

**NUS Graduate School for Integrative Sciences and Engineering  
Research Project Write-up**

**Title of Project :**           **Imaging-guided cancer therapy**

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**Short Description**

Multi-color fluorescent quantum dots and magnetic agents are encapsulated within nanometer-sized (~50 nm) chitosan nanoparticles. The small size of the nanoparticles allows them to be used as a labeling tag, at the same time, as a contrast agent in magnetic resonance imaging (MRI) as well. In the labeling of cancer cells, specific targeting molecules that recognize cancer cells can be attached to the surface of the nanoparticles so that they bind onto the surface of the cancer cells specifically. This can potentially help in the localization and identification of a cancerous tissue. Moreover, these nanoparticles can be used to deliver therapeutic drugs, proteins and genes by intravenous, oral and mucosal administration. Using these nanoparticles, drugs or genes can be precisely delivered to the specific cells or specific regions of tissues with aid of imaging techniques, for various applications.

