



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Rami Lieberman	Project Number J1314
Project Title Biomimetics and the Lotus Effect	
Objectives/Goals Many living organisms have microstructures and nanostructures that allow them to have sophisticated effects in order to create structural colors, hydrophobic properties, adhesion properties, etc. The objective was to identify which of those structures are only due to the textures created by these organisms in order to be able to copy them and then be able to mass produce them with embossing or casting techniques onto films in order to have new novel technologies and materials such as self cleaning displays (cellular phone displays, TV displays, glass panes, windshields, etc)	
Abstract Methods/Materials Procedure: In order to copy the lotus leaf structures we used a UV curable lacquer and a room temperature curable silicon. The experiments needed for the lacquer and silicon are as follows: UV curable lacquer: With a UV light the lacquer was cured on top of the leaf structures and then peeled from it. Silicon: At room temperature the silicon lacquer was cured on top of the leaf structures and then peeled from it. The experiments and testing consisted of 50 trials in total. Materials: 1.Live Lotus plant 2.Dried Lotus leafs 3.Motion Picture F/X Company (silicon) 4.Radcure (lacquer) 5.UV light 6.Dropper 7.Funnells 8.Plastic cups 9.Weight Scale 10.Scissors 11.Tape 12.Microscope 13.Gloves 14.UV light protective goggles 15.Long Sleeve shirt 16.Acitate sheets	
Results 1.- That the ideal mix for the lacquer is 40% dilution in order to obtain the best replication. 2.- After twenty minutes of curing the replication quality remains the same. 3.-The more pressure the better the replication. 4.- The micro and nano structures can be replicated and mass produced in films 5.- The mass produced films keep the same properties as the original micro or nano structures	
Conclusions/Discussion Conclusions:	
Summary Statement Identifying and copying nanostructures of living organisms in order to mass produce them onto new novel materials and applications such as; military, medical, industrial, commercial ones, etc.	
Help Received My mother helped me organizing everything; My dad helped me with ideas and some of his equipment; Mrs. Rines my advisor helped me fixing all sorts of things	