

Name OMOTO Kenichiro	Job Title Assistant professor	Area of Expertise Coordination Chemistry Supramolecular Chemistry
1. Main Research Topics My research focuses on the construction of supramolecular metal complexes—metal complexes with unique higher-order structures such as helices, rings, and sheets—by utilizing coordination bonds formed around metal ions to fix and assemble organic molecules. In particular, I aim to develop novel types of supramolecular metal complexes based on flexible coordination bonds that have not been widely exploited, such as metal–metal bonds and metal–π interactions. Furthermore, by integrating molecular design concepts from soft materials such as biological membranes and liquid crystals, I aim to create stimuli-responsive materials that combine both rigidity and flexibility. ① Metal-mediated folding of unsaturated hydrocarbons Several metal ions, such as Ag(I), are known to form coordination bonds (metal–π interactions) with C=C bonds of unsaturated hydrocarbons. In this study, I aim to develop methods for controlling and fixing the 3D structures of linear hydrocarbons bearing multiple C=C units through complexation with metal ions via metal–π interactions. The resulting complexes are expected to exhibit metal-dependent stereochemical structures and corresponding reactivities. ② Development of Stimuli-Responsive Coordination Polymers via Incorporation of Soft Molecular Assemblies I am exploring the design of stimuli-responsive crystalline materials by incorporating soft molecular assemblies—such as those found in lipid bilayers and liquid crystal compounds—into the crystalline structures of coordination polymers. In particular, by embedding long alkyl chains into coordination polymers, I aim to induce thermal phase transitions within the crystal lattice, thereby enabling the control of small molecule adsorption/desorption and molecular transport in response to external stimuli.		
2. Keywords Supramolecular chemistry/Host–guest chemistry/Coordination chemistry/Coordination polymers		
3. Remarks and Websites researchmap : https://researchmap.jp/omoto_kenichiro Laboratory: https://www.cms.nagasaki-u.ac.jp/lab/sakutai/ Project : KAKENHI, Grant-in-Aid for Scientific Research (C), JP23K04768 In Research Project 1, I aim to pioneer new possibilities in the development of novel reactions and photofunctional materials based on linear unsaturated hydrocarbons and metal clusters. Research Project 2 explores potential applications such as gas adsorption materials by utilizing the crystalline structures of metal complexes.		