

## Functionalized SPIO Conjugated with Doxorubicin for Tumor Diagnosis and Chemotherapy Enhanced by Applying Magnetic Fields

**Authors :** Po-Chin Liang, Yung-Chu Chen, Chi-Feng Chiang, Yun-Ping Lin, Wen-Yuan Hsieh, Win-Li Lin

**Abstract :** The aim of this study was to develop super paramagnetic iron oxide (SPIO) nano-particles comprised of a magnetic Fe<sub>3</sub>O<sub>4</sub> core and a shell of aqueous stable self-doped polyethylene glycol (PEG) with a high loading of doxorubicin (SPIO-PEG-D) for tumor theranostics. The in-vivo MRI study showed that there was a stronger T<sub>2</sub>-weighted signal enhancement for the group under a magnetic field, and hence it indicated that this group had a better accumulation of SPIO-PEG than the group without a magnetic field. In the anticancer evaluation of SPIO-PEG-D, the group with a magnetic field displayed a significantly smaller tumor size than the group without. The overall results show that SPIO-PEG-D nanoparticles have the potential for the application of MRI/monitoring chemotherapy and the therapy can be locally enhanced by applying an external magnetic field.

**Keywords :** super paramagnetic iron oxide nano particles, doxorubicin, chemotherapy, MRI, magnetic fields

**Conference Title :** ICBPS 2015 : International Conference on Biomedical and Pharmaceutical Sciences

**Conference Location :** Tokyo, Japan

**Conference Dates :** May 28-29, 2015