Development of innovative engineering methodologies for precisely defined polymeric therapeutics

State Key Laboratory of Chemical Resource Engineering

报告人：刘尽尧 (麻省理工学院Koch研究所博士后,合作导师：Robert S. Langer教授)

时　间：2016-05-27（周五）9:30 AM-10:30 AM

地　点：化新楼B座 211（篮球场北侧）

个人简介：

刘尽尧，博士，麻省理工学院Koch研究所博士后（2015年9月至今，合作导师Dr. Robert S. Langer教授，美国科学院、医学院、工程院院士）。2013年3月毕业于上海交通大学高分子系（师从颜德岳教授，中国科学院院士），获工学博士学位。2013年4月至2015年8月在美国杜克大学生物医学工程系从事博士后研究（合作导师Ashutosh Chilkoti教授，Chair，美国发明院院士）。研究兴趣主要包括生物医用材料、蛋白质药物、智能高分子及其药物高效递送系统等。从聚合物可控制备、药物缀合物与多功能纳米药物、可植入医疗器件等方面做了一系列新颖性工作。第一作者在Angew. Chem. Int. Ed., Biomaterials, Macromolecules等国际著名学术期刊上发表论文共18篇，获教育部博士研究生学术新人奖、国家研究生奖和卢嘉锡优秀研究生奖等，并受邀在美国戈登会议（Gordon Research Conferences），MIT Polymer Day Symposium等做口头报告。SM Journal of Biomedical Engineering期刊编委，Biomaterials, Small, Biomacromolecules, Mol. Pharm., Polym. Chem.,RSC Advances, Biomater. Sci., J. Mater. Chem. B, React. Funct. Polym., Colloids Surf. B: Biointerfaces, Int. J. Org. Chem.等期刊特邀审稿人。

报告摘要：

Development of innovative engineering methodologies that allow for preparation of precisely defined polymeric therapeutics has significant fundamental interest and enormous potential for medical applications. In my postdoc research, various versatile approaches have been successfully developed for preparation of well-defined polymeric therapeutics including drug loaded nanoparticles, polymer-protein/peptide conjugates, and gastric-residence devices. In terms of drug loaded nanoparticles, a general method has been developed to prepare drug loaded nanoparticles via ring-opening polymerization of prodrugs, in which drug loading and release can be controlled easily. For protein/peptide delivery, a modular method has been established to engineer protein/peptide-polymer conjugates in a well-controlled manner of site-specific, stoichiometric, and high yield, which combines recombinant expression, enzyme-mediated ligation and click chemistry. In respect to prolonged gastric retention with improved safety profile, a triggerable gastric device has been constructed by using double-network tough hydrogel that helped to achieve long-term drug release of 8 days in a large animal model with the aim to solve poor medication adherence. The application of these polymeric therapeutics will be further discussed by giving examples of treating solid tumour, type-2 diabetes and malaria.

化工资源有效利用国家重点实验室
生物医用材料北京实验室