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A new theranostic system based on endoglin aptamer conjugated fluorescent silica nanoparticles

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Background & Aim: Tumor vessels can potentially serve as diagnostic, prognostic and therapeutic targets for solid tumors. Fluorescent dyes are commonly used as biological indicators, while photobleaching seriously hinders their application. In this study, we aim to generate a Fluorescent Silica Nanoparticles (FSiNPs) theranostic system marked by the mouse endoglin (mEND) aptamer, YQ26.

Methods: A highly specific YQ26 was selected by using gene-modified cell line-based SELEX technique. FSiNPs were prepared via the reverse microemulsion method. The YQ26-FSiNPs theranostic system was developed by combining YQ26 with the FSiNPs for *in vivo* tumor imaging, treatment and monitoring.

Results: Both *in vitro* experiments (i.e., cellular and tumor tissue targeting assays) and *in vivo* animal studies (i.e., *in vivo* imaging and antitumor efficacy of YQ26-FSiNPs) clearly demonstrated that YQ26-FSiNPs could achieve prominently high targeting efficiency and therapeutic effects via aptamer YQ26-mediated binding to Endoglin (END) molecule.

Conclusion: This simple, sensitive and specific YQ26-FSiNPs theranostic system has a great potential for clinical tumor targeting imaging and treatment.

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Biography

Yongxiang Zhao is the Director of the National Center for International Research of Biological Targeting Diagnosis and Therapy. His researches focus on biological targeting diagnosis and therapy for tumor, including the key targets and mechanism of malignant tumors occurrence and progress, homologous antitumor vaccines, research and development of heterologous oncolytic biological drugs and research and development of tumor bio targeted diagnostic reagents. He has 79 SCI papers published in international journals. He also has one International Academic award, one Ministerial and Provincial first prize, 30 national patents and 2 authorized international PCT patents.

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