

The Summer Undergraduate Research Fellowship (SURF) Symposium  
7 August 2014  
Purdue University, West Lafayette, Indiana, USA

## Formation of lactalbumin nanoparticles by desolvation method

Menglu Gao, Jozef Kokini, Luis Fernando Maldonado Mejia  
Department of Food Science, Purdue University, West Lafayette, Indiana, USA.

### ABSTRACT

Protein nanoparticles are ideal carriers for bioactive compounds such as nutraceuticals and drugs because they are biodegradable, less immunogenic and non-toxic and can be nanoparticulated. This study focuses on the desolvation method to form lactalbumin protein nanoparticles. Lactalbumin is soluble in water and insoluble in many organic solvents. Different solvent/non-solvent ratios are evaluated in this research project for the effect they have on the size, PDI and stability of protein nanoparticles. Different methods including sonication and centrifugation were used and compared in terms of their effectiveness to produce small nanoparticles during fabrication of the nanoparticles. Data collected including protein nanoparticles average size and zeta potential, also SEM and TEM images were used to study the nanoparticles. It was found that high non-solvent ratio can significantly decrease the average particle size, while it also causes an increase in polydispersity index. Sonication can cause some aggregation of the nanoparticles and makes the average particle size slightly increase. Centrifugation can precipitate the large particles and when the supernatant is collected the average particle size is much smaller. These measurement will contribute to the further understanding of the formation of high quality protein nanoparticles that can serve as efficient drug carriers.

### KEYWORDS

Nanoparticles;  $\alpha$ -Lactalbumin; Desolvation method; Drug delivery

### REFERENCES

Sundar, S., Kundu, J., & Kundu, S. C. (2010). Biopolymeric nanoparticles. *Science and Technology of Advanced Materials*, 11(1), 014104.