

## 2015 Kathleen L. Miller Fellow

### **Sean Wu, UC Berkeley Masters Candidate in the School of Public Health**

Sean Wu is a 1<sup>st</sup> year graduate student in the School of Public Health, where he is focusing on Epidemiology and Biostatistics. He is interested in using RNA microarray methods to look at biomarkers of susceptibility in highly susceptible individuals, and his research interests generally include RNA-seq and array analysis and machine learning and classification techniques applied to public health data. Sean was born in San Diego, and attended the University of California, Irvine, graduating with a degree in International Studies and a minor in Statistics.



### **Fellowship Proposal**

Schistosomiasis, a blood fluke second only to malaria as the most devastating WHO neglected tropical disease, is endemic to much of the world's tropical and subtropical regions including Africa, South America, and China. In 2014, the WHO estimated that in sub-Saharan Africa alone, more than 200,000 deaths per year are solely attributable to schistosomiasis. Infection leaves lifelong morbidities even after eradication in the individual, including anemia, renal failure, bladder cancer, to malnutrition and cognitive impairment. New research indicates current epidemiology vastly underestimates burden of disease.

Sean proposes to work with UC Berkeley professor, Robert Spear, who leads the Berkeley Schistosomiasis Group, a research team dedicated to the eradication of the parasite in rural areas of Sichuan, China. Research will take place in the Xichang district of Sichuan Province, where the parasite is endemic. Sean's goal will be to analyze micro RNA (miRNA) from human subjects who have experienced chronic or reoccurring infection as a potential biomarker for individual-level susceptibility. Previous epidemiologic research from endemic regions in Sichuan has shown that certain individuals have higher baseline rates of infection that cannot be explained by extrapersonal factors alone. This increased rate of infection remains after controlling for factors such as water exposure and occupation which suggests that individual level factors, such as genetics, strongly determine an individual's infection status.

Through the identification of miRNA biomarkers, Sean hopes to aid eradication efforts by allowing for easier identification of susceptible individuals, who may be harboring the disease in low prevalence situations. If focused treatment can be brought to bear on these individuals, not only can unnecessary suffering and mortality be alleviated, but the chain of infection can be attacked at its most vulnerable point. Methods to determine individual susceptibility not only show promise for transmission interruption of schistosomiasis in Sichuan, but could also be adapted by researchers and public health professionals worldwide in the fight against the disease; consequently, this project not only shows promise locally in China, but globally against this oft overlooked yet deadly parasite.