学 术 报 告

In Vitro Construction of Human Vascularized Tissue Models Using Nano/Micro-biomaterials

时 间： 2018年3月27日（周二）15:30---17:00

地 点： 图书馆中心会议室

报告简介:

In vitro development of highly-organized three dimensional (3D)-engineered tissues consist of multiple types of cells and ECM, which possess a similar structure and function as natural tissues, is a key challenge for pharmaceutical assay. Especially, “organ on a chip” is the current hot topic as a next generation pharmaceutical technology. Human organ on a chip integrating 3D-engineered tissues will be a powerful technology altering an animal experiment. We developed a simple and unique bottom-up approach, "hierarchical cell manipulation", using nanometer-sized Layer-by-Layer films consisting of fibronectin and gelatin (FN-G) as a nano-extracellular matrix (nano-ECM). Moreover, fully and homogeneously vascularized tissues of 1 cm width and over 100 μm height were obtained by a sandwich culture of the endothelial cells. Since these technologies are easily applied to cell-inkjet printing system, both manipulations will be promising to achieve organ on a chip.

报告人简介:

Michiya Matsusaki，大阪大学副教授，JST-PRESTO项目研究员。他于2003年在鹿儿岛大学获得博士学位，师从Mitsuru Akashi教授。2003年至2005年在大阪大学从事博士后研究，在2004年作为访问学者在隆德大学Carl A. K.教授Borrebaeck实验室进行研究工作；2006年成为大阪大学应用化学专业助理教授并于2015年晋升为副教授；在2008年至2011年及2015年至今担任JST-PRESTO项目研究员。他的研究方向主要是功能高分子、生物材料及其在生物医学、组织工程支架等领域的应用。在Adv. Mater.， Angew. Chem. Int. Ed.等期刊发表论文125篇，综述及专著章节50篇，授权专利65项。

代表作:

[1] Use of Three-dimensional Arterial Models To Predict the In Vivo Behavior of Nanoparticles for Drug Delivery. *Angew. Chem. Int. Ed.* **2016**, *55*, 4461.

[2] Three-dimensional Cell Culture Technique and Pathophysiology. *Adv. Drug Deliv. Rev.* **2014**, *74*, 95.

[3] LbL Assembly Through Weak Interactions and Their Biomedical Applications, *Adv. Mater*. **2012**, *24*, 454 .

[4] Rapid Construction of Three-dimensional Multilayered Tissues with Endothelial Tube Networks by the Cell-accumulation Technique. *Adv. Mater.* **2011**, *23*, 3506.

[5] Multi-Quantitative 3D-Analysis of Nitric Oxide Diffusion in a 3D-Artery Model Using Sensor Particle. *Angew. Chem. Int. Ed.* **2011,** *50*, 7557.

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