TCRSF Finalists at International Science & Engineering Fair
in Phoenix, AZ 2016 www.tcrsf.org now www.tcrsf.net

Finalist 2015 & 2016 – Twin Cities

Finalist 2016 – Western Suburbs
Best in Category Translational
Medical Science $5000, 1st Grand
Award $3000; Intel Foundation
Cultural and Scientific Visit to
China, Ceres program asteroids
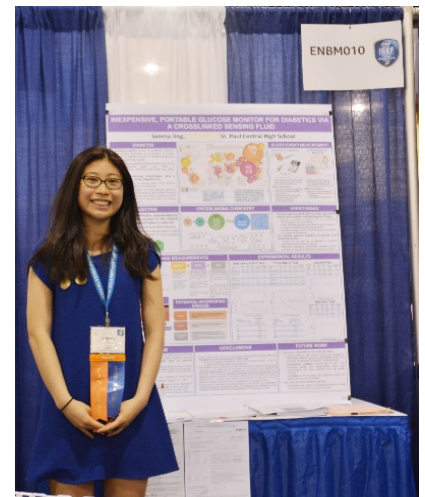named for students, Sigma Xi
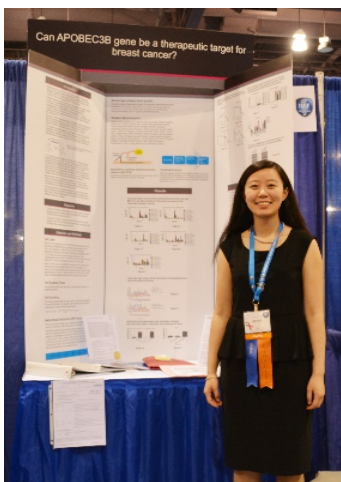award $1000. nationals JSHS

Finalist 2016– Twin Cities

Finalist 2016 – Twin Cities
Arizona State University full scholarship

Finalist 2015 & 2016 – St. Paul

Finalist 2015 & 2016 – St. Paul
4th Grand Award $500,
China Association for Science &
Technology Award $1200

Finalist 2016 - Western Suburbs
National Semifinalist
Science Talent Search

◄ Finalist chosen at State
2016 –Western Suburbs
2nd Grand Award Biomedical
Engineering & Ceres program
asteroids named for students

Finalist 2016 – Western Suburbs

◄ Finalist chosen at State 2016 –Western
Suburbs; 2nd Grand Award Computational
Biology & Bioinformatics, & Ceres program
asteroids named for students

Predicting a cancerous outcome: Creating a test for assessing risk of human papilloma virus-associated oropharyngeal cancer

Category:
Translational Medical Science (TMED)

Prashant Godishala & Brennan Clark
Breck School
grade 12, grade 12
USMN10 Western Suburbs

2016 ISEF in Phoenix, Arizona

BEST IN CATEGORY $5000
1st Grand $3000
Intel Foundation Cultural and Scientific Visit to China
Ceres program asteroids named for students
Sigma Xi award $1000

There has been a recent rise in human papilloma virus (HPV)-related throat, larynx, mouth, and tracheal (oropharyngeal) cancer. This paper reports the development of a non-invasive risk-assessment analysis tool for assessing HPV-associated oropharyngeal cancer in dental oral-rinse samples. The idea for the analysis tool came from work that showed evidence of abnormal numbers of chromosomes (aneuploidy) in HPV-related bladder-cancer cells (1). Therefore, a cell-preparation procedure and a fluorescent in-situ hybridization (FISH)/TeleGene protocol previously developed for use with bladder cells was re-engineered for use with oropharyngeal cells. Then, the procedure was used to establish a baseline for aneuploidy in chromosomes 3, 7, 8, and 20 of oral cells in 62 oral-rinse samples from healthy dental patients. This procedure was based on work by King et al. (unpublished) that suggested these chromosomes have higher aneuploidy than in other oral chromosomes (2). A baseline for numbers of aneuploid oropharyngeal cells was established for subjects who do not have HPV-associated oropharyngeal cancer. There was no significant difference in the mean numbers of aneuploid-positive cells among enumeration groups, and there was also no significant difference in mean of aneuploid-positive cells by gender ($p > 0.05$). However, there was a significant difference between HPV positive and negative samples ($p < 0.05$), suggesting that the created test is effective in analyzing for potential risk of HPV associated oropharyngeal cancer. As a result of our work, our research site has recently sold the process outlined in this paper for massed clinical application.