CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
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Project Number
S1201

Project Title
Blood Proteins TRMP1 and Clusterin as Minimally Invasive Biomarkers of AR in Renal and Cardiac Transplants

Abstract

Objectives/Goals
My objective was to validate the ability of blood proteins TRMP1 and Clusterin to serve as minimally invasive biomarkers for diagnosis of Acute rejection in renal and cardiac transplant patients.

Methods/Materials
I tested previously collected samples from AR and stable patients using ELISA (Enzyme Linked Immunosorbent Assay)kits pre-coated with antibodies specific to the proteins I was testing for.
The results of the experiments were determined using a Microplate Reader and data graphing software.
There was much pipetting involved in transferring samples and chemical solutions from well to well on the ELISA plate.
An analytical Scale/Balance was also used in the preparation of solutions (often needed to be diluted)

Results
Blood Proteins TRMP1 and Clusterin increased in samples of patients experience acute transplant rejection VS samples of patients with stable transplant status.

Conclusions/Discussion
Through ELISA test validation, I found blood proteins TRMP1 and Clusterin able to:
1. Evaluate the health of a transplanted kidney or heart (compared to stable) semi invasively.
2. Identify acute rejection from stable grafts in renal or cardiac transplant patients can con therefore serve as acute rejection specific biomarkers.
3. Possibly diagnose opportunistic infections such as CMV (cytomegalovirus) in an immunocompromised patient- Clusterin and TRMP1 concentration were lower than the stable in infected patients.

Summary Statement
The ability of blood proteins TRMP1 and Clusterin to serve as minimally invasive biomarkers for acute transplant rejection diagnosis in renal and cardiac transplant patients.

Help Received
Used lab equipment at Stanford University under the supervision of Tara Sigdel; Participant in Stanford Institutes of Medicine Summer Research Program, Science Fair coach (Don Van Ness) had my board laminated.