the initiator of and the payer for the date. However, no studies have experimentally examined how behaviors on a date affect the perceptions of attractiveness and compatibility of a couple. In this experiment, participants (N= 812) viewed one of six vignettes that manipulated the gender of the initiator of the date as well as the gender of the initiator of the payment and payer for the date. Analyses revealed that perceived attractiveness of a man or woman and the perceived compatibility of a couple were unaffected by the gender of the initiator of the date. However, men are expected to both initiate a date as well as offer to pay for the date; on the other hand, women who initiate dates should not continue to hold the dominant role by offering to pay. Similarly, women were perceived to be more attractive when men offered to pay for the date. Responses also suggested that people perceive both men and women to be more attractive and a relationship to have more potential when the man paid for the date. The results of the experiment suggest that despite movements toward gender equality, the perceptions of gender roles in the dating world still remain immensely traditional.

- 2nd Place, Junior Science and Humanities Symposium
- Invited Poster Presenter, Association for the Psychological Science (2019)
- Honorable Mention, Long Island Science and Engineering Fair Junior Division
- 1st Place, Stemanities Fair
- 1st Place, Long Island Psychology Fair
- Published Paper in the *Journal of Secondary Psychological Studies*

Grade 10:
Too Many Looks at Online Gradebooks: The Relationship between Academic Stress and Extrinsic Motivation and Frequency of Access to Online Gradebook

- 2nd Place, WAC Lighting Invitational Science Fair
- High Honors, Professor L. Chiarenza Award & Best in Category, Long Island Science Congress Junior Division

Grade 9:
Beat the Heat! The Effect of Type of Sunscreen and Storage Temperature on Effectiveness of Sunscreen
Honorable Mention, EcyberMission
Certificate of Merit, WAC Lighting Invitational Science Fair

Andrew Goldberg

By Jake Stoller

Andrew Terry Goldberg is a true paradox. His dashing smile can warm a room, yet the man's got ice in his veins. If you don't earn his respect, he's cold. Lose his respect and you'll get burned. The point: proceed with caution. So I will.

Some say that the thing about smart people is that they seem crazy to dumb people. Now I'm not saying I'm dumb, but Andrew Goldberg is 100% crazy. He's a genius too, which gives him the most versatile skill set to expose any substitute teacher in his path. A last second Fashion Show dropout, Andrew's got moves both on and off the court. Though his moves haven't brought him atop Tik-Tok's top charts, Andrew has sat atop the rankings of Lincoln Douglas Debate, winning at both Princeton and Harvard. You really never know what tricks this kid's got up his sleeve.

But, if you did care to travel up his sleeve, you would reach Andrew's armpit, home to his first research study. Alongside Truman Chong, Joshua Flashner, and Joshua Kim, Andrew discovered that switching underarm products led to deleterious effects to the microbiome of the underarm. Andrew is now one of the few men at Roslyn High School that can wear white t-shirts during the summer.

During his sophomore year, Andrew teamed up with Flashner once again, designing a convolutional neural network that diagnosed x-rays of bone fractures better than actual radiologists. Now why Andrew had such a keen interest in analyzing bones is beyond me. Considering his stealthy-disposition, I think we all had our suspicions. Luckily, they have yet to have been confirmed.

Andrew then brought his big brain to the Big Apple. At Columbia University, Andrew spent the summer following his sophomore year studying how the creation of new neurons (neurogenesis) is related to clinical depression. Andrew's research found that those who were never treated for their depression during their lifetime had significantly lower neurogenesis than healthy individuals and those who suffered from depression but were treated with SSRIs (selective serotonin uptake inhibitors).

Andrew then redirected his research towards schizophrenia. Back at Colombia, Andrew studied irregularities in information processing in schizophrenia. Andrew found that individuals with schizophrenia held information for significantly less time compared to healthy individuals in areas of the brain which deal with the formation of novel associations and the refinement of current associations. Andrew believes that this may explain why those with schizophrenia suffer from delusions. Andrew was named a Regeneron Scholar for his study.

Next year, Andrew will take his talents (and schemes) to Princeton where he will continue to pursue his interest in neuroscience.

Research Resume

Grade 12 – Project Abstract:

Compression of Intrinsic Neural Timescale in Schizophrenia

Hierarchy is a key neuroanatomical organizing principle in the processing of sensory information and the integration of neural circuitry; gray matter myelination and intrinsic neural timescale, or how long information is maintained in a given area of the brain, are two established measures of hierarchy. The present study analyzed these two measures with respect to schizophrenia, a severe psychotic disorder that has been associated with irregularities in sensory processing systems. By analyzing resting-state functional magnetic resonance imaging (rsfMRI), the present study found that, compared to healthy controls, patients with schizophrenia tended to have shorter intrinsic neural timescales in higher-order processing systems which deal with association formation and longer intrinsic neural timescales in lower-order processing systems, which deal with perception of sensory stimuli. These findings further explain the current understanding that patients with schizophrenia tend to weigh local sensory data abnormally and fail to integrate novel information to update erroneous beliefs. Additionally, this study also found a negative correlation between conceptual disorganization and intrinsic neural timescale, driven by reduced intrinsic timescale in higher-order processing. This indicates that shorter timescales, and therefore less time to form novel beliefs and refine existing beliefs, were associated with an increased severity in conceptual disorganization. In terms of gender, men tended to have longer timescales in higher-order processing, which may explain why women have been found to have higher rates of paranoid schizophrenia and illogical thinking in first-episode psychosis when compared to men. Lastly, gray matter myelination and intrinsic neural timescale in healthy individuals were inversely correlated, supporting the theory that gray matter myelin's function is to guide axonal growth and novel synapse formation to modulate cortical plasticity and thus the function of neural circuits supporting temporal integration at different timescales. Ultimately, the present study indicates that atypicality in hierarchy in the brain is linked with the development of schizophrenia and symptom severity.

- Scholar, Regeneron Science Talent Search Scholar

Grade 11:

The Relationship between MDD, MDD Treatment, and Adult Hippocampal Neurogenesis Marker Doublecortin

- High Honors, Long Island Science Congress
- 8th Place, NSPC Health Fair

Grade 10:

Man vs. Machine: Comparing Accuracy of Long-Bone Fracture Identification between Convolutional Neural Networks and Radiologists

- 1st Place, Research Association Fair
- Honors, Long Island Science Congress

Grade 9 *:*

The Relative Effects of Change in Underarm Product on the Microbiome of the Underarm

- Honorable Mention, EcyberMission
- 3rd place, Roslyn Research Fair

Daleep Grewal

Daleep has been a long-time member of the Research Program since the ’16 Intro class. Inspired by the not-so-popular Netflix series *Lie to Me*, Daleep started his research career off by exploring the effects of microexpressions on the doctor-patient relationship with William, Daniel, and Spencer. Despite the team’s initial ambitions, they were preoccupied with more pressing questions such as who the “MAIN researcher” in the group really was, and whether it would be appropriate to name the research squad “The Goofy Specters”. The ultimate clash of egos somehow yielded an honorable mention from the eCyber folks, but the trauma from the drama was ultimately too much for Daniel and Spencer, leading to their departure from the research program (gone but never forgotten).

The following year, Daleep joined forces with his long-time pal Daniella to examine the relationship between a mother’s employment status and her children’s belief in gender equality. A combination of unproductive 3 A.M. FaceTime calls, lectures from Mr. Dispigno, and disheartening progress check grades posted by Ms. Morin on Powerschool really damaged the morale of the group, but it all paid off when the group received a paper “merit award” certificate from RAF. So rewarding!

Disillusioned, Daleep decided to conduct research at Mount Sinai Hospital in NYC to explore the causes of kidney disease. Daleep’s love for naps grew immensely during the summer as labs in the hospital never opened until 9 A.M, but more importantly, Daleep was able to clarify his interest in cellular biology. After receiving recognition from online journals and research competitions, Daleep began to genuinely enjoy the rollercoaster journey of research. However, his issues with group work in the past came back to haunt him, as his partner in the lab refused to split data for senior-year competitions. So much for teamwork!

When Daleep isn’t researching, he’s most likely napping, playing pickup ball at the JCC, or racking up dubs on Fortnite.

Research Resume

Grade 11-12 – Project Abstract:

The Role of FYN Inhibition and Knockdown in Determining Podocyte Cell Size and Actin Cytoskeleton

Chronic kidney disease currently affects 30 million adults in the United States and is expected to rise substantially in the next 25 years, indicating that the current method of kidney transplant is sub-par and genomic analysis is necessary to find biomarkers of the disease. *Shroom3* was identified as a novel candidate gene whose expression in the renal allograft correlates with the decline of renal function. This is of public health relevance as 40% of Caucasian and admixed populations were found to carry a single nucleotide polymorphism (SNP), i.e. a *Shroom3* mutation (Chuang & Menon, 2012). To further study the role of the *Shroom3* gene, Menon et al have used animal models where *Shroom3* levels were modulated {Menon, 2015; Menon, 2018}. Specifically, in podocytes, a specialized kidney cell, a protein-protein interaction was identified between *Schroom3* and *Fyn*, another Src protein, which impacts podocyte actin cytoskeleton and cell size (Menon, 2018). This interaction was necessary for *Fyn* activation. It is thus imperative to elucidate whether *Fyn* has independent effects on podocyte morphology in order to delineate the downstream mechanism of *Shroom3*, such that future therapeutics could specifically target the protein. The present study manipulated *Fyn* in podocytes such that the protein was either inhibited, using a novel inhibitor, or knocked down via shRNA. Overall, the actin organization in podocytes was not affected upon BD55 treatment (inhibition) or FYN knockdown. While there were observed increases in non-phosphorylated total Src kinase fraction, no differences in podocyte cell size or phosphorylated Src were seen with BD55. Upon *Fyn* knockdown, while no overt cytoskeletal changes were seen, podocyte cell size was reduced. These findings could suggest the importance of other Src family proteins in taking over the function of FYN in its absence or after inhibition of activation. Future studies are required to modify the structure of BD55 to reduce toxicity and confirm the effect of FYN knockdown on podocytes. This study provides insight on cell signaling, regulation, and morphology, which can hopefully contribute to the discovery of new biomarkers that play a role in chronic kidney disease.

- 3rd Place, Long Island Science and Engineering Fair - JV
- Published in National High School Journal of Science

Grade 10:

An Exploration of the Effect of Maternal Employment (Following Maternity Leave) on Children's Ambition Level of Career Choice (with Daniella Futuron)

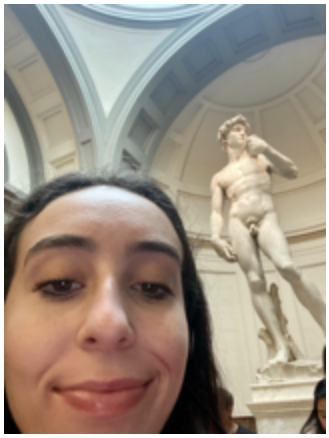
- Merit Award, WAC Lighting Invitational Research Association Fair

Grade 9:

Microexpressions and Their Application Towards the Doctor-Patient Relationship (with William Borges, Spencer Tsao, and Daniel Sung)

- Honorable Mention in NY State, eCybermission Competition

Madeline Groothuis



Maddie Groothuis (one half of the iconic Maddie^2, also known as Madleen or Grooth) began her research career freshwoman year with several near failing grades in Intro to Research. Her first study, alongside partners Makenzie, other Maddie, and dear cousin Andie (see: research graveyard), on epidemic timespan of the influenza virus, involved great camaraderie and complete disaster. Although the study itself was a flop, Dr. Weseley took a special affinity towards Maddie and Andie's grandmother; known as Grammy, a bond that would persist for the entirety of Maddie's research career.

Maddie began her sophomore year project, with partner and BFF Ariella, on appearance and perceived hiring ability. Although they do not look alike, Dr. Weseley often confused them on account of their laziness and procrastination skills. Maddie was so dedicated to this research that one gray December morning, after realizing she had forgotten her research logs as the school bus rapidly approached, Maddie sprinted up her home stairs so quickly that she miscalculated the location of the top stair and proceeded to trip and kick said stair. One trip to urgent care later and another to the orthopedist, Maddie was diagnosed with a broken left foot and forbidden from skiing for December vacation. Although the crutches and pain were unpleasant, Maddie felt a sense of pride in being the first and only research-related injury Roslyn High School has ever witnessed (at least she thinks).

Junior year, Maddie flew solo for a project about sexual harassment and gender. This project consisted mainly of Maddie posing hypothetical scenarios to her fellow researchers and Dr. Weseley, asking them whether they considered these situations to be sexual harassment. Initially, the purpose of this activity was to enhance her study, but eventually it became a concerning hobby of hers to place friends into distressing sexual harassment situations. Don't you worry, no researchers were harmed or me too'd in the process. After finding significance, Maddie realized this was only half the battle, and she proceeded to spend many hours analyzing and begging Dr. Weseley for help in an attempt to make sense of her results. Eventually, all her labors paid off, and Maddie finally figured out how to open SPSS on her laptop at home.

Instead of spending her summers in a lab, Maddie opted for the more traditional route of running a stained glass program at summer camp in rural Massachusetts. This forced Maddie to complete her Regeneron application whilst glass cutting, explaining her many glass-related injuries and lack of lab knowledge (sorry other Maddie).

Outside of research, Maddie can be found "playing" the mellophone in the marching band, drinking coffee whilst listening to Billie Eilish, presidenting in habitat for humanity, at an obscure art museum, or mostly likely in Ms. Kim's extra help. Maddie is extremely grateful for the opportunity to have participated in the Research Program and to Dr. Weseley for all her support. In college, Maddie hopes to study history and political science, and will, of course, be utilizing her extensive research skills and sexual harassment knowledge in order to create a safer tomorrow.

Research Resume

Grade 11-12 – Project Abstract:

#HeToo? How Gender Affects Perceptions of Harassment

During the last few years, the #MeToo Movement has dominated the media, bringing down highly prominent and powerful men. Although the movement focuses on sexual harassment of women, men are victims of sexual harassment as well. Much ambiguity surrounds what constitutes sexual harassment, and past studies have revealed that gender may play a significant role in what is considered sexual harassment. The present study sought to determine if perceptions of sexual harassment change by manipulating the gender of the people involved. Participants were shown three scenarios, each depicting either a female employee in a potential harassment situation with a male supervisor, or a male employee in a potential harassment situation with a female supervisor. The participants then rated their agreement with a statement that said, "I consider this behavior to be sexual harassment". The results showed that participants perceived more scenarios as sexual harassment when the supervisor was male instead of female. They also demonstrated that female employees were more frequently perceived to be harassed than male employees based on the same conduct and that female participants perceived significantly more scenarios as sexual harassment than male participants. Finally, the results revealed that verbal exchanges between male supervisors and female employees led to the highest perceived ratings of harassment, while exchanges between female supervisors and male employees led to the lowest perceived ratings of harassment. These findings illustrate that gender plays a significant role in perceptions of sexual harassment.

- 2nd Place, WAC Lighting Invitational Research Association Fair (RAF)
- High Honors, Long Island Science Congress

Grade 10:

Appearance Isn't Everything (with Ariella Hakimi)

Grade 9:

The Effect of Epidemic Timespan on Perceptions of the Influenza Virus (with Madeline Rubin, Makenzie Komack, Andie Weiner)

Ariella Hakimi

Ariella Hakimi's interest in research all began in 8th grade when Dr. Weseley came into her English class to introduce the research program. One of her friends (who will remain unnamed) frequently says to Ariella when she is complaining about research, "I don't know what Dr. Weseley said to make you want to take that class. Seems so boring." And sometimes, Ariella wondered that too. But, all her research adventures say otherwise.

It all started with the infamous "CalCounters" (Ariella, Paige Schultz and Daniella Futoran who is sadly no longer with us) who, miraculously I might add, made it to the eCybermission National competition. After a weekend of army boot camp training, vegetable lights, and "The Creme Brulee Anti Social Squad," the CalCounters unfortunately did not win the competition. There is still a plaque hanging on the wall though, so we can't complain.

Sophomore year, Ariella and her partner Maddie Groothuis did a project on how the hair color and texture of a woman affected other people's perceptions of her intelligence and hireability. This led Dr. Weseley's comments to this day on Ariella and Maddie's hair every time they straighten it. (Soph year's Honorable Mention: the scuba diving factorial design YouTube video. If you know about this video you know that it saves many lives. Look it up for next year, trust me).

Junior year, Ariella decided to complicate her life by doing a project she would have to do in classes. She studied the effects of different quiz formats and environments (open book, closed book, and crib sheet) on students' anxiety, performance and retention of material. Honestly, an immense shoutout to Ms. Pearlman for putting up with Ariella. Ariella tried contacting multiple teachers to do the study in their classes but they were all unwilling. If she told you how many pictures she has of teachers' class schedules in her phone right now you wouldn't even want to know. Ariella received Honorable Mention at RAF, and some award as Dr. Weseley put it as "the highest designation without having to attend the award ceremony" at LISC. Honestly, pretty solid considering she and Maddie dissected a styrofoam cherry the whole time. Don't ask.

Senior year, Ariella continued her junior year project in which she was supposed to go on another out of state trip with Dr. Weseley to Boston although that, of course, got cancelled due to the coronavirus (sad, Maddie and Ariella were excited to get to visit Tufts for Kate!) She also dreaded submitting to Regeneron in which Dr. Weseley told her to let her sister read over her paper as "Natalia seems more detail oriented than you." Her other novel contribution senior year was designing the senior research sweatshirts (which I don't know were even ordered by the time this yearbook comes out oops). Research was a ride for sure (and hopefully it's not over because Ariella is currently writing this during the two week coronacation-- a week after it was due).

Research Resume

Grades 11-12—Project Abstract:
The Effects of Quiz Type on Quiz Performance, Anxiety and Retention

In the twenty-first century, the stress levels of high school students are sky-high. One factor that contributes to the stress of these students is the pressure of colleges becoming increasingly more competitive and having lower acceptance rates. Acceptance rates at elite colleges has been decreasing. For example, the class of 2001's admission rate to Stanford was 15.5% while Harvard's rate was 12.3%. Twenty years later for the class of 2021, Stanford's rate decreased to merely 4.7% and Harvard's to 5.2% (Jackson, 2017). Students in high school are tested with tremendous frequency, and, unfortunately, many suffer from test anxiety. The problem this study investigated was whether test anxiety and stress can be decreased and learning increased by altering the test environment. The current testing environment may be contributing to student stress and anxiety. The popular way of testing, currently and in the past, is by a closed-book examination in which students do not have access to their learning materials during the examination. However, there are test format alternatives, such as open-book and crib-sheet exams, which may cause students less test anxiety. In addition, this study tested the effects of multiple-choice and short answer questions on performance. In a matched-pair design, 64 students in three sections of an AP Psychology course took a series of three quizzes in which every participant saw every condition of the study. While the crib-sheet showed the highest level of performance, these differences were not statistically significant, although they had a relatively large effect size. In addition, the open-book and crib-sheet conditions caused the same level of anxiety while the closed-book condition caused a higher level of anxiety. These results were not statistically significant but had an effect size of five percent.

- Honorable Mention, WAC Lighting Invitational Research Association Fair
- Achievement Award, Long Island Science Congress

Grade 10:
Appearance Isn't Everything **(with Madeline Groothuis)**

Grade 9:
Do Calories Really Count? **(with Daniella Futoran and Paige Schultz)**

- **National Finalist, eCybermission**

Makenzie Komack

By Nikki Blattman

The one and only Makenzie Komack entered Roslyn High School with a multitude of questions: she wondered if she would grow by senior year, she wondered if she would stop wearing all black outfits, and she wondered if she could survive the Roslyn Research Program under the watchful eye of Dr. Weseley. While the first two questions received a resounding, all-consuming "no," 4 years later, Makenzie has avoided a place in the Research Graveyard and has earned herself quite a few notable honors.

MPK started off her research career with the fire quartet of her, Maddie^2, and Andie Weiner (of Research Graveyard fame). The doe-eyed frosh looked at Dr. Weseley as the center of the universe, so much so that Makenzie decided to set a picture of Dr. Weseley as her background, making for a very awkward encounter when Dr. Weseley saw. Anyway, the four frosh researched how epidemic timespan affected the perceived risk of the influenza virus, which begs the question…will there be a part 2 for the coronavirus? Reunion tour?

Sophomore year, Makenzie wanted more. She wanted passion, excitement, oomph… she wanted environmental science! Teaming up with Nikki Blattman, the pair set out to Erase the Waste™ by using *Daphnia Magna* as an indicator of pollution and toxicity in manipulated and local surface waters. That competition season, MakNik went on to win Best in Fair at our very own Roslyn Research Fair as well as 1st place in Environmental Sciences at the Research Association Fair.

In 11th grade, our sweet Makenzie lost her way and decided to look at drinking behaviors in young adults. Although seemingly unqualified to analyze binge drinking, due to her less than packed social calendar, she brought home the big stuff: 1st place in Behavioral Science at both the RAF and LISC. These prizes were necessary feats to rebuild her self-esteem after a crushing offhand comment by Dr. Weseley that former partner Nikki's Buzz Lightyear Halloween costume was more realistic than her own Woody. Though Halloween was not part of a competition, Makenzie did in fact shed a tear over her lackluster woody impersonation.

After junior year, Makenzie packed her bags, kissed her parents and doggy goodbye, and set off to the exotic Tufts University to create a silk-based power PICC for infusion of medicine and nutrients. The result? A project that brought her all the way to JSHS nationals (except that it got cancelled), a bizarre conversation with a middle-aged competition judge (where her project was referred to as sexy), and the creation of an uncomfortably close relationship with her roommate Miela.

All in all, Makenzie has had quite the research career, and she will continue to develop her scientific talents as she goes off to college where she definitely will not continue to analyze drinking behaviors of college students. That would be ridiculous.

BROWN

Research Resume

Grade 12 – Project Abstract:

The Power is in the PICC: Creation of Silk Based Power PICC Lines

Secure, safe, and efficient access to a major vein can be the deciding factor in the life or death of a patient in critical condition. One accepted way of gaining venous access is through the PICC (peripherally inserted central catheter) line, a subset of central venous catheters that is a thin, soft, and long catheter, which can be inserted in the lower arm and pushed into the superior vena cava. In United States hospitals alone, patients with cancer, cystic fibrosis, and other illnesses collectively spend 15 million days with a PICC line implanted in their arm. These hospital days are riddled with complication rates ranging from 30 percent to 50 percent depending on the patient's condition. The biomaterial silk may provide an answer to many of the complications facing PICC line receiving patients, as it has been shown to be useful in similar catheters to a PICC line. Silk contains remarkable qualities including the ability to degrade slowly *in vivo,* its capability to be processed into a wide variety of materials, and its biocompatibility. The goal of this study was to create 25 cm tubes of silk that have both porous and non-porous capabilities while still being robust and flexible. Tubes were created using the parameters of the currently accepted PICC, the Healthline Corporation PICC, which is described as an 18 gauge. Results supported a wide range of pores can be created in silk for the usage of multiple different medicines. Additionally, the study demonstrated the PICC could withstand a constant flow of 05 mL/min and 4.8 mL/min for over two hours without any leakage. The silk-based PICC line is on the forefront of a future where medical devices will increasingly be made from biomaterials to cut down on risk of complications.

- National finalists, Junior Science and Humanities Symposium

Summer 2019: Kaplan Lab of Regenerative Medicine at Tufts University.

Grade 11:

The Battle of The Binge: An Analysis of Drinking and Drinking Behaviors in Young Adults

- 1st Place, WAC Lighting Research Association Fair
- High Honors and Best in Category, Long Island Science Congress

Grade 10:

Erase the Waste: The Use of Daphnia magna as an Indicator of Pollution and Toxicity in Manipulated and Local Surface Waters

- 1st Place, WAC Lighting Research Association Fair
- 1st place and Best in Competition, Roslyn Research Fair

Grade 9:

The Effect of Epidemic Timespan on the Perceived Risk of the Influenza Virus

Jake Litvack

Throughout Jake's (aka, Litvack to avoid confusion with the more popular researcher and OCC member, Jake Stoller) research career, he has always flown under the radar. Litvack's participation in Roslyn's Research Program began on his first day of high school in his 3rd period Introduction to Research Class in 2016. Going in, he knew that research was an academically challenging course, but he did not anticipate the support of the research community that came along with it.

His first year in the program, Litvack selected his team based on name and stature. The famous team, "Extraneous Variables," consisted of Jake, Jake, Jacob, and the tallest, biggest, most intimidating researcher of them all, Yasin. Their project investigated The Effects of the Number Law Enforcement Officers at Stadiums on People's Perceptions of Safety. The team worked tirelessly on their project but their Ecybermission submission was an absolute blunder. The year of hard work ended in submitting a half finished document (containing dozens of Dr. Weseley's comments critiquing their young work) as their final submission.

In his sophomore year, Litvack decided to study The Effects of Physical Activity on Academic Achievement in the Classroom with ex researcher Jacob Stein (see research graveyard). Despite their questionable past (including several heated arguments as teammates in Public Forum Debate in 9th grade), Jake and Jacob thought it would be smart to remain as a team sophomore year. The team did not find significant results, however, they did find entertainment in the form of watching AP psychology classes exercise in the middle of a lesson.

Finally, in Litvack's junior and senior year he decided to study The Effects of Various Security Techniques on People's Perceptions of Safety in School. This project was both a spinoff of his 9th grade project and Jake Stoller's 10th grade research proposal. Litvack enjoyed himself during this project as he got to indulge in the idea of fake news. He had fun creating fake articles and school names to portray different security measures to his participants. In his final project at Roslyn High School, Litvack was finally able to achieve significant results.

And yet, despite this research victory, during the mugging ceremony at the end of junior year, Litvack waited the entire time to receive a mug and, to his dismay, was forgotten and left mugless (only temporarily and only due to the abhorrent irresponsibility of a certain senior researcher who failed to attend the mugging!). Even though Litvack was once, briefly forgotten, he typically can be easily spotted, looking slightly disheveled, probably wearing pink, with his Buzz Lightyear backpack, and in his Ugg slippers everyday. It almost goes without saying that every time Litvack entered the classroom, his excitement for learning was matched by Dr. Weseley's excitement regarding his hairstyle/outfit of the day.

Litvack is unusually athletic for a Roslyn researcher. If you can't catch him inside the classroom delving into his assignment of the day, you can most likely catch him watching or playing hockey, baseball, football, or volleyball. While other seniors may mourn the possibility of missing graduation and prom, Litvack is mainly saddened by the disruption of so many sport seasons … and, of course, the possibility of a year without a Research Symposium.

Research Resume

Grade 11-12-- Project Abstract:

Too Scared for School?: The Effects of Various Security Techniques on People's Perceptions

As attacks against our nation's schools become more and more prevalent, schools continue to react aggressively by bulking up their security measures. While the intentions of these techniques are to safeguard students and staff, they may remind them that they are in an environment where violence can happen and thus undercut the learning environment of school. Research shows that students tend to have positive opinions of some security measures, however, no studies have examined how students react to arming members of the school community, a suggestion that has grown popular in the wake of Columbine, Sandy Hook, and Parkland. In Experiment 1, high school students (ages 14-18) were randomly assigned to read a newspaper article describing a security procedure being adopted by a local high school (maintaining the current system, employing unarmed guards, employing armed guards, arming teachers, or installing metal detectors). Students then reported how safe they would feel if they were to attend this school and how much they would like their own school to adopt procedures similar to the ones described in the article. Results showed that students felt significantly less safe when teachers were armed compared to all other manipulated conditions. Furthermore, students reported preferring unarmed guards significantly more than metal detectors and armed teachers. Experiment 2 used the same methodology to investigate the effects of the same security procedures on adults' perceptions of safety and security preferences. Experiment 2 demonstrated that adults felt safer sending their children to a school with metal detectors compared to a school with armed teachers and that they preferred that their local school use any technique described in this study more than armed teachers. This study reveals the negative opinions that both parents and students have regarding arming teachers.

- 3rd Place, WAC Lighting Invitational Research Association Fair (RAF)
- Honors, Long Island Science Congress

Grade 10

The Effects of Physical Activity on Students' Academic Achievement (With Jacob Stein)

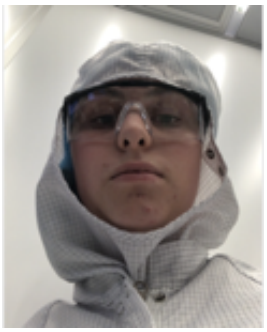
- Honorable Mention, WAC Lighting Invitational Research Association Fair (RAF)

Grade 9

The Effects of Law Enforcement Officers on Individuals' Perceived Danger (With Jacob Stein, Jake Stoller, and Yasin Badawy)

Maddie Rubin

On Maddie's first day of research, she ran at her swift 3 mi/hr pace to arrive at the famed Lecture Room A. Quickly, she had found her home: a room lined with hundreds of movie posters. While she shortly thereafter realized that the films had no connection to the empirical research at hand, Maddie still appreciated the cinematic sentiment in her surroundings. She appreciated it so much, that even after some failed assignments, she powered through Intro to Research to remain in her film paradise, finding solace in the fact that Brad Pitt from *Fight Club* would be watching over her research efforts.



It then came to Maddie's surprise when she moved up to the 3rd floor Research Center. With her partners Maddie Groothuis, Andie Weiner, and Makenzie Komack, she researched the Effect of Epidemic Timespan on the Perceived Risk of the Influenza Virus. The results were as insignificant as could be and the group definitely took a blow to their research morale, but Maddie really marveled at the statistical power within SPSS, considering herself an expert in 3x2 ANOVAs w/ post-hoc (use the "univariate" option under analyze data and select your independent variables as fixed factors; consult pg. 32 in the research guide for more help xox). Thus began her perpetual hunger for data.

Her sophomore year, in a ruse to get the school to fund her army of fruit flies, Maddie researched The Effect of Resource pH on the Transgenerational Fitness of *Drosophila melanogaster*. Long story short: alongside Lianna Friedman and Mr. Dispigno, Maddie tediously sedated fruit flies and watched them fight to the death over the alcoholic, yet tasty, food prepared for them, culminating in her planning a mass funeral for over 300 bugs. Rest In Peace to Henry, Todd, Melissa, Barry + 296 more beautiful souls.

Maddie's excellence in dealing with animals led her to Dr. Esser-Kahn's lab at the University of Chicago, where she researched "The Synthesis and Purification of Pam3CSK4 Spacer-Tag Variants." While she may tell you that she went to Chicago to follow in the footsteps of Lip Gallagher from *Shameless*, Maddie immensely enjoyed her time here actually following in the footsteps of Mentor Ethan. Despite rarely leaving Hyde Park, Maddie had a fantastic time exploring the Second City. Yet when you see her, remind her that she owes Yena Kim $0.27 for the bar of soap that the roommates split 3 ways.

Maddie's research career ended on a high note—literally. Upon a mountaintop in Harlem at the CUNY Advanced Science Research Center, Maddie trekked up in the blazing heat, put on her hazmat suit, and synthesized films of silicon oxy-nitride using a plasma enhanced chemical vapor deposition. She was so proud of her research that she submitted her project three months early to Regeneron—while it was still incomplete :)

When not researching, Maddie is probably swooning over movie posters in Lecture Room A or convincing people that DECA is just as viable of a club as debate. She will be taking her talents to Duke University's Pratt School of Engineering as an A.B. Duke Scholar, where she hopes to continue her education in biomedical engineering/business/movies.

Research Resume

Grade 11-12 – Project Abstract:

Plasma-Enhanced Growth, Composition, and Refractive Index of Silicon Oxy-Nitride

The ability to synthesize materials with specific refractive indices (RI) has allowed for the development of optical components that refract light to achieve desired effects, including waveguide structures and anti-reflective coatings (Schmidt, 2015). These materials have been used across a wide array of products, such as electronic screens and camera lenses. Silicon oxynitride films are of specific interest for the development of these structures because they can be tuned in a wide RI range by altering the material's composition (Davis, 2012). Furthermore, the deposition parameters, including the pressure, gas flow, and RF power , when growing SiON via Plasma Enhanced Chemical Vapor Deposition (PECVD), have been found to affect the composition and thickness of the silicon oxynitride films (Patel, 2017), which then alters the RI (Alayo, 2004). The present study sought to elucidate the relationship between these PECVD parameters on the RI of the films to create tuning curves for experimentation and product development. Thirty-four films grown with varying pressure, RF power, and gas flow rate were synthesized in a PECVD chamber, and then, the RI and composition of the films were determined using ellipsometry and x-ray photoelectron spectrometry (XPS),. It was found that the RI generally decreased with increased RF power, pressure, and N2O gas flow, while the opposite was true for NH3. While there was no defined pattern in the stoichiometry of the films that can be attributed to the change in RI, reliable tuning curves and reproducible recipes of silicon oxynitride with varying RI's were generated. These recipes will allow scientists to easily and cost-effectively produce a specific RI to be used in research and product development.

- Semi-Finalist, Junior Science and Humanities Symposium

Summer 2019:

Research Assistant in Dr. Vishal Narang's Lab at CUNY Advanced Science Research Center

Grade 11:

The Synthesis and Purification of Pam3CSK4 Spacer-Tag Variants

- Honorable Mention, WAC Lighting Invitational Research Association Fair
- Honorable Mention, JV LISEF

Summer 2018:

Research Assistant in Dr. Esser-Kahn's lab at the University of Chicago

Grade 10:

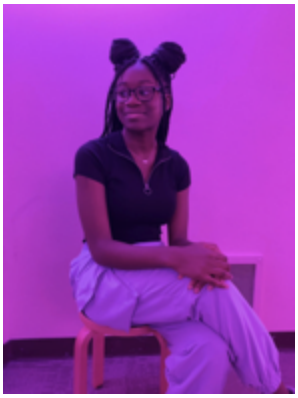
The Effect of Resource pH on the Transgenerational Fitness of Drosophila melanogaster (with Lianna Friedman)

- 3rd Place, WAC Lighting Invitational Research Association Fair
- High Honors, Long Island Science Congress
- Best in Category, Roslyn Research Fair

Grade 9:

The Effect of Epidemic Timespan on the Perceived Risk of the Influenza Virus (With Maddie Groothuis, Andie Weiner, and Makenzie Komack)

Feyi Rufai



Feyi's time in the research program can be summarized by two statements: "When's the party happening" and her love for psychology projects (she's a social sciences type of gal).

Feyi's research career started as most do, with her group being named after cheese. Shropshire blued had a pretty successful run, winning the merit award at WAC. However, their project was arguably best known for being the group that was disqualified from E-Cybermission for failing to provide a citation for a picture of cigarettes on the posters they hung up around the school.

Then came sophomore year. After half of the iconic Shropshire blued became a part of the research graveyard (RIP Sarah and Serena), Feyi was stuck with Olivia. Their research project "The effect of gender and gendered traits on perceived qualifications" was a hit at research competitions. They came in 1st at WAC despite the fact that their study had not one piece of significant data. This came as a surprise to not only the duo but to Ms. Morin who probably expected the lack of significant results to lead to their downfall.

Then junior year came around, which meant a solo project and having to create a new color scheme for her board. Alas, best friends Feyi and Olivia no longer had research together (spoiler alert senior year their conferences aren't the same period either). Although she had to rewrite parts of her paper MANY, MANY, MANY times, she still finished before many and earned the opportunity to attend LISEF JV where the presenters get chairs, while the rest of her peers sat had to sit on the Saint Anthony's indoor turf at LISC marveling at the money an athletic powerhouse devotes to its sports facilities. Her study "Does that make me crazy" always caught the eye of judges and dealt with the perceptions of the different methods to treat depression. (She also won $5,500 at the health fair- no biggie).

Senior year consisted of Feyi skipping (sorry "missing") second period to help the frosh and taking field trips (Senioritis hit hard). Oh, and she also continued to compete with her project and won Honorable Mention at Day 2 of LISEF. When she's not helping the frosh at REX or leading the marching band, she can be found taking a nap, playing WoodShop, or scoping out the best places for chicken and fries.

Research Resume

Grade 11-12--Project Abstract:
DOES THAT MAKE ME CRAZY?
Research has established people are stigmatized based on the treatment they receive; however, there has been very little research on this stigma varies with certain psychological disorders. The present study will investigate students' perceptions of a theoretical college roommate. The participants will be randomly assigned to read a text message of a student with either depression or anxiety who will either receive therapy, medication, or no treatment. Participants were then given a series of statements based off of the text message and responded using a Likert type scale. For depression, no treatment received the most positive feedback. However, for anxiety, medication received the most positive feedback ($p = .028$). The results also show females tend to stigmatize more than males ($p = .032$). The experiment suggests there is still a stigma associated with certain psychological disorders and treatments.

- Honorable Mention @ Long Island Science and Engineering Fair Junior Varsity
- 3rd Place @ WAC Lighting Invitational Research Association Fair
- 1st Place @ Neurological Science PS Health Fair
- Honorable Mention @ Long Island Science and Engineering Fair

Grade 10: The Effect of Gender and Gendered Traits on Perceived Qualification

- Honors @ Long Island Science Congress
- 1st Place @ WAC Lighting Invitation Research Association Fair

Grade 9: How Do Teens Perceive Electronic Cigarettes?

- Merit in WAC Invitational Research Association Fair

Paige Schultz

Paige's research career began and peaked in 9th grade while researching Cal Counters Abstract… or was it The Effect of Varying Calorie Representations on the Number of Calories a Consumer Orders?

This year gave Paige the opportunity to overcome obstacles. Whether it be a lack of statistical significance or a naming mishap where she accidentally submitted her abstract title as her project title for all her judges at RAF to see, things somehow panned out in the end. Weseley expertly coached "The Ellas" to victory, teaching them how to pitch the idea that lack of statistical significance did not necessarily indicate lack of clinical significance. Paige, Daniella, and Ariella became national Finalists in the army-run eCybermission competition and spent a week at a luxurious resort in Virginia where they made frequent visits to a snack buffet set up 24-7.

Things went downhill from there - how could they not? Finding one research partner to commit to for the whole year seemed like a daunting task, but with a last minute decision turned awry, Paris was born. With the guidance of Mr. Kreyling, Paige and Harris (RIP) researched The Effect of Varying Yeast Types in the Diet of Fruit Flies, which caused Paige to leave school for inhaling fly tranquilizer one too many times. The scarring nature of this incident and Dr. Weseley's wrath led Paige to take a "vacation" (no matter what the others say, she will not accept that she temporarily dropped out of research) from research during hell year.

Despite this bump in the road, which seemed more like an end, Paige came to the conclusion that her nighttime coffee addiction was not created for nothing. After what felt like hundreds of emails, Paige finally landed a summer lab internship at Weill Cornell for the summer. It is rumored that no one to this day knows exactly what Paige studied in these closed quarters, but Paige likes to say it had something to do with discovering a new immunotherapy for metastatic bladder cancer and that she absolutely did not harm any mice. .

If you don't know anything else about Paige, you should know she's indecisive. Paige made the last minute decision to apply ED to Cornell University and was accepted. She originally thought she would study Pre-Med as a nutrition major, but her research grades and intuition now tell her that policy and government may be a better route for her. Right now, she hopes to study law and combat misleading nutrition policies, but Dr. Weseley thinks she would like being a therapist and Mr. Mumma says she was great in art history. And, then, she could always return to the army and her research glory days as an Ecyber National Finalist.

Research Resume

Grades 12—Project Abstract:

The Effect of Utilizing Kira-8 and MKC-8866 to Inhibit the IRE1-XBP1 Pathway

Metastatic bladder cancer therapies capable of eliciting an effective response remain an unmet need, and immunotherapy is seen as a possible treatment. Cancer cells induce a set of adaptive response pathways to survive in the face of stressors such as the Unfolded Protein Response (UPR), where enzyme IRE1 splices protein XBP1. This process contributes to angiogenesis, tumorigenesis, metastasis, tDC malfunction, and anti0-tumor drug resistance. This study targeted the IRE1-XBP1 pathway in tumor infiltrating immune cells which can be used to unleash anti-tumor responses. Past studies have failed to find a successful IRE1 inhibitor, and this study successfully identified a successful IRE1 inhibitor and anti-tumor immunity. Small-molecule inhibitors KIRA-8 and MKC were found to successfully target the IRE1-XBP1 pathway in murine bladder and pancreas cells, and an analysis of these tissues was conducted using qPCR. The results suggest that MKC-8866 and KIRA-8 are effective and sage inhibitors to continue research with because they successfully inhibited the UPR.

Grade 10:

The Effect of Varying Yeast Types in the Diet of Fruit Flies (with Harris Miller)

Grade 9:

Do Calories Really Count? (with Daniella Futoran and Ariella Hakimi)

- National Finalist, eCybermission

Jake Stoller

By Andrew Goldberg

Jake Stoller is a "good kid." He's a good guy; he genuinely cares about the people around him, is willing to make sacrifices for the betterment of others, and always tries to see the good in people. Sometimes when people see a little guy with a big heart, they think that's all that's there. They're wrong.

Jake Stoller is the star director around here, and we are just the actors. Whether he's heading up Roslyn's behavioral science journal, the *Journal of Secondary Psychological Studies*, leading the research buddies, or serving as president of the Ethics and Government club, Jake gives the great auteurs of Roslyn's past a run for their money.

Jake began his research career, alongside Jake Litvack, Jacob Stein, and Yasin Badawy, examining how the number and type of law enforcement officers present affected perceptions of safety and danger by manipulating the number of law enforcement officers present at a stadium as well as the type (police or military).

Sophomore year, Jake worked with Yasin studying the psychological and physical effects of straw diameter on consumption; they manipulated the diameter of a straw and assessed its effects on perceived thirst, perceived consumption, and actual consumption in an attempt to uncover a novel method to curb the overconsumption of soda in the United States. This study was published in the W*alt Whitman Journal of Psychology*.

The following summer, Jake worked at Memorial Sloan Kettering. His junior year project was titled "The Effects of Palbociclib and Decitabine on Dedifferentiated Liposarcoma."He combined a CDK 4 / 6 inhibitor (palbociclib) and a DNA methyltransferase inhibitor (decitbaine) in order to elucidate a synergistic effect on defifferentiated liposarcoma. The combination failed; however, assessing the effects of each drug as a monotherapy provided crucial insight as to why this was the case. Using this intel, Jake designed his study for the following summer, assessing the efficacy of an MDM2 antagonist with decitabine pre-treatment on Dedifferentiated Liposarcoma. His approach produced a synergistic effect and is now in further testing. His findings may illuminate a new treatment option for Dedifferentiated liposarcoma patients. Jake was named a Regeneron Scholar for his study.

In the fall, Jake will be attending Duke University where he intends to study biology and continue researching. Dr. Weseley is in denial and can be found periodically wandering around the Research Center muttering things like, "what will I do without Stoller"?

Research Resume

Grade 12 — Project Abstract:

Examining the Effects of Decitabine on the Efficacy of DS-3032b in Dedifferentiated Liposarcoma

Dedifferentiated liposarcoma (DDLS) is an aggressive malignancy. Systemic chemotherapy is recommended for metastatic or unresectable disease; however, these therapeutic options have demonstrated low response rates in DDLS patients. Therefore, there is an unmet medical need to find more effective treatments and dosing regimens for DDLS. DDLS is characterized by the amplification of the 12q13~15 chromosome region, which includes the proto-oncogene MDM2, making MDM2 a compelling therapeutic target. DS-3032b is an MDM2 inhibitor that has been shown to induce G1 growth arrest and apoptosis, demonstrating great promise in treating solid tumor malignancies in clinical trials. The present study tested a novel combination therapy to determine whether the epigenetic modulator decitabine could sensitize DDLS cells to DS-3032b and elicit a synergistic effect on DDLS cell lines. Two patient derived DDLS cell lines (DDLS8817 and RDD8107) were used to evaluate the efficacy of the combination of decitabine and DS-3032b when administered both sequentially and simultaneously. The effects of the combination therapy on cell survival, protein expression, and mRNA expression were assessed. The results demonstrated that the sequential, but not simultaneous, administration of decitabine and DS-3032b produced a synergistic effect on cell death ($p < 0.001$). This finding suggests that the sequential treatment of DDLS with decitabine and DS-3032b may constitute a promising new therapeutic option for DDLS patients. In a broader context, the results demonstrate the potential of using epigenetic modulators in combination with small-molecule inhibitors such as DS-3032b to provide more effective cytotoxic therapies in cancers with low response rates like DDLS.

- Regeneron Scholar, Regeneron Science Talent Search

Grade 11:

Examining the Effects of Palbociclib and Decitabine on Dedifferentiated Liposarcoma

- 3rd Place, WAC Lighting Invitational Research Association Fair (RAF)
- High Honors, Long Island Science Congress (LISC)

Grade 10:

Examining the Psychological and Physical Effects of Straw Diameter on Consumption (with Yasin Badawy)

- Published in the *Whitman Journal of Psychology*
- Honorable Mention, WAC Lighting Invitational Research Association Fair (RAF)
- Honorable Mention, Roslyn Research Fair

Grade 9:

Examining How the Number and Type of Law Enforcement Officers Present Affects Perceptions of Safety and Danger

- Honorable Mention, Roslyn Research Fair

Olivia Viruet-Quintero

By Feyi Rufai

Not only is Olivia a researcher, but she is also a queen, a scholar, the CEO of accents, and a Latin legend. As my mom loves to remind me, she is the child many parents dream of having on her way to a stellar education. Whenever she puts her mind to something, there is no stopping her. This has led to her not only being the vice president of Robotics and Diversity Club and an all county athlete, but she is also notorious for never leaving a competition empty handed.

Nonetheless, her research career has not been all unicorns and rainbows. Olivia started her controversial 9th grade year studying electronic cigarettes alongside Feyi, Serena (RIP), and Sarah (RIP). After the infamous research bee fiasco (aka Kahootgate), Olivia worked hard to gain Weseley's approval. Unfortunately eCybermission had other plans and accused the team of plagiarism. Olivia and her group, named after a bougie cheese, however, turned their 2 Ls into a W and earned Honorable Mention at RAF. Olivia continued on with hermana (me!) to study how gender and gendered traits affect perceived qualifications. Despite the petty texts exchanged over who wrote worse, the sisters went on to win 1st place at RAF and Honorable Mention at LISC.

During junior and senior year, Olivia took the time to study the effect of accents on perceived qualifications even after Dr. Weseley and Ms. Pearlman suggested she not. She spent most of her junior year writing 20 versions of her introduction. When she finally got Dr. Weseley's permission to move on, she struggled to find people with accents in the un-diverse land of Roslyn. Despite the constant obstacles, the unstoppable queen went on to win both Honors at LISC and 2nd place at RAF. As a senior, Olivia was forced to find a "professional" who could speak in multiple accents illustrating that research can make your pockets hurt.

When Olivia is not winning competitions and life, she works at becoming a woke queen. At home, she forces her family to talk to her in Spanish. At school, she fights people who have never watched the cultural masterpiece *Coco*. At Diversity Club, she is still trying to convince Ms. Baptiste to have the club watch *Roma*. Olivia walked, so Raini Rodriguez could run.

Research Resume

Grades 11-12 — Project Abstract:

The Effect of Accent and Accent Strength on Perceptions of Doctors

Research has found that "non-accented" people are more desired for jobs, especially in fields where strong communication skills are required. This study sought to explore the effects of accent on the perceived qualifications and hireability of a doctor. In Experiment 1, which utilized a non-matched guise technique, 135 American participants were randomly assigned to listen to an excerpt from a job interview where a doctor had one of four accents (Chinese, Indian, New York, or Puerto Rican) and spoke with either a heavy or light accent. Experiment 2, which used a matched guise technique, tested 209 American participants who were again randomly assigned to listen to one of the eight conditions. In both studies, after listening to the recording, participants were surveyed about the doctor's qualifications and rated their agreement to a series of statements about the doctor. Experiment 1 found that doctors with an Indian accent were seen as significantly more qualified than doctors with a New York accent. However, in Experiment 2 accent was seen to have no impact on perceptions of the doctor's qualifications and hireability. Additionally, there was no difference in ratings between a doctor with a light accent and a doctor with a heavier accent across all conditions and both experiments. The experiment suggests that using matched and non-matched guise approaches may lead to different conclusions.

- Honors, Long Island Science Congress
- 3rd place, Long Island Science and Engineering Fair ("LISEF")
- 2nd place, WAC Lighting Research Association Fair

Grade 10:

The Effect of Gender and Gendered traits on Perceived Qualifications *(with Feyi Rufai)*

- Honors, Long Island Science Congress
- 1st place, WAC Lighting Research Association Fair

Grade 9: ***How Do Teens Perceive Electronic Cigarettes?*** (with Sarah Kim, Feyi Rufai, and Serena Shah)

- Merit Award, WAC Lighting Research Association Fair

Lowest Test Grades

Yasin Badaway: 45, French

Andrew Goldberg: 60, 7th grade Science

Feyi Rufai: 73, Freshman Humanities

Will Borges: 52, Physics C

Maddie Groothuis: 63, AP Calc AB

Sophie Fries: 69, AP Spanish

Olivia Viruet Quintero: 42, Living Environment Honors

Ariella Hakimi: 40, AP Gov

Jake Litvack: 50, AP Lang

Maddie Rubin: 50, Freshman Humanities

Jake Stoller: 30, 8th grade English

Lianna Friedman: 50, AP Physics C

Makenzie Komack: 50, Research

Daleep Grewal: 34, AP Physics 1

Gabby Fries: 66, AP biology

Paige Schultz: 58, Algebra

Nikki Blattman:50, Research Seminar

Favorite Research Memory

Yasin Badawy: Taking a leave of absence

Andrew Goldberg: TGS Fort

Feyi Rufai: Mr.Oggeri walking into our freshman class carrying statistics for dummies.

Will Borges: Exploring the roof.

Maddie Groothuis: Dissecting a styrofoam cherry on the floor of LISC with Ariella.

Sophie Fries: Flash splitting his pants at LISC.

Olivia Viruet Quintero: Sophomore year WAC

Ariella Hakimi: Going to ecybermission.

Jake Litvack: Yasin handing in a half complete copy as our final draft for eCyber mission.

Maddie Rubin: Getting First Place in the Inaugural Roslyn Research Bee

Jake Stoller: Finding Spencer Lazar passed out on the research couch.

Lianna Friedman: Paige leaving school due to flynap.

Makenzie Komack: Napping in the research center and being awoken by bizarre sounds coming from Dr. Wes and the underclassmen.

Daleep Grewal: Picking on Flash with Goldberg.

Gabby Fries: Spending two days in California with Dr. Weseley.

Paige Schultz: Going to Washington D.C with Dr. Weseley and the Cal Counters.

Nikki Blattman: Jumping from 4th place to 1st place in an extra credit Kahoot!

Favorite Quote by Dr.Weseley

Yasin Badawy: “If you drop this year, I am afraid that you will float away from the research orbit.”

Andrew Goldberg: “Give me the Oreos” (Dr. Weseley to Deepak)

Feyi Rufai: “Feyi, you're eating a lot today.”

Will Borges: The growl she makes while she's thinking.

Maddie Groothuis: "Maddie, were the holes in your shirt made by machines or exploited Chinese children?"

Sophie Fries: *Paige dyes hair blonde* Dr. Weseley: "I see you're dealing with premature greying. I'm so sorry."

Olivia Viruet Quintero: “What’s for lunch today?”

Ariella Hakimi: *confuses Maddie G. and I instead of the two Maddie’s*

Jake Litvack: *confused gibberish*

Maddie Rubin: "As you may have heard, there was some cheating on the Research Bee."

Jake Stoller: "Oh you didn't say that. Huh, must have been one of the voices in my head."

Lianna Friedman: “You’re such a... you.”

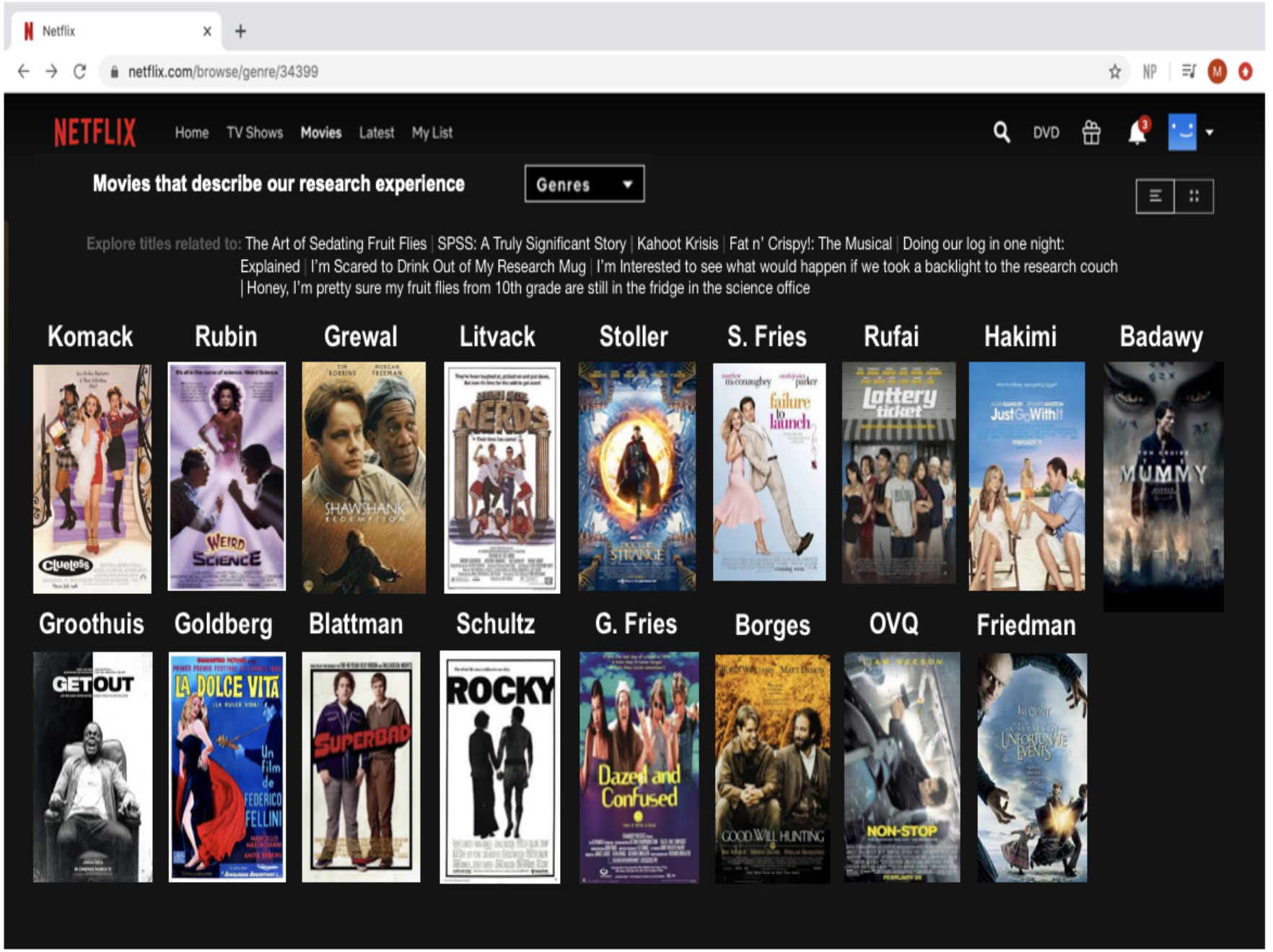
Makenzie Komack: “Are you sure english is your first language?”

Daleep Grewal: “Can we get all this done by tomorrow?”

Gabby Fries: “Don’t tell Kate how immature I am.”

Paige Schultz: *insert illegible noises Wes makes while looking at our work.*

Nikki Blattman: “If you get nervous during your presentation just change into your cheer uniform and remind everyone that you’re captain.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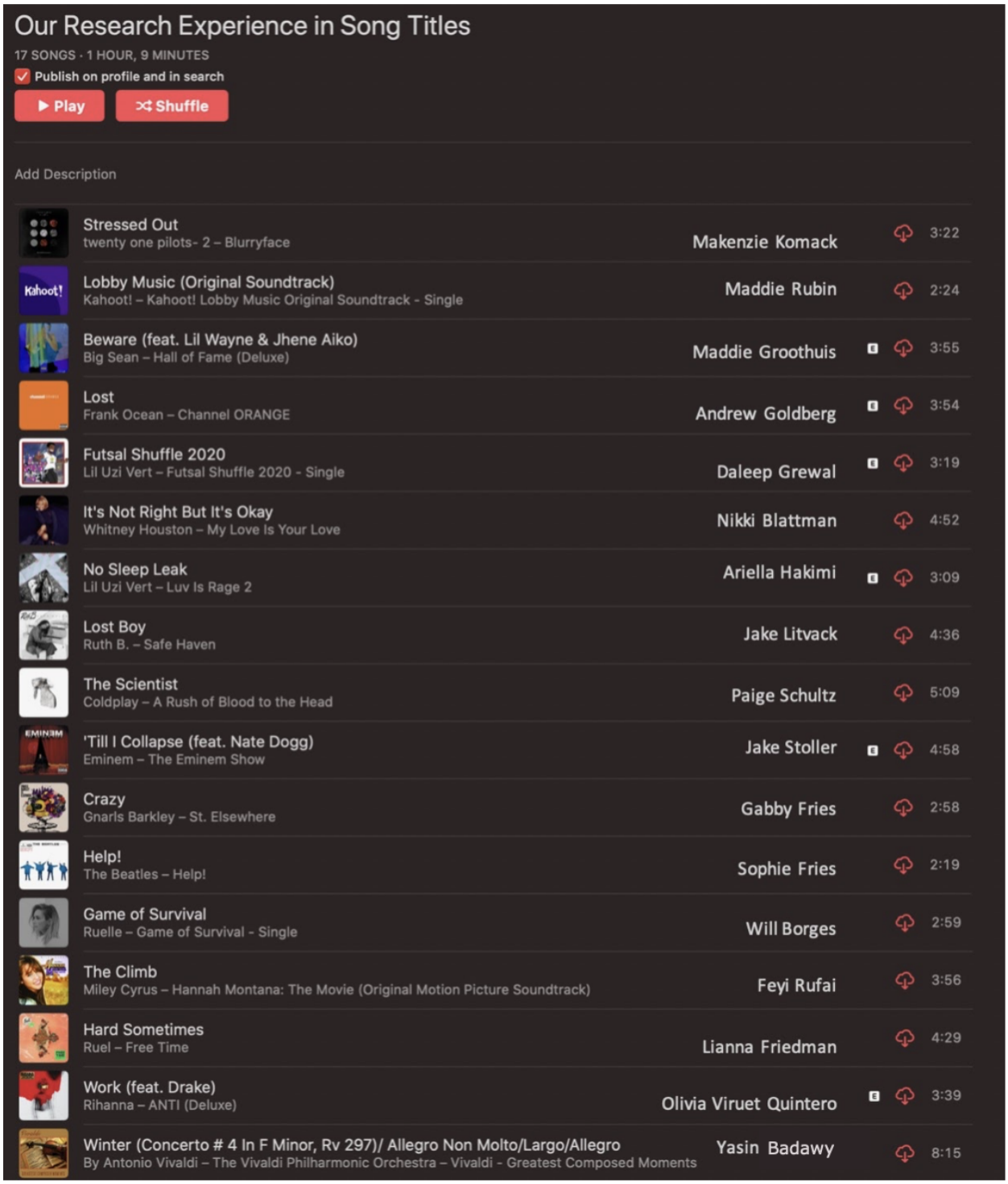
Latest
My List
DVD
Movies that describe our research experience
Genres
Explore titles related to: The Art of Sedating Fruit Flies | SPSS: A Truly Significant Story | Kahoot Krisis | Fat n' Crispy!: The Musical | Doing our log in one night: Explained | I'm Scared to Drink Out of My Research Mug | I'm Interested to see what would happen if we took a backlight to the research couch | Honey, I'm pretty sure my fruit flies from 10th grade are still in the fridge in the science office
Komack
Rubin
Grewal
Litvack
Stoller
S. Fries
Rufai
Hakimi
Badawy
Groothuis
Goldberg
Blattman
Schultz
G. Fries
Borges
OVQ
Friedman

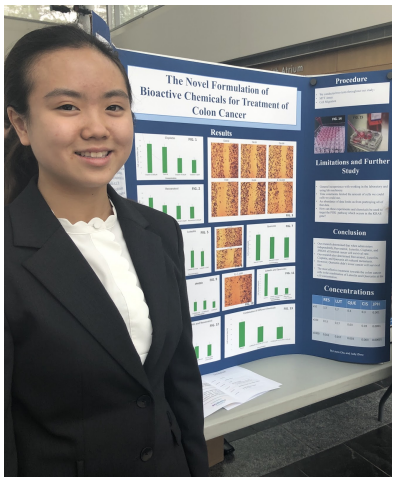

Our Research Experience in Song Titles
17 SONGS · 1 HOUR, 9 MINUTES
Publish on profile and in search
Play
Shuffle
Add Description
Stressed Out
twenty one pilots- 2 – Blurryface
Makenzie Komack
3:22
Lobby Music (Original Soundtrack)
Kahoot! – Kahoot! Lobby Music Original Soundtrack - Single
Maddie Rubin
2:24
Beware (feat. Lil Wayne & Jhene Aiko)
Big Sean – Hall of Fame (Deluxe)
Maddie Groothuis
3:55
Lost
Frank Ocean – Channel ORANGE
Andrew Goldberg
3:54
Futsal Shuffle 2020
Lil Uzi Vert – Futsal Shuffle 2020 - Single
Daleep Grewal
3:19
It's Not Right But It's Okay
Whitney Houston – My Love Is Your Love
Nikki Blattman
4:52
No Sleep Leak
Lil Uzi Vert – Luv Is Rage 2
Ariella Hakimi
3:09
Lost Boy
Ruth B. – Safe Haven
Jake Litvack
4:36
The Scientist
Coldplay – A Rush of Blood to the Head
Paige Schultz
5:09
'Till I Collapse (feat. Nate Dogg)
Eminem – The Eminem Show
Jake Stoller
4:58
Crazy
Gnarls Barkley – St. Elsewhere
Gabby Fries
2:58
Help!
The Beatles – Help!
Sophie Fries
2:19
Game of Survival
Ruelle – Game of Survival - Single
Will Borges
2:59
The Climb
Miley Cyrus – Hannah Montana: The Movie (Original Motion Picture Soundtrack)
Feyi Rufai
3:56
Hard Sometimes
Ruel – Free Time
Lianna Friedman
4:29
Work (feat. Drake)
Rihanna – ANTI (Deluxe)
Olivia Viruet Quintero
3:39
Winter (Concerto # 4 In F Minor, Rv 297)/ Allegro Non Molto/Largo/Allegro
By Antonio Vivaldi – The Vivaldi Philharmonic Orchestra – Vivaldi - Greatest Composed Moments
Yasin Badawy
8:15

Grade 9-11 Abstracts

Jake Azrolan (11th)

My project is on How High Glucose Affects APOL1-microRNA193a in Podocytes. APOL1 (Apoliprotein) has renal risk alleles G1,G2. These risk alleles have a close association for podocyte and kidney health and function. High-glucose milieu has been demonstrated to induce dedifferentiation of podocytes which results in podocyte injury. High glucose has been also found to affect the podocyte expression of its renin angiotensin system (RAS). It was hypothesized that under conditions of high glucose APOL1 should be down regulated, microRNA should be up regulated, and the actin cytoskeleton of the podocyte will be disrupted.

Laura Chu (11th)



Research has shown that about 1 in every 59 children and 1-1.2% of the adult population is diagnosed with autism spectrum disorder (ASD). Despite its increasing prevalence, the idiopathic mechanisms by which this disorder progresses are largely unknown and therefore no way to currently fix ASD on a molecular level.This also results in making treatment options limited and oftentimes completely ineffective. Research has suggested that ADNP, known as activity dependent neuroprotective protein, mutations are among the most significant findings associated with patients ascertained with neurodevelopmental disorders, oftentimes resulting in a diagnosis of ASD. However, past research studies done on mouse model studies do not accurately represent all of the genetic and epigenetic diversity characteristics of the human disorder. Furthermore, the autism sequencing consortium (ASC) reports that there is a substantial 40% of ASC genes that are involved in chromatin remodeling. A comprehensive detailed understanding of how impaired function of such chromatin modifiers lead to the present pathobiological changes will lead to a better apprehension of the mechanistic bases of autism. Thus, the purpose of this study was to construct expression vectors to elucidate the localization and expression of the idiopathic mechanisms of certain mutation regions in the ADNP gene.

Chelsea Kumar (11th)

Gastrointestinal tract (GI) disorders affect an estimated 70 million Americans each year. Common treatments are often time consuming, expensive, and ineffective against those suffering with chronic GI tract disorders. Vagus nerve stimulation (VNS) has been explored as a treatment for a variety of autoimmune and chronic inflammatory disorders, due to its demonstrated anti-inflammatory properties. VMS has been approved by the FDA (Food and Drug Administration) for use in the treatment of epilepsy and depression. Stimulation of the vagus nerve provides a way to regulate autonomic tones as the after end projections of the vagus nerve are integrated at the level of the autonomic brainstem before projecting to other regions of the central nervous system.

Stimulation paired with kilohertz electrical stimulation, or a “blocking” signal, has been shown to enhance anti-inflammatory benefits of VNS for the cervical vagus nerve, which is an area of the vagus nerve to be stimulated. Thus developing a unidirectional vagus nerve stimulator, as using the blocking signal, the stimulating signal will propagate in the single direction of choice. The device has been designed and developed to be capable of generating two simultaneous signals, one for stimulating at a range of 10-20 Hz, and one blocking in the range of 10KHz. Using a 4 layered PCB and an external voltage regulator, the device has the width and length of 50mm. Commercial off-the-shelf components were used for the device’s development. The system has the capability to be used for treating functional gastrointestinal disorders in future.

Katie Lam (11th)

Apple scab is the most common disease for apples. Worldwide, growers are finding diseases harder to prevent and manage due to the onset of resistance to fungicides. Over the past decade, newer fungicides with a different mode-of-action (MoA) targeting natural cellular processes have been developed for apple scab. This study aimed to test the efficacy of SDHI (succinate dehydrogenase inhibitor) fungicides on a variety of cultivars using recently developed software intended to identify the best time for application on apple scab. Prior to my arrival in the lab, the fungicide treatment applications were done on varying experimental schedules following differing time points in apple tree growth stages. There were four replicates per treatment, including the untreated control. My job was to rate and analyze the apple scab infection. SDHI and non-SDHI fungicides resulted in a similar scab incidence of close to 0%, and the fungicides applied before predicted high infection risk as recommended by the RIMpro software were more effective in preventing apple scab compared to fungicides applied after infection. This experiment suggests that SDHI fungicides are appropriate alternatives to existing fungicides. Deepening our understanding of different plant pathogens and the methods of their control will be helpful from both an economic and sustainable standpoint; finding more effective treatment caused by apple scab.

Sara Lok (11th)

Society has moved closer towards gender equality, but there is still lingering perceptions that say otherwise. For a long time, people have looked at the traditional ideas of a man being the primary breadwinner and the woman being the primary caregiver. These beliefs have been translated into preconceived notions that people use as a standard in major aspects of our society. One of these aspects being custody decisions. In agreement with traditional belief, research has shown perceptions that mothers are seen as more competent and fitting for the parental role. Likewise, parents who go against traditional parental roles are seen as less competent. These perceptions show how, generally, the people in our society are thinking. Perceptions such as these are playing

a role in major decisions that can affect the lives of various people. If these preconceived notions are indeed playing the role that research has shown, then we are no longer doing what is best them. Many previous studies have looked at looked perceptions of nontraditional gender roles, but never in combination with custody decisions. The purpose of this study was to look at adult perceptions of nontraditional gender roles and implications on custody battles. Each participant was randomly assigned to one of two conditions. In each condition we manipulated whether the father or the mother was the stay-at-home parent. Each participant was asked to read an experimental stimulus describing the couple and then answer a question regarding who they would choose as a custodial parent. They were then asked to answer a couple questions off of a Parental Competence Scale, measuring perceptions of parental competence, and a couple of demographics questions. I found that overall stay-at-home parents were chosen as primary custodial parent more often than working parents, which goes along with traditional beliefs. Also, mothers were chosen more often than fathers. And stay-at-home parents also had higher averages off of the Parental Competence Scale. There was a significant interaction found between parent gender and condition. But interestingly I found that fathers actually tended to have higher average scores on the scale. These results led me to believe that these traditional pre-conceived notions still play a part in custody decisions. With stereotypical perceptions such as these, society still has a long way to go with making unbiased decisions.

Elena Lynn (11th)

Research has established the dangers of electronic cigarettes and conventional cigarettes. However, it has been found that people do not perceive electronic cigarettes to be as dangerous as conventional cigarettes. No studies have looked at how the new information that came out in the summer and fall of 2019 have impacted people's current perceptions of electronic and conventional cigarettes. The purpose of the study is to analyze teens' current perceptions of electronic cigarettes given that recent research has demonstrated the potentially severe negative effects. Sixty one teenagers were recruited through Roslyn High School health classes. The students were asked to take a survey on cigarettes and electronic cigarettes that gathered their beliefs of the devices and tested their knowledge on the devices. Participants were also found to be less knowledgeable on electronic cigarettes than cigarettes, however this was not statistically significant. Participants also found electronic cigarettes to be less dangerous than conventional cigarettes. There is however, no relationship between the perceived danger of electronic and conventional cigarettes to the participant's knowledge of them. The experiment suggests that teens' perceptions of danger of electronic cigarettes is still lower than their perceptions of danger of conventional cigarettes. However, participants are becoming more knowledgeable on electronic cigarettes.

Ali Malik (11th)

Although chronic cough is a widespread disorder and has been previously studied, it goes unexplained in approximately 10% of cases and diagnosis success rates are suboptimal (Kaplan, 2019). A suspected reasoning for these unexplained cases and suboptimal diagnoses success rates is the absence of agreed diagnostic criteria and the confusion created due to the variety of terms to express one disorder, which specifically pertains to chronic sinusitis (Chung, 2008). This study aimed to detect the frequencies of various causes of chronic cough, with specific emphasis on the potential prevalence of chronic sinusitis. Data was collected from a sample of 206 patients from Crown Heights Medical Center's chronic cough patient population. Progress notes were used to assess whether or not the patient's cough was chronic and problem lists were used to detect the patient's associated disorder/cause of chronic cough. A frequency of 95.1% was detected for chronic sinusitis, 45.1% for asthma, 11.1% for GERD, and 0.5% for other. Additionally, 91.7% of the chronic cough cases were successfully treated, which indicates overall diagnoses success (Mayo Clinic, 2005). These findings suggest that chronic sinusitis is the most common cause of chronic cough and should be treated first in chronic cough patients for optimal diagnoses and treatment success.

Joselle Mashkevich (11th)

There is a growing population of ex convicts in the United States, and their increasing inability to successfully reintegrate into society is producing consequences for them and the country as well. Prison records and convictions greatly lower an ex-convict's chances of finding work. A reason that ex convicts might be struggling to find jobs is because many employers have preconceived notions and stereotypes regarding ex convicts. A movement called Ban The Box was created in order to try to solve this problem of employers automatically assuming negative things about an applicant that is an ex-convict. This policy removes the field on a job application that asks about the previous criminal history of an applicant. The purpose of this study is to see how likely employers are to hire an applicant with or without this criminal history field on their application based on the applicant's race and gender. Previous studies have looked at how this change impacted certain racial minorities in the hiring process, and I looked at this in my own study as well as how gender discrimination was produced by this policy. In my experiment, each participant was randomly assigned to one of twelve different conditions. They viewed a job application, and then were asked if they would hire the applicant, followed by a trustworthiness scale to assess their perceptions of trustworthiness of the applicant. The race, gender, and criminal state of the applicant was manipulated in each condition. The "box" was also manipulated, so participants either saw an application with a checked box (indicating criminal history), an unchecked box, or no box. Within male applicants, participants were significantly more likely to hire applicants who had no criminal background, and were even less likely to hire applicants when they saw an application with no "box" as opposed to applicants who did have a criminal background. Within female

applicants, participants were significantly less likely to hire an applicant who had a criminal background as opposed to an applicant from either of the other conditions. Across the checked box condition, participants were significantly less likely to hire white females than any other applicant. Across the unchecked box condition, participants were significantly less likely to hire black males than any other applicant. Across the no box condition, while black females were hired most often, there was not a significant difference when compared to the hiring rates of the other applicants. This experiment suggests that "banning the box" does produce certain biases towards certain racial and gender groups during the hiring process, and the policy could have dramatic and unintended consequences for minority applicants if implemented nationwide.

Ariana Matarangas (11th)

This past summer, I was fortunate to have the opportunity to gather experience in the field of cancer research. I shadowed and conducted behavioral medicine research with a physician at the radiation medicine department at Northwell Health's Center for Advanced Medicine on Long Island. I got exposure in the field of radiation oncology, and I was introduced to cutting edge-medical technology and learned about cancer physiology in lectures. I was fortunate to work with the co-director of the cancer institute, chairperson of the radiation medicine research, and a specialist in radiation oncology for head and neck cancer, Dr. Bhupesh Parashar, as my mentor. I conducted a correlational study between trait-mindfulness, anxiety, and social support of head and neck cancer patients prior to radiation treatment and how these factors are related to prognostic results including toxicity and local control. Through this experience, I'm fortunate enough to be an author on an abstract submitted to the American Society of Radiation Oncology conference. Even though I had a great experience and maybe will be published in a journal, my project didn't turn out the way it had hoped. Dr. Weseley and I realized early on in the summer that this project would be problematic for competitions because allegedly the Feinstein Institute has weird ways of avoiding an IRB, and according to the research coordinator, we didn't need one; this put me ineligible for most competitions like LISEF and NSPC. Once school started, it was clear that the data collection was very slow, and the future of my project didn't look great. Dr. Weseley and I even discussed many design flaws in the study and thought it would be best to suggest to Dr. Parashar if we could potentially input a control group; even though we knew it couldn't be a perfect control group, I brought our discussion to meet with him in person during 1st period one day and he explained, in a very obscure way, that it wasn't even needed. Then, I was promised by December that data collection would be complete. That ended up being pushed back to January; however, when January came around, my research mentor just wasn't responding. Finally, by mid-January, he sends me the abstract to the project that was submitted to the American Society of Radiation Oncology conference – all without giving me any more of the data to come up with my own project or letting me do any of the analysis. Thus, I'm here without a project, with an Incomplete research grade for the first semester, great experience if I decide to go into the field of Oncology in the future, and a possible publication.

Alida Pahlevan (11th)

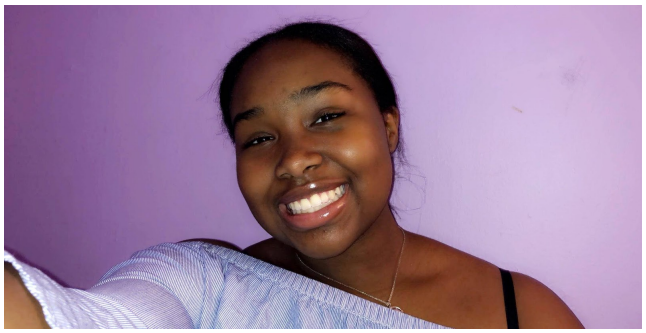
Research has shown that about 1 in every 59 children and 1-1.2% of the adult population is diagnosed with autism spectrum disorder (ASD). Despite its increasing prevalence, the idiopathic mechanisms by which this disorder progresses are largely unknown and therefore no way to currently fix ASD on a molecular level.This also results in making treatment options limited and oftentimes completely ineffective. Research has suggested that ADNP, known as activity dependent neuroprotective protein, mutations are among the most significant findings associated with patients ascertained with neurodevelopmental disorders, oftentimes resulting in a diagnosis of ASD. However, past research studies done on mouse model studies do not accurately represent all of the genetic and epigenetic diversity characteristics of the human disorder. Furthermore, the autism sequencing consortium (ASC) reports that there is a substantial 40% of ASC genes that are involved in chromatin remodeling. A comprehensive detailed understanding of how impaired function of such chromatin modifiers lead to the present pathobiological changes will lead to a better apprehension of the mechanistic bases of autism. Thus, the purpose of this study was to construct expression vectors to elucidate the localization and expression of the idiopathic mechanisms of certain mutation regions in the ADNP gene.

Emily Ruttgeizer (11th)

Although the number of transgender people in the United States is rising, discrimination still remains a common problem. Many transgender people also face misgendering, being called by a wrong or former name or pronoun. Research has shown that over time, people have started to have more favorable opinions of transgender people and gender-neutral pronouns. However, no studies have compared age of participants with their opinions of transgender people and gender-neutral pronouns. The present experiment investigated how age relates to opinions of transgender people and gender-neutral pronouns. In study one of this experiment, 179 participants filled out their opinions of transgender people on the Attitude Toward Transgender Men and Women Scale, as well as questions about their opinions of the gender-neutral pronoun “they” on a 7-point Likert-Type scale. A correlation revealed that age showed no significant relationship with attitudes toward gender-neutral pronouns. However, a correlation revealed that more positive opinions of “they” also related to more positive opinions of transgender people. A one-way ANOVA also revealed a significant effect of race on scores on the ATTMW Scale. In study two of this experiment 131 participants were randomly assigned to view a description of a transgender science teacher, either using the pronouns he, she, or they. Participants then evaluated the teacher on a 7-point Likert-Type scale. A one-way ANOVA revealed that when teachers were referred to as “he,” they were rated significantly higher than when referred to as “they.” A two-way ANOVA revealed that male participants rated the teacher referred to as “he” and “they” better than the female participants. This experiment suggests that people are generally

more accepting of cisgender people than transgender people, and people who have favorable opinions of transgender people also have favorable opinions of gender-neutral pronouns.

Brooke Williams (11th)



Accusations of crimes involving sexual harassment, assault, and rape seem often boil down to disputes between accused and accuser about what actually transpired. These types of cases often become a he-said she-said situation. The #MeToo movement has brought this issue to light with many high-profile cases: Bill Cosby, Larry Nassar, and Harvey Weinstein, just to name a few. Research has shown that credibility is a key factor in deciding whether you believe the accuser or the accused in a sexually related incident or crime. Race plays a large impact on the perceptions of credibility. There is a lack of research that investigates credibility in sexual harassment cases: specifically, in the workplace. Given the ambiguous nature of sexual harassment allegations, the purpose of this study is to see how the race of the accuser and accused affect credibility in an incident of workplace sexual assault. Participants (N=248) were randomly assigned to view one of five vignettes that described a male coworker sexually harassing a female coworker. To manipulate the race of the accuser, the accuser was either named “Emma” or “Deja”. To manipulate the race of the perpetrator, the perpetrator was either named “Colin” or “Jamal”. After viewing the vignette participants took a survey that measured credibility of both accuser and accused in the vignette. Participants also answered questions that measured their view of sexual harassment. The results revealed that Participants rated accusers of their own race as more credible than those of another race. The results also showed that White participants and Asian participants rated the Black perpetrator to be more credible than the white perpetrator, whereas Latinos and Blacks rated the white perpetrator to be significantly more credible than the black perpetrator. And finally, the results showed that Asian/ Asian American participants were found to victim blame more than any other group. This experiment suggest that race plays a large part in perceptions of credibility in sexual harassment. As a society we need to further our understanding and perception of sexual harassment and race.

Faith Lee (11th)

Dental fear and anxiety are some of the most significant factors that lead to avoidance of dental care. One non-pharmaceutical approach to decrease dental anxiety is utilizing music. Listening to self selected music is one technique shown to lower medical anxiety. Another audio technique called binaural beats plays specific frequencies that can have effects on the “brain state” by syncing the brain waves to the binaural beats. These music types are also proven to lower blood pressure and heart rate. However, no study has been found that uses both self-selected music and binaural beats during a routine dental cleaning, which allows them to be compared. The present study investigated the effects of listening to self selected music and

binaural beats during a dental procedure in attempts to lower dental anxiety. Thirty-nine participants were randomly assigned to listen to either self selected music, binaural beats, or no music. Their heart rate and blood pressure were measured three times (before, during, after the procedure). They completed the Modified Dental Anxiety Scale before the procedure to measure their baseline dental anxiety which consisted of 5 questions with a 5 category rating scale, ranging from 'not anxious' to 'extremely anxious'. After the procedure, they answered a question based on the Patient Rating of Anxiety that asks "How would you describe your anxiety during the dental treatment today?" on a scale of 1 (calm and relaxed) to 7 (extremely tense and upset). A one-way ANOVA revealed that patients' heart rate decreased from pre to during the procedure ($p < .001$) and from during to post-procedure ($p = .01$) for both types of music. However, the type of music had no effect on blood pressure or self-reported anxiety. This experiment suggests that listening to any music lowers heart rate, but patients do not consciously feel less anxious.

Yazid Badawy and Michael Rice (10th)

Commercial aviation is an important aspect of the economy that has drastically improved the quality of human life. However, two critical problems have plagued aircrafts: fuel consumption and flight efficiency. These two factors have long made air travel expensive for the general public, but by reducing these factors accessibility has increased. Furthermore, by increasing a plane's efficiency we would require less fuel per flight, thus decreasing the amount of greenhouse gases released making air travel more environmentally friendly. The purpose of this study was to assess the benefits of utilizing forward-swept wing designs on commercial aircraft fuselages tested via wind tunnel. The wind tunnel was constructed out of plywood and used an open circuit design, featuring a large attic fan to draw air into the tunnel and simulate flight. This method allowed the measuring of the forces exerted on the aircraft as well as the different air flow patterns over its body. Four different airplane models were tested, each using the same type of fuselage, but different wing design. The models varied based on: the presence of canards, and the sweep of the wings (forward versus aft swept). Using force sensors attached to the aircraft, lift and drag data was measured and recorded for analysis, which were used to compute the lift-to-drag ratio of the different designs. Based on the results, this experiment suggests that forward-swept wings in the presence of canards were the most efficient design ($p<.0001$). Contrastingly, without the presence of canards, the forward swept-wing design was found to be the least efficient ($p<.0001$).

Julian Barish and Yasmine Kaplan (10th)


CBD oil is an increasingly popular treatment for anxiety, stress, and sleep issues (Shannon & Opila-Lehman, 2016). While more information on CBD continues to come out, CBD oil effects have gained a negative reputation among some. This was shown when many negative tweets were put out about CBD with THC. Consumers expressed that they felt that the edibles' THC dosage was unreliable and that they had delayed effects. Due to this fact, many consumers ended up over-consuming these edibles (Lamy et al., 2016). The purpose of this study was to determine how changing the method of CBD intake and the reason for use would affect the social acceptance of the user and perceived effectiveness of the CBD product. One hundred forty four participants were surveyed via Amazon Mechanical Turk. Participants were not aware that the type of CBD product or reason for use was being manipulated, in order to avoid any participant biases. Our study was a 3 x 2 design and manipulated two independent variables. The first one, type of CBD product, had three levels; CBD oil, CBD gummy, and CBD with THC. The other variable, reason for use, had two levels, medical reasons or recreational reasons. Participants were randomly assigned to one of the 6 conditions. CBD oil was perceived as most effective for dealing with stress, a recreational reason, when compared to CBD gummies & CBD with THC. Additionally, participants thought a person using CBD oil was more socially acceptable than someone using CBD with THC or CBD gummies.This supports our hypothesis because results indicate that using CBD products for medical reasons is deemed more socially acceptable. In both situations, CBD oil was perceived as more socially acceptable and effective than the other two CBD products whether it was used medically or recreationally.

Owen Edelstein and Lindsay Fabricant (10th)


Microplastics (MPs) have become a danger to the environment. They are polluting ecosystems, threatening the survival of many species, and being ingested by humans. Two common MP polymers, polystyrene and polyethylene, have been known to contaminate fresh and saltwater ecosystems. This affects the life processes of many marine organisms, such as *D. magna*. However, both plastic polymers had not yet been tested and compared in one study. This study sought to compare the effect of polystyrene MPs and polyethylene MPs on the speed and mortality rate of *D. magna*. Each group consisted of 7 containers filled with 5 *D. magna*, which were either fed 25 polystyrene MPs and

1 mL of algae, 25 polyethylene MPs and 1 mL of algae, or just 1 mL of algae. In order to test for speed, a phototactic response test was performed and recorded weekly. To test for mortality rate, the number of living *D. magna* were recorded in each container. Overall, the experiment indicated no statistical significance between MP consumption and *D. magna* speed, nor between MP consumption and mortality rate. However, there was a statistically significant relationship between MP consumption and circular swimming patterns. This study demonstrated that MP consumption resulted in circular swimming patterns by *D. magna*. This suggests that ingestion of MPs may lead to changes in activity.

Benjamin Farhi and Monty Goldstein (10th)

The most prominent problem that mankind is currently facing is climate change and global warming. This problem is caused by the immense amounts of carbon dioxide that is being released into the atmosphere through the burning of fossil fuels. A solution to this problem is the utilization of solar energy. However, today's solar panels are not efficient enough to supply the worlds energy demands. The purpose of this study was to increase the efficiency of solar panels by utilizing a water spray cooling system. Previous research has shown that solar panels perform more efficiently while they are cool, which is why we hypothesized that a water spray cooling system would increase the efficiency of solar panels. Not only do water spray cooling systems cool solar panels, but it cleans the panels of dirt as well. During our study we set up two groups of solar panels, each having one monocrystalline and one polycrystalline panel. We set up our solar panels on planks outside of two east facing windows. We then connected a water spray cooling system to one of the groups and recorded the energy output and temperature of all the solar panels daily for 3 weeks. After running our experiment, we found that water spray cooling systems significantly increase the efficiency of both monocrystalline and polycrystalline panels. In conclusion, solar panels still aren't an extremely efficient energy source when connected to a water spray cooling system. But, if you are using solar panels anyway because you want to help the environment, use a water spray cooling system to make your solar panels as efficient as possible.

Jaideep Grewal, Sebastian Plaza, and Harshita Sehgal (10th)

Vaping, a new form of inhaling nicotine and other unknown chemicals through electronic cigarettes (e-cigarettes) is a major problem in the United States. Past research (Vallone, Pearson, Richardson, Niaura, and Abrams, 2018) has shown that vaping has increased in popularity among youth and concerns have been raised over the negative consequences of nicotine on the developing adolescent brain, with specific regard to addiction susceptibility. Previous studies have investigated the aspects of medical jargon

(Graham & Brookey, 2008) and form of communication (Murray, Wordie, Oliver, and Simpson, 2017)
on reading comprehension, while this study examines how these aspects affect people's perceptions on the severity of vaping and need to enforce stricter vaping laws. Participants were assigned to one of four conditions (Simple Language Infographic, Medical
Jargon Infographic, Simple Language Paragraph, and Medical Jargon Paragraph) and read information regarding the negative effects of vaping (n=187). E-cigarettes were perceived to have a greater risk than cigarettes ($p<0.001$), and in general, participants
agreed to greater government intervention. Furthermore, there was a negative correlation between age and perceived risk of e-cigarettes ($r=-0.43$) and cigarettes ($r=-0.46$). As a whole, the simple language infographics garnered a high perceived risk. This study
suggests that it would be beneficial for health officials to convey important information regarding diseases and other epidemics with simple language and infographics, as opposed to complicating medical information.

Maya Groothuis and Natalia Hakimi (10th)

Each year 1,625 people are convicted of serious crimes who have been later shown to be not guilty (Broda-Bahm, 2015). Many factors can affect juror decision making, including certain defending characteristics such as race, age, and gender. Past research (Rogers & Davies, 2007) has proven that as the age of both the defendant and juror increases, likelihood of conviction and severity of sentencing also increase. It has also been proven that female jurors are more likely to convict the defendant and give them harsher sentences than their male counterparts. Female defendants are also treated with more leniency. Our study differs from previous ones because we tested the age gap between the juror (participant) and the accused. This study investigates the effect of juror (participant) gender and age and accused age on perception of conviction and severity of sentencing. Participants (N=236) took a survey with a vignette regarding a break-in theft in a neighborhood, with claims from witnesses and the accused. All information was kept constant except for the ages manipulated: 15, 25, 35, and 45. Gender and level of punishment had a significant interaction, meaning that males were more likely than females to give harsher sentences ($p= .025$). Besides this finding, our study did not discover significance in any other area. Further experimentation is necessary to determine the true effects of these manipulations.

Saydie Grossman (10th)

As the dilemma of obesity across the U.S. has increased exponentially, the use of artificial sweeteners as a substitute for sugar has also increased. The perceptions of artificial sweeteners compared to cane sugar vary in terms of effectiveness and harmfulness. Artificial sweeteners such as Aspartame and Sucralose are synthetically made sweeteners, while Stevia is a naturally derived sweetener. These substances have been linked to causing dysbiosis in the content of an organism's microbiome, which supports that they may be harmful to the human microbiome as well. This study focuses on the effect of artificial sweeteners on intestinal bacteria; the types of bacteria used in this study were Lactobacillus acidophilus and Escherichia coli. Two methods were conducted in order to analyze the effect of artificial sweeteners on the colonial growth of each type of bacteria, and analyzing the zones of inhibition around filter-paper disks soaked in each artificial sweetener. The bacteria was analyzed after three days of incubating. An ANOVA revealed that the artificial sweeteners had a significant effect on the growth of L.acidophilus ($p = 0.042$) with significant interactions between most conditions. The Sucralose condition had the least bacterial growth, while the Aspartame condition had the most bacterial growth. The artificial sweeteners had little effect on the E.coli growth; each plate of E.coli grew a lawn of bacteria. The filter-paper disks soaked in artificial sweetener had little effect on both types of bacteria; the zones of inhibition were not observably effected.

Yeji Kim and Hailee Youn (10th)

People's online presence is on the rise as the need for online communication is increasing. As people look for a way to present themselves virtually, avatar usage is also increasing. However, in terms of social interaction, our behavior online may differ from real life. Previous research has shown that people formulate impressions of others based on the physical characteristics of another person, and further studies (Donath, 2017) suggest that this can be applied to the virtual world, as well. Two hundred participants over the age of 18 were recruited through Amazon Mechanical Turk to participate in a survey created through Qualtrics. Participants were presented with a vignette of a sample profile of an online user, with the experimental stimuli being one of the six conditions for the avatar picture used for the user: male-neutral, male-smiling, male-grinning, female-neutral, female-smiling, female-grinning. The

participants were then asked to evaluate their perceptions of the user in terms of perceived warmth, competence, and trustworthiness. Our findings show that smiling and grinning avatars both produced a significant difference in how friendly ($p<.001$) and competent ($p=.019$) users are perceived to be. However, the gender of the avatars did not have any significant effects on the perception of the user. This study suggests that perceived warmth and competence of users can be influenced by the facial expressions of their avatar, although there was no significance between levels of smiliness and perceptions of the user. Furthermore, this study also suggests that there are no significant differences in how a person perceives the user based on the gender of their avatar, and no significant effect on how trustworthy the user was perceived to be.

Hailey Margulies, Bennett Levine, and Sam Jacobson (10th)

We live in a world which is consumed with political correctness. However, there is confusion on the correct way to refer to people with disabilities. Research has shown that people think it is more appropriate to say 'autism' and 'on the autism spectrum' rather than 'autistic' (Kenny, 2015); however, no studies have looked at how labels affect perception of physical conditions compared to mental conditions. The purpose of our study was to determine how labels affect the perceived social acceptability and severity of mental and physical conditions, using the terms autistic, amputee, person with autism, and person with amputation. 172 participants were randomly assigned to read one of four possible vignettes, followed by two scales which measured our dependent variables, social acceptability and severity of condition. We found interactions between the type of condition (physical or mental) and'' the labels used (noun- autistic/amputee or adjective- person with) on the dependent variables. In the first significant interaction, the physical noun and the mental adjective were rated as more acceptable then physical adjectives and mental nouns respectably. We also found that males perceive nouns as more severe than adjectives compared to females who perceived adjectives as more severe. Finally, we discovered that there is a significant three-way interaction in which females view a physical noun and a mental adjective as more acceptable compared to men who view mental and physical nouns as more acceptable. Our findings emphasize the importance of labelling mental and physical conditions.

Laura McNair and Mahi Shah (10th)

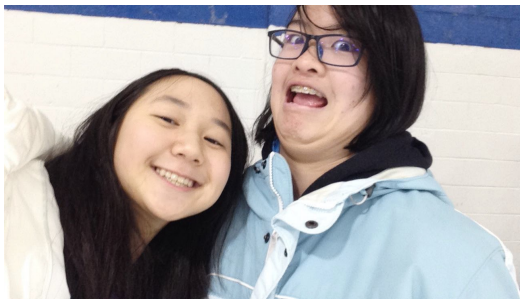
The use of E-Cigarettes has skyrocketed amongst teens, the most popular being JUUL. (Simon, 2018). Despite the pernicious effects of e-cigarettes and their toxic ingredients, many teens remain indifferent towards the consequences of vaping. Past research showed vaping ingredients that are common in JUUL produced diacetyl (Allen et al., 2016).

Diacetyl is a toxic food flavoring, known to cause Bronchitis Obliterans (popcorn lung). Formaldehyde, a carcinogen, is produced in the vaping process, due to the presence of Propylene Glycol (Omaiye et al., 2018). This study expanded this research by investigating how manipulating whether the Drosophila melanogaster received aerosolized or liquid forms of JUUL and the flavor of the e-juice (mint or menthol). The Drosophila were administered JUUL for two weeks during which their populations were counted. After two weeks two flies, from each condition, were placed into five new vials to reproduce (creating a new generation). This process was done twice, so there were three generations. The control groups, compared to each of the experimental groups, showed a statistically significant increase ($p < 0.05$). However, the population between the aerosolized and liquid groups showed no significance, contrary to what we predicted. Based on these results we concluded that the inhalation and metabolization of the chemicals formaldehyde, benzoic acid, propylene glycol, and diacetyl could have caused the populations to decrease.

Trevor Kim and Ethan Kessler (10th)

Marketers work tirelessly to attract people to their products. One method is by advertising their promotions. Marketers usually use these offers to trick consumers into thinking they are paying less than they actually are which may cause them to buy more (McKechnie, Devlin, Ennew & Smith, 2012). We wanted to examine how different types of promotions affected people's views on items at different price points. While other studies only compare absolute amount off and percentage off promotions, our study will add "buy one get one free" promotions and look for interaction between the promotions and price points. Two hundred participants, from Amazon Mechanical Turk, were randomly assigned to view one of six different stimuli. Each stimulus depicted a high or low priced shoe. The promotions used were an absolute amount off, 50% off, or "buy one get one free". After viewing a stimulus, participants answered questions about the perceived value of the shoe and purchase intention.We found two significant main effects. First, regardless of the discount, the lower priced shoe had a better overall perceived value and purchase intention. Secondly, regardless of the price, people preferred the shoes with the 50% off discount. The results of this study will help alert consumers to the common tricks marketers use and help them make better choices in stores.

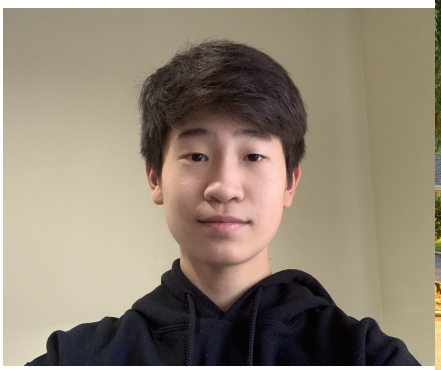
Chloe Tao and Elaine Lee (10th)



Microbial fuel cells (MFC's) show promising potential for the advancement of more economical and sustainable wastewater treatment procedures due to their ability to produce electricity from anaerobic oxidation of biodegradable organic substrates. The current experiment examines a MFC's functionality within different concentrations of ammonium nitrate, a substrate representative of wastewater, by measuring electricity output. A total of ten single chambered MFCs were used,

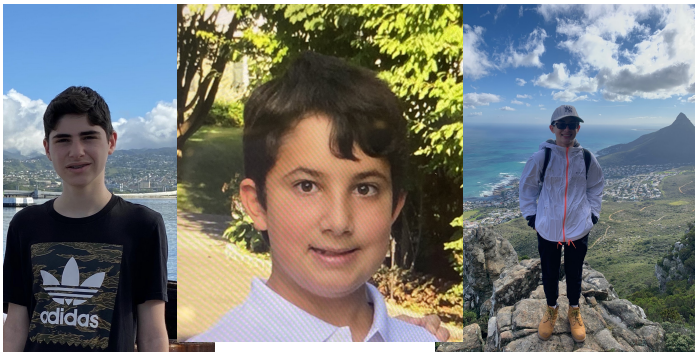
every two MFC's were exposed to 5mL of different concentrations; 5mg/L of ammonium nitrate (low concentration), 13 mg/L of ammonium nitrate (medium concentration), 30mg/L of ammonium nitrate (high concentration), and a group exposed to no ammonium nitrate. Data was taken throughout the course of ten days. All groups exposed to the ammonium nitrate yielded a statistically significant amount of electricity compared to the group exposed to none. There was a statistical significance found between the medium and high concentration groups, but none within the low concentration group compared to the medium and high concentrations. The medium concentration of ammonium nitrate yielded the most electricity (151mw at its peak), followed by the high concentration group (130mw), low concentration groups (127mw), and lastly the group that was exposed to no ammonium nitrate (34mw.) This experiment suggests that MFC's are functional in low, medium, and high concentrations of wastewater, but yield the most electricity in medium concentration environments.

Jake Ramsey and William Xu (10th)



In the modern era, the general public continues to express increasing concern regarding physical health, as well as disease prevention. Although Western medicine is the most widely accepted form of treatment in the world (Piron et al., 2000), certain diseases exist that remain untreatable through Western means. Recent studies have shown, however, that Eastern alternatives can be just as or more effective than their Western counterparts. Varying perceptions exist regarding Eastern and Western medicine, and although prior studies have been conducted, most of these were done in Eastern countries. Furthermore, findings have been contradictory and have not been thoroughly solidified. As a result, we sought to find people's perceptions of Eastern and Western medicine in terms of effectiveness and trustworthiness. One hundred forty participants were randomly assigned to read one of four vignettes which were altered by changing the medical condition described (either a sprained ankle or colon cancer) and the recommended treatment (Eastern or Western treatment). Participants then completed two scales that measured perceived effectiveness and trustworthiness, along with demographics questions and a manipulation check. We found that participants perceived Western medicine to be more effective and more trustworthy than Eastern medicine for treating cancer, while perceiving both treatments about equally for treating sprains. Furthermore, we found that Caucasians perceived Western medicine as more effective and more trustworthy than Eastern medicine, while Asians perceived both treatments about equally. Our results concluded that participants generally prefer Western treatments. These perceptions may be misled, however, as our background research showed the benefits of Eastern medicine. By informing patients about the possible benefits of using Eastern medicine, they may be more open to Eastern treatments.

Jaiden Berger, Harry Gerber, and Mac Schwartz (9th)



With the changing climate on the Earth, many habitats are changing constantly. Not only will habitats on land change, but ones under water as well. This experiment focuses mainly on the effect of salinity levels on algae cells. We hypothesized that as salinity levels of water increase, the algae cells will decrease in size. To conduct this experiment, solutions with water, salt, and algae were created. Then slides were made from the solutions after first concentrating the algae in the solutions using a centrifuge. Using a high-tech camera that was placed on a microscope, the algae was analyzed. The cell diameters of the algae cells were measured after taking pictures using the Moticam camera. The results supported the original hypothesis. It was concluded that climate change and salinity level is having some detrimental effects on the environment. The algae cells in the greater salinity shriveled up due to the process of osmosis and they were not able to carry out all the necessary processes they needed to. It is not just these algae cells that are affected by salt and the changing climate. Other marine organisms face similar situations and are fighting to survive while many land organisms face different problems that they must overcome caused by climate change.

Sonia Chandra, Kristi Lam, Shrimoyee Sen, and Arya Sinha (9th)

School work, studying, and exams are a great source of stress for students everywhere. Research shows that 49% of all students experience a great deal of stress on a daily basis, with grades and school work being the greatest source of that stress (James, 2015). Unfortunately, the stress that students experience can negatively affect their memories, making their study sessions unbeneficial to them (Scott, 2019). However, music is a powerful stress management tool as it levels down the amount of stress hormones (Collingwood, 2018). The present experiment investigated the effect of music tempo and preference on the memory and stress levels of students. The participants were randomly assigned to one of three different groups, with each group listening to a different tempo of music or no music while studying. One-hundred and two participants from six, mandatory health classes were asked to fill out a survey measuring their stress levels, study vocabulary words, and take a memory-based exam. Finally, they were told to answer a question to determine their perception of the music that they had listened to. While our study revealed no statistically significant differences in stress levels based on music tempo, stress in students is still a prominent issue. In order to determine if an effect truly exists or if the results were due to

Joseph Chen, Rachel Kwon, Logan Huckins, Jaya Lee (9th)

Due to the common use of the Internet, scams have become a part of our daily lives. One type of scam can trick one into giving money to someone who is not who they claim to be, or to pay for something that is falsely advertised. Past research displayed that the people that are most commonly targeted by scams are the elderly (Carrns, 2017). The purpose of this study was to see if the elderly were more gullible than younger people. An advertisement for fake medical products was created, and was paired with a vignette as a stimulus for the volunteers. The advertisement displayed a medicine box called Cetrozal that claimed to cure common cold symptoms in seconds. Participants were categorized into three age groups, the young age group, ranging from participants being 18 years old to 40 years old, the middle age group, ranging from participants being 41 years old to 65 years old, and the old age group, ranging from participants aging from 66 years old to 95 years old. Our participants then viewed the product and were surveyed about how much they trusted our product, cetrozal. They also answered questions in which they had to self- assess themselves on how gullible they believe they are. The survey included two scales that both proved to be reliable in testing our participants susceptibility to scams and their gullibility. We found that as age increased, susceptibility ($p = 0.323$, $F(2,27) = 1.146$) and gullibility did not increase significantly ($p = 0.642$, $F(2,110) = 0.446$). However as susceptibility increased, so did gullibility, buthe correlation was very slight ($p = 0.043$, $r = 0.214$). This suggests that although the elderly are most targeted with scams, they are not significantly more gullible or susceptible than their younger counterparts.

Jessie Dong, Ron Behiri, Lior Schwartz, and Sayem Kamal (9th)

Previous research has found which methods of presentation, including infographics, pamphlets, and PowerPoint presentation, causes participants to have the least complacency and constraints and highest calculation, confidence, and collective responsibility. However, no research has looked into the relationship between the doctor and the patient which would cause the participant to have the least complacency and constraints while having the highest possible calculation, confidence, and collective responsibility. This study examined the effects of doctor-patient gender relations and reexamined the effects of visual aids on vaccine hesitancy. The participants were collected through Amazon Mechanical Turk and took the survey using Qualtrics. The survey was based on the 5C scale created by Betsch and others in 2018. This study was a 2 by 2 study, which means participants had one version out of four stimuli, which included a vignette with either female or male pronouns and either an infographic or no infographic. The vignette included an

explanation of research done by a made-up researcher which was either male or female. After being exposed to the stimuli, they answered a survey that consisted of a series of 5-point Likert type items. This study had 203 participants who were shown to have higher calculation and confidence with the male physician. Additionally, infographics were found to give the participants a higher complacency and confidence rate. This research suggests that vaccine hesitancy is much more complex than previously thought and more research should be done in this topic.

Eliza Garmise, Amanda Liswood, and Sara Rosenbaum (9th)

In society, the prevalence of obesity and overweight people is on the rise. According to the World Health Organization, 1.9 billion adults suffer from obesity. Previous literature reveals that nutrition labels on products can impact the extent to which consumers perceive a product as nutritious (Kim 2009). The purpose of our study was to investigate if the name of a product affects the perceived nutrition of and the likelihood to purchase that product. Fifty participants were recruited at a local supermarket and were asked to read a short description and examine the logo of a new cereal. They were then asked to answer questions about their perceptions. Participants were randomly assigned one of two cereal names: Fruiti-O's or Sugar-O's. Only participants that passed the manipulation check were included in our results. Analyses revealed that participants rated Fruiti-O's as significantly more nutritious than Sugar-O's ($p<.001$); in addition, participants reported that they were significantly more likely to purchase Fruiti-O's than Sugar-O's ($p<.001$). In a follow-up experiment, we added an identical nutrition facts panel to all versions of the stimulus to see if the effect would persist despite the availability of actual nutrition facts. Thirty-four participants were recruited at the same local supermarket. Analyses revealed that Fruiti-O's was still seen as significantly more nutritious and likely to be purchased than Sugar-O's. However, Fruiti-O's were perceived as significantly more nutritious when no nutrition facts were presented compared to when nutrition facts were presented, whereas Sugar-O's were perceived as significantly more nutritious when a nutrition label was present compared to when it was not ($p<.01$). In addition, participants perceived Fruiti-O's as more likely to be purchased with no nutrition label compared to a nutrition label, whereas Sugar-O's was perceived more likely to be purchased with a nutrition label ($p<0.07$). Product names can often mislead customers to believe that product is healthy.

Jacob Kaftol, Jake Konigsberg, Joey Rice, and Alexander Siegel (9th)

In the United States, many people face discrimination based on their sexual orientation or gender. Although we have made progress in terms of trying to limit these biases and prejudiced views, discrimination still exists, especially in the police force . Our study investigated the effect of sexual orientation and gender on

perceptions of a police officer's biases and qualifications. We gathered 94 participants and randomly assigned them to view one of four variations; gay male, straight male, gay female, and straight female. Then, we had them complete a survey which measured the participants' perceptions of the police officer's perceived biases while on the job and qualifications. Our results showed that the gay officers, as a whole, were perceived as less biased when making an arrest compared to the straight officers ($p < .01$). While, gay male officers were perceived as less qualfified than straight male officers, gay female officers were perceived as more qualified than straight female officers ($p < .01$). The experiment suggests that sexual orientation and gender have a significant effect on viewpoints of a police officer's biases and job qualification.

Max Lerner and Samara Yadegari (9th)

All over the world, fossil fuels are polluting, and destroying, our atmosphere. Large energy production companies overlook research regarding climate change, and utilize fossil fuels to no avail. Measures must be taken towards a renewable future, to decrease the use of coal and crude oils. Wind turbines are a contemporary source of energy, and are being built every day, both onshore and offshore. However, 82% of the world's energy *still* comes from fossil fuels (anonymous, 2007). In other words, extreme measures must be taken to prevent the oncoming climate crisis. Our group strived to do this by experimenting with wind turbines, and their blades; testing whether or not traditional blade designs truly exhibit the most energy-producing qualities. We hypothesized that the wind turbine with the 21.8 cm blades would complete more full rotations than the wind turbine with the 41.2 cm blades. Employing the "Wind Power Kit," from *Carolina Biological*, we used two wind turbine blades, and attached them, in turn, onto the same base. We tested our hypothesis over the course of several days. The data supported our hypothesis; we found that the shorter blades *did* indeed complete more rotations per minute (rpm) than the longer blades. The data obtained by our group can be applied to further research in an effort to help entice companies into using efficient, energy producing wind turbines. We can work towards altering the stigma around renewable energy, and work towards a renewable future.

Belinda Lin, Zoe Liu, and Andrea Vintimilla (9th)

Medicine errors have been known to be the third leading cause of death, with approximately 251,000 deaths in a year (Anderson, 2017). While there have been many studies on how the font size and font type affect the perception of the medicine label, there weren't studies

on the effect of vocabulary on the comprehension of the medicine label, which can cause medicine errors. So this paper provides an analysis of several experiments done on font size and vocabulary. We had 40 adult participants for each condition. Our first experiment measures how the type of vocabulary affects how people comprehend the medicine label. Where we manipulated the type of vocabulary based on sophisticated vocabulary vs. easy vocabulary. We came up with our results based on the amount of the questions that they got correct on the true-false scale. The results for this study had a statistical significance having $p < .003$. Our second experiment measured how the type of vocabulary affects the perception of participants determined by the results of the 4 Likert-type questions. We had measured how the manipulation of the vocabulary affected the average perception of participants--statistically significant with $p<.001$. Our third experiment was on the bold-faced text and the perception of the medicine. Our results came from the ratings from the Likert scale testing the likelihood of buying the medicine, which also had a $p<.001$. Through these experiments, we found that there is a clear difference between the two variables because all the results were statistically significant with p-values lower than .05. These experiments suggest that the harder vocabulary and the bold-faced text can have a huge impact on medicine errors.

Dina Nabavian, Emelie Nguyen, Stanley Zhao (9th)

Each year, billions of cups of coffee are consumed all around the world (Stone, 2018). This finding is not surprising, as many people drink it as a way to wake themselves up and keep them awake throughout the day. However, some research suggests that the prolonged effects of caffeine could be debilitating (Olsen, 2018). Research on caffeine has been linked to the health problems of individuals, but not to populations as a whole. In our experiment, we measured varying caffeine levels in two groups of ants, and measured their productivity as well as mortality. Our results indicated that caffeinated ants may have been more productive, as caffeinated ants had a higher average rate of change in terms of constructed tunnel lengths. The results of our second hypothesis were not supported, as our results were deemed statistically insignificant ($p = .90$). Postponed by time constraints and insufficient measuring tools, we suggest our study be further investigated with more trials as we only ran one, and over a longer period of time (ex. many months).

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