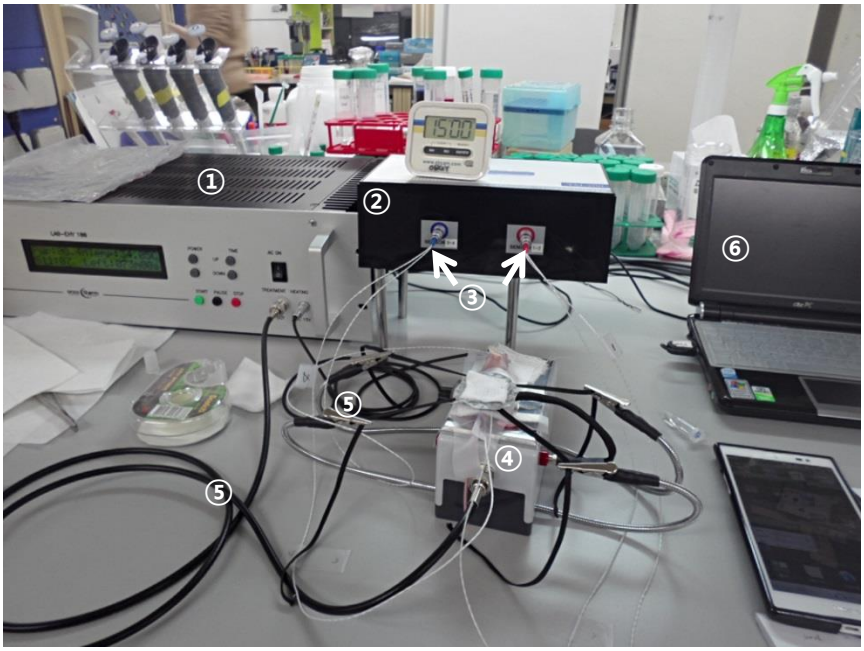
SUPPLEMENTAL DATA

A.



B.

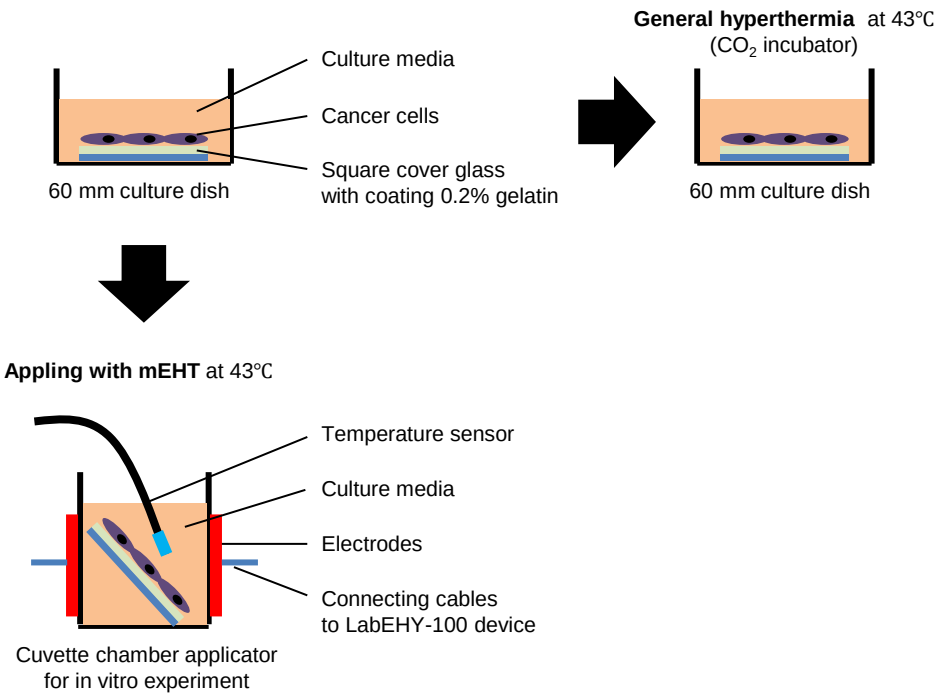


Figure S1. mEHT device for in vitro and in vivo experiment (LabEHY-100). (A) The LabEHY-100 is composed with an radiofrequency (RF) current modulator (①), 4 channel thermometer (②), conn ectors for 4 temperature sensors (③), in vivo mouse applicator with flexible textile electrode (④) and, connecting cables (⑤), including the suitable software which is monitored and recorded tem perature and period (⑥). A suitable software collected the variation of radiofrequency, temperat ure change, and treated period and recorded these information. **(B)** Shown the diagram of in vitro cell experiment. Cancer cells were seeded in 0.2% gelatin coating cover glass and cultured at over night (Top). Cover glass were placed at a cuvette chamber applicator and the energy of RF current were passed for a period of time (Bottom). General hyperthermia were increased temperature at 43℃ using CO_2 incubator (Right).

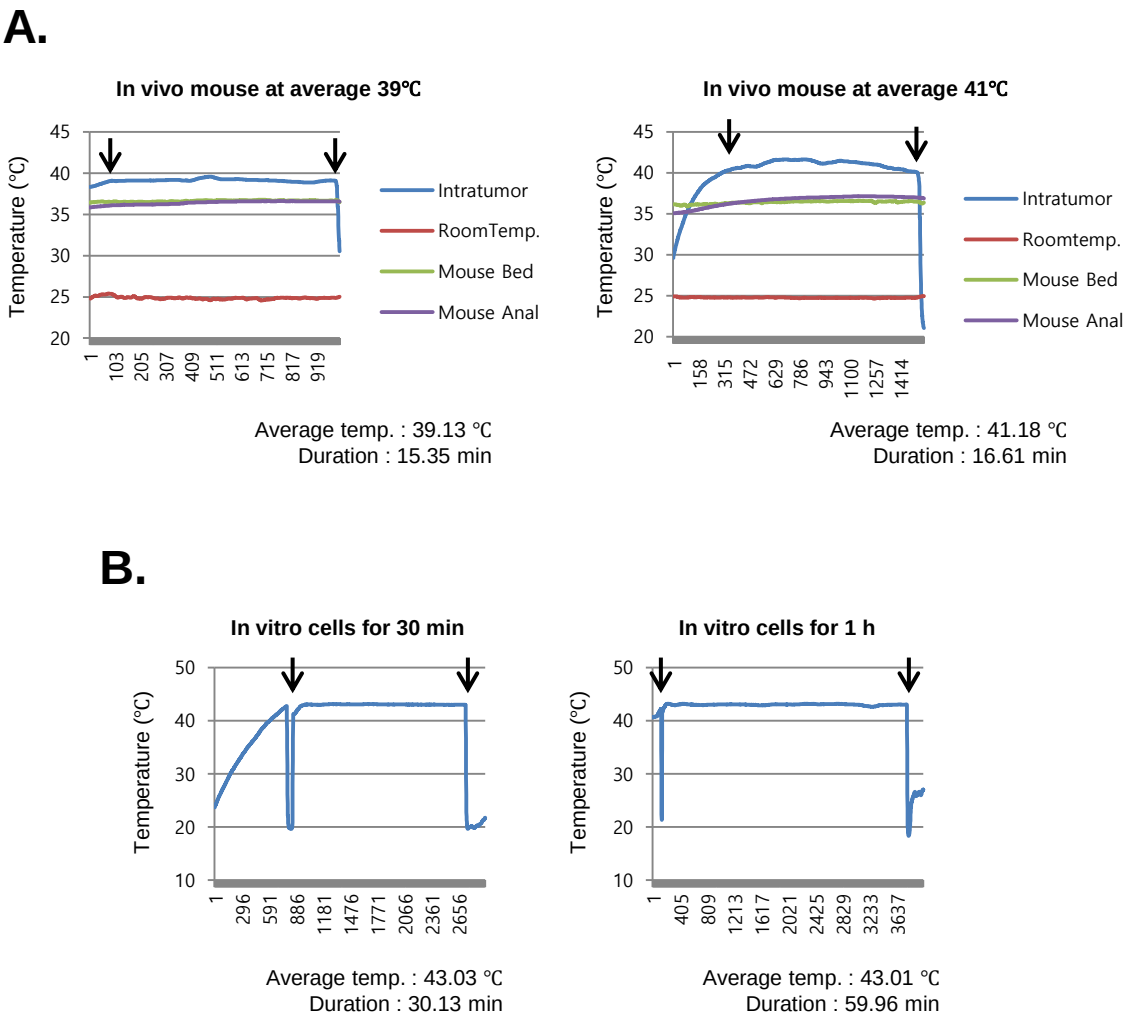


Figure S2. Representative graph of temperature change in mEHT treatment. Shown the repr esentative graph of temperature and treated period. **(A)** xenograft tumors were applied with mEHT at 39℃ (Left) or 41℃ (Right) for 15 min. **(B)** cancer cells were applied at 43℃ for 30mi n (Left) or 1 h (Right). Black arrow is start or end point of mEHT treatment.

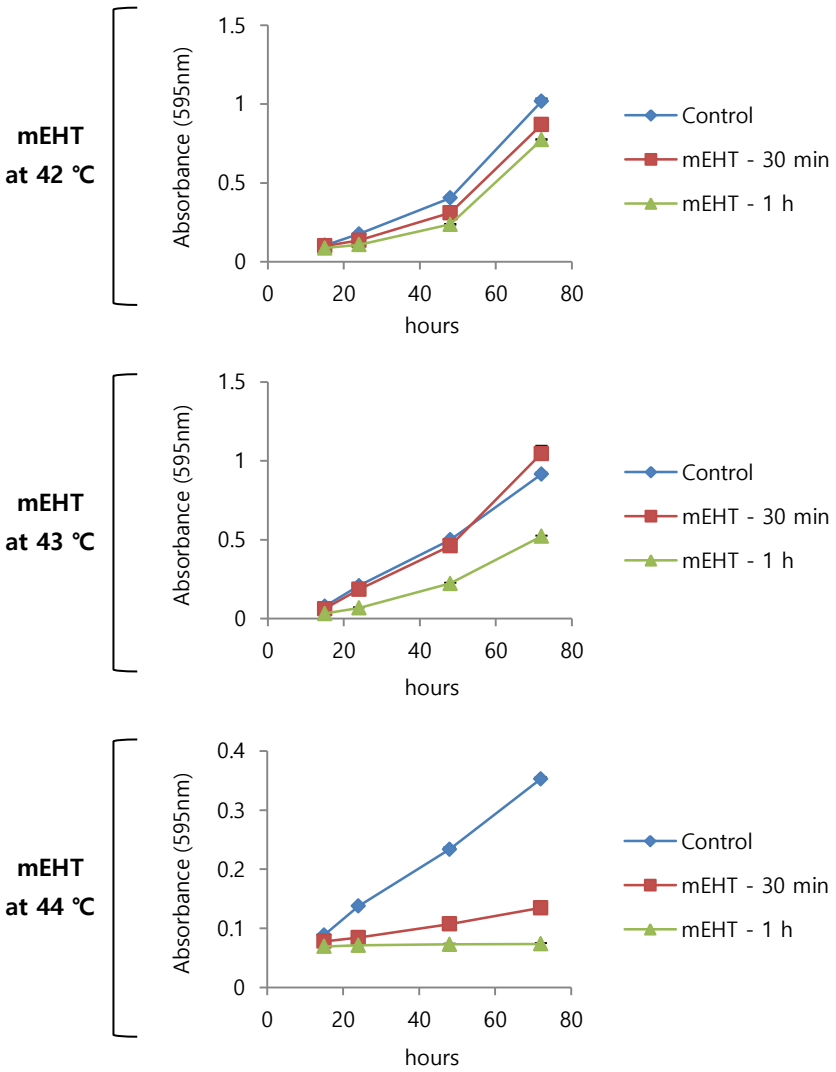


Figure S3. The effect of mEHT was evaluated in HeLa cells for optimizing experimental cond ition. 3 × 10^6 HeLa cells were seeded on 0.2% gelatin coated cover glass and were applied wi th mEHT at 42 ℃, 43 ℃ and 44 ℃ for 30 min or 1 h. mEHT exposed HeLa cells were incubate d for indicated time (16 h to 72 h) in the presence of 5% CO_2 at 37 ℃ in a incubator. Cell viabi lity was measured via crystal violet assay. Results are the means ± S.E. n = 4.

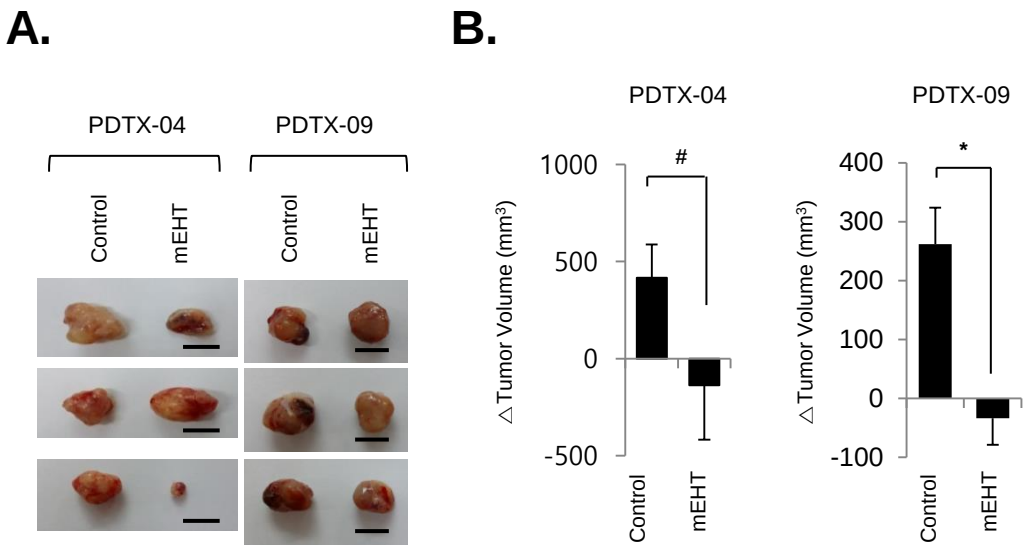
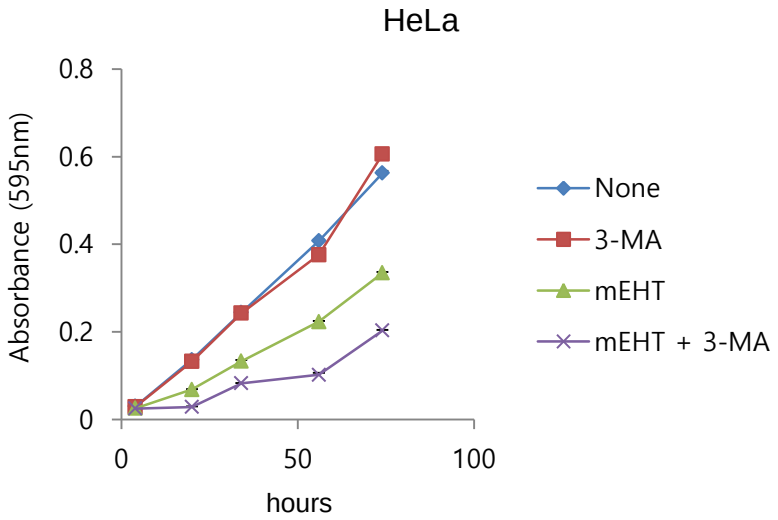


Figure S4. mEHT suppressed the tumor growth in patients-derived tumor xenograft. Athymic nude mice were transplanted subcutaneously into two patients-derived tumo r xenograft (PDTX) piece with roughly 3 mm in length and width. PDTX-04 (Endometria l cancer) or PDTX-09 (Ovarian cancer) tumors were applied with mEHT at 41℃ for 15 min. (PDTX-04, 5 times of mEHT between 35 and 44 day; PDTX-09, 4 times of mEHT be tween 85 and 104 day). **(A)** Gross images of PDTX tumors. Scale bar = 1 cm. **(B)** PDTX t umor volume were measured using digital caliper. The box plot was shown the variatio n value of tumor growth. Results are the mean of growth variation (Δ tumor volume = tumor volume at end day – tumor volume at start day) ± S.E. n = 3. (#, $p > 0.05$; *, $p < 0.05$)**.**

A.



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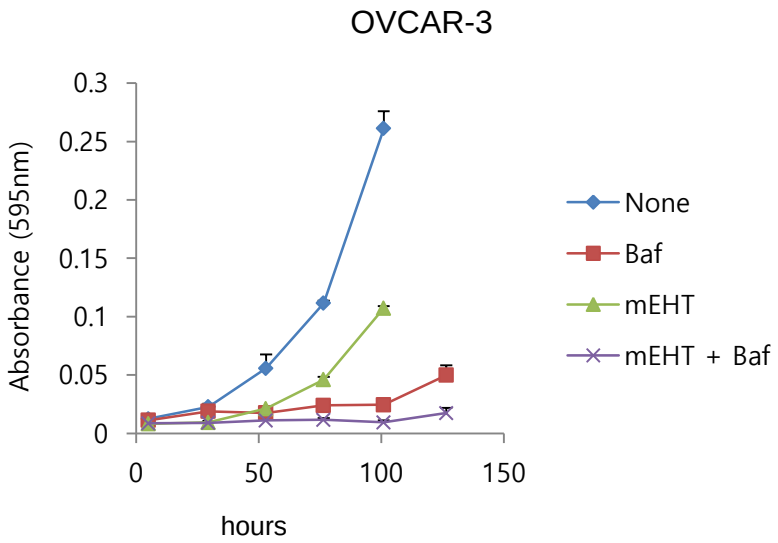

Figure S5. Autophagy inhibitor enhanced apoptosis in mEHT-exposed HeLa and OVCAR-3 cancer cells. (A) HeLa cervical cancer cells were exposed to mEHT at 43℃ for 1 h in the presence of 1 mM 3-methyladenine (3-MA). **(B)** OVCAR-3 ovarian cancer cells were exposed to mEHT at 43 ℃ for 1 h in the presence of 100 nM bafilomycin. mEHT exposed cells were incubated for 6 to 72 h at 37 ℃ and 5% CO_2 incubator. Cell viability was measured via crystal violet assay. Results are the means ± S.E. n = 4.

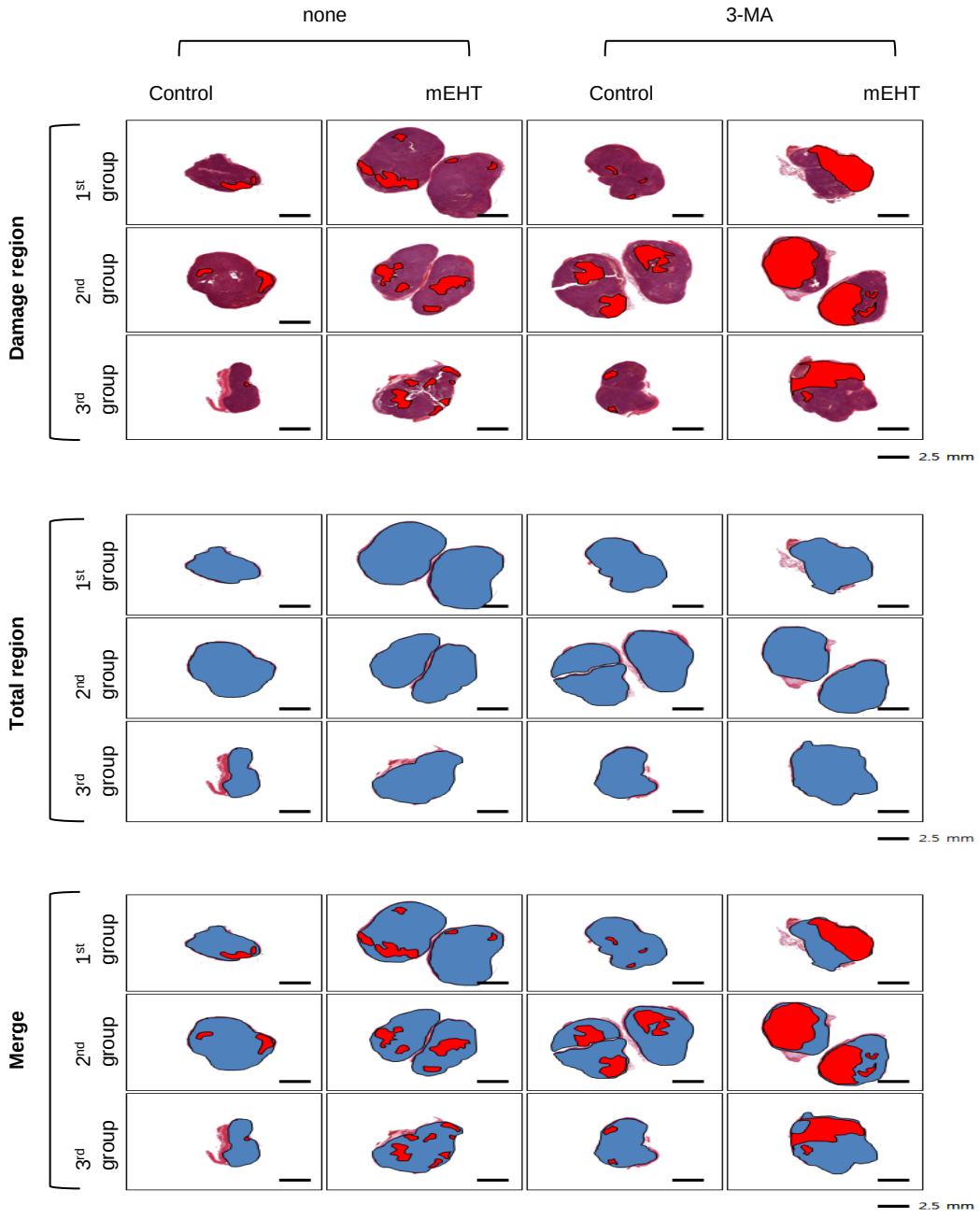

Figure S6. Subdivided images according to damaged tissue regions in haematoxylin a nd eosin (H&E) stained slides. Paraffin embeded xenograft tumor were sectioned at 10 um for H&E staining. H&E stained slide were scanned for high resolution image and wer e analyzed by pathologist. Pathologist have marked damaged region (Red) and whole tis sue region (Blue) on H&E stained slides.

Table S1. Summary of mEHT results in PDTX-04 and PDTX-09.

PDTX number		n	Start day	Start Volume	End day	End volume	Variation of volume	p value
PDTX-04	Control	3	35	524.6 ± 86.5	44	940.9 ± 238.4	416.3 ± 171.5	0.1668[#]
	mEHT	3		810.4 ± 201.2		673.1 ± 344.8	- 137.3 ± 279.7	
PDTX-09	Control	3	85	509.5 ± 101.8	104	771.1 ± 69.7	261.6 ± 62.3	0.0185[*]
	mEHT	3		838.4 ± 145.4		804.8 ± 156.6	- 33.6 ± 45.1	

Results are the mean of growth variation (Δ tumor volume = tumor volume at start day – tumor volume at end day, tumor volume is mm3) ± S.E. n = 3. (#, $p > 0.05$; *, $p < 0.05$)