

ORGANIC SEMINAR

Protein Bioconjugation and Chemical Evolution in Nonaqueous Systems

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Selective and efficient reactions of polypeptides in living systems are enabled by a range of enzymes and molecular machinery even in a complex mixture of cellular components. During the past decades, nonenzymatic reactions or chemical modification of polypeptides have been extensively studied by addressing challenges of aqueous chemical transformation of the polyfunctional biomolecules for various purposes such as creation of therapeutic agents as well as investigation of biomolecular processes in many contexts. Nonetheless, realization of selective, effective chemical reactions of polypeptides in aqueous media represents a formidable challenge. Recognizing the existence of nonaqueous environments where polypeptides would not necessarily lose their structural integrity or functions, the central theme of the Ohata research group is to examine chemical reactivities of polypeptides in nonaqueous media. One aspect of the research campaign is to achieve nonaqueous bioconjugation for creation of therapeutic agents such as antibody–drug conjugates. This presentation also describes another direction of the program about chemical reactivities of polypeptides in prebiotically plausible conditions such as those in the early Earth and other astrochemical events.



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