

*Seminar*

**Design of Photostable Plasmonic Nanoparticle Probes and Biosensors for Molecular Imaging of Single Living Cells**

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All living organisms are equipped with unique membrane transport apparatus that protect the cells from hazardous and noxious compounds. The membrane transport plays a leading role in a wide spectrum of cellular and subcellular function, including multidrug resistance, cellular signaling and cell-cell communication. It appears that membrane proteins can assemble membrane transporters optimized for the selective extrusion of specific encountered substrates (e.g., chemotoxics and drugs). Such fascinating smart sensing and transport mechanisms occur at the nanoscale region. Despite extensive study over decades, the structure, mechanisms and function of extrusion membrane transport remain unclear.

We have recently prepared monodisperse desired size and shape of noble metal nanoparticles, characterized their photostability and biocompatibility, and utilized their intrinsic optical properties for real-time imaging single living cells at the nanometer spatial resolution and millisecond time resolution (A-B). These nanoparticles are extremely bright, resist photodecomposition and blinking, and can serve as an optical probe to continuously monitor dynamic events in living cells for an extended period of times.

The related research background, detailed experimental designs, and prospective applications will be discussed in this seminar.

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