

What can a chemist do in nanomedicine?

Chen-Sheng Yeh*

Department of Chemistry, National Cheng-Kung University

csyeh@mail.ncku.edu.tw

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Distinguished Professor Chen-Sheng Yeh has devoted himself to develop nanomaterials and the related nanotechnology since he was employed as a faculty in Department of Chemistry, National Cheng Kung University in 1995. Research has focused on the nano-structural synthesis and biomedical applications of nanomaterials in cancer therapy and imaging diagnostics. Prof. Yeh's group that is one of very few laboratories in Department of Chemistry in Taiwan's Universities has the capability to conduct *in vivo* experiments with the established tumor models in mice.



Research includes five different categories:

- (1) **Development of synthetic methodology for novel nanomedicine materials:** (a) Synthesis of monodispersed nanomaterials using thermal decomposition or wet chemistry preparation Hollow or porous nanomaterials by template method;(c) Highly biocompatible polymeric nanomaterials with size tunable property by self-assembly method; (d) With advanced nano-synthesis technology and unique design, we can combine diverse synthesis methods to construct the novel structural nanomaterials with multi-function.
- (2) **Nanoparticles as imaging contrast agents for cancer diagnosis:** development of nanomaterials as magnetic resonance imaging (MRI) and fluorescence contrast agents.
- (3) **Nanomaterials with thermal effect for cancer therapy:** Due to the increasing demand for emerging anti-cancer drugs, the nanomaterials with photothermal effect have shown their promising in cancer therapy where they could decrease the risk of normal cells damage under cancer treatments.
- (4) **Fabrication of multifunctional nanomaterials for killing cancer cells by photodynamic or photothermal treatments, and combined with contrast imaging capability for MRI and optical imaging:**
- (5) **Near-infrared light triggered nanocarriers for cancer treatments:** Due to the good penetration to tissue for near-infrared light, several kinds of nanoparticles are developed to be sensitive to the near-infrared light for biomedical applications.

In recent 5 years, Prof. Yeh has published 36 SCI papers including 10 papers with IF > 10. Three papers have been selected by the top-tier journals as cover (Chem. Soc. Rev.), inside front cover (Adv. Funct. Mater.) and back cover (Adv. Mater.). His research has been in the cutting edge in the field of nanomedicine and has attracted significant attraction with high citation;

- (1) Ranked as top 1% cited author in Taiwan in (Thomson Reuters) Essential Science Indicators (ESI) in material science field (2012).
- (2) List in the top 10% of most highly cited authors in the general chemistry portfolio of journals of Royal Society of Chemistry, United Kingdom (2016).