

Development of Functional Anthracene-Based Multiblock Fluorophore for Visualization of Biological Environment

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Phase separation is a ubiquitous phenomenon in biological systems such as lipid raft and liquid-liquid phase separation, where the environment is slightly different from the surroundings. Recently, this phenomenon has been revealed to play important roles in biological activities and attracts a great deal of attention not only in biology but also in chemistry.¹ However, details of this phenomenon remain unexplored, and there is a need to investigate the behavior of relevant molecules in the biological environment.

Our research group has developed a series of multiblock molecules, which form supramolecular assemblies in the lipid bilayer membranes and exhibit functions.² This functionality takes advantage of the environmental characteristics of the lipid bilayer membranes that have hydrophobic region surrounded by aqueous phases. By leveraging our experience of developing the functional molecules sensitive to the surrounding environment, we aimed to develop novel molecules that are able to sense a biological environment with phase separation.

Here, we designed anthracene-based multiblock fluorophores which successfully showed characteristic emission depending on the physical parameters of the surrounding environment, and applied them for visualization of the phase-separated substances related to the biological environment. The details of the chemical properties of these fluorophores will be presented at the conference.

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2) Sato, K.; Muraoka, T.; Kinbara, K. Supramolecular Transmembrane Ion Channels Formed by Multiblock Amphiphiles. *Acc. Chem. Res.* **2021**, *54*, 3700–3709.