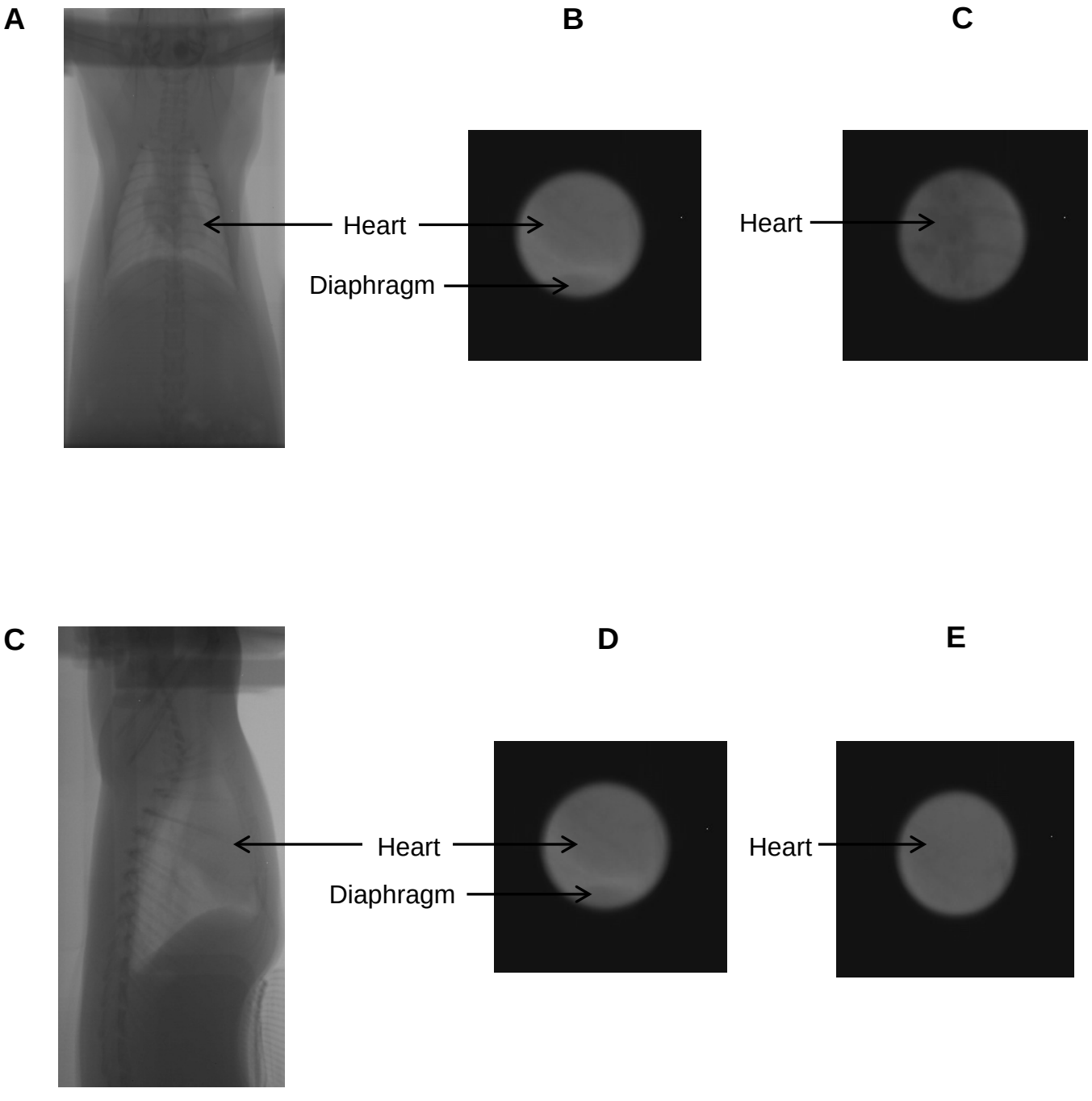
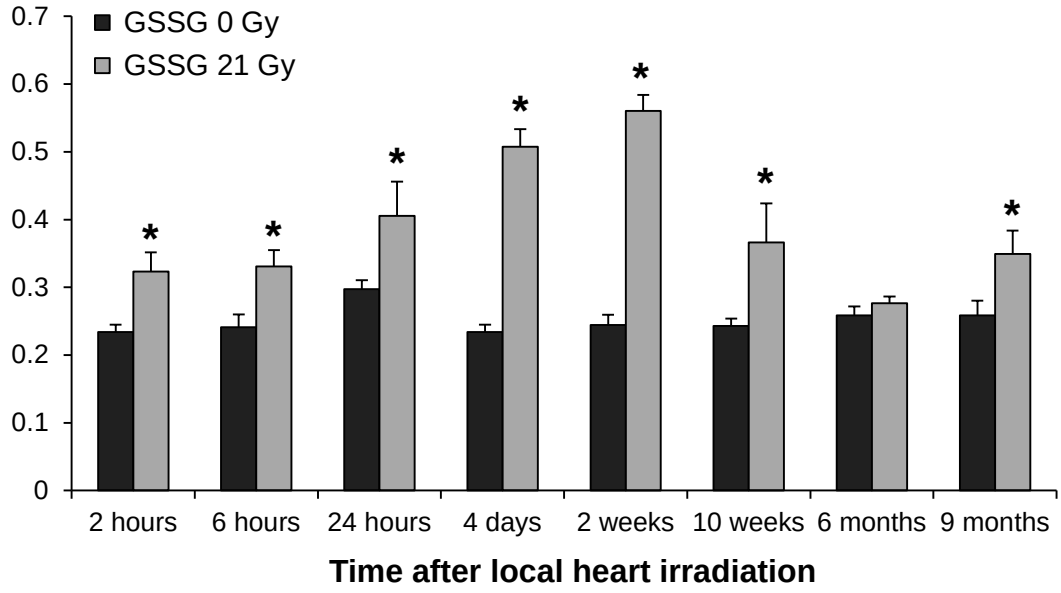
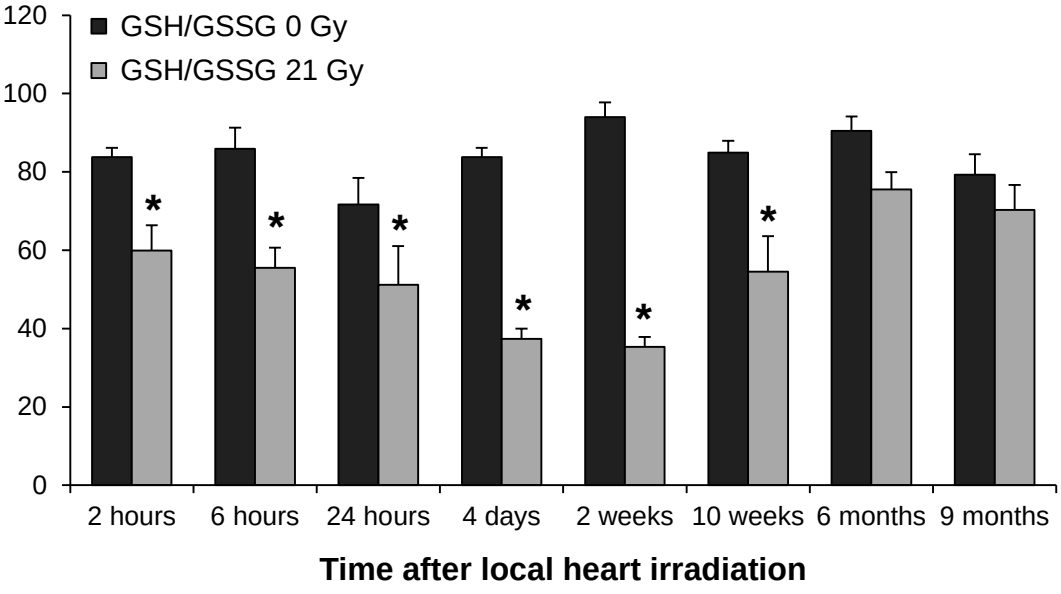
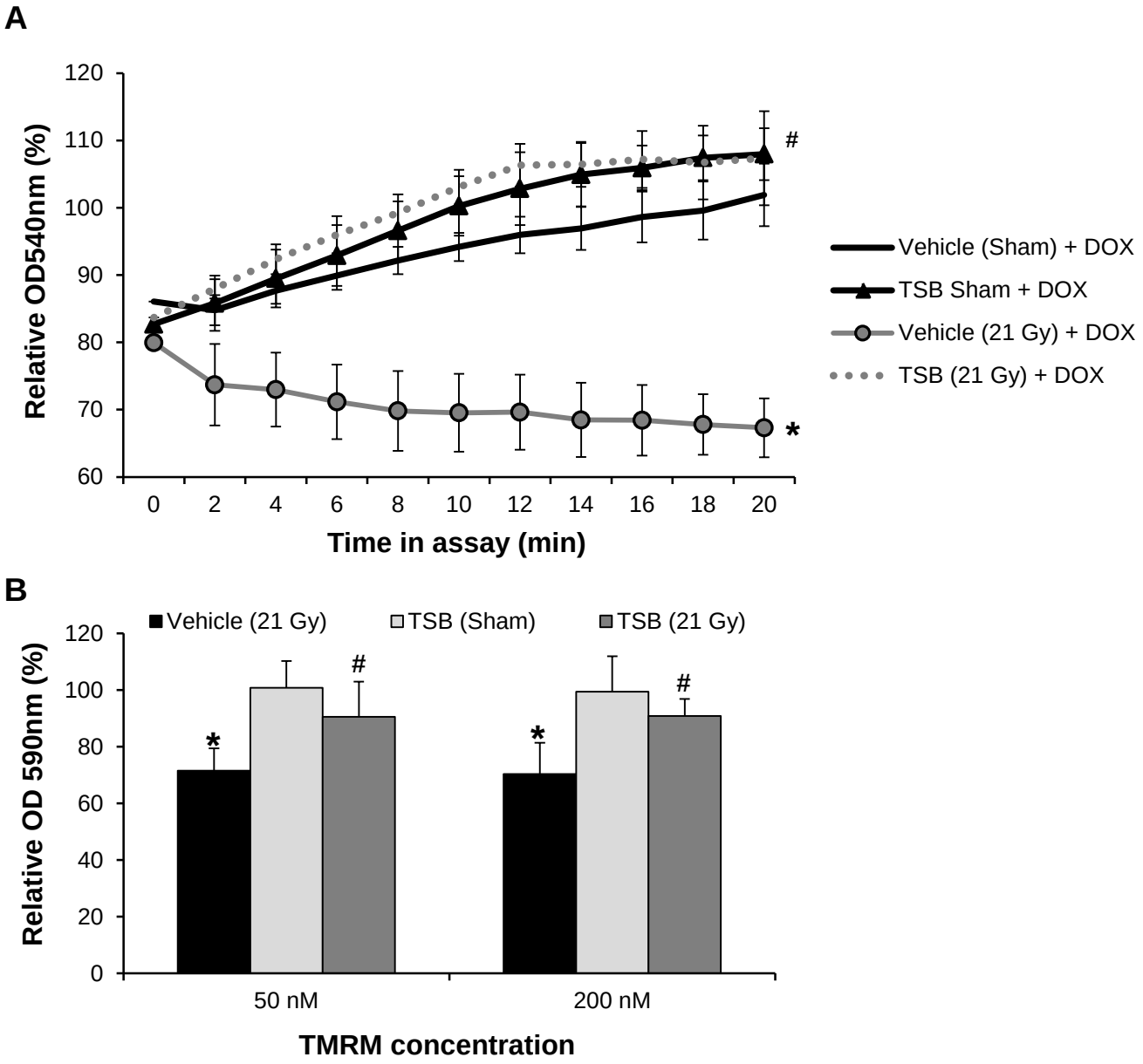


Supplementary Figure S1. Image guided irradiation of the rat heart. (**A**) X-ray image of rat, anesthetized and placed vertically in a plexiglas holder. (**B**) Collimator is attached to the X-ray tube and diaphragm is used as a landmark to guide the collimator to the heart. (**C**) Once the collimator is covering the heart only, the animal will be irradiated. (**D**) X-ray image of rat turned at 90º from (**A**). (**D** & **E**) The same strategy is used to identify and irradiate the heart.

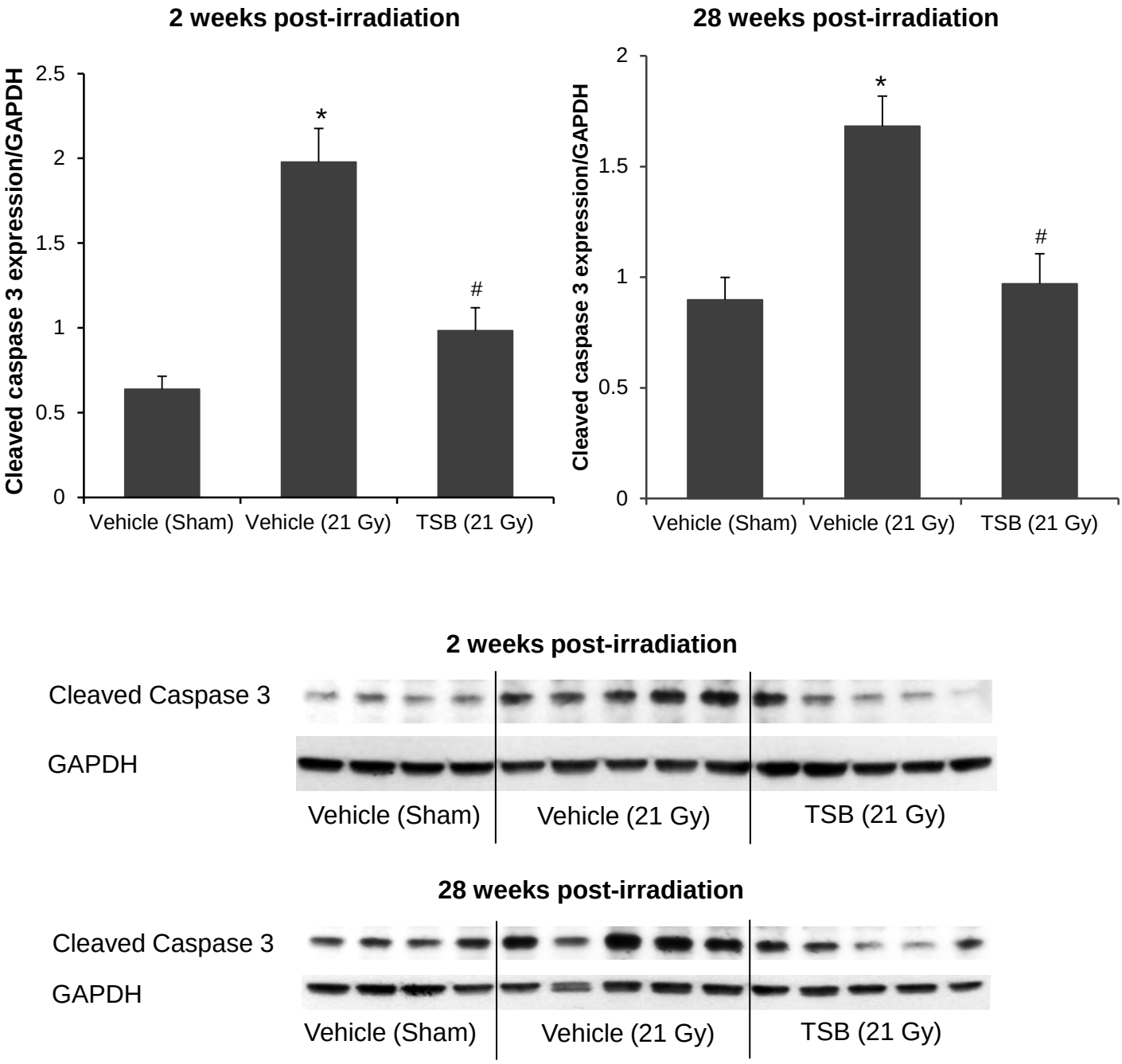




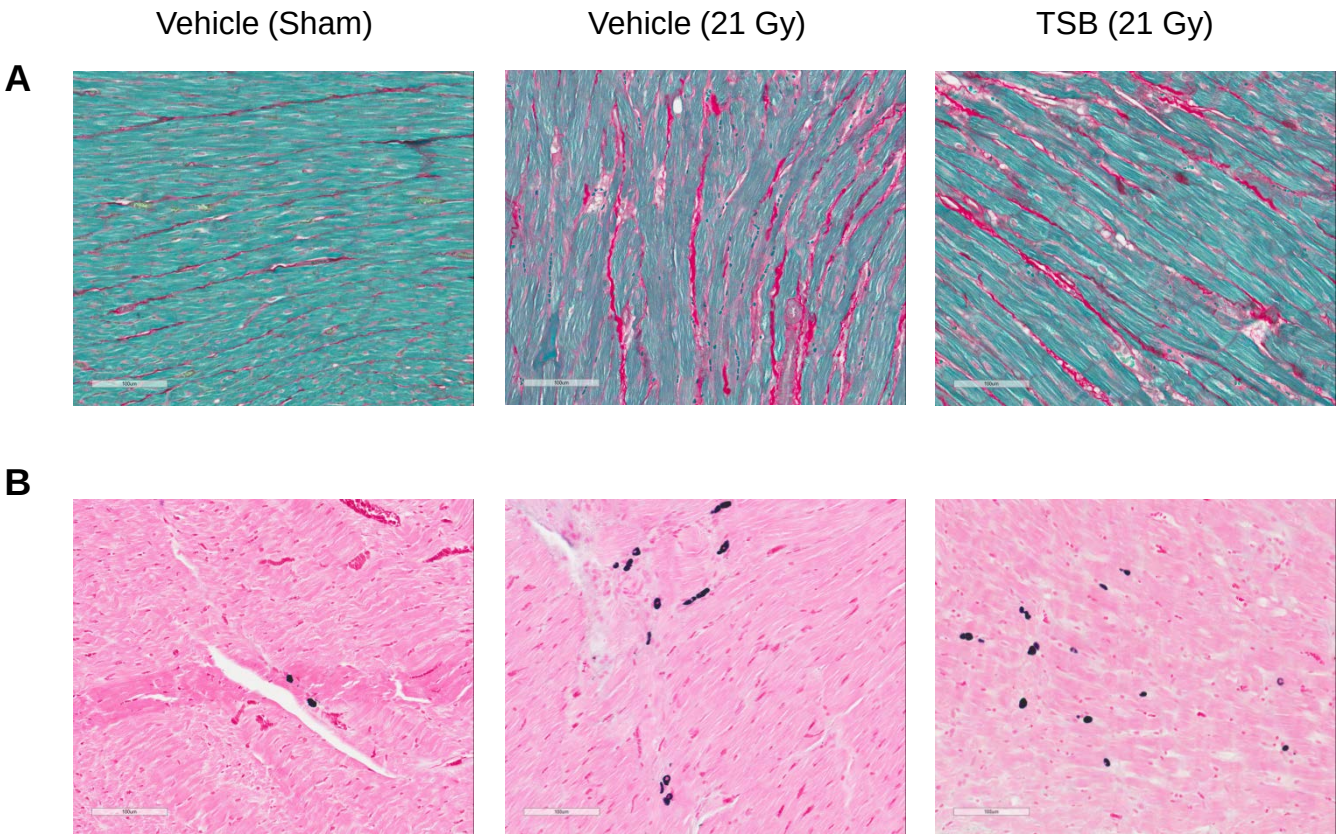
Supplementary Figure S2. HPLC analysis of reduced glutathione (GSH) and oxidized glutathione (GSSG) in left ventricles at 2 hours to 9 months after local heart irradiation in adult male Sprague-Dawley rats. A radiation-induced increase in GSSG levels caused a significant decrease in GSH/GSSG ratios from 2 hours up to 10 weeks after irradiation. GSH and GSSG levels were calculated as nmol per mg total protein. Data are presented as average ± sem, n= 3-6. *p<0.05 compared to time-matched sham-irradiated control.



Supplementary Figure S3. Effects of radiation and TSB on mitochondrial membrane properties. (**A**) Swelling assays with mitochondria isolated from left ventricle at 2 weeks after irradiation and *ex vivo* exposed to doxorubicin. Swelling is expressed as mitochondrial optical density at 540 nm (OD540nm), relative to OD540nm immediately before the start of the assay. Doxorubicin (DOX, 5 µM) caused significant swelling in mitochondria isolated from irradiated hearts only. Swelling was inhibited by the mPTP inhibitor cyclosporin A (CsA), indicating that swelling was due to enhanced mPTP opening. (**B**) Mitochondrial membrane potential, as assessed by mitochondrial uptake of TMRM at 2 weeks and 28 weeks after irradiation. TMRM uptake is expressed as OD590nm relative to that of mitochondria isolated from sham-irradiated hearts. Average ± sem, n=5-6. *p<0.05 compared to sham-irradiated control, $^{\#}$p<0.05 compared to vehicle-pretreated irradiated.



Supplementary Figure S4. Effects of radiation and TSB on protein levels of cleaved caspase 3. (**A**) Local heart irradiation caused an increase in left ventricular cleaved caspase 3 levels at both 2 weeks and 28 weeks after irradiation. TSB-pretreated groups were not significantly different from vehicle-pretreated sham controls. (**B**) Representative Western-Blot image of cleaved caspase 3. Average ± sem, n=5-6. *$p<0.05$ compared to sham-irradiated control. $^{\#}p<0.05$ compared to vehicle-pretreated irradiated.



Supplementary Figure S5. Representative images of histological staining at 28 weeks after irradiation. (**A**) Left ventricular collagen deposition as indicated by Sirius Red + Fast Green. (**B**) Mast cells as indicated by Toluidine Blue with Eosin background staining. Mast cells are stained blue. 20X magnification, scale bar 100 µm.