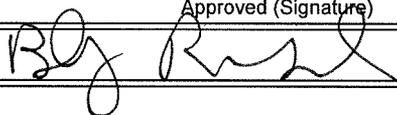


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U.S. Department of Agriculture Accomplishments Report AD-421 U.S. Dept. of Agriculture, State Agricultural Experiment Stations and Other Institutions			Date (Month, Day, Year)
1. Accession 0216870	Agency Identification No. 2. CSREES 3. LA.B	5. Work Unit/Project No. LAB03950	6. Status Annual Report
7. Title Chitosan/PLGA Nanoparticles for Increased Bioaccessibility and Bioavailability of Model Lipophilic Vitamins			
12. Investigator Name(s) (Last Name and Initials) Sabliov, C. M.; Moldovan, D.			
20. Termination Date 11/30/2012		40. Period Covered (mo/da/year): 12/01/2010 TO 11/30/2011	
Outputs: The results of this work have been presented at five national and international conferences.			
Outcomes/Impacts: Physicochemical properties, controlled release characteristics, stability, and cellular uptake of Chi/PLGA and PLGA particles with entrapped α T were investigated to understand the behavior of these nanoparticles in the GI tract. Chi/PLGA and PLGA particles stabilized by lecithin were synthesized and fully characterized for oral GI delivery via TEM, DLS, HPLC, and fluorescence microscopy. Particle stability was pH and system dependent. In-vitro release profiles showed a higher percentage of drug released in the intestinal domain by Chi/PLGA as opposed to PLGA nanoparticles. Fluorescent counterparts of these particles were associated with the surface of the intestinal villi, and penetrate deep in the endothelial lining of rabbit intestinal explants indicating uptake. In-vitro and ex-vivo results showed that PLGA and Chi/PLGA nanoparticles were efficiently taken up by the GI tract and could be optimized to deliver vitamin E to the intestine and improve its bioavailability.			
Publications: Lin, J., B. Novak, and D. Moldovan. 2012. Molecular dynamics simulation study of the effect of DMSO on permeability of lipid bilayers. <i>Annals of Biomedical Engineering</i> . <i>J. Phys. Chem. B</i> , 2012, 116(4), pp. 1299-1308.			
Participants: C. Sabliov, (PI), D. Moldovan, A. Murugesu, K. Xia, J. Lao, C. Astete, and T. Morgan, LSU AgCenter.			
Target Audiences: Academia, food and pharmaceutical industry.			
Project Modifications: Nothing significant to report during this reporting period.			
Approved (Signature) 		Title	Date