



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Monica L. Boedigheimer	Project Number 31625
Project Title The Effects of Caffeine and Pharmacological Agents on Web-Spinning Spiders	
Abstract Objectives/Goals This project is designed to test pharmacological agents with different effects on humans, namely caffeine, acetaminophen, and pseudoephedrine, on a spider's ability to spin a proper orb web. Methods/Materials Each spider was dosed with 100 micrograms of either caffeine, acetaminophen, or pseudoephedrine. The drugs were dissolved in water and dripped it on the spiders in the proper concentrations. Depending on how much of an effect that amount had, either a higher dose of more than 600 micrograms or a lower dose of 50 micrograms was administered. Webs were photographed and compared to each spider's drug-free control web. Results Low Caffeine-no effect High Caffeine-missing spirals and only 3 main spokes, started a second web at this dosage that was just as chaotic as first, evacuated home Low Acetaminophen-cannot find web or spider High Acetaminophen-spirals get more spaced out towards middle, there was a finished web that evening, cannot find spider Low Pseudoephedrine- no effect High Pseudoephedrine-minimal effect, small crescent shaped areas with no webbing Conclusions/Discussion I was surprised with the results. Caffeine was the most predictable. I suspect that the reason the acetaminophen spiders could not be found was because of an artifact, considering it rained later that day. However, it might have been that they were getting a higher effective dose than realized because it absorbed more through their exoskeletons, causing them to flee from discomfort. Also, I thought pseudoephedrine would have more of an effect because of how heavily it was guarded at the drug store, its amphetamine-like chemical structure, and the rates of abuse with it.	
Summary Statement I tested how caffeine, acetaminophen, and pseudophedrine affected a spider's ability to spin a proper orb web.	
Help Received Neighbor provided spiders. Parents are scientists and offered feedback.	