

## The Bronx High School of Science Celebrates Senior Students' Research Projects

The Bronx High School of Science held a reception to celebrate the efforts and accomplishments of the senior research students and to thank their parents, mentors and teachers on Tuesday, December 6, 2011 in the student cafeteria. 109 students presented their original research projects in science, math and social science at a poster session followed by a buffet dinner, funded by the Parents' Association. The keynote speakers, Bronx Science graduates and former Westinghouse finalists and winners, inspired the students with their stories. Travel expenses for the speakers are funded by the Endowment. The event was covered by Chinese-language newspapers.

Students investigated projects of their own choosing and generally worked on them for two years, including summers in most cases. Each student was assigned a teacher to advise them on his or her research project and most students worked with outside mentors. This year students worked with faculty members from many New York City institutions including Columbia University, Rockefeller University, New York University, Memorial Sloan-Kettering Cancer Center, Weill Cornell Medical College, Fordham University, CUNY, Mt. Sinai Medical School, Albert Einstein College of Medicine, Montefiore Medical Center, SUNY Downstate Medical Center, and the New York Botanical Garden. A few students worked with mentors at farther flung institutions: Yale University, Emory University, and the University of California at Santa Barbara.

Many students did projects in the field of biomedical research. Among the many notable projects were: *Tongzhu Xu* discovered a previously unknown mechanism of action for Fuzeon, a drug used in the fight against AIDS, which is significant because it provides a model for new strategies upon which to base design and development of novel and more effective HIV inhibitors. Tongzhu did his research under the direction of Dr. Lu Lu and Dr. Shibo Jiang of the New York Blood Center, and Dr. Marisa Wagner, a biology teacher at Bronx Science. *Samantha Lau* researched how *Staphylococcus aureus*, a bacteria responsible for many hospital-acquired infections, colonizes individuals, and her research suggests more efficient ways to interrupt its transmission. She worked in the lab of Dr. Richard Novick and Dr. Bo Shopsin at New York University, and is a student of Mr. Richard Lee. *Talal Syed*, also a student of Mr. Lee's, developed an assay to detect cancer stem cells. He worked with Dr. Christopher Lange at SUNY Downstate Medical Center. *Anthony Hagouel* compared the maturation of different types of nerve cells of mice with a genetic deficiency linked to schizophrenia. His findings give insight into the causes and possible treatment of schizophrenia. Anthony worked with Joseph Gogos M.D. Ph.D and Bin Xu, Ph.D. at Columbia University Medical Center, and his Bronx Science research advisor is Dr. Julie Mankiewicz. *Vincent Shieh* identified two molecules that interfere with the disassembly of cilia and may inhibit cell cycle progression. This knowledge may be helpful in finding treatment for certain kidney and eye diseases. Vincent worked in Dr. Ching-Hwa Sung's lab at Weill Cornell Medical Center and his research advisor at Bronx Science was Dr. Erin O'Leary. *Yuwen Cheng* identified a novel protein involved in one of the first steps in the cell's response to DNA damage. This finding helps elucidate a

mechanism by which cells repair DNA to prevent cancer. Yuwen worked under the guidance of Lukas Cermak, Ph.D. in the laboratory of Michele Pagano, M.D. at the NYU School of Medicine and her advisor Bronx Science was Dr. JoAnn Gensert.

Other students' projects ranged from behavioral to mathematical research.

*Rebecca Hia* examined qualitative and quantitative data from a survey of parents with children on the Autism Spectrum, considering the rise in Autism Spectrum diagnoses as a social epidemic, and concluding that where a child goes to school, and the familiarity of the school and neighborhood with autism, plays a large role in determining whether a given child will receive a diagnosis. Rebecca worked with Dr. Peter Bearman at Columbia University and her Bronx Science research teacher is Dr. Zach Lynn. *Neil Zhao* developed a novel DNA barcoding computational methodology with applications to herbal medicines and conserving species. Neil worked with Mr. Damon Little of the New York Botanical Garden and his Bronx Science research teacher is Dr. Vladimir Shapovalov. *Andrzej Jackowski*, also a student of Dr. Shapovalov, worked with Dr. Anargyrous Papagierogu of Columbia University, on implementing a quantum algorithm for finding the ground state energy on a quantum computer.

This year there was a trio of keynote speakers, all siblings and graduates of the Bronx High School of Science, all finalists or winners in past Science Talent Search contests, and all of whom have distinguished careers in research. Dr. Cecilia Lo and her brother Dr. Martin Lo graduated from Bronx Science in 1971; their younger brother Dr. Andrew Lo in 1977. Today, Cecilia is Professor and Chair of the Developmental Biology Department at the University of Pittsburgh School of Medicine, Martin is at Caltech working on mathematical models of the universe, and Andrew is a professor at MIT working in computer science. All three spoke about their background as immigrants, arriving in the United States not knowing English, and the important foundation that Bronx Science provided them. They stressed to the current students the importance of hard work and perseverance, and their gratitude to their parents and teachers.