Solvent-Assisted Coalescent Assembly of Amphiphilic Core-Shell Nanoparticles

Junmin Zhu, Department of Biomedical Engineering, Case Western Reserve University

The goal of this project is to do develop a novel strategy, solvent-assisted coalescent assembly of core-shell nanoparticles (CSNPs) into advanced nanostructures. A novel strategy, hydroperoxide/amine-initiated graft polymerization (HAIGP) (Fig 1) was used to prepared PMMA@PEI CSNPs (Fig 2A) with well-defined core-shell structure (Fig 2B). CSNPs was assembled into bigger particles (Fig 2C) or nanofibers (Fig 2D) by solvent-assisted coalescence by a chloroform/water extraction and evaporation method, which depends on the composition of CSNPs.

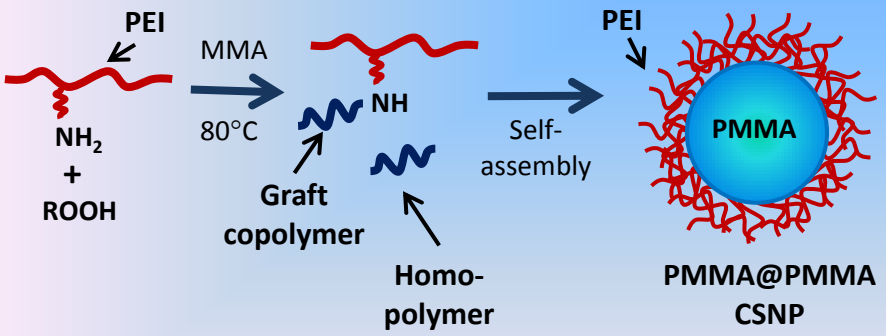

Fig 1. Preparation of PMMA@PEI CSNPs by HAIGP

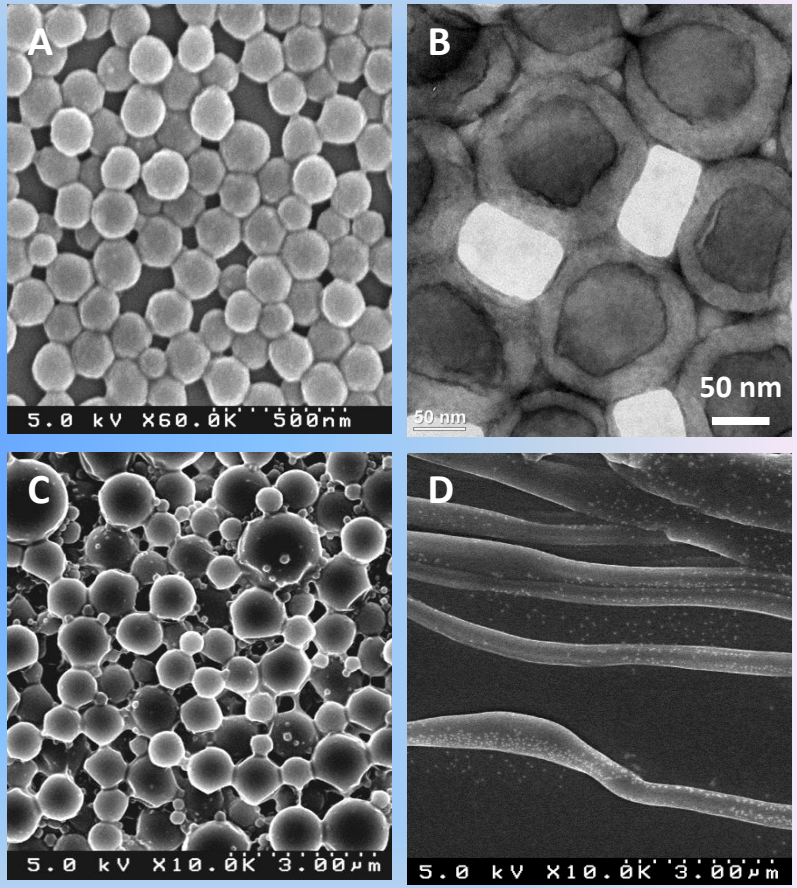

Fig 2. Morphology of PMMA@PEI by HAIGP at pH 11 by SEM (A) and TEM (B); SEM morphology of chloroform-assisted assembly of PMMA@PEI CSNPs prepared at pH = 7.0 (C) and pH = 11.0 (D)