



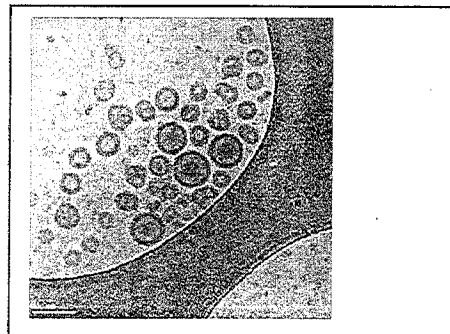
Title of Invention

(Below is limited to 1-page only; be careful not to disclose vital technology content. Please delete these words when the document is finished)

PI: Prof. Hui-Wen Chen

Department of Veterinary Medicine, National Taiwan University

Experience: <https://sites.google.com/site/winnichenlab/>



Market Needs: Synthetic polymeric nanoparticles have broad applications as a carrier of active agents in numerous fields such as drug delivery and vaccine development, but the difficulty in creating a nanoscale enclosure with a large aqueous interior significantly limits platform applications involving the encapsulation of hydrophilic and macromolecular content. Existing polymeric nanoparticle platforms are generally solid with little to no internal aqueous core for hydrophilic cargo encapsulation. Several hollow nanoformulations consisting of polymeric shells have been described, but they have a size limitation above 150 nm, no definition of shell thickness, no evidence of defect-free shell enclosure, and poor cargo encapsulation efficiency.

Our Technology:

The invention described herein is a polymeric hollow nanoparticle platform differentiable from prior arts with defect-free polymeric shells below the thickness of 20 nm. Using polymers with defined length and sharp polarity in a double emulsion process, preparation of hollow polymeric nanoparticles with outer diameters between 600 and 30 nm are demonstrated, with polymeric shells ranging between 8 to 15 nm. It should be noted that the present invention demonstrates for the first time a hollow polymeric nanostructure below 40 nm in diameter, which is achievable only through minimization of polymeric shells.

Strength:

The invention will serve as a platform technology for drug delivery, theranostics, and vaccine development applications. The thin shelled polymeric hollow nanoparticles will be applied to encapsulate bioactive agents, including but not limited to small molecules, peptides, proteins, nucleic acids, imaging agents, inorganic nanoparticles, organic nanoparticles, and any combination of the above. The surface of the platform will be optionally decorated with functional moieties, including but not limited to small molecules, peptides, proteins, nucleic acids, imaging agents, nanoparticles, for different applications such as long-circulating drug delivery, targeted drug delivery, and antigen delivery.

Competing Products: None

Intellectual Properties: Pending

Contact (do not need to fill out):

Center for Industry-Academia Cooperation, NTU

Tel: 02-3366-9945, E-mail: ntuciac@ntu.edu.tw