

第73回 工学とバイオ セミナー

**“Design of Stimuli-Sensitive Biomaterials Leveraging Polymeric Micellar Assembly
and Their Biomedical Applications”**

Date: 1:30PM – 2:30 PM, April 24th (Thursday), 2025

Room: Dw-601, Research Bldg., IIS, UT

Lecturer: Dr. Urara Hasegawa

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Abstract:

Polymeric micelles are self-assembled nanoparticles composed of amphiphilic block copolymers, which consist of a hydrophobic core and a hydrophilic shell. Their structural characteristics, including size, shape and thermodynamic stability, can be fine-tuned by changing the chemical and physicochemical nature of the amphiphilic block copolymers. Due to this design flexibility, polymeric micelles have attracted attention as promising functional materials in the field of biomedical engineering.

In my group, we have sought to engineer polymeric biomaterials that respond to biologically-relevant stimuli by leveraging the unique self-assembled structures of polymeric micelles. In this talk, I will present two topics: 1) polymeric micelles that release drugs in response to oxidative stress, which is characteristic for cancer and inflammatory diseases, and 2) injectable hydrogels composed of polymeric micelles that percolate into three-dimensional networks to form hydrogels upon warming to body temperature. Design concepts, characterization of these materials as well as their interaction with biological systems will be discussed.

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