



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Simon Lebsekal	Project Number S0209
Project Title Interfacing the Bionic Eye via the Retinal Matrix	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Due to pressure caused by a retinal tack that is used to attach the current micro-electrode prosthesis to the surface of the retina, vascular leakage and retinal folding are becoming more and more apparent. This is defeating the purpose of restoring vision to victims with Retinitis Pigmentosa. The goal of my project is to develop a biological adhesive that will allow the attachment of the silicone prosthesis to the retina, which should significantly reduce the negative affects of pressure on the retinal surface.</p> <p>Methods/Materials Silicone with lasered points to ensure the free electrons will be ascertained in order to allow for good adherence to the Contotrostatin protein. Once we receive this as well as the snake venom protein (Contortrostatin) we begin to remove the retinal samples from the porcine eyes and place them on aluminum cylinders. We will place the protein on the lasered Silicone and allow it to dry. Once we have the experiment ready we use a Bose pressure sensor to find a precise amount adherence to the retina by the Contortrostatin covered Silicone. This adherence will be read on the computer by the amount load in mN.</p> <p>Results We found that the protein Contortrostatin had a load of 340mN and the Silicone without the protein had a load of 10mN. This shows that this protein is a good candidate for further more thorough and extensive testing.</p> <p>Conclusions/Discussion The problem with many bio-adhesives is that they can be neurotoxic and non biocompatible, etc. The data we have received is only preliminary data and will only lead to many more experiments such as temperature tests, animal testing, and histology for further understanding of the protein; maybe even a way to remove protein with the help of enzymes. The advent of this new technology can be applicable to many other fields and will be very beneficial to field of medicine and biomedical engineering.</p>	
Summary Statement The goal of my project is to develop a biological adhesive that is not neuro-toxic and will allow the attachment of a Silicone retinal prosthesis with ease.	
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