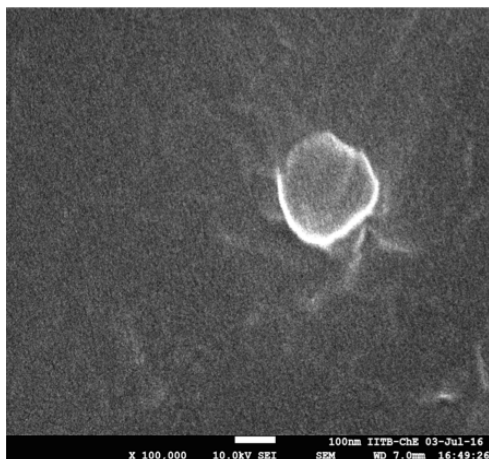
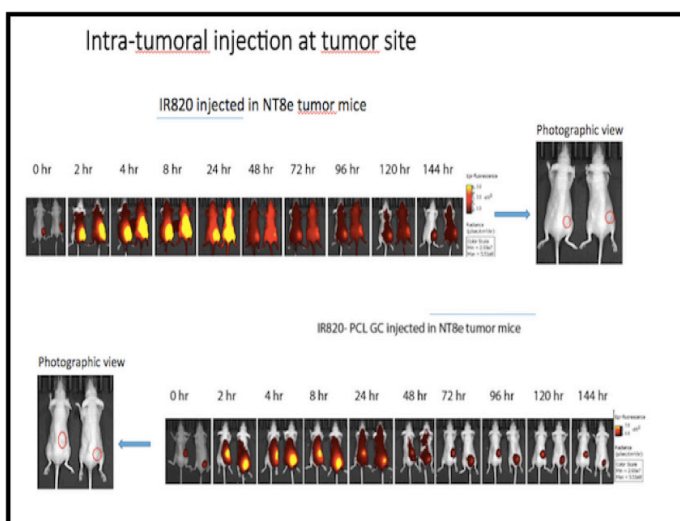


PCLGCIR820 composite nanoparticles as theranostic agents for cancer therapy



Recently, photothermal therapy (PTT) has attracted tremendous attention because of its high efficacy in tumor ablation and minimal damage to normal tissues. A variety of organic photothermal agents have also emerged in recent years, aiming at replacing their inorganic counterparts, which usually are not biodegradable.

Among various cyanine derivatives, ICG is one of the most commonly employed medical imaging dyes and approved by US Food and Drug Administration (FDA) for clinical use on patients, which has been widely investigated for photothermal cancer therapy. Numerous cyanine derivatives have been synthesised as NIR dyes that are mainly utilised in fluorescent imaging during recent years. The cyanine derivatives have been simultaneously employed as an efficient photothermal agent as well as a



Sample	Tumor localisation	Perfusion	Toxicity
PCLGCIR820 NPs	+++	+	+
IR820	+	+++	+++

Inference: The data suggests better results in terms of sample retention, tumor localisation

fluorescent imaging probe due to its strong NIR absorbance and partial conversion from optical energy to heat. However drawbacks such as limited aqueous stability, rapid body clearance, poor cellular uptake, severely limit the direct use of free NIR dyes in photothermal cancer therapy.

To effectively utilise NIR dyes, various nanocarriers containing NIR dyes have been designed as photothermal nanoagents. IR820 is the most biocompatible cyanine dye. In vivo, the plasma distribution half-life of IR820 is about 15 minutes, which is 5 times that of ICG, with an elimination half-life of over 30 hours for IR820 compared to approximately 2 hours for ICG. Thus, this study is aimed to explore the efficacy of PCLGCIR820 as a photothermal agent in-vivo on cancer mouse models.

***In vivo* intra tumoral injection**

Bio-distribution study performed with BATCH-2 particles on intra-tumoral injection (at tumor site). It was performed on two sets, one injected with the sample (PCLGCIR820 NPs) and the other as a control, injecting free IR820 dye causing lower systemic toxicity.

3D modeling

It serves as a handy tool to measure the depth and shape of the tumor and its localisation with respect to organs that cannot be viewed in 2D imaging.

