TITLE: Fluorescent Dye-encoded Assemblies of Amphiphilic Janus Magnetoplasmonic Nanoparticles: Cluster,  
lamellae, and Vesicles  
AUTHORS: Derong Lu , Shuai Hou , Yonghao Chen, Hongwei Duan  
1. School of Chemical and Biomedical Engineering, Nanyang Technological University,  
Singapore, Singapore.  
Abstract: We report the morphological transition of plasmonic assemblies from cluster-to lamellae-to-vesicle assembled from magnetoplasmonic Janus nanoparticles decorated with pH-responsive dye-conjugated copolymer. The polymer grafts provide the driving force for self-assembly and serve as modulator to tuning dye-plasmonic nanoparticles distance and control the disassembly of resulting assemblies, stimulated by the dimensional changing of copolymer spacing layer. The dye-encoded assemblies exhibit pH-dependent variation in terms of fluorescence emission intensity owing to the swelling and the hydrophobic/hydrophilic transition of copolymer grafts. The incorporation of size tunable spacer allows for the experimentally investigate the influence of quenching efficiency and scattering intensity on over all quantum yield of dye by excluding the impact of excitation enhancement arising from the enhanced electric field. The simulation was also utilized to reveal the dominant contribution on apparent fluorescence emission intensity depending on the relative position of dye and the physical extinction cross sections of assemblies.

