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## Supplementary Information

## Dual Ultrasound-Activatable Nanodroplets with Deep Penetration for Highly Efficient Ovarian Cancer Theranostics

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Fig. S1 Molecular structure of DPPC, FA-PEG2000-DSPE, cholesterol, HMME and PFP.





Fig. S3 The digital photographs of FA-H@NPs (reddish brown) and FA@NDs (white).



**Fig. S4** UV-vis-NIR absorption spectra of (a) FA-H@NDs, (b) free HMME and (c) the normalized absorption for one day stored in dark.



Fig. S5 The size distribution of FA-H@NDs in fetal blood serum at 0 d, 1 d, 3 d, 5 d and 7d.



**Fig. S6** Time dependent phase-transformation optical (top) and fluorescence (button) images of FA-H@NDs under US irradiation.



**Fig. S7** PA intensity of FA-H@NDs excited by PA laser at wavelength ranging from 680 nm to 970 nm.



**Fig. S8** The frozen section of tumor tissues after administration with Dil-labeled H@NDs or FA-H@NDs observed by fluorescence microscopy.



**Fig. S9** a. H@NDs distribution in different tumor sections with ADV; b. Extravascular distribution of H@NDs (red fluorescence) with ADV. Blood vasculature was stained in green. The white arrows indicated the extravascular distribution of the H@NDs.



Fig. S10 H&E staining of major organs of mice after different treatments.