Communication ☒ Oral
☐ Poster

Design of All-Organic FRET Near Infrared Nanoparticles by Co-nanoprecipitation

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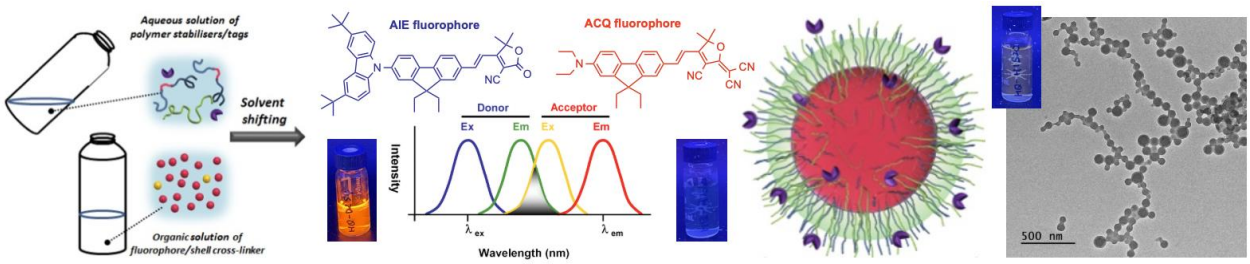
Solid all-organic fluorescent nanoparticles (FONs) have emerged as powerful tools in life science research for in vivo bioimaging, biosensing, and therapy. However, the practical use of such tracers has been hindered by the difficulty of designing bright nanoparticles with controlled dimensions (typically below 200 nm), narrow size dispersity, and long residence half-time in vivo. In previous studies, we developed a very simple yet effective approach to produce stable ultrabright all organic AIE (Aggregation Induced Emission) nanocrystals surrounded by a cross-linked hydrophilic polymer shell by nanoprecipitation and freeze-drying process.[1] In this project, we aim at exploiting this process to generate new functional probes for in vivo two-photon neuroinflammation imaging. Exploiting Förster Resonance Energy Transfer (FRET), we concomitantly use AIE and ACQ fluorophores to generate nanoprobes emitting at longer wavelengths in NIR. By comprehending the mechanisms and the experimental parameters underlying the formation of FONs, we show here how to optimize the co-nanoprecipitation process to obtain stable, ultrabright sub-100 nm probes with special emphasis on size control, long term stability and upscaling for practical application. The FRET-based AIE FONs design principles reported here are applicable to a range of fluorophores with different chemical structures.



Références :
(1) Yan, X.*et al*. General and Scalable Approach to Bright, Stable and Functional AIE Fluorogen Colloidal Nanocrystals for in Vivo Imaging. *ACS Applied Materials Interfaces* **2018**, *10*, 25154–25165.