



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Adam Sowlati	Project Number S1911
Project Title Cryptobiotic Performances of Tardigrades	
Abstract Objectives/Goals The research was performed to see whether tardigrades exposed to varying times in cryobiosis would experience different cryptobiotic performances (times out of cryobiosis). Methods/Materials First the tardigrades were isolated using a probe. The isolated tardigrades were placed into four separate microscopic test slides and transitioned into a state of anhydrobiosis for 24 hours by allowing them to completely dehydrate. They were then put into a freezer to induce a state of cryobiosis. The times in cryobiosis were increased in increments of five hours to a maximum of 30 hours. Immediately, after removing the tardigrades from the freezer, a timer was activated so the time it took them to come out of cryobiosis could be measured. A re-hydration medium was used to retrieve the tardigrades from cryobiosis. The time, in which the tardigrades first exhibited movement, was logged into a data table as their cryptobiotic performance. The experiment was repeated using all four test slides. Results The results of this research clearly show an upward trend in cryptobiotic performances with increased time in cryobiosis on all test subjects. Conclusions/Discussion The longer the tardigrades were in a state of cryobiosis, the longer it took them to come out of this state. This can be explained due to the fact that the longer the tardigrades were in cryobiosis, the more their metabolic functions were slowed and stopped. The recovery period from cryobiosis requires energy stored inside the tardigrade. This energy will over time be lost due to natural progressions. Therefore, the longer the tardigrade remains in cryobiosis, the more energy is lost. The tardigrades in cryobiosis for longer periods of time would have to make use of the available energy, to come out of this state. This research has brought great understanding to the field of cryobiology, cryptobiosis, and the overall physiology of tardigrades.	
Summary Statement This project studied the reactions of tardigrades (Milnesium sp.) to various states of cryobiosis.	
Help Received Technical questions answered by Professor William R. Miller, Ph.D. of Chestnut Hill College in Philadelphia, PA and The Professors of Carolina Biological. Used Biology lab and equipment at Viewpoint School.	