



**CALIFORNIA STATE SCIENCE FAIR  
2013 PROJECT SUMMARY**

<b>Name(s)</b> <b>Daelin T. Arney</b>	<b>Project Number</b> <b>S0301</b>
<b>Project Title</b> <b>Pneumatic Prosthetic</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> There is room for advancements in the field do human prosthetics. This project was developed to test the feasibility and applicability of pneumatic muscles in human prosthetics. Tests were carried out to measure the flexion of muscles at differing lengths. Research indicated that a pneumatic muscle at 85 p.s.i would flex 25% of its original length. Once this data was gathered it was then applied to develop the muscles, that were then used in the model skeletal arm.</p> <p><b>Methods/Materials</b> Latex tubing Woven nylon loom Zip ties/ Hose clamps Nylon bolts High pressure tubing Air Compressor Barbed male connectors-(nylon)</p> <p><b>Results</b> The first pneumatic muscles built were not very applicable to what was need in the arm. After considerable experimentation the muscles began to operate with the degree of flexion that was needed in the human model. Once I had the ideology down of how the pneumatic muscles actually worked I was able to deduce that at any given length a muscle will flex 25% of its original measurement. I then was able to implement this concept into the model arm. After a minute amount of tweaking I construct my first model of P.A.M one, which operated with promising results and proved that the implementation of pneumatic muscles on the human phasic was possible at least at the skeletal level.</p> <p><b>Conclusions/Discussion</b> Overall my experiment was a success I created an arm that sets the for-ground for the development of what I call advanced prosthesis now I# m held back by money, access to materials and the technology of my time. But if I#m capable of creating #P.A.M-1# with nothing but my imagination minimal funds and common materials imagine what is possible when this mentality is induced in a lab, with a team of scientists. The possibilities are endless we may actually be able to give disabled human beings the well desired right to walk or use their arms. We have the ability to change the way disabled individuals live their lives whether they be veterans or the victim of a tragedy we can change their lives for the better.</p>	
<b>Summary Statement</b> The application of Pneumatic muscles in human Prosthetics.	
<b>Help Received</b> Mother assisted with editing, Family Friend provided tools as well as helped with building.	