

Article

Targeted Gold Nanohybrids Functionalized with Folate-Hydrophobic-Quaternized Pullulan Delivering Camptothecin for Enhancing Hydrophobic Anticancer Drug Efficacy

Sakchai Laksee ^{1,*}, Chamaiporn Supachettapun ², Nongnui Muangsin ³, Pattra Lertsarawut ¹, Thitirat Rattanawongwiboon ¹, Phitchan Sricharoen ¹, Nunticha Limchoowong ⁴, Threeraphat Chutimasakul ¹, Tanagorn Kwamman ¹ and Kasinee Hemvichian ¹

- ¹ Nuclear Technology Research and Development Center, Thailand Institute of Nuclear Technology (Public Organization), Nakhon Nayok 26120, Thailand; pattra@tint.or.th (P.L.); thitirat@tint.or.th (T.R.); phitchan@tint.or.th (P.S.); threeraphat@tint.or.th (T.C.); tanagorn@tint.or.th (T.K.); kasinee@tint.or.th (K.H.)
 - ² Program in Petrochemistry and Polymer Science, Faculty of Science, Chulalongkorn University, Bangkok 10330, Thailand; chamai190134@gmail.com
 - ³ Department of Chemistry, Faculty of Science, Chulalongkorn University, Bangkok 10330, Thailand; nongnui.j@chula.ac.th
 - ⁴ Department of Chemistry, Faculty of Science, Srinakharinwirot University, Bangkok 10110, Thailand; nuntichoo@gmail.com
- * Correspondence: sakchai@tint.or.th

Citation: Laksee, S.; Supachettapun, C.; Muangsin, N.; Lertsarawut, P.; Rattanawongwiboon, T.; Sricharoen, P.; Limchoowong, N.; Chutimasakul, T.; Kwamman, T.; Hemvichian, K. Targeted Gold Nanohybrids Functionalized with Folate-Hydrophobic-Quaternized Pullulan Delivering Camptothecin for Enhancing Hydrophobic Anticancer Drug Efficacy. *Polymers* **2021**, *13*, 2670. <https://doi.org/10.3390/polym13162670>

Academic Editor: Iole Venditti

Received: 15 July 2021

Accepted: 7 August 2021

Published: 10 August 2021

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2021 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Supplementary Information

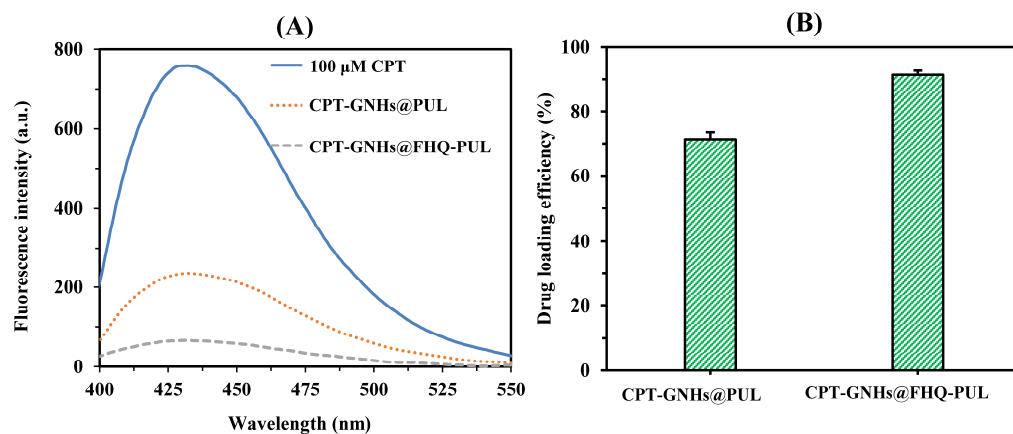


Figure S1. (A) Fluorescence spectra and (B) % drug loading efficiency of CPT-GNHs@FHQ-PUL compared with CPT-GNHs@PUL.

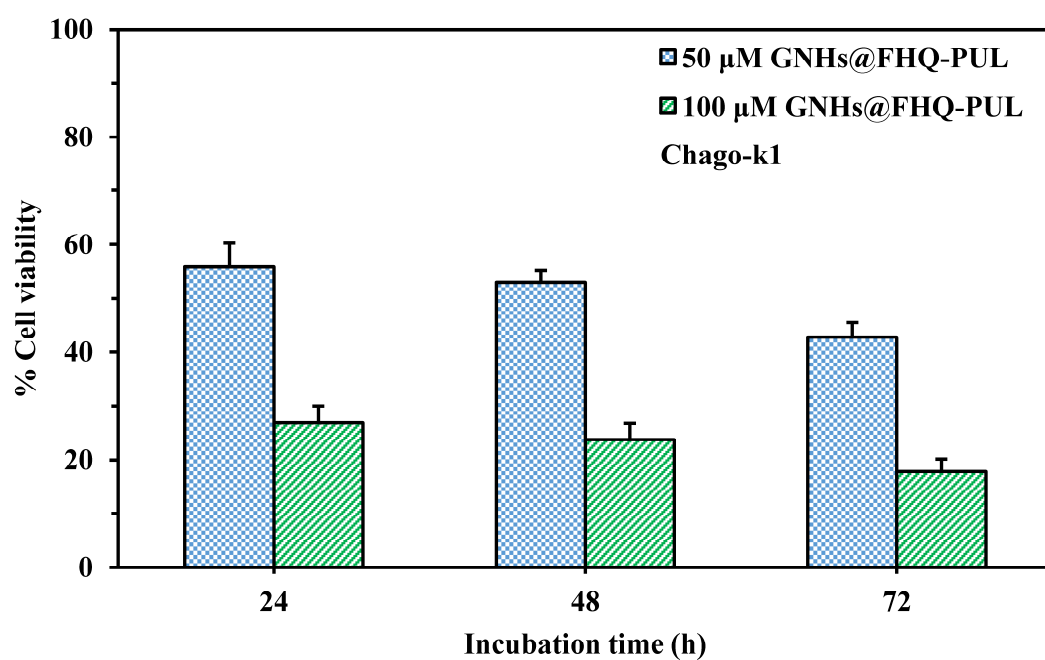


Figure S2. (A) % Cell viability of human lung cancer cells (Chago-k1) after incubation with GNHs@FHQ-PUL (50 and 100 μM) at 37 $^{\circ}\text{C}$ for 24, 48 and 72 h. Data are shown as mean \pm 1SD of triplicate experiments.

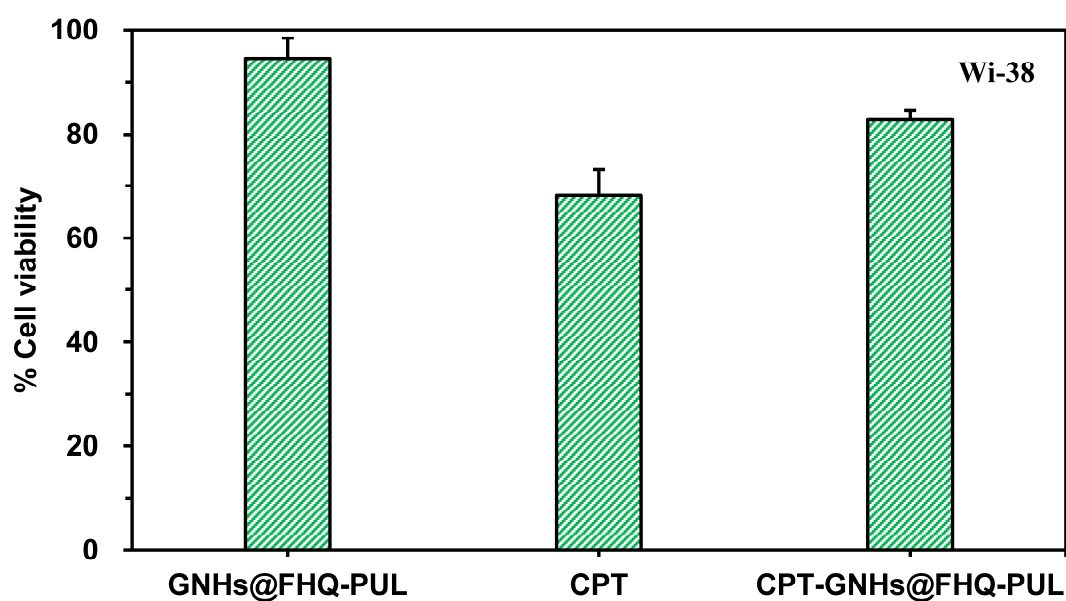


Figure S3. (A) % Cell viability of human lung normal cells (Wi-38) after treatment with 40 μM GNHs@FHQ-PUL, 5 μM CPT and 5 μM CPT-GNHs@FHQ-PUL at 37 $^{\circ}\text{C}$ for 72 h. Data are shown as mean \pm 1SD, derived from three independent trials.