

# Novel “Photoswitchable” Molecular Assemblies

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Surfactant molecular assemblies that form, collapse, or change morphology upon application of external stimuli, such as light irradiation, redox reaction, and pH, have been studied extensively with a view to applying for controlled release of drugs and perfumes encapsulated in the assemblies. Our particular interest lies in active control of interfacial properties and molecular assembly formations by means of photo-responsive surfactants. The benefits of photo-responsive nature as an external stimulus over other stimuli include scalable miniaturization and limited chemical contamination, allowing for the development of green sustainable systems. In this presentation, I would like to address some of our recent studies regarding formation control of molecular assembly using novel “photo-switchable” surfactants. First, I will introduce photo-cleavable surfactants modified with cinnamic acid derivative which can be decomposed by UV light irradiation to decrease interfacial chemical properties. I will also present novel amphiphilic lophine dimers showing rapid change in interfacial chemical properties by light irradiation.

**References:** 1) S. Aikawa H. Sakai, et al., *Langmuir*, **29**(19), 5668-5676 (2013).  
2) M. Akamatsu, H. Sakai, et al., *Scientific Reports*, **11**(1), 1-9 (2021).