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Supporting Information

Facile size controlled synthesis of fucoidan coated gold nanoparticles and cooperative anticancer effect with doxorubicin

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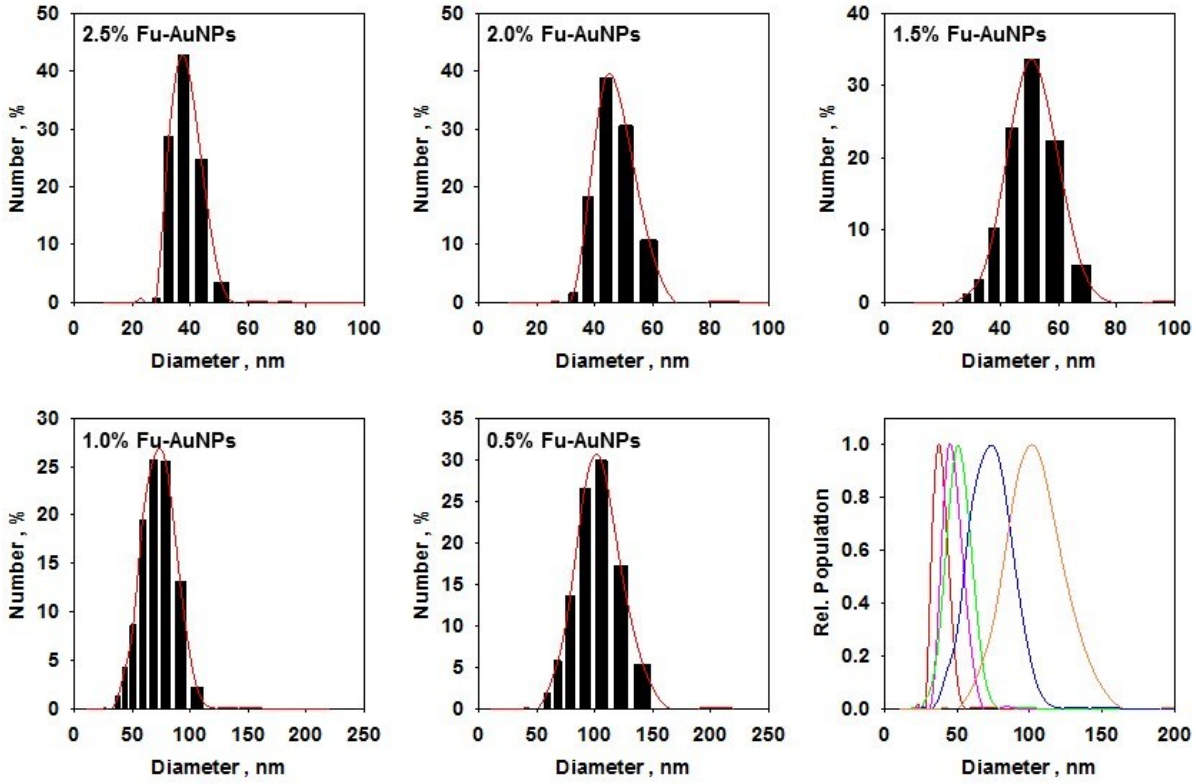


	2.5% Fu-AuNPs	2.0% Fu-AuNPs	1.5% Fu-AuNPs	1.0% Fu-AuNPs	0.5% Fu-AuNPs
Zeta potential (mV)	**-40.9 ± 1.0**	**-38.1 ± 1.2**	**-35.0 ± 0.1**	**-33.1 ± 0.8**	**-27.8 ± 1.1**

Figure S1. Dynamic light scattering (DLS) and zeta potential data of synthesized Fu-AuNPs. According to the DLS measurement, hydrodynamic radius of Fu-AuNPs from 2.5, 2.0, 1.5, 1.0 and 0.5 wt% fucoidan synthetic concentrations measured as 38 ± 5.4, 45 ± 7.2, 50 ± 10.3, 75 ± 16.6 and 120 ± 28.5 nm, respectively.

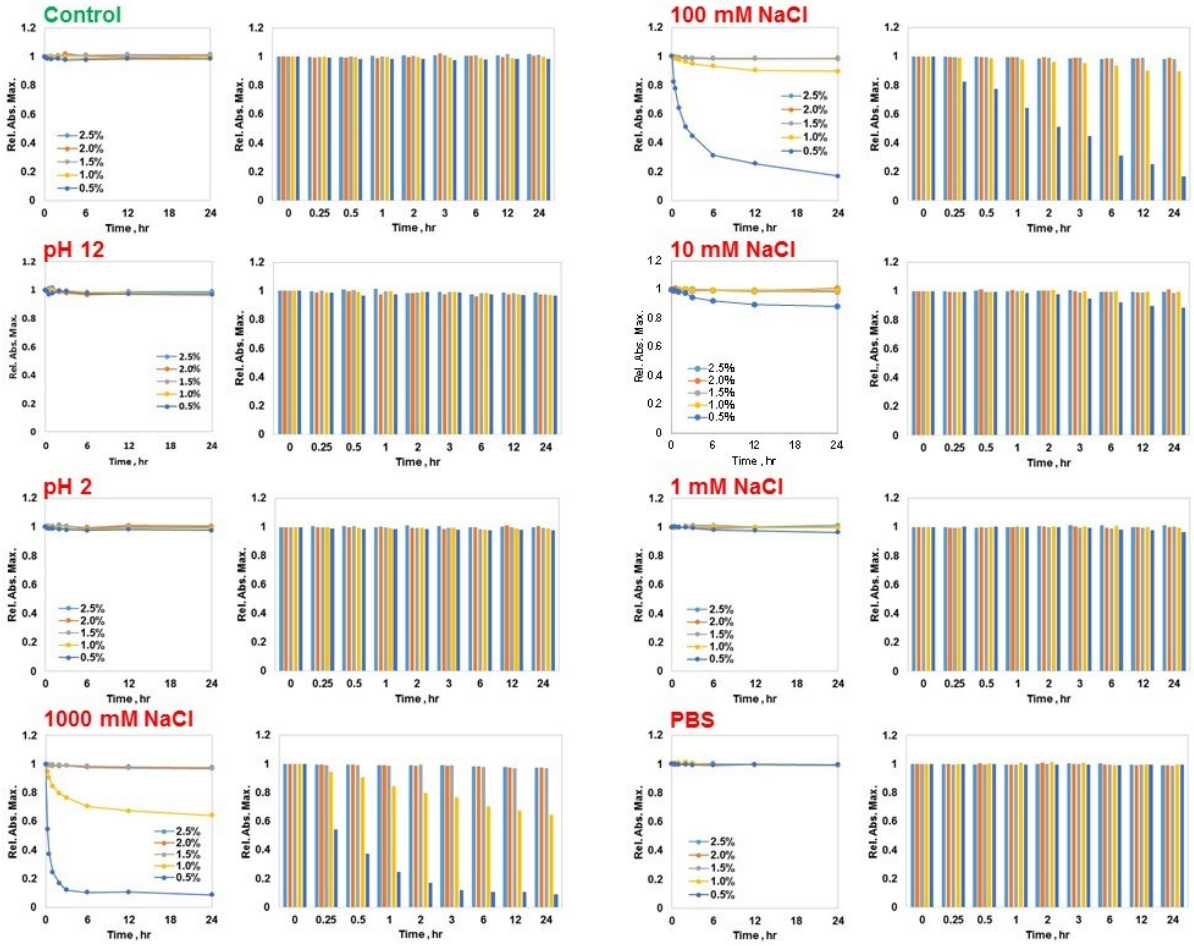


Figure S2. Colloidal stability assay of Fu-AuNPs. 2.5, 2.0, 1.5 and 1.0 wt% Fu-AuNPs exhibited highly maintained colloidal stability against basic (pH 12), acidic (pH 2), high salt concentration (1 to 1000 mM NaCl) and 1X PBS buffered solution up to 24 hrs. 0.5 wt% Fu-AuNPs started to aggregate in 100 and 1000 mM NaCl solution within 6 hrs from mixing.

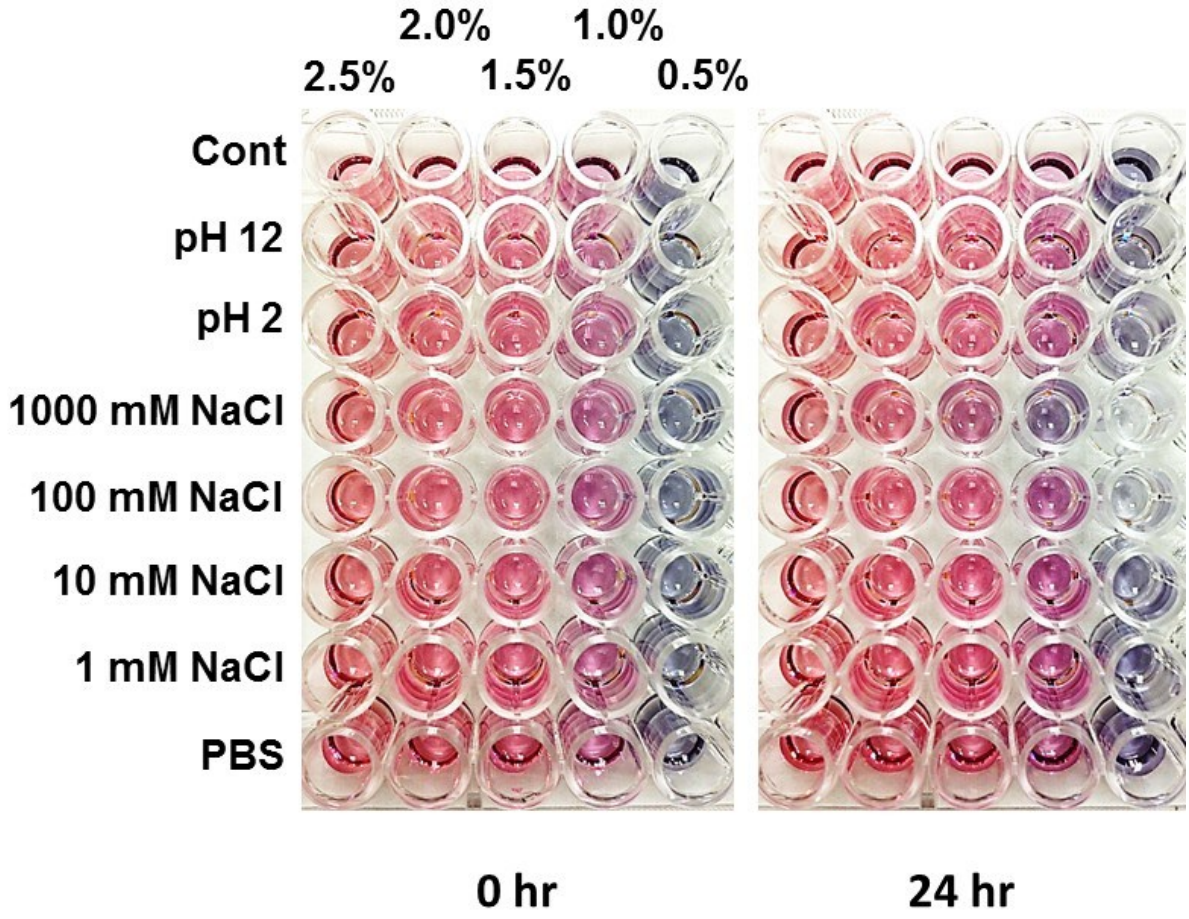


Figure S3. Digital image of Fu-AuNPs during colloidal stability assay. 2.5, 2.0, 1.5, 1.0 wt% Fu-AuNPs exhibited highly maintained colloidal stability against all experimental conditions including acidic (pH 2), basic (pH 12), high salt concentrations (1 to 1000 mM) and 1X PBS buffered solution. In case of 0.5 wt% Fu-AuNPs, changing of solution color into transparent was observed due to the aggregation from colloidal stability disturbance.

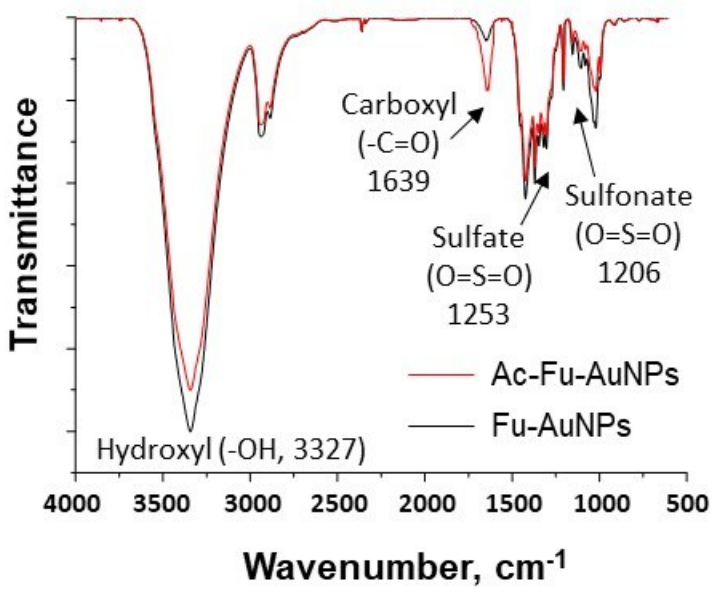


Figure S4. FT-IR spectra of Fu-AuNPs and Ac-Fu-AuNPs.

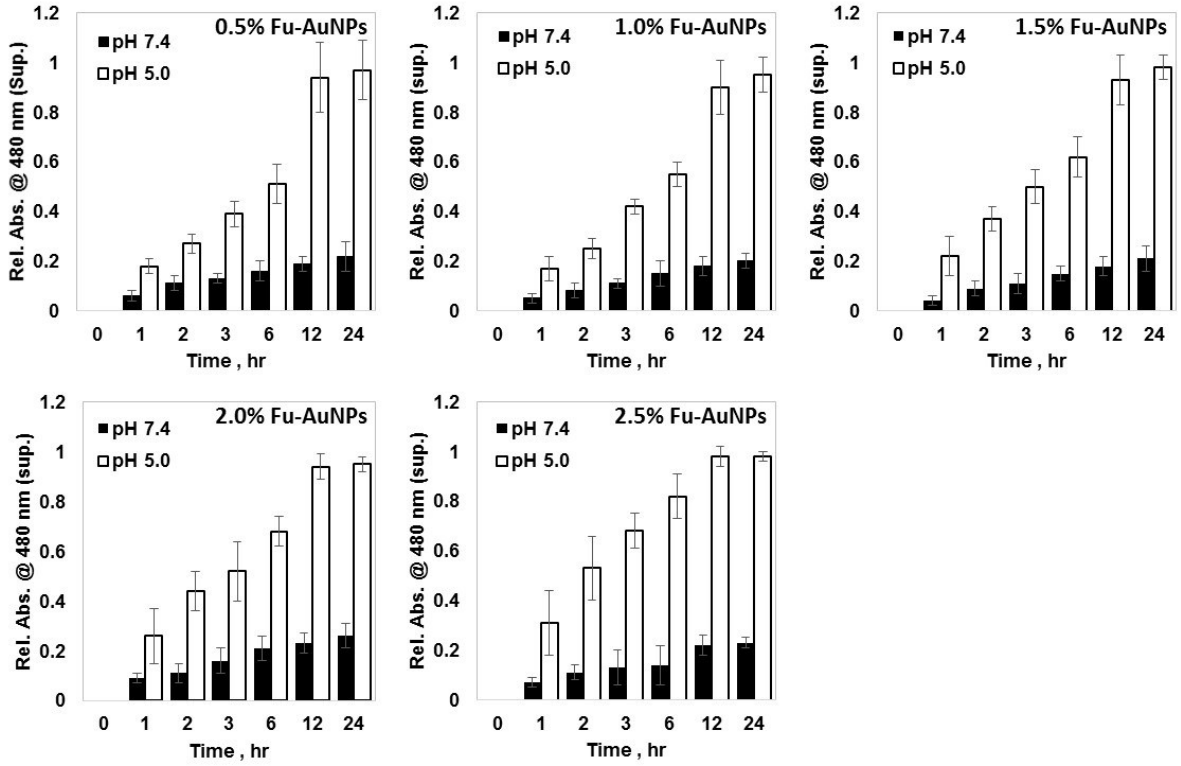


Figure S5. Releasing profile of various sized Dox-Ac-Fu-AuNPs against acidic (pH 5) and neutral (pH 7.4) environment. According to the measurement of Dox absorption at 480nm of supernatant, every Dox-Ac-Fu-AuNPs exhibited distinctive Dox releasing properties triggered by acidic environment.

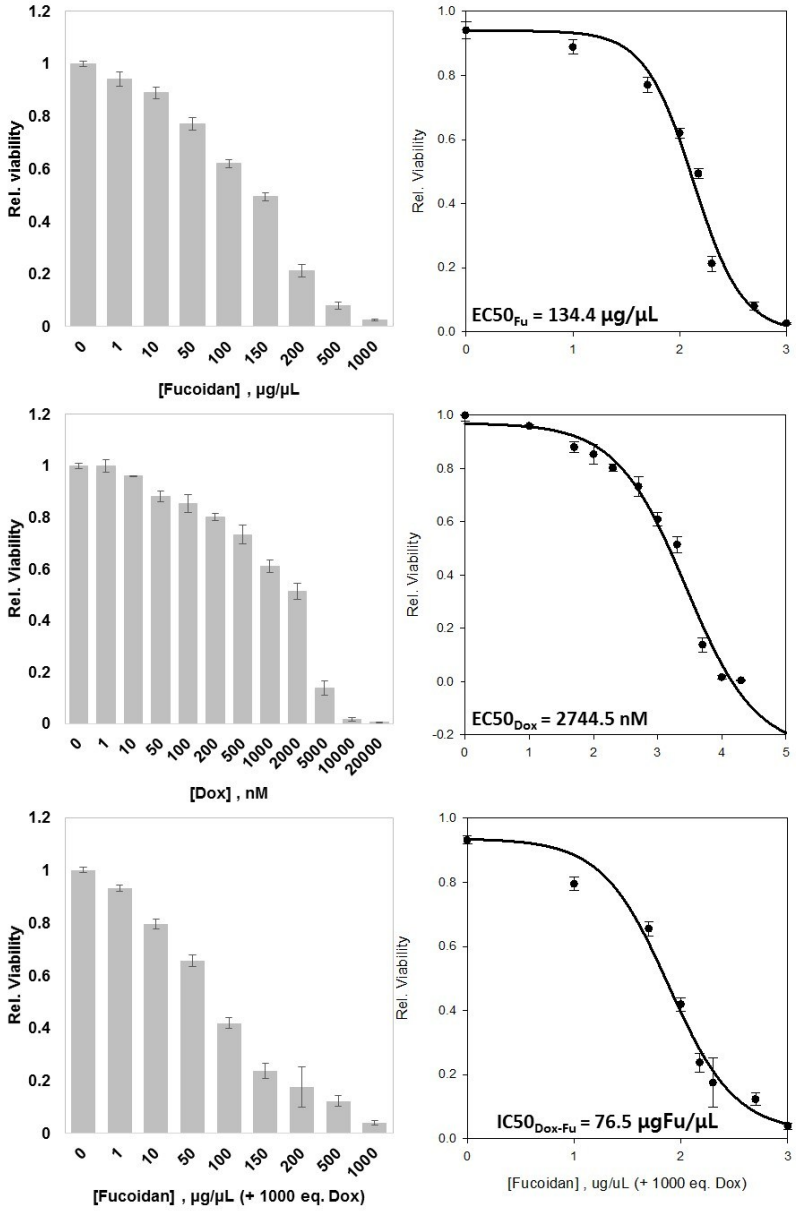
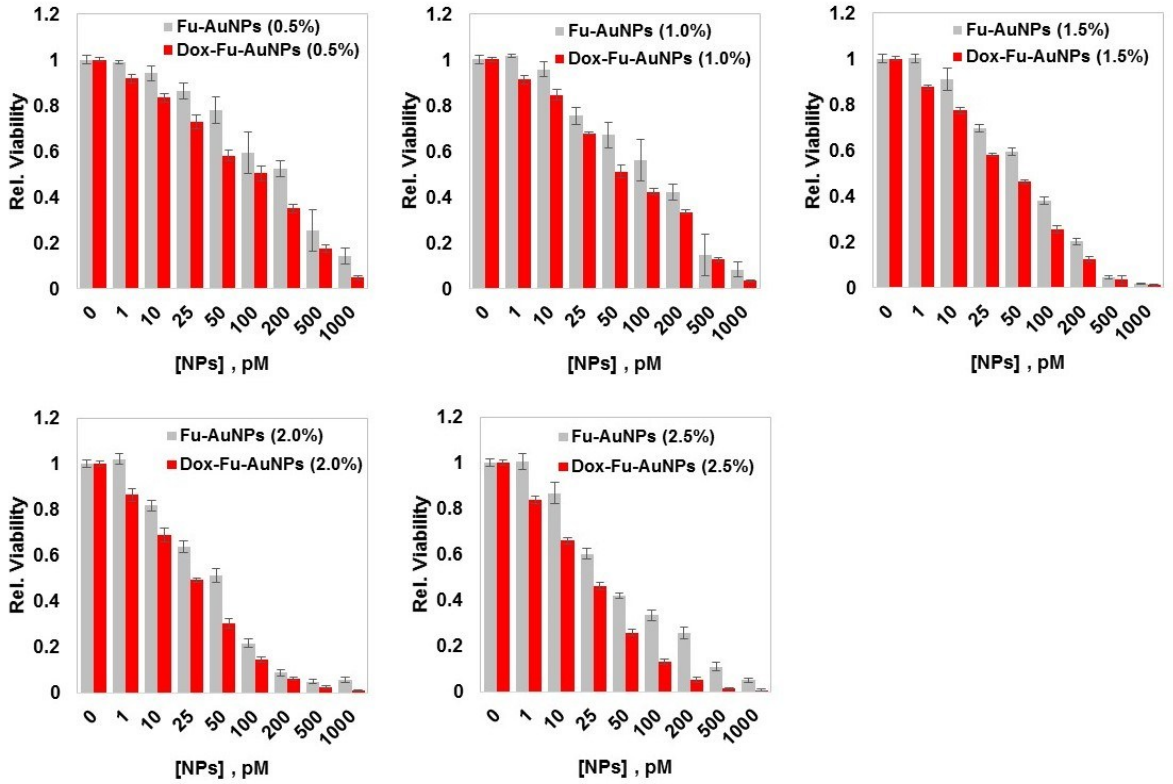


Figure S6. Cell viability assay against free Fu, free Dox and Dox-Ac-Fu against HSC3 cells and EC50 calculations by using four parameter logistic regression. The calculated EC50s were 134.4 µg/µL, 2744.5 nM and 76.5 µgFu/µL for free Fu, free Dox and Dox-Ac-Fu, respectively. EC50 values supported the enhanced anticancer effect of Dox conjugated Fu against free Fu.



	0.5%	1.0%	1.5%	2.0%	2.5%	
Fu-AuNPs	230.5	161.3	69.3	40.5	37.7	
Dox-Fu-AuNPs	99.2	115.4	45.6	25.8	22.6	EC50, pM

Figure S7. Cell viability assay for therapeutic efficacy comparison assignment between Ac-Fu-AuNPs and Dox-Ac-Fu-AuNPs. Based on the viability measurement, EC50 of each experimental conditions were calculated as denoted.

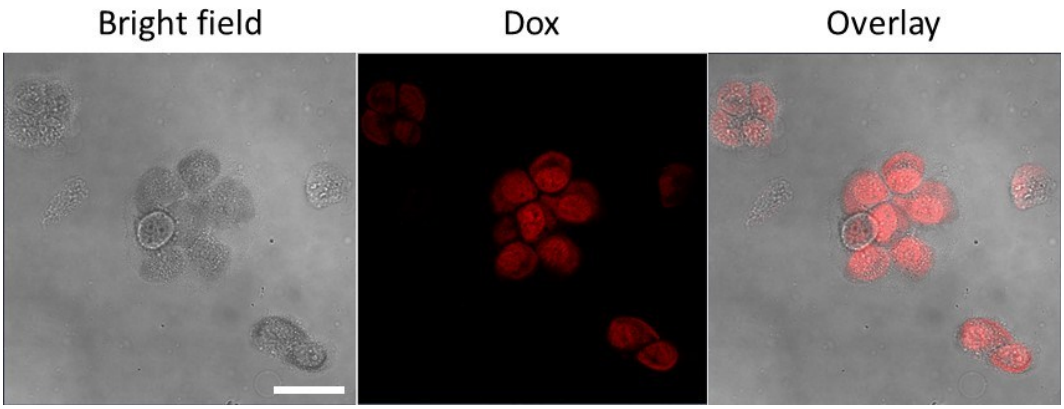


Figure S8. Fluorescent microscope image of Dox-Ac-Fu-AuNPs treated HSC3 cells.