



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Caroline C. Zhang	Project Number 36001
Project Title Investigation of Glucocorticoid Receptor Degradation and Its Antagonists to Address Cancer Drug Resistance	
Objectives/Goals Abstract In prostate cancer, there are current treatment methods that rely upon the suppression of the androgen receptor (AR) pathway, but high levels of glucocorticoid receptor (GR) can compensate for loss of AR activity, resulting in a drug-resistant tumor. Lowering of GR levels and usage of GR antagonists has been reported as being capable of restoring drug sensitivity. To address cancer drug resistance, a stable cell line was developed to evaluate compounds that can degrade GR. A cell line was transfected with a plasmid to express the GR linked to a fluorescent indicator. Protein expression and GR functionality were also tested with Western Blot and fluorescence microscope. The cell line has capability for future GR antagonist testing, and compounds that degrade GR will be identifiable by loss of fluorescence. In the meantime, to expedite discovery of GR antagonists, the structures of known GR ligands were investigated. Molecular modeling led to identification of multiple potential GR antagonists.	
Summary Statement To address the upregulation of glucocorticoid receptor (GR) in prostate cancer drug resistance, a stable cell line for evaluation of GR degradation was developed and potential GR antagonists were identified through molecular modeling.	
Help Received Dr. Nanhai He, Salk Institute	