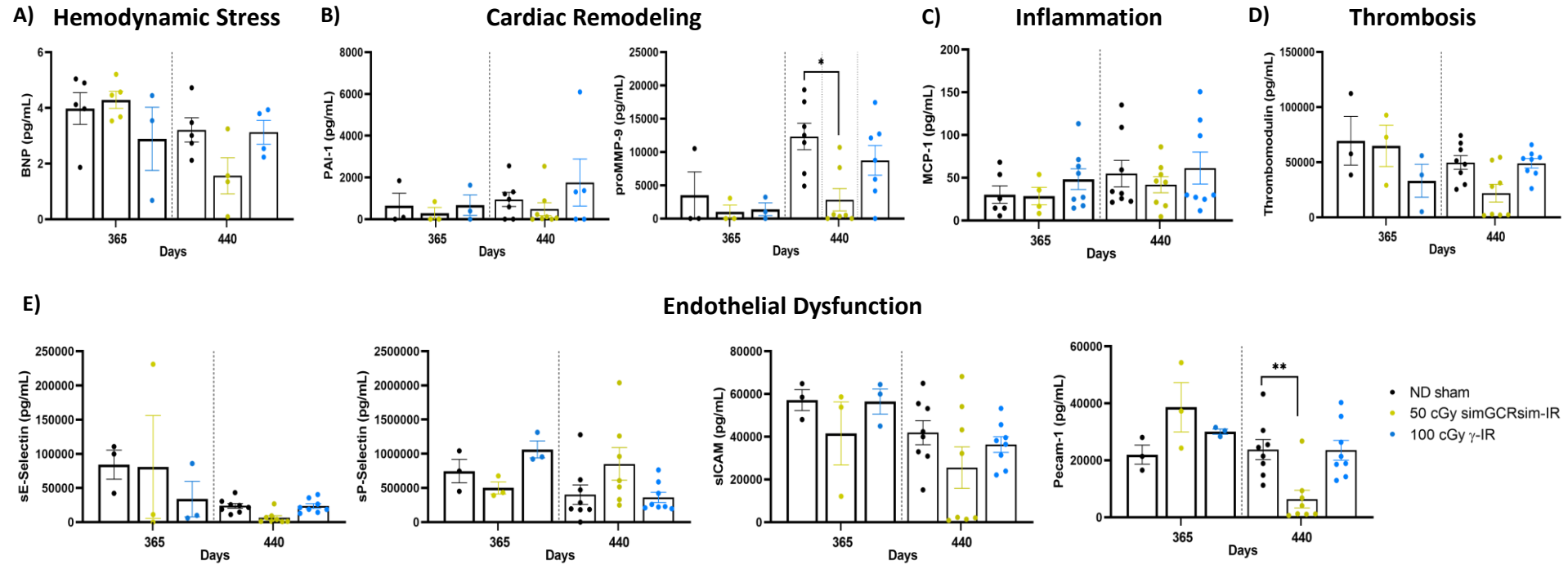


Supplementary Figure S1. Mortality in C57BL/6J male mice irradiated with gamma and simGCRsim irradiation. Graphs depicting the total number of (A) all-cause deaths, including (B) spontaneous deaths, defined as mice found dead in cages, and (C) animals euthanized during the course of experiments for adverse health effects.



Supplementary Figure S2. Select cardiac serum markers assessed 365 and 440 days after gamma and simGCRsim irradiation. Peripheral blood serum was processed using standard ELISA to assess for serum levels of (A) brain natriuretic peptide (BNP). Remaining samples were used for Multiplex assay to assess for markers of (B) cardiac remodeling: plasminogen activator inhibitor-1 (PAI-1) and pro-matrix metalloprotease-9 (proMMP-9), (C) inflammation: Monocyte Chemoattractant Protein-1 (MCP-1), (D) Thrombosis: thrombomodulin, and (E) endothelial dysfunction: sE-Selectin, sP-Selectin, sICAM, PECAM-1. All values are reported as pg/mL as mean \pm SEM. N=3-8 animals/treatment group; p-values were calculated using Kruskal-Wallis, *p < 0.05.

	No-IR	simGCRsim-IR		γ-IR	
	ND-fed	50 cGy	100 cGy	100 cGy	200 cGy
<i>Myocardial injury/heart failure/vascular injury</i>					
Mild to moderate multifocal myocardial replacement fibrosis with myocardial mineralization	1	-	-	1	-
Moderate, multifocal acute degeneratoion of myocardium with mild multifocal mineralization	1	-	-	-	-
Severe, multifocally extensive, myocardial degeneration, fibrosis and mineralization	-	-	-	1	-
Multifocal subepicardial myocardial mineratization	1	-	-	-	-
Severe, multifocal vascular mineralization	-	-	-	1	-
Extensive intimal mineratization of aorta	1	-	-	-	-
Mild, multifocal myocardial fibrosis, disarray and hypertrophy	-	-	-	1	-
Acute necrotizing myocarditis	1	-	-	-	-
<i>Cancer</i>					
Histiocytic sarcoma	-	-	-	1	-
Metastatic Lymphoma	-	-	-	1	-
Leukemia	-	1	-	-	-
<i>Sepsis and/or infectious disease/inflammation</i>					
Acute interstitial pneumonia with intravascular bacteria	3	-	-	-	-
Intrahistiocytic bacteria in spleen	-	1	-	-	-
Acute multifocal hepatitis with intralesional bacteria	1	-	-	-	-
Intravascular bacteria in heart	1	-	-	-	-
Vascular neutrophilia	-	-	-	-	1
<i>Possible toxic injury</i>					
Severe diffuse vacuolar degeneration in liver	2	-	-	-	-
<i>Inflammation</i>					
Severe lymphoid atrophy	-	-	-	1	-
Multifocal microthrombi with perivascular lymphoplasmacytic vasculitis	1	-	-	-	-
<i>Renal</i>					
Marked,chronic glomerulonephropathy	-	-	-	1	-
<i>Hepatic</i>					
Marked, multifocal hepatic necrosis and infarcts	-	1	-	-	-
Hepatocellular adenoma	-	-	1	-	-
Hepatocellular hyperplasia with cystic degeneration, necrosis	-	-	1	-	-
<i>Other</i>					
Unknown Cause	2	-	-	2	-
Rule out post-mortem leakage in lungs	3	2	2	2	1

Supplementary Table S1. Autopsy data from mice found spontaneously dead or euthanized during the course of the longitudinal lifetime experiment.