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Centro Singular de Investigación en Química Biolóxica e Materiais Moleculares

Conferencia:

Function of Chirality-Responsive Dynamic Helical Polymers

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Aula de Seminarios do CIQUS

10:00 h

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1995 M.S. Graduate School of Engineering, Nagoya University

1998 Ph.D. Graduate School of Engineering, Nagoya University (Supervisor: Prof. Yoshio Okamoto)

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1998-2002 Research Associate, Graduate School of Eng., Nagoya University (Prof. Eiji Yashima)

2002-2007 Lecturer, Graduate School of Eng., Nagoya University (Prof. Eiji Yashima)

2007-2008 Designated Lecturer, Institute for Advanced Research, Nagoya University

2008-2015 Associate Professor, Institute of Science and Eng., Kanazawa University

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Award for Encouragement of Research in Polymer Science; The Society of Polymer Science, Japan (2002), The Excellent Presentation Award for Young Scientists: The Society of Polymer Science, Japan (2005), Thomson Reuters Research Front Award 2012: Thomson Reuters (2012)

Function of Chirality-Responsive Dynamic Helical Polymers

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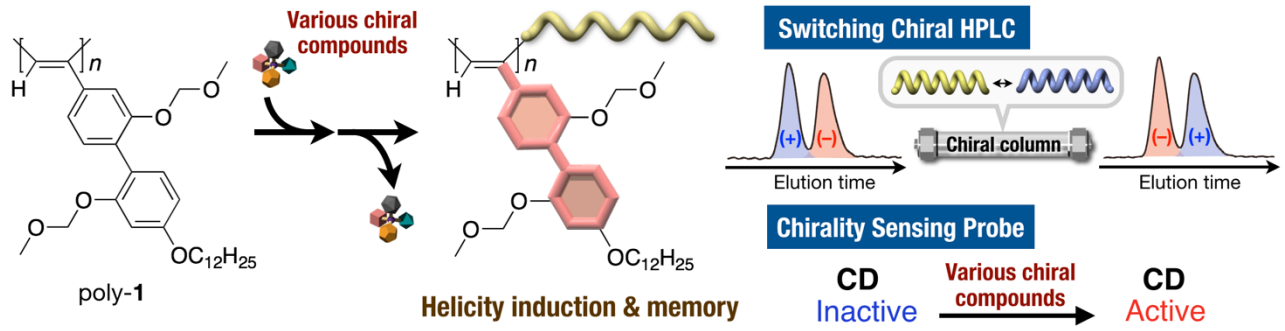
The helix is an essential structural motif for many biopolymers, as represented by double helix in DNA and α-helix in proteins. Their helical structures are considered to play an important role in performing their excellent functions. Therefore, the synthesis of helical polymers with a controlled helix sense has been attracting much interest in the fields of polymer and supramolecular chemistry not only for mimicking biological helices, but also for developing new chiral materials. In this presentation, I will introduce our recent works on the development of stimuli-responsive helical polymers utilizing structural features of dynamic helical polymers. These polymers showed intriguing chiral discrimination ability and chiral amplification phenomena based on their unique helical conformation [1-3]. For example, we found that the helix sense of a polyacetylene derivative bearing 2,2'-biphenol-derived pendants (poly-**1**) was reversibly switched and memorized in the solid state as well as in solution upon interaction with the opposite enantiomeric alcohol followed by its removal, which allowed us to develop the first switchable chiral stationary phase for high performance liquid chromatography (HPLC) [4,5]. Poly-**1** also responded to the chirality of a large variety of chiral compounds including alcohols, amines, esters, ethers, amino acid derivatives, and hydrocarbons, thus showing induced circular dichroisms (CDs) in the polymer backbone region due to the formation of preferred-handed helix. Owing to the chiral memory effect, poly-**1** can detect the chirality of an extremely small amount of chiral compounds including chiral hydrocarbons [6].



References:

[1] Yashima, E.; Maeda, K.; Iida, H.; Furusho, Y.; Nagai, K., *Chem. Rev.* **2009,** *109*, 6102-6211.

[2] Yashima, E.; Ousaka, N.; Taura, D.; Shimomura, K.; Ikai, T.; Maeda, K., *Chem. Rev.* **2016,** *116*, 13752-13990.

[3] Maeda, K.; Yashima, E., *Top. Curr. Chem.* **2017,** *375*, 72.

[4] Shimomura, K.; Ikai, T.; Kanoh, S.; Yashima, E.; Maeda, K., *Nat. Chem.* **2014,** *6* (5), 429-434.

[5] Ishidate, R.; Shimomura, K.; Ikai, T.; Kanoh, S.; Maeda, K., *Chem. Lett.* **2015,** *44*, 946-948.

[6] Maeda, K.; Hirose, D.; Okoshi, N.; Shimomura, K.; Wada, Y.; Ikai, T.; Kanoh, S.; Yashima, E., *J. Am. Chem. Soc.* **2018**, DOI: 10.1021/jacs.7b10981.