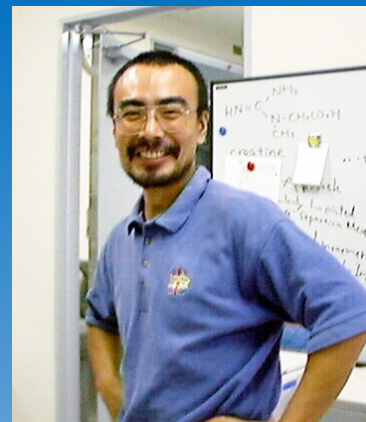


学术报告

报告人: Toshifumi Takeuchi 教授

Graduate School of Engineering
Kobe University

题目: **Molecularly Imprinted Nanomaterials
for Sensing and Drug Delivery Systems**



摘要: Our research group is intensively focused on the development of biomimetic/bio-inspired polymers with affinity adsorption activity, signalling functions, catalytic activity, and other bio-related functions. We use these polymers in molecular imprinting (the template-induced formation of specific recognition sites) in order to achieve molecular recognition in specific binding cavities via these bio-related functions [1]. So far, we have prepared many MIPs with high affinity, selectivity, and specific signalling functions for biologically active compounds, including herbicides, endocrine disruptors, antibiotics, nucleobases, drugs and proteins. Recently, we proposed the idea of post-imprinting modifications (PIMs), which was inspired by post-translational modifications (PTMs) of proteins. Similar to PTMs, PIMs enhanced the functionality of MIPs in a variety of ways, specifically by forming cofactor-coupled molecularly imprinted cavities where prosthetic groups are introduced into these cavities either covalently or non-covalently to improve binding activity [2-11]. In this presentation, recent advances in PIM-based MIPs will be discussed in detail. Also I will present novel and quite unconventional long circulating MIP-based nanogels (MIP-NGs) in the blood streams capable of acquiring stealth in situ by cloaking themselves with the body's own dysopsonic proteins [12]. Since nanomaterials have been attracting attention in the fields of biomedical and life sciences, our challenge will provide a new class of drug nanocarriers for therapeutic purpose.

References

- [1] Takeuchi, T., et al. *Chromatography* 2014, 35, 139-145 (open access).
- [2] Horikawa, R., et al. *Angew. Chem. Int. Ed.* 2016, 55, 13023.
- [3] Kuwahara, A, et al. *Angew. Chem. Int. Ed.* 2014, 53, 12765.
- [4] Sunayama, H., et al. *ACS Appl. Mater. Interfaces* 2014, 6, 20003.
- [5] Sunayama, H., et al. *Chem. Commun.* 2014, 50, 1347.
- [6] Suga, Y. *Chem. Commun.* 2013 49, 8450.
- [7] Taguchi, Y., et al. *Langmuir* 2012, 28, 7083.
- [8] Sunayama, H., et al. *Biosens. Bioelectron.* 2010, 26, 458
- [9] Takeda, K., et al. *J. Am. Chem. Soc.* 2009, 131, 8833.
- [10] Takeuchi, T., et al. *Org. Biomol. Chem.* 2006, 4, 565.
- [11] Yane, T., et al. *Org. Biomol. Chem.* 2006, 4, 4469.
- [12] Takeuchi, T., et al. *Angew. Chem. Int. Ed.* 2017, in press. (DOI: 10.1002/anie.201700647)

报告时间: **2017年5月15日(周一)上午10:00**

报告地点: **南开大学 蒙民伟楼 201室**

药物化学生物学国家重点实验室, 功能高分子材料教育部重点实验室