



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Amanda R. Suzuki	Project Number S0217
Project Title Pull Out Strength of Various Suture Anchors in Bone	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective was to test the overall strength of four types of suture anchors. The hypothesis was that the Fastin RC anchor would be the strongest, followed by the super anchor, the rotator cuff anchor, and the GII anchor. The hypothesis was made based on the design and size of the anchors tested.</p> <p>Methods/Materials The repetitive stress apparatus was constructed with wood, k'nex pieces, and a k'nex motor. A suture anchor was attached by a suture loop to the apparatus. The apparatus was turned on and the stopwatch measured the time until failure, which is defined as the suture anchor pulling out from the styrofoam or until two minutes (the allotted time limit) have passed. A conversion factor was used to convert seconds to cycles to failure. All four anchors were tested on the apparatus ten trials each. For the maximum tension test, an anchor was inserted into balsa wood. Using a manual fishing weight scale, the anchor was pulled out of the balsa wood and the kilograms exerted upon pullout were recorded. Each anchor were subjected to this test for ten trials each.</p> <p>Results The Fastin RC anchor tested in both the repetitive stress test and the maximum tension test. The super anchor outperformed the rotator cuff anchor in the repetitive stress test, but the super anchor and the rotator cuff anchor had similar results in the maximum tension test. The GII anchor had the weakest performance in both tests.</p> <p>Conclusions/Discussion The Fastin RC is the best anchor for use in areas of repetitive movement or when sudden high tension might occur. The GII anchor, despite its poor results, is still useful because of its small size.</p>	
Summary Statement My project tests the overall strength of four types of suture anchors in both a repetitive stress test and a maximum tension test.	
Help Received The Mitek Company donated the suture anchors; Dr. Stephen Suzuki knotted suture loops for repetitive stress test.	