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Stimuli-responsive nanomaterials in cancer therapy

Chen-Sheng Yeh*

*National Cheng-Kung University, Taiwan

The use of state-of-the-art noninvasive therapies at the organ level in modern medicine has gradually become possible. However, cancer treatment demands for spatially and temporally controlled noninvasive therapy at the cell level because nonspecific toxicity often causes complicated side effects. To increase survival in cancer patients further, combination therapy and combination drugs are explored which demand for high specificity to avoid combined drug side effects. The high specificity could be obtained by implementing stimuli-responsive nanoparticles in photo- and ultrasound-induced therapy. To refine this therapy and subsequently achieve high efficiency, novel nanomaterials can be designed and modified either to enhance the uptake and drug delivery to the cancer site, or control treatment to administer therapy efficiently. These modifications and developments have been demonstrated to achieve spatial and temporal control when conducting an *in vivo* xenograft. The nanoplatforms discussed in this talk include core-shell $\text{Fe}_3\text{O}_4/\text{Au}$ nanotrisoctahedra, rattle-type $\text{Fe}_3\text{O}_4/\text{CuS}$ nanoparticle, and $\text{H}_2\text{O}_2/\text{Fe}_3\text{O}_4$ -PLGA polymersome.

Biography

Chen-Sheng Yeh received a MS degree from National Tsing Hua University, Taiwan, and a PhD degree in Chemistry from University of Georgia, USA, in 1993. He then worked as Post-doctoral fellow at Department of Chemistry in Purdue University, USA. He started as an Associate Professor at the Department of Chemistry, National Cheng Kung University, Taiwan, in 1995. He was promoted to Professor and Distinguished Professor in 2001 and 2009, respectively. Currently, he is the Coordinator of Discipline of Chemistry, Ministry of Science and Technology, Taiwan. His research focuses on the development of functional nanomaterials in biological applications and the area of nanostructured characteristics and has published over 100 SCI papers.

csyeh@mail.ncku.edu.tw

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