

# Amino Acid-based Supramolecular Gel and Its Chiroptical Application

Hiroataka IHARA

*Kumamoto University, Kumamoto, Japan  
Okinawa College, National Institute of Technology, Nago, Japan*

**Abstract:** Circularly polarized luminescence (CPL) contains more information than natural or linearly polarized light, making it promising for applications in molecular sensing, optical security devices, and storage units. Therefore, organic molecular systems that generate CPL have been widely studied, and various compounds have been developed in the world. However, many of these CPL-generating molecules have complex chemical structures, making chemical synthesis difficult, resulting in molecular designs with limited structures. On the other hand, we succeeded in producing CPL in the formation of a binary system using supramolecular self-assemblies with an amino acid-based chiral lipid as a chiral host system and a non-chiral fluorescent dye as a guest molecule.<sup>1</sup> The advantages of this method are highlighted by the fact that nonfluorescent dyes can be used and by controlling the molecular orientation of the chiral template, very high CPL intensities and flexible emission wavelength ranges can be achieved. In this presentation, we will focus on various chiral lipids derived from glutamic acid, and introduce their supramolecular optical properties based on their unique dispersion and aggregation behavior, as well as their chiroptical applications including CPL production.

## References:

1. T. Goto, Y. Okazaki, H. Ihara, et al., *Angew. Chem. Int. Ed.*, 56, 2989-2993, 2017.

**Biography:** Professor Hiroataka IHARA was awarded the title of professor emerita at Kumamoto University (2019) and at Okinawa College, National Institute of Technology, Japan (2022), and currently serves as a specially appointed professor at Kumamoto University. He received his doctorate (1982) in polymer science from Kyushu University under the supervision of Prof. Toyoki Kunitake. He was also visiting professors of Kyoto University (2001, 2017 and 2018), Kyushu University (2003 - 2004), JSPS Research Center for Science Systems (2013- 2015), Kumamoto University (2020 - 2022) and Lanzhou Institute of Chemical Physics, China (2019 - 2021). He was also FRSC (UK) since 2003 and Fellow of the Society of Polymer Science (Japan) since 2015. His main research areas are self-assembling chemistry, nanostructure chemistry and functional polymers. Other definitions of his research areas include molecular technology, particle technology and separation technology. Current research interests include nano- to micro-sized functional materials, supramolecular gels,  $\pi$ -conjugated carbon-like substances, organic-inorganic hybrid materials, and bio-inspired smart materials. Total publications: 400 (h-index: 51, i10-index: 227).