SUPPORTING INFORMATION

Surface Decorated Gold Nanoparticles by Linear and Cyclic Peptides as Molecular Transporters

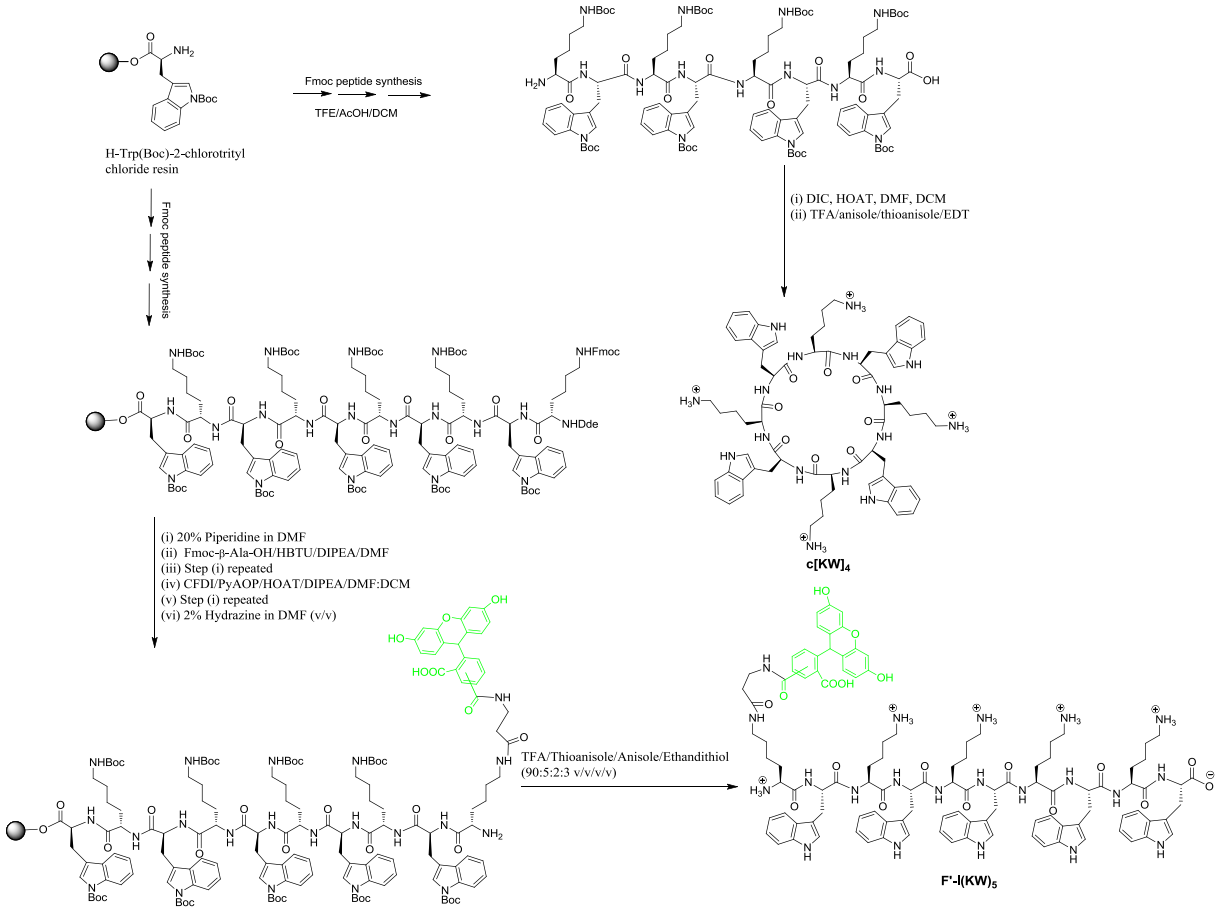
Amir Nasrolahi Shirazi,[a] Rakesh Kumar Tiwari,[a,b] Donghoon Oh,[a] Brian Sullivan,[a] Kellen McCaffrey,[a] Dindyal Mandal,[a] and Keykavous Parang[a,b,*]

[a]*Department of Biomedical and Pharmaceutical Sciences, College of Pharmacy, University of Rhode Island, Kingston, Rhode Island 02881, United States;* [b]*College of Pharmacy, Chapman University, Orange, California, United States 92866*

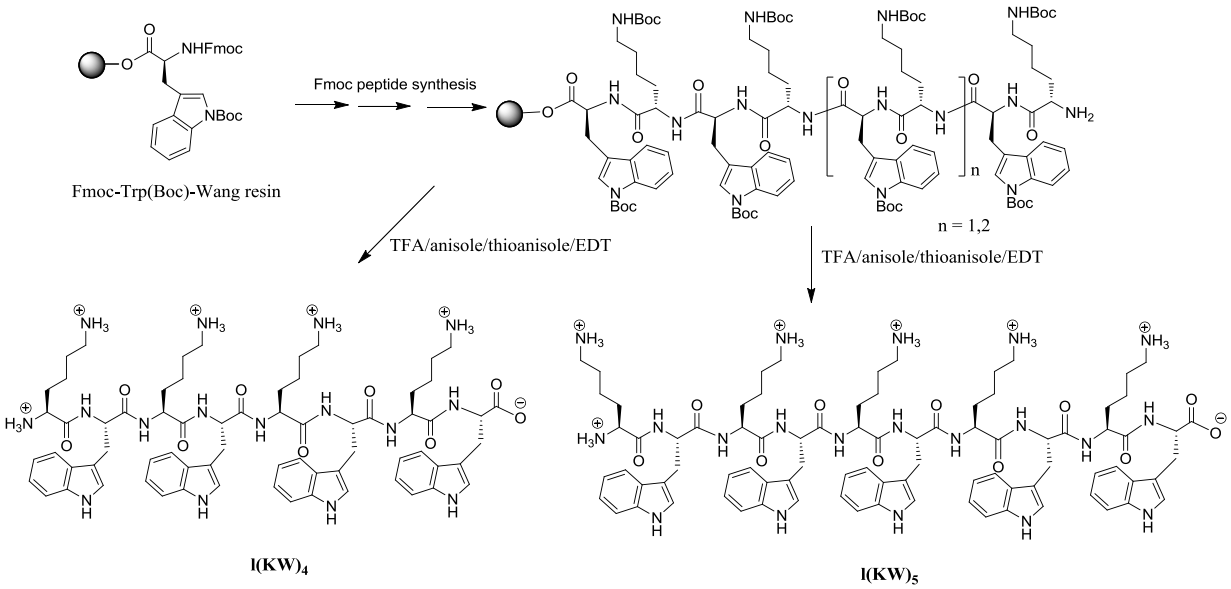
kparang@uri.edu

*Corresponding author. K. Parang: 7 Greenhouse Road, Department of Biomedical and Pharmaceutical Sciences, College of Pharmacy, University of Rhode Island, Kingston, Rhode Island, 02881, United States; Tel.: +1-401-874-4471; Fax: +1-401-874-5787; E-mail address: kparang@uri.edu

Solid-phase synthesis of l(KW)$_4$, c[KW]$_4$, and F′-l(KW)$_5$. As a representative example, the synthesis of cyclic [KW]$_4$ was accomplished through assembling of the linear peptide on the H-Trp(Boc)-2-chlorotrityl chloride resin, followed by *N*-terminal Fmoc deprotection by piperidine in DMF (20% v/v). After cleavage from trityl resin in the presence of the cleavage cocktail acetic acid/TFE/DCM (1:2:7 v/v/v), the peptide underwent cyclization in the presence of HOAt and DIC, final deprotection with reagent R (TFA/thioanisole/EDT/anisole (90:5:3:2 v/v/v/v)), and purification by HPLC to afford cyclic [KW]$_4$ (Scheme S1). Linear (KW)$_4$ was synthesized by assembling of amino acids on Fmoc-Trp(Boc)-Wang resin using Fmoc synthesis and cleavage (Scheme S2). Other cyclic peptides were synthesized using a similar protocol by using appropriate resins and protected amino acids.



Scheme S1. Solid-phase synthesis of l(KW)$_4$, c[KW]$_4$, and F′-l(KW)$_5$.



Scheme S2. Solid-phase synthesis of linear peptides $(KW)_4$ and $(KW)_5$.

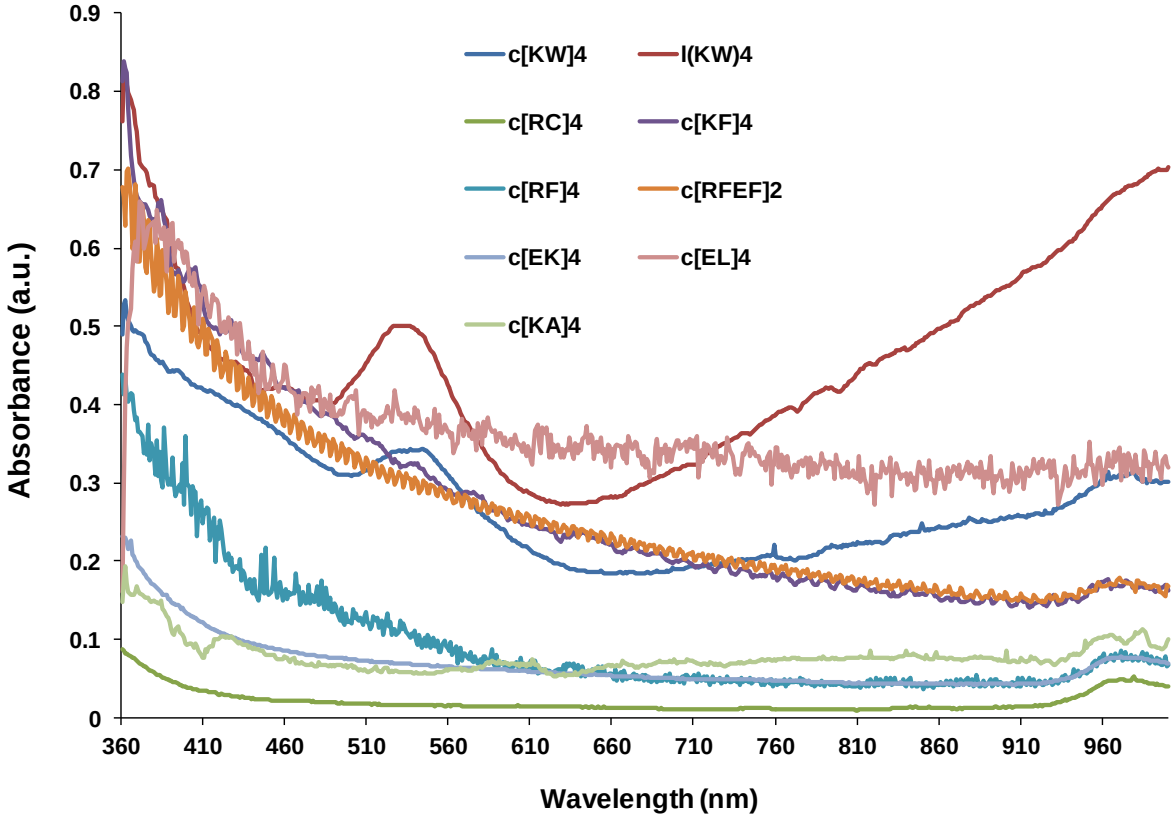


Figure S1. UV-Vis spectroscopy **of p**eptide-capped gold nanoparticles.

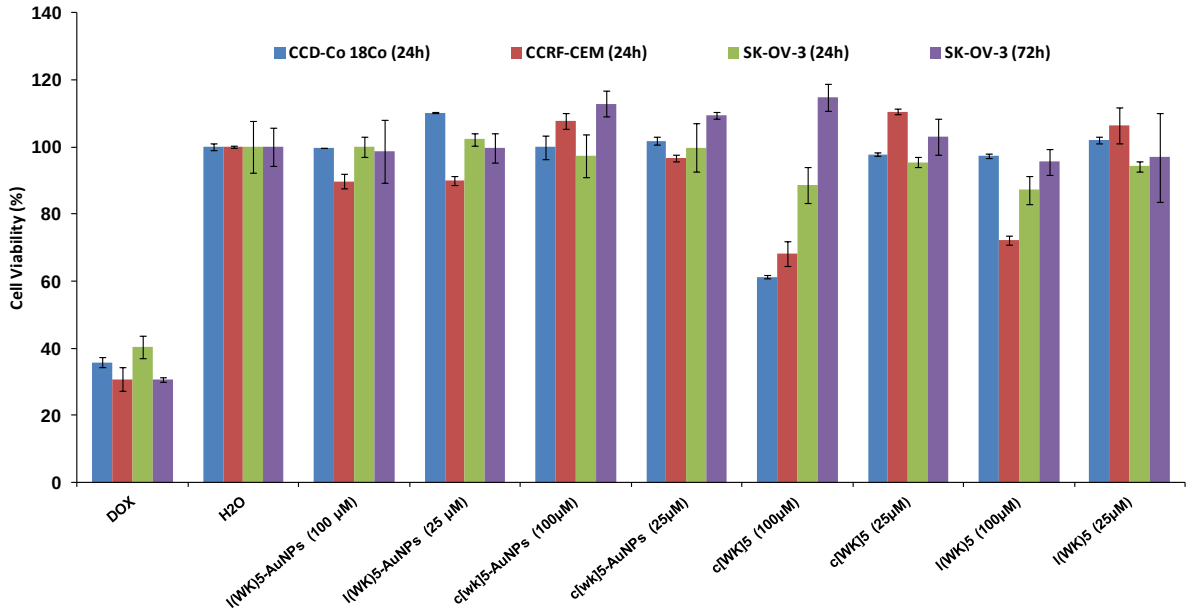


Figure S2. Cytotoxicity of peptides and corresponding P-AuNPs.

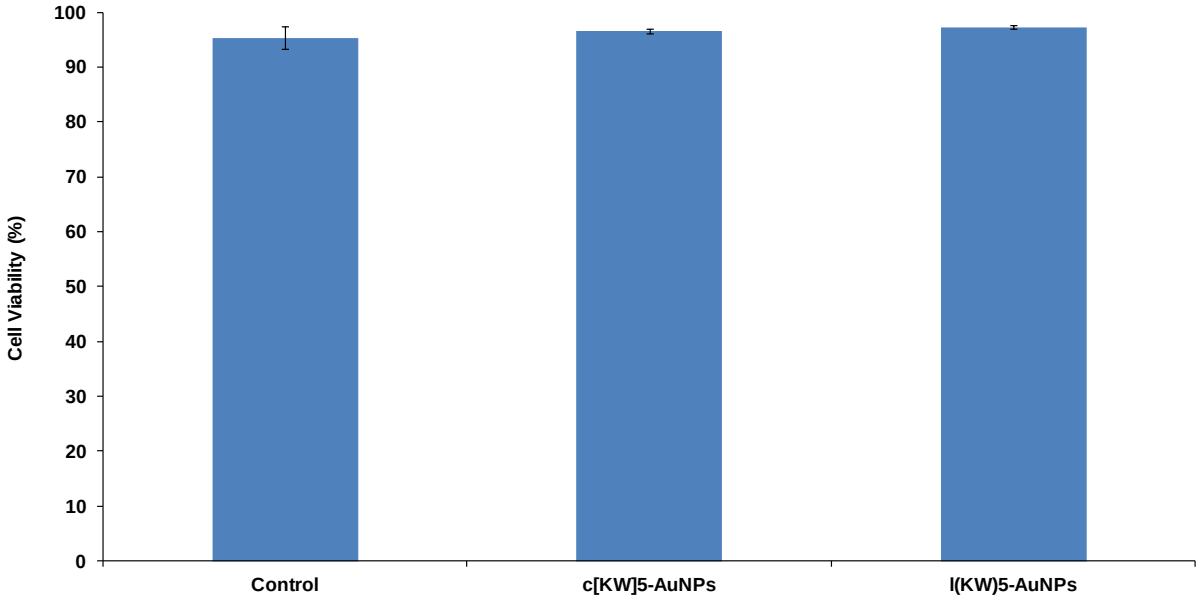


Figure S3. Membrane integrity of SK-OV-3 cells in the presence of P-AuNPs (50 µM) (mean ± SD, n =3).

Intraceullar Release of Dox

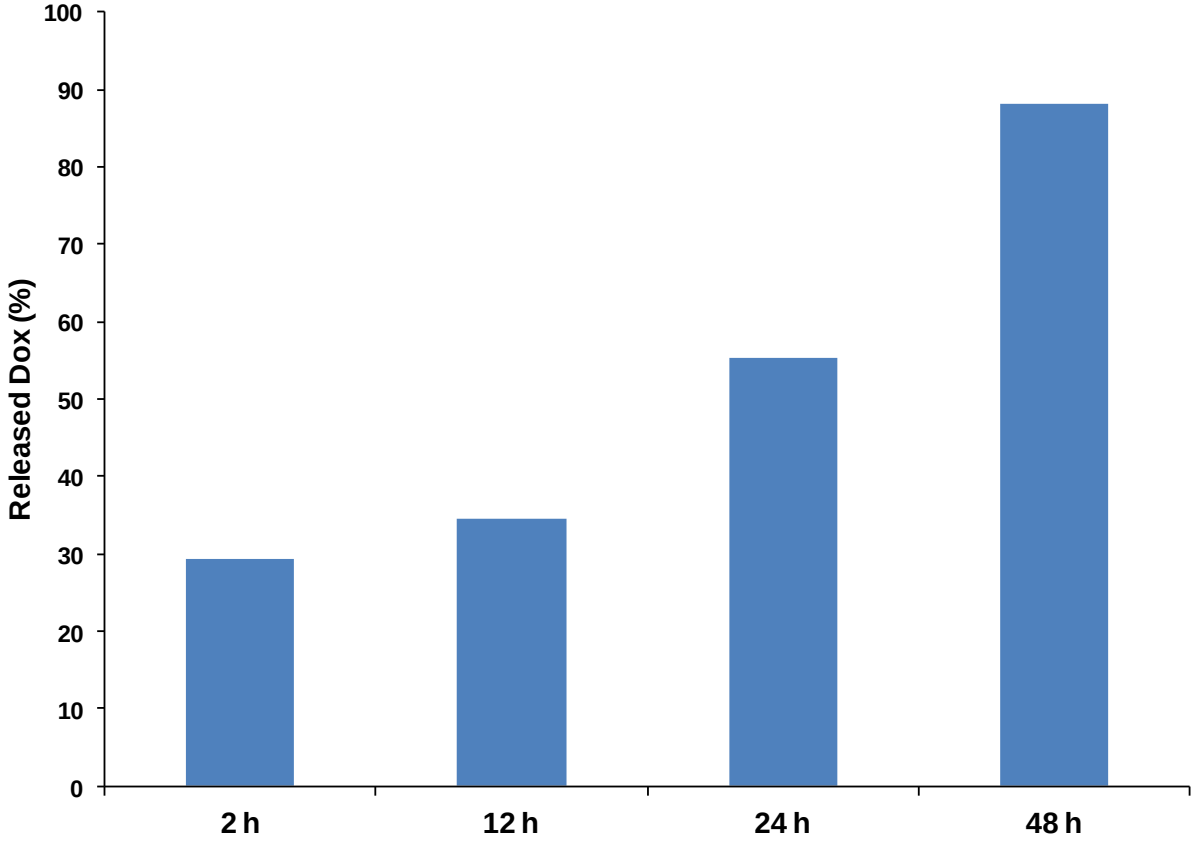


Figure S4. Intracellular release of Dox after incubation of Dox-loaded c[WK]$_5$-AuNPs with CCRF-CEM cells.

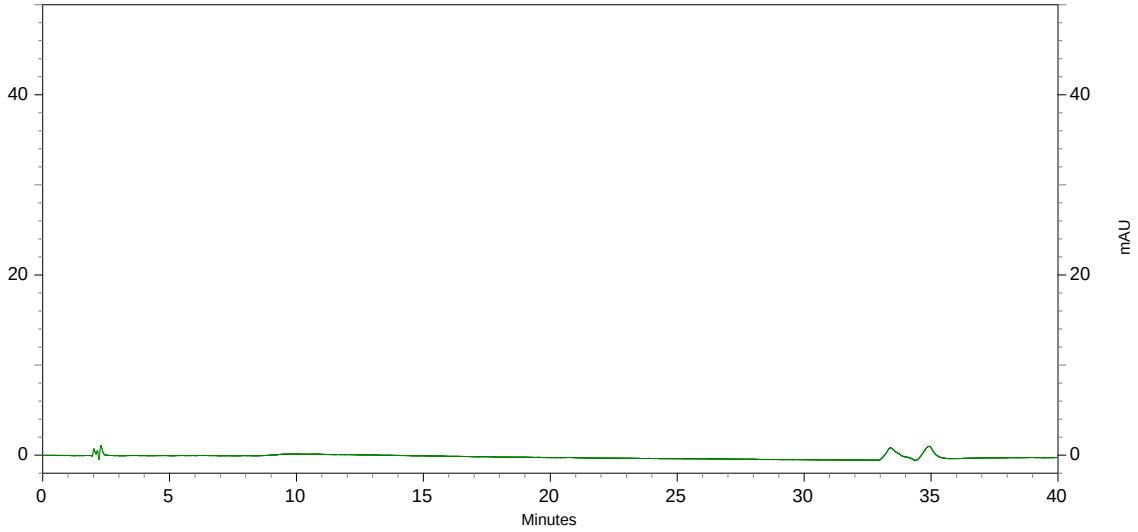


Figure S5. The chromatogram of blank solution without Dox-loaded c[WK]$_5$-AuNPs.

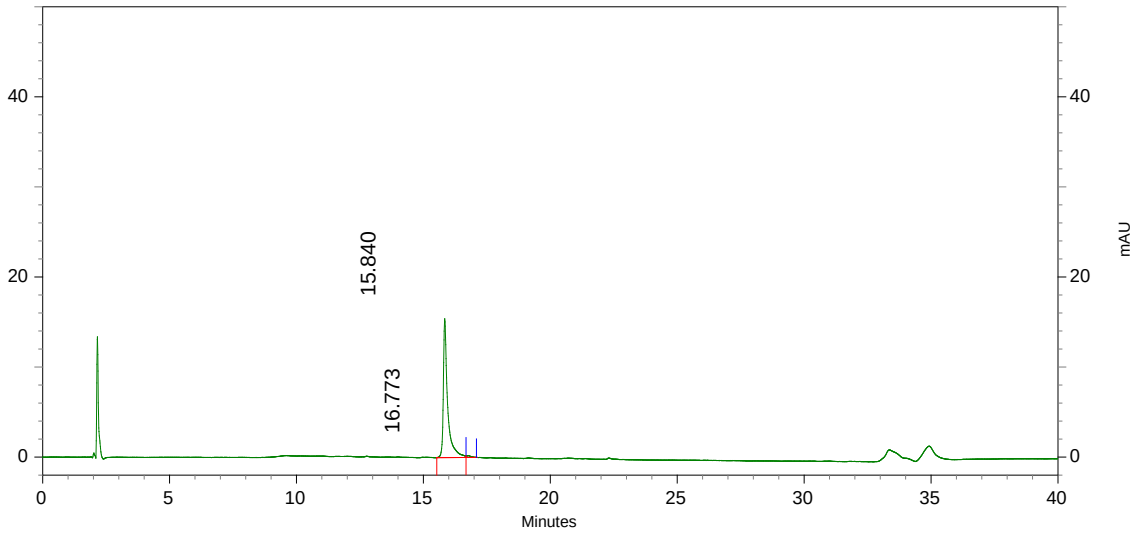


Figure S6. HPLC chromatogram of Dox-loaded c[WK]$_5$-AuNPs after 2 h incubation with CCRF-CEM cells.

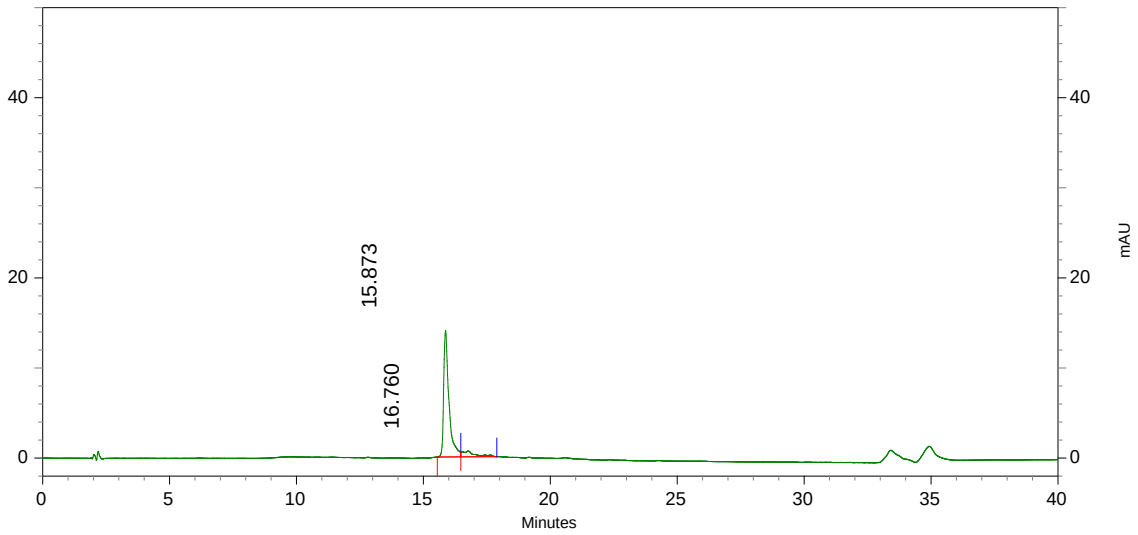


Figure S7. HPLC chromatogram of Dox-loaded c[WK]$_5$-AuNPs after 12 h incubation with CCRF-CEM cells.

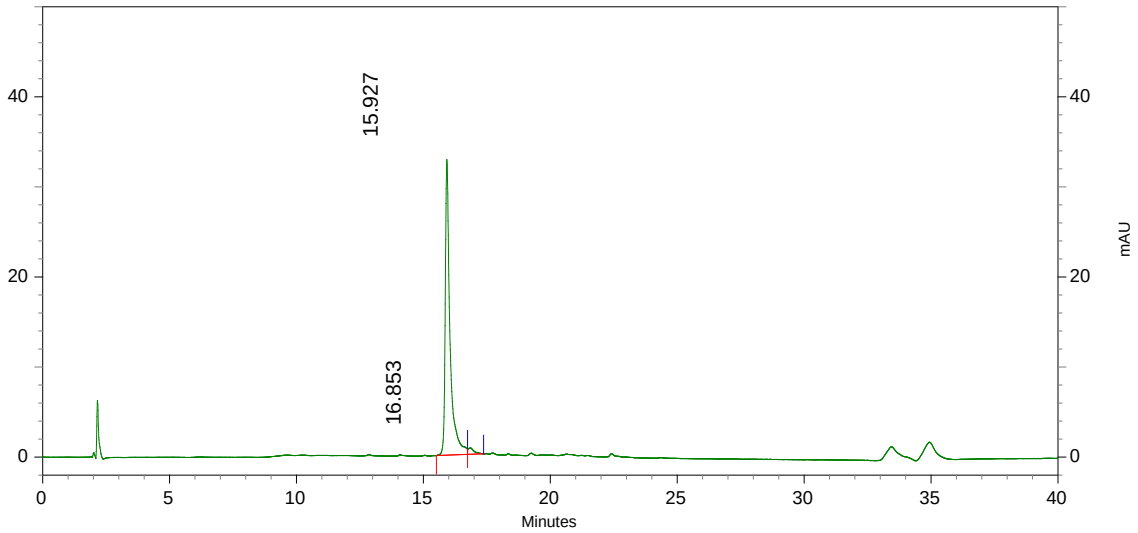


Figure S8. HPLC chromatogram of Dox-loaded c[WK]$_5$-AuNPs after 24 h incubation with CCRF-CEM cells.

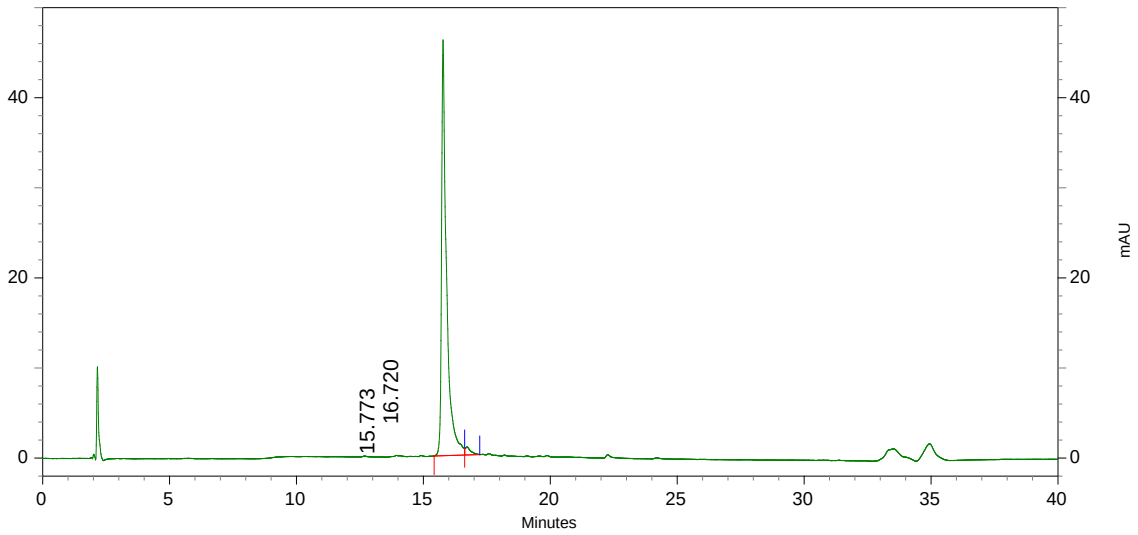


Figure S9. HPLC chromatogram of Dox-loaded c[WK]$_5$-AuNPs after 48 h incubation with CCRF-CEM cells.

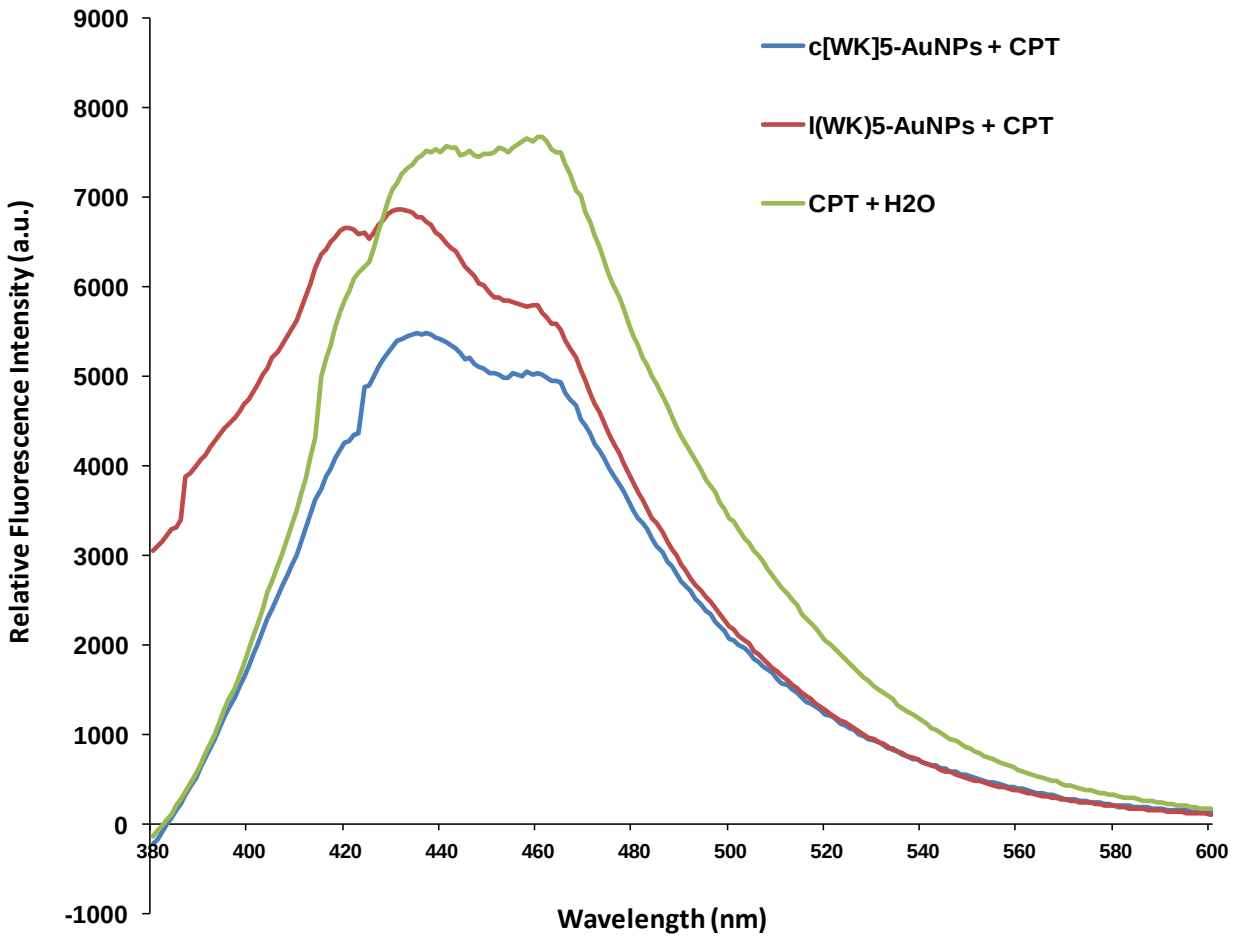


Figure S10. Fluorescence of CPT in the presence of c[KW]$_5$-AuNPs and l[(KW)$_5$-AuNPs (1:1 molar ratio) after 4 h incubation.

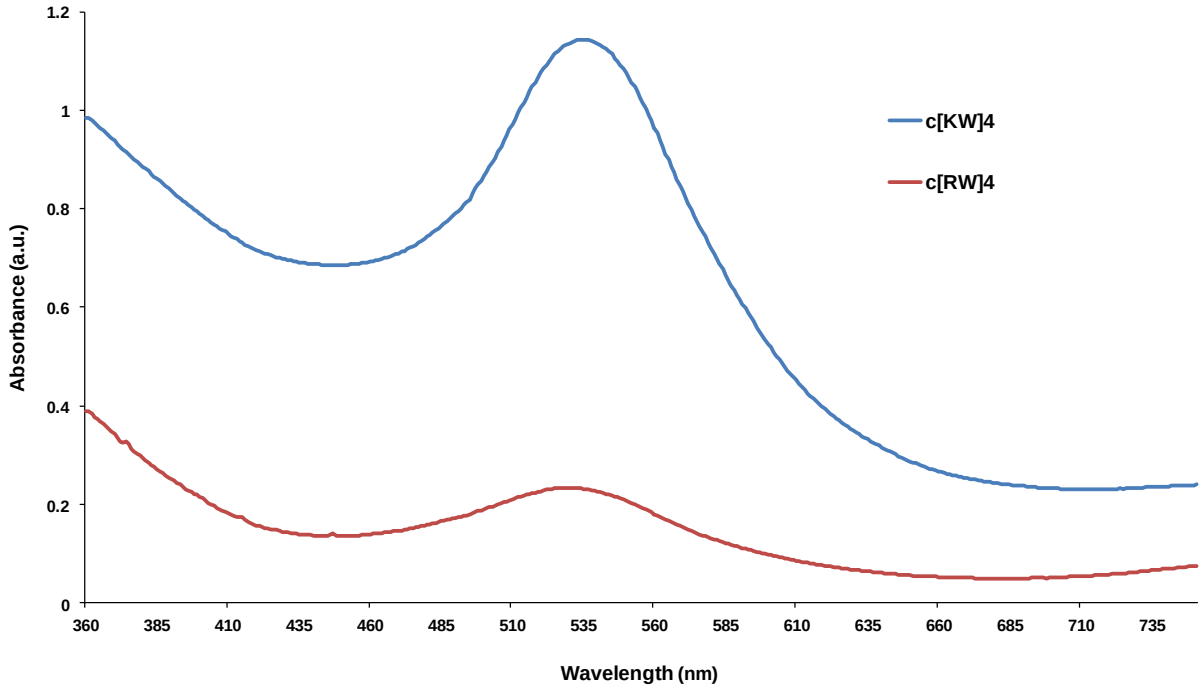


Figure S11. UV-Vis spectroscopy of c[KW]$_4$-AuNPs and c[RW]$_4$-AuNPs.