A Novel Protein Delivery Platform Based on Single-Protein Nanocapsules

Yunfeng Lu
Chemical and Biomolecular Engineering
University of California Los Angeles

An average eukaryotic cell contains thousands of proteins participating in normal cellular functions. Most diseases are somehow related to malfunctioning of particular proteins systematically or locally. In this context, protein therapy offers the most direct and safe approach for the treatment of such diseases. Recent advances in recombinant DNA technology enables the synthesis of a large variety of pharmaceutical proteins; however, broad use of protein therapy is still limited by several substantial barriers, such as low delivery efficiency and stability against proteases. Herein, we report a novel delivery platform based on nanocapsules consisting of a protein core and a thin permeable polymeric shell. Multiple proteins can be delivered with high efficiency, activity and low toxicity for imaging, therapeutic, and cosmetic applications.