

# Metal-organic cage assembly for gel engineering

Shuhei Furukawa<sup>a</sup>,

*<sup>a</sup>Institute for Integrated Cell-Material Sciences, Kyoto University, Yoshida, Sakyo-ku,  
Kyoto 606-8501, Japan.*

*shuhei.furukawa@icems.kyoto-u.ac.jp*

## ABSTRACT

A gel is a soft material containing a cross-linked three-dimensional network and a continuous phase like a liquid. Most gel materials reported so far are composed of cross-linked organic polymers or silica-based networks. Recently metal-organic network systems started contributing to this class of materials. In this case, either amorphous metal-organic networks or colloidal networks based on metal-organic frameworks (MOFs) are used; however, it has been challenging to control their cross-linked network structures. Our group recently reported another type of metal-organic network to form gels, in which well-defined metal-organic cages (MOCs) are used as building blocks and their inter-cage linkage is tuned by coordination chemistry. This network further produces colloidal spheres, followed by connecting them to form colloidal networks. This hierarchical nature of metal-organic networks based on MOCs gives us an opportunity to control their cross-linked networks across the multiple length scales. In this presentation, we will discuss the strategies to regulate the cross-linked networks of MOCs and tune the resulting properties including porosity.

