The 84th iCeMS SEMINAR

2011 7. 5 (火)

11:00-12:00

演　題：**Multifunctional Nanomaterial-based Targeted Drug Delivery for Controlling Cancer/Stem Cell Fate**

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This talk will focus on developing methods for synthesizing multi-functional nanoparticles that can be utilized as non-viral gene delivery vehicles and therapeutic agents in cancer/stem cell biology. At first, we are working on several orthogonal nanotechnology-based approaches against brain tumor cells [glioblastoma multiforme (GBM)]: i) application of multi-functional nanoparticles for non-viral siRNA delivery in GBM cell lines to manipulate gene expression levels of GBM cell proliferation; and ii) harnessing the potential of the multivalent nanoparticles for delivering anti-cancer therapeutics into the glioblastoma cell lines with high efficacy. In our research, we typically synthesize inorganic/organic nanomaterials such as gold nanoparticles, quantum dots, magnetic nanoparticles, and functional polymers that are readily tuned and possess novel electronic, optical, magnetic, and chemical properties. These unique attributes make these nanoparticles useful as nanocarriers for chemotherapeutic molecules, since they can be used to deliver drugs and simultaneously monitor the drug delivery over extended periods of time *in vitro* and *in vivo*. In such projects, we carefully designed the ligand/conjugation chemistry to make biocompatible nanoparticles. Novel synthetic approaches for anti-cancer drugs [e.g. Erlotinib and Histone deacetylase inhibitors (HDAC inhibitors)] and modified siRNA (against EGFRVIII receptors) to be linked with nanoparticles have been developed. In parallel, we are developing novel non-viral gene/drug delivery systems to efficiently deliver siRNA molecules and chemical inducers of neurogenesis (e.g. RA and SAHA) to significantly enhance neuronal differentiation of the human pluripotent stem cells (hPSCs)/human neural stem cells (hNSCs) with minimum cytotoxicity. A summary of the results from these efforts and the future directions will be discussed in this talk.

主　催：　京都大学 物質ー細胞統合システム拠点（iCeMS =アイセムス）
共　催：　京都大学医学研究科グローバルCOEプログラム「生命原理の解明を基とする医学研究教育拠点」
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