



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Eugene Laksana	Project Number S1814
Project Title MgCl(2) Stimulating Effect on Osteogenesis and Promotion towards Bone Densification	
Abstract Objectives/Goals The purpose of this experiment is to determine how magnesium chloride plays a role in the bone remodeling process, osteogenesis, and how its role differs from the effects of various other supplementary medications. Methods/Materials I used 15 cups (and bones) each containing 3 samples of the 5 variables: (per cup) 120 ml H ₂ O; 120 ml H ₂ O, 1g OsteoPhase; 120 ml H ₂ O, 1g MgCl ₂ ; 120 ml H ₂ O, 1g CaCl ₂ , 120 ml H ₂ O, 1g OsCal. The bones were submerged and left in their solutions for 4 months with periodic x-ray samples taken halfway between the experimental term and the end. Upon completion, the radiographs were taken to City of Hope to be analyzed with the bio-rad densitometer and an image density quantifier to determine density in OD (optical density.) Results Each of the radiographs produced very different results, suggesting that each of the supplements played a different role in bones, and by working by themselves, they proved to be very ineffective. However, in terms of density repair, every medication contributed to increasing density between term 1 and term 2. H ₂ O bones increased by 14%, Osteophase bones increased by 6.7%, MgCl ₂ bones increased by 11.4%, CaCl ₂ bones increased by 15.9%, and OsCal bones increased by 27.2%. Conclusions/Discussion I believe that bone development (based on the radiograph observations) and repair is not singularly based on one mineral in order to not only sustain density but stabilize growth, especially during child/teenhood. Instead, the whole idea of bones is literally dealing with numerous elements and compounds, which work together in order to develop the structure that we refer to as, the framework of our body, our skeletal system. Although a single element may contain primary dominance in bones, without the other, it just will not work.	
Summary Statement What are the combinations of various supplementary and non-supplementary substances effects towards bone health, strength, and repair?	
Help Received Dr. Haidekker helped with research; Dr. Jia Wang helped with bio-rad operation; Dr. Chen introduced bio-rad technician; Mrs. Zschomler gave access to City of Hope facility; Dr. Judo helped with x-ray machine operation; Mr. Jankowski helped with microscope operation; Dad helped sizing the bones; Mom	