



Conference Proceeding

# Peptide-Mediated Tumor-Targeted Diagnosis and Therapy

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**Presented:** 2018 Chinese Conference on Oncology. Shenyang, China, Aug. 17-19, 2018; **Published:** Oct. 17, 2018.**Citation:** Min Qian, Shanshan Wang, Chengyi Li, Yi Wang, and Rongqin Huang, Peptide-Mediated Tumor-Targeted Diagnosis and Therapy. *Nano Biomed. Eng.*, 2018, Special Issue: 312

## Abstract

With the increase of global cancer morbidity and mortality, it is of great importance to control the development of cancer. In recent years, plenty of strategies have been developed for tumor diagnosis and therapy. As one of the major approaches, ligand-mediated receptor-introduced drug delivery has been extensively studied over the past decade. Our laboratory mainly engages in the related researches on the combined diagnosis and treatment of tumors, especially glioma. A series of smart biocompatible theranostic systems were designed and constructed, including precise oligomer-based nanoparticles, polymer-coated nitrogen carbon nanodots, multifunctional mesoporous silica graphite nanosheets, magnetic graphene mesoporous silica nanoparticles, etc. Then, based on the design of specific ligand-receptor targeting strategies such as IL-13, Angiopep and I<sub>6</sub>P<sub>7</sub>, these systems were applied for tumor-targeted drug delivery, gene therapy, photothermal therapy and tumor imaging. For example, the nuclear localization signal sequence LNP in Lim kinase 2 protein, was used to modify the dendrimer-based nano gene delivery system. With the ability to cross the blood-brain barrier, the translocation efficiency of nanoparticles and anti-glioma effect were improved. And, the new controlled drug delivery system, using graphene as nanocarrier, was prepared with excellent properties, such as pH- and NIR- responsive, and controlled drug release, showing chemotherapeutic and photothermal synergistic therapy of glioma. A receptor-mediated cascade-targeting drug delivery system, which constructed by polymer-coated nitrogen-carbon nanodots and a multifunctional peptide (I<sub>6</sub>P<sub>7</sub>) with the ability to transport through the blood-brain barrier, target glioma and inhibit the expression of tumor growth factors, were constructed for the imaging-guided combined glioma therapy. Relating work provides new ideas and theoretical basis for cancer theragnosis.

**Keywords:** Peptide ligand; Receptor-mediated transportation; Glioma; Blood-brain barrier; Tumor diagnosis and therapy

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