

Biodegradable Nanoparticles for Receptor-Mediated Oral Protein Delivery

Erik Brewer

Therapeutic proteins are used in the treatment of a variety of diseases, but have to be delivered through intravenous or intramuscular delivery, despite the inconvenience and poor patient compliance associated with this route. Though the peroral route would be the ideal choice, proteins suffer a bioavailability of less than 1% due to two obstacles: enzyme digestion in the stomach, and poor transport through the intestinal lining.

Protein transport can be increased through the linkage of transport ligands that utilize receptor-mediated endocytosis, though this involves complex reactions that can hinder the therapeutic value of the drug. Biodegradable nanoparticles offer an alternative to direct linkage by being able to both bond with the ligand and encapsulate the free protein, which can then diffuse out the particle after transport. This work focuses on characterizing the ability of the intestinal cells to transport nanoparticles with respect to particle size and size dispersity with the aid of an *in vitro* model.