

**演講題目：**Organic and Inorganic hybrid nanocomposites for biological applications

**講者：**李佳洪 國立東華大學生命科學系 副教授

**摘要：**In recent times, the rapid development of nanotechnology fascinates many researchers for various applications such as cancer diagnosis and treatment, as well as antibacterials in the field of nanomedicine. Inorganic nanostructured biocompatible ensembles such as an anionic clay matrix layered double hydroxides (LDH) and mesoporous silica nanoparticles (MSN and IBN-4) specifically designed to deliver various drugs for therapy and contrast agents for targeting. We functionalized the surfaces of LDH and MSN with various organic groups bearing different charges for the applications of controllable release, biodistribution studies and cancer therapy. In addition, we also developed of LDH for photodynamic therapy (PDT) based on the intercalation of a photosensitizer in the gallery of LDH for melanoma theragnosis. The synthesized nanocomposites rendered extremely efficacious therapy in B16F10 melanoma cell line by improving the solubility of the hydrophobic photosensitizer. Furthermore, the *in vivo* results using a tumour xenograft model in mice indicated the apparent absence of body weight loss and relative organ weight variation to the liver and kidney demonstrated that the nanocomposites were biosafety with significant reduction in tumour volume for anti-cancer efficacy of PDT. The use of these organic-inorganic nanohybrid constructs takes the advantages of increase in both tumour-specific targets through EPR effects and high levels of free radicals propagation in cancer as well as bacteria cells which may progress traditional chemotherapy and provide an opportunity to develop novel anticancer strategies.