Functional Nanoparticles from Proteins: Development of Affinity Carbon Dots for Protein Mimicking, Cell Trafficking, and Super-Resolution Imaging



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Carbon dots, which exhibit quantum confinement similar to inorganic quantum dots, have been developed from a variety of precursors and used in a wide range of applications. Our group has pioneered top-down thermal synthesis of protein-based carbon dots, which can be tailored to retain protein functionality such as membrane receptor targeting. This new class of carbon materials can be used as contrast agents, theranostics, and as labels for super-resolution imaging. Our group has demonstrated cancer-targeting protein carbon dots and has followed the fate of conjugated carbon dots through the transferrin degradation pathway. In this talk, I will present recent advances in our lab, as well as an overview of carbon dot nanoparticles and their potential applications in life sciences.