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**Significance of structure elucidation of protein at the interface in designing polymer nanoparticle mediated protein delivery system**

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It is of utmost importance to deliver protein in safe and efficacious form from the nano particulate delivery system knowing that adsorption of proteins on to nanoparticle surfaces involves complex interactions including hydrophobic interaction, electrostatic interaction and/or interaction between adsorbed protein molecules which may lead to loss of protein stability. However, adsorption based drug delivery systems for protein drugs would be one of the simplest and most effective forms of drug if the mechanistic understanding of adsorption of proteins at solid/liquid interfaces is obtained. Evaluation of the changes in structure of recombinant human Growth Hormone (r-hGH) upon adsorption at biodegradable Poly (lactide-co-glycolide) PLGA nanoparticles of different hydrophobicity as a function of pH revealed the polymer grades suitable for delivery system. The comprehension of structural stability and polymer grade is extremely useful in developing sustained delivery of protein like r-hGH. This kind of dosage form is currently lacking in the market despite the facts that r-hGH was first approved for use by FDA in 1995, the conventional dosage form in the market has a limitation of daily subcutaneous injections, a long-acting dosage form of r-hGH; Nutropin Depot was discontinued in 2004, about 5 years after its approval from FDA and since then continued research has been focused in this area. Thus, direct evaluation of secondary and tertiary structural conformations of the adsorbed proteins on the polymer surface with the analytical techniques such as dynamic light scattering Spectroscopy, fluorescence spectroscopy and circular dichroism spectroscopy will help understand the nature of the interactions that govern the adsorption of the protein on the polymer, leading to successful design of nanoparticulate delivery systems.

**Biography**

Vaishnavi Parikh has completed her PhD in Pharmaceutics from Philadelphia College of Pharmacy. She has more than eight years of experience in research and development of oral dosage forms and novel drug delivery systems for small molecules as well as biologics. She currently manages the Product Development Department at Genus Lifesciences Inc. Her work on development of a novel concept for long acting delivery of recombinant human Growth Hormone (r-hGH) was very well recognized and led to patent filing. She has published several papers in reputed journals; presented at several international conferences; has been serving as a Reviewer on six reputed journals and also an Editor for the journal, *Insight-Automatic Control*.

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