



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

Name(s) Sarah N. Saboorian	Project Number J0517
Project Title Is There a More Efficient Method to Make a Cheaper Gel Electrophoresis Kit and Is Gel Electrophoresis a Viable Way to Te	
Abstract Objectives/Goals My goal for the kit was to make it cheap, normal-size, and easy to make and use. I predicted that an at home kit would be a viable way to test for breast cancer. Methods/Materials My materials were urine cups, saliva, alligator clips, 3 mini-pipettes, bromothymol blue dye, a clear square container, Tris-Glycine buffer, 10 9-volt batteries, 1 gallon of distilled water, agarose powder, a voltage meter, a block of wood, and a drill. Write a consent form, get samples of saliva from people with and without breast cancer, and have all participants sign. Brainstorm a prototype and buy materials. Make the comb out of wood and the agarose gel by boiling the powder with distilled water. Place the comb in the container. Pour the solution in the container selected to be your chamber and leave the comb. Have a 3rd party blind you from which ones are cancerous and make an according list. Attach the batteries together into a battery pack and measure the voltage. Once the gel is set, cut two sides out about two inches in from the edge of the container with a knife. Create the buffer by mixing the powder with water. Remove the comb from the gel and fill the sides with buffer. Pipe dye into each well then pipe the first sample into the first well on the left using a different mini-pipette. Clean pipette with water and pipe second sample into mini pipette and squirt into second well on the left. Repeat moving one well to the right each sample. Place electrodes, paperclips, in buffer. Wait for about an hour and take photos of the migration patterns. Try to identify which are cancerous. Check to see how many you got correct. Identify possible mistakes and run the test again. Results I was only able to identify 4 out of the 10 correctly. Out of those four only one was cancerous. As for the kit, I saved about \$60 by making an at home kit. Conclusions/Discussion You can save about \$60 on average if you make your own kit vs. buying one online. A homemade kit would be efficient if you wanted to learn more about electrophoresis and were willing to put time in. Using an at home kit is not a viable way to detect breast cancer at this time but is a possibility. Overall, there is a more efficient method to make a cheaper at-home electrophoresis kit, and it may beat out online kits, but the kit cannot detect breast cancer.	
Summary Statement The focus of my project was to create a cheaper, yet effective at home electrophoresis kit, as the need for one is growing, and to use that kit to test for breast cancer.	
Help Received Dad supervised; helped drill comb	