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## His-tagged virus-like nanoparticles as smart pH-responsive carriers for cancer drug delivery

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P delivery. Recently, virus-like nanoparticles (VLNPs) have received more attention as a versatile platform for drug delivery system. However, developing pH-responsive drug delivery systems based on VLNPs always involves tedious and time-consuming dissociation and association steps. To simplify and shorten these procedures, a method which can be used to display doxorubicin (DOX) on the His-tagged VLNPs for controlled drug delivery was introduced. His-tag exposed on the surface of hepatitis B virus core antigen (HBcAg) VLNPs was exploited as pH-responsive nano-joints which released DOX from VLNPs in a controlled manner. Nitrilotriacetic acid-DOX (NTA-DOX) was synthesized and displayed on the surface of the His-tagged HBcAg VLNPs via NTA conjugation. Folic acid (FA) molecules were then conjugated to the His-tagged VLNPs to target the nanoparticles to cancer cells expressing folate receptor (FR). His-tagged VLNPs cross-linked with FA and conjugated non-covalently with DOX demonstrated a sustainable drug release profile *in vitro* at tumor tissue conditions in a controlled manner. The cytotoxicity and cellular uptake results revealed that these VLNPs significantly improved the uptake of DOX and increased the accumulation of DOX in ovarian cancer cells, leading to enhanced antitumor effects. This study demonstrated that His-tagged VLNPs could serve as promising smart nano-carriers for targeted delivery and controlled release of anti-cancer drugs in cancer therapy.

## **Biography**

Roya Biabanikhankahdani is currently pursuing her PhD under the supervisory of Professor Tan Wen Siang at Universiti Putra Malaysia (UPM). She has published two papers in the field of nanomedicine and targeted drug delivery in the Scientific Reports journal by the Nature Publishing Group.

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