



# CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

<b>Name(s)</b> Camryn L. More	<b>Project Number</b> <b>J0511</b>
<b>Project Title</b> <b>The Use of Homemade Protein Electrophoresis to Determine a Hypoallergenic Dog Breed</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> "Hypoallergenic" dog breeds have become popular as the rate of dog allergy has increased. No study has shown a particular breed to be hypoallergenic. I sought to determine if a certain breed of dog produces less allergen by using a homemade protein electrophoresis assay.</p> <p><b>Methods/Materials</b> Hair and fur samples were gathered from several breeds of unwashed dogs. Protein extraction was accomplished by soaking the samples in distilled water overnight at room temperature. A commercial dog allergen extract was used as a control. Gel preparation was accomplished using unflavored gelatin in a glass dish with copper wire on opposite sides to conduct electrical current. Dog protein extract was loaded into wells cut in the gelatin. A buffered electrolyte solution made with sodium chloride and sodium bicarbonate was poured over the gel. Direct current was ran across the copper wires for 24 hours using seven 9-volt batteries connected in series. A Coomassie Blue stain was made using FD&amp;C Blue #1, acetic acid and ethanol. Stain on kept on gel was for 8 hours and removed. The gel was examined for stained protein. A semi-quantitative analysis was performed to determine the protein concentration present in each sample of dog protein extract.</p> <p><b>Results</b> The dog hair/fur sample with the most protein was the Welsh Corgi, followed by the Labradoodle, the Golden Retriever, the Labrador Mix, the Bijon-Frise, the miniature Schnauzer, the Jack Russell Terrier, and the Shepherd Retriever Mix. The dog hair/fur sample with the least amount of protein was the Shih Tzu.</p> <p><b>Conclusions/Discussion</b> Using a completely homemade protein electrophoresis assay, I was able to determine the amount of protein in various samples of hair/fur obtained from various species of dogs. It is likely that these proteins represent dog allergens. The Welsh Corgi was found to have the most amount of protein, and therefore is not a good choice as a pet for a person with dog allergy. The Shih Tzu had the least amount of dog protein, and therefore may be a good choice as a pet for a person with dog allergy. Dog breeds that have classically been considered to be hypoallergenic, such as the Labradoodle, actually showed to have a higher amount of dog protein compared to many other dog breeds. Future studies are needed on a wider range of dog breeds, and to confirm with a IgE immunoblot that these proteins are allergens.</p>	
<b>Summary Statement</b> By using a homemade protein electrophoresis assay, I determined the Shih Tzu to be the most hypoallergenic dog breed.	
<b>Help Received</b> My dad helped me perform the experiment.	