



CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

Name(s) Alexandra Maloof	Project Number S1207
Project Title The Accuracy of Genetic Testing in Diagnosing Common Metabolic and Heart Diseases	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this project was to discover the accuracy and usefulness of genetic testing to be used in private medical offices.</p> <p>Methods/Materials Ten individuals were selected from a private internal medicine practice to be genetically tested for twenty-five diseases. The researcher made comparisons between the patients' past medical histories and the genetic test results to determine the accuracy of the genetic tests. The second part of the experiment involved performing conventional testing on the patients to rule out the diseases that were not found in their past medical histories but were above the average lifetime risk in their genetic test results. Then, patients were provided with personalized protocols to prevent their likelihood for obtaining diseases. Some of the materials utilized in this project were genetic test kits, lancets, alcohol swabs, EKG machine, exercise treadmill machine, thallium stress test machine, echo stress test machine, Sequenom massarray chip, Sequenom massarray machine, thermalcycler, and a nanodispenser.</p> <p>Results In the final analysis, macular degeneration resulted in being a disease that was most accurate, 100%, with aneurysm following, 90%. Type 2 diabetes and peripheral vascular disease were both 80% accurate, and in both diseases the genetic test was inaccurate in identifying the controls. Then, osteoarthritis and migraine were both 70% accurate. Type 1 diabetes was 70% accurate, failing to identify all the cases, while obesity, which was 60% accurate, failed to identify some of the controls. Lastly, coronary heart disease was the least accurate, 20%.</p> <p>Conclusions/Discussion Genetic testing was not 100% accurate in distinguishing the cases and controls for some diseases; however, genetic testing can be utilized as a tool to aid physicians in the diagnosis of diseases, the determination of the patients' conditions, and the prevention of future diseases. We are entering an era of personal genome testing at the nucleotide level. By using the clinician's armamentarium, personal genome testing will change the field of medicine in a propitious way, allowing physicians to pinpoint their patients' diseases.</p>	
Summary Statement This study involved discovering the accuracy of genetic testing in distinguishing the cases and controls of common metabolic and heart diseases, as well as finding the benefits of utilizing genetic testing in private medical offices.	
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