



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Irene G. Li	Project Number S0621
Project Title Analysis of Novel Carboxymethyl Chitosan/Sodium Alginate Microspheres as a Potential Drug Delivery System	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to find an appropriate delivery system to create oral protein therapeutics.</p> <p>Methods/Materials Carboxymethyl chitosan and sodium alginate were used to coat human serum albumin in the form of microspheres, which were treated in pH 2 and pH 7.5. A time course of the protein release from microspheres was studied by using UV spectroscopy and the structural integrity of the protein was assayed using HPLC.</p> <p>Results Microspheres treated in low pH were smaller than those treated in neutral pH. The protein concentration increased over time. In both low and neutral pH, microspheres showed a quick initial release, then an extended release, although those in low pH had a slower release rate. The HPLC showed that HSA was still detectable in low quantities.</p> <p>Conclusions/Discussion The release rate of the protein is related to the swelling degree of the microspheres. Those in low pH swelled less, resulting in slower release rates. The microspheres were able to maintain the structure of a portion of the protein. Therefore, carboxymethyl chitosan and sodium alginate is a viable potential oral peptide drug carrier.</p>	
Summary Statement Carboxymethyl chitosan/sodium alginate microspheres can be used as a potential oral peptide drug carrier due to its extended release and its protection of protein integrity.	
Help Received I created the method for making microspheres from literature review. Dr. Tiansheng Li from HTL Biosolutions helped me learn to use the UV spectrophotometer and HPLC.	