

Figure Legends for Supplemental Figures

Supplemental Figure 1. (A) Circulating free hydrogen sulfide (H₂S) and (B) Circulating sulfane sulfur levels (μM) in wild-type control, CSE deficient (CSE KO) and CSE KO mice treated with the H₂S donor SG-1002, (C) Myocardial H₂S and (D) sulfane sulfur levels (nmol/mg wet weight) in WT, CSE KO and CSE KO+SG-1002 mice. Results are expressed as mean ± SEM. **p* < 0.05, ***p* < 0.01 vs. WT, n=5-6 per group.

Supplemental Figure 2. (A) Left Ventricular end-diastolic diameter (LVEDD) length at 12 weeks following TAC in wild-type (WT+TAC) mice, CSE deficient (CSE KO+TAC) mice, and CSE KO mice treated with SG1002 (CSE KO+TAC+SG-1002). (B) LVEDD at 12 weeks of TAC in wild-type (WT+TAC) and cardiac specific CSE transgenic mice (CS-CSE Tg+TAC). (C) LVEDD at 12 weeks following TAC in wild-type mice treated with Vehicle (TAC+Vehicle) or SG-1002 (TAC+SG-1002). (D) LVEDD at 12 weeks of TAC in eNOS deficient (eNOS KO) mice and eNOS KO mice treated with SG1002 (eNOS KO+SG1002). Results are expressed as mean ± SEM. #*p*<0.01 and #*p*<0.001 vs. WT. **p*<0.05, ***p*<.01, and ****p*<0.001 vs. Baseline.

Supplemental Figure 3. (A) Kaplan-Meier survival curves for 84 days following transverse aortic constriction in wild-type (n=13), CSE KO mice (n=14), and CSE KO mice treated with SG-1002 (n=10). **(B)** Kaplan-Meier survival curves for wild-type (n=13) and cardiac-specific CSE transgenic mice (n=16) following 12 weeks of TAC. **(C)** Kaplan-Meier survival curves for wild-type mice fed a control diet (n=18) and mice fed a SG-1002 diet (n=15) following 12 weeks of TAC.

Supplemental Figure 4. Representative immunoblots of cystathionine beta synthase (CBS), and 3-mercaptopyruvate sulfutransferase (3-MST) from the hearts of wild-type (n=3) and mice with cardiac-restricted over expression of cystathionine gamma lyase (CS-CSE; n=3).

Supplemental Figure 5. (A) Left ventricular end-systolic diameter (LVESD, mm), **(B)** Left ventricular end-diastolic diameter (LVEDD, mm), and **(C)** Left ventricular ejection fraction (%) in wild-type mice treated with SG-1002 for 6 weeks following transverse aortic constriction (TAC; n=7), mice treated with SG-1002 for 1 week after TAC followed by withdrawal of SG-1002 for 5 weeks (n=7), and mice treated with SG-1002 for 3 weeks following TAC followed by withdrawal of SG-1002 for 3 weeks (n=7). Results are expressed as mean \pm SEM. * $p < 0.05$, *** $p < 0.001$ vs. Baseline.

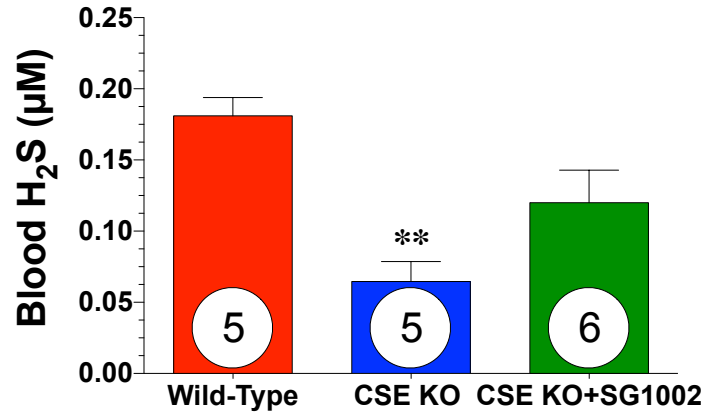
Supplemental Figure 6. (A) Serum levels (pg/mL) of VEGF-A in Sham control (n=8) and following TAC in Vehicle (n=16) and SG-1002 treated mice (n=16) at 6

weeks following TAC. **(B)** Representative immunoblots for myocardial nNOS and iNOS from the hearts of Sham, TAC+Vehicle, and TAC+SG-1002 treated mice at 6 weeks of TAC (n=3 per group). **(C)** Densitometric analysis of nNOS protein relative to fibrillar in Sham, TAC+Vehicle, and TAC+SG-1002 hearts. **(D)** Bar graph of densitometric analysis of myocardial iNOS protein relative to fibrillar in Sham, TAC+Vehicle, and TAC+SG-1002 mice following 6 weeks of TAC. Results are expressed as mean \pm SEM. * $p < 0.05$, ** $p < 0.01$ vs. Sham, n=5 per group.

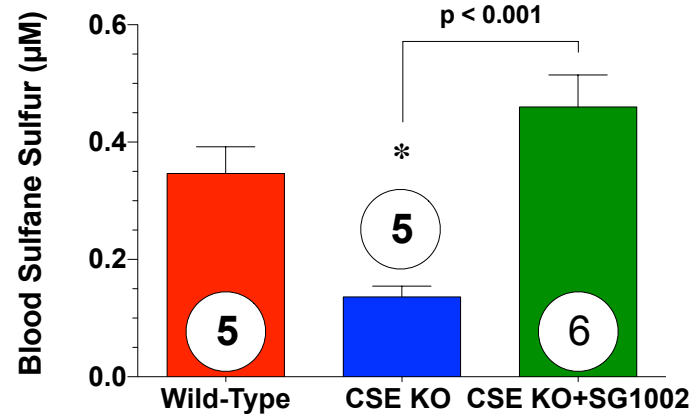
Supplemental Figure 7. (A) Mitochondrial respiratory function ($\mu\text{M O}_2/\text{sec}/\text{mg}$) in State 3 and State 4 in isolated mitochondria harvested from Sham, TAC+Vehicle, and TAC+SG-1002 hearts at 6 weeks of TAC. **(B)** Respiratory control ratio (RCR) from the hearts of the experimental groups at 6 weeks of TAC (n=5-6 per group). **(C-D)** Plasma and heart 8-isoprostane levels at 6 weeks of TAC. **(E)** Representative immunoblots and densitometric analysis of NADPH oxidase 4 (Nox4) in hearts of the experimental groups at 6 weeks of TAC. **(F)** Representative immunoblots and densitometric analysis of heme oxygenase 1 (HO-1) in hearts of the experimental groups at 6 weeks of TAC Results are expressed as mean \pm SEM. * $p < 0.05$ and *** $p < 0.001$ vs. Sham; n=5-6 per study group.

Supplemental Figure 1

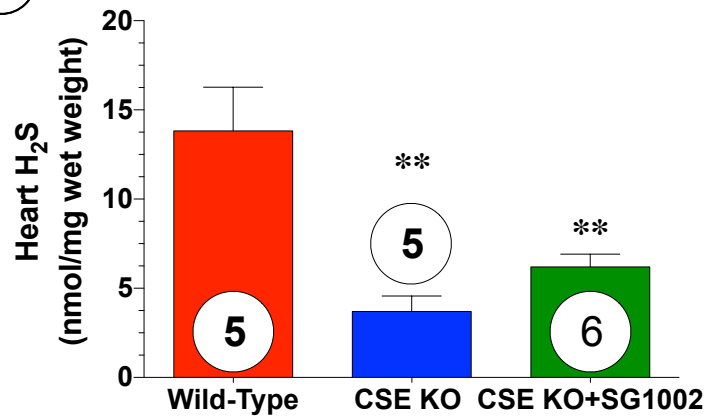
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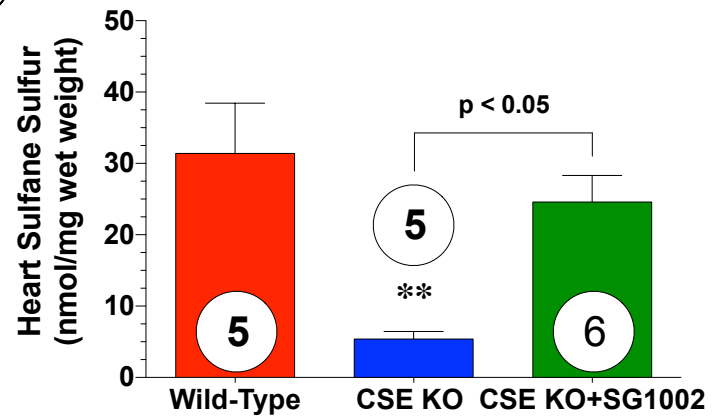
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C

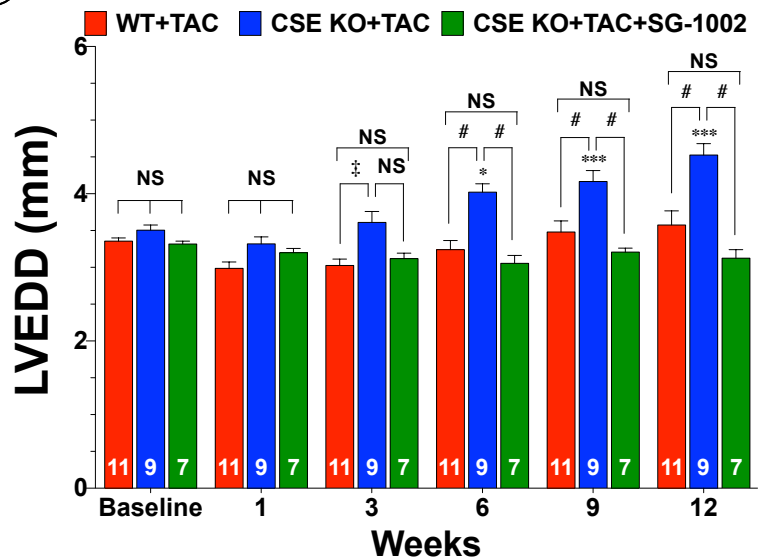


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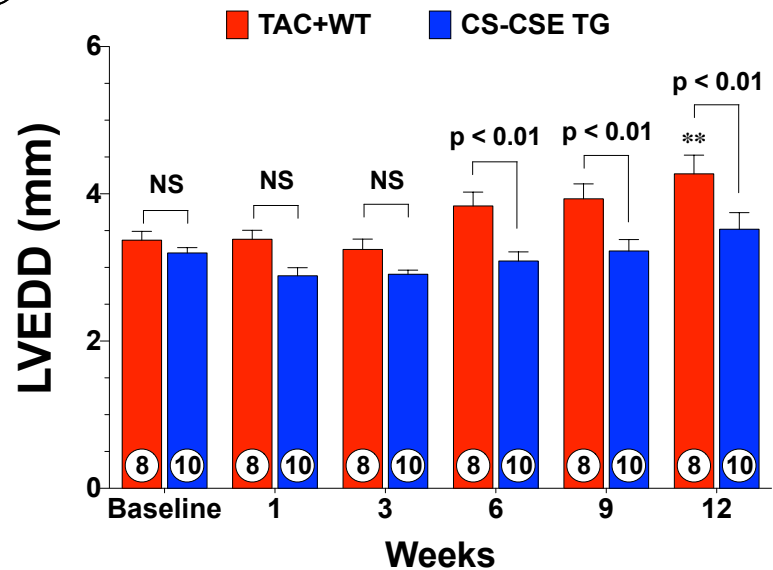


Supplemental Figure 2

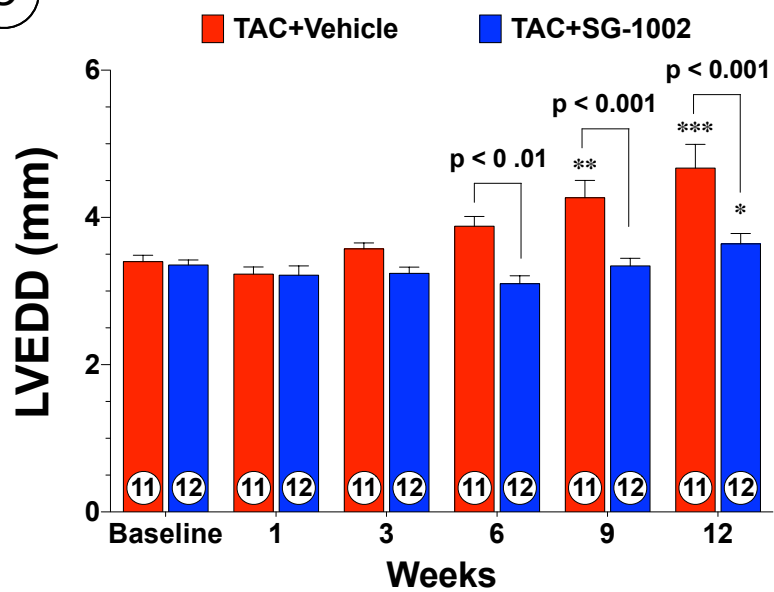
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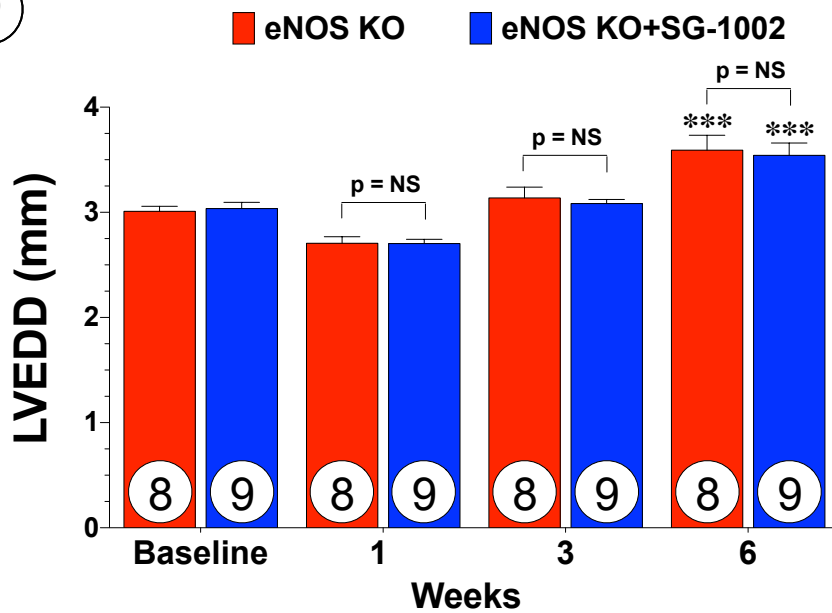
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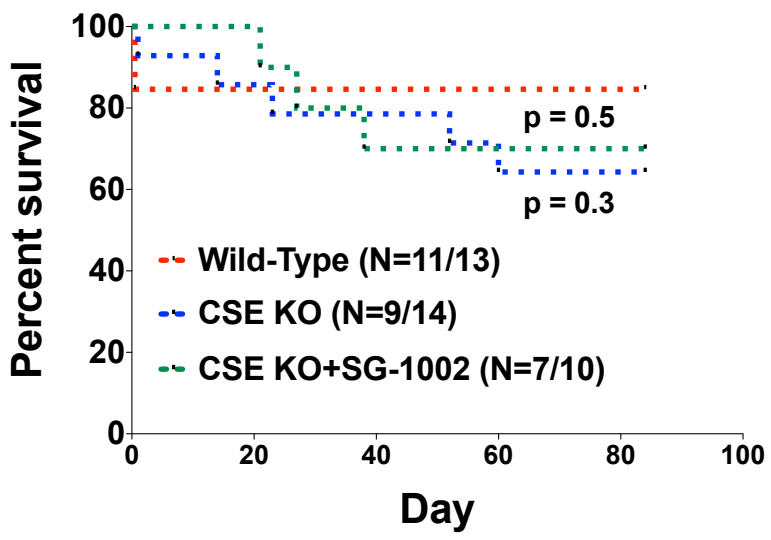


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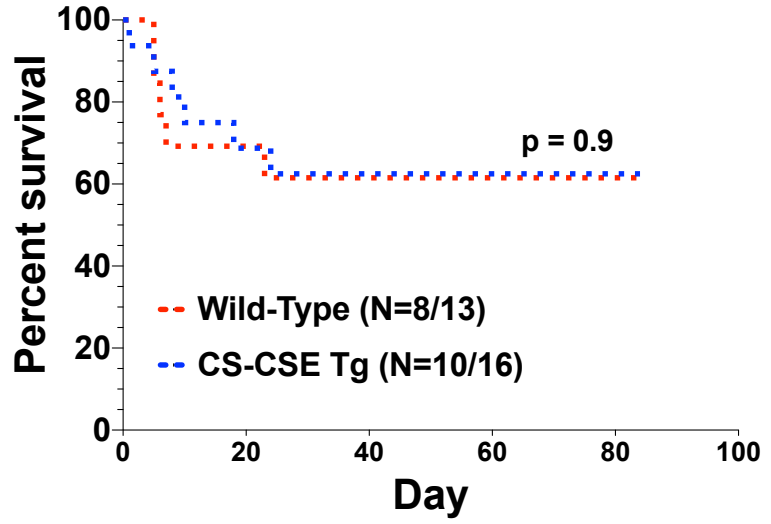


Supplemental Figure 3

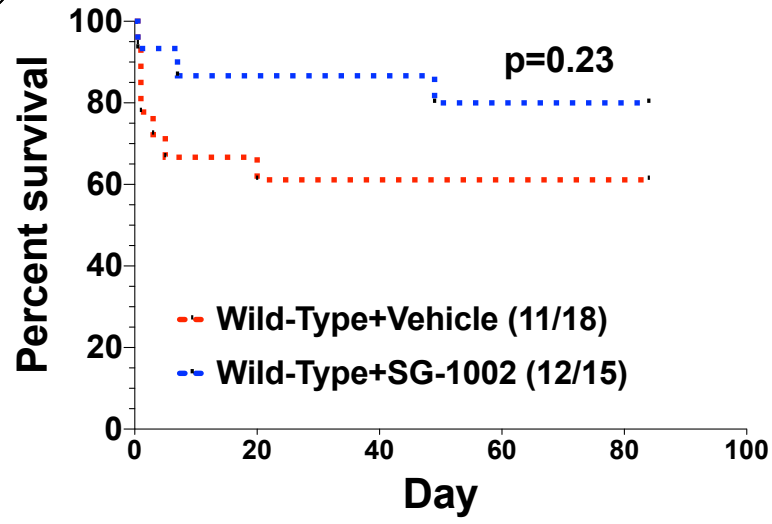
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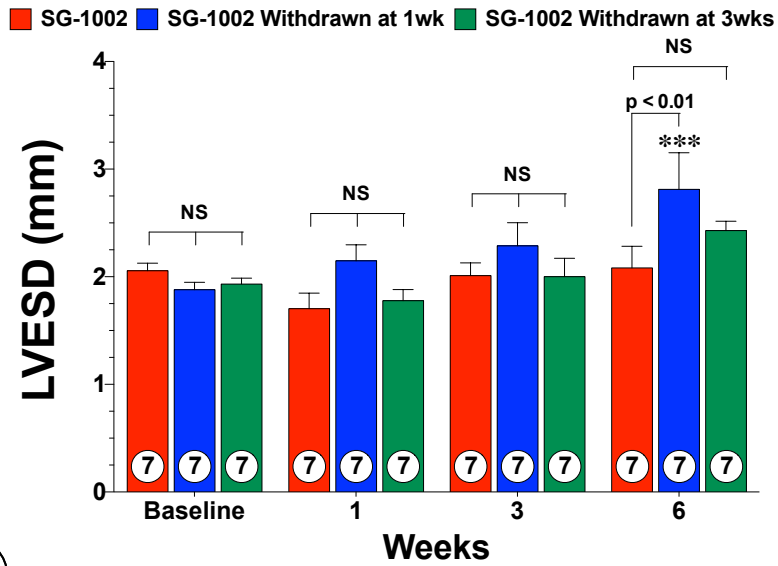


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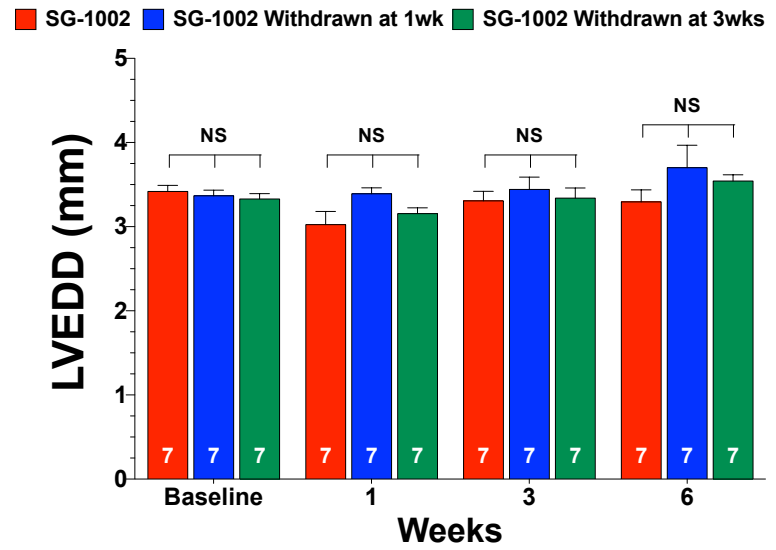


Supplemental Figure 5

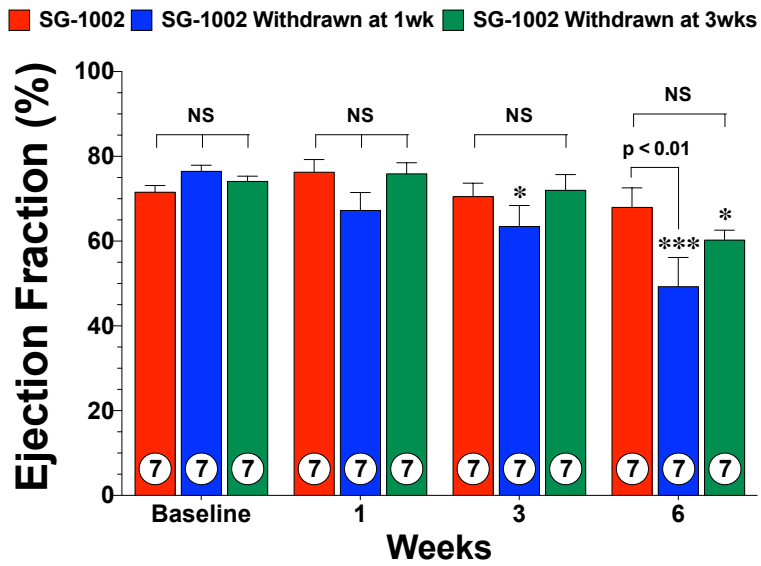
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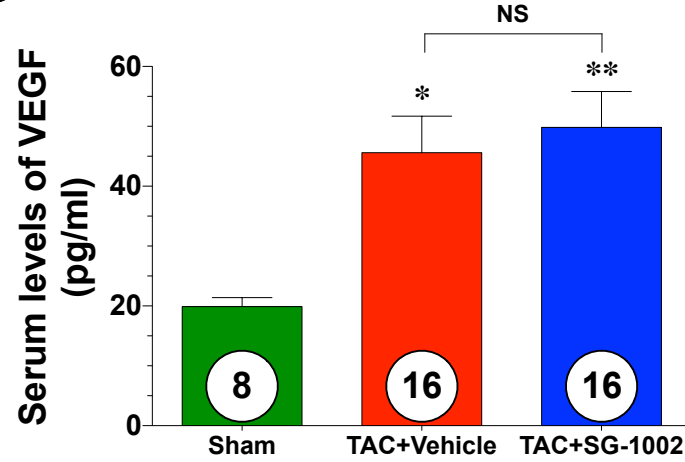


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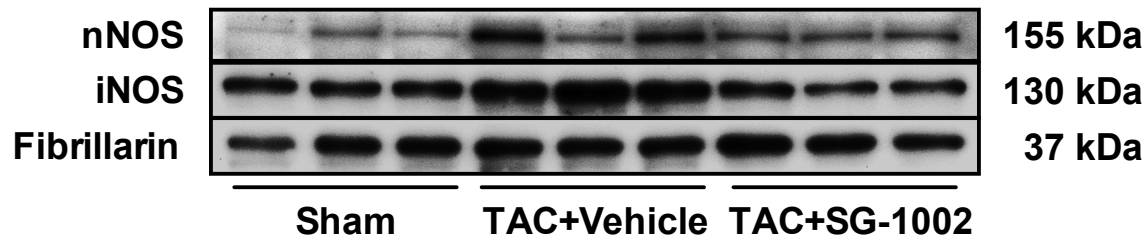


Supplemental Figure 6

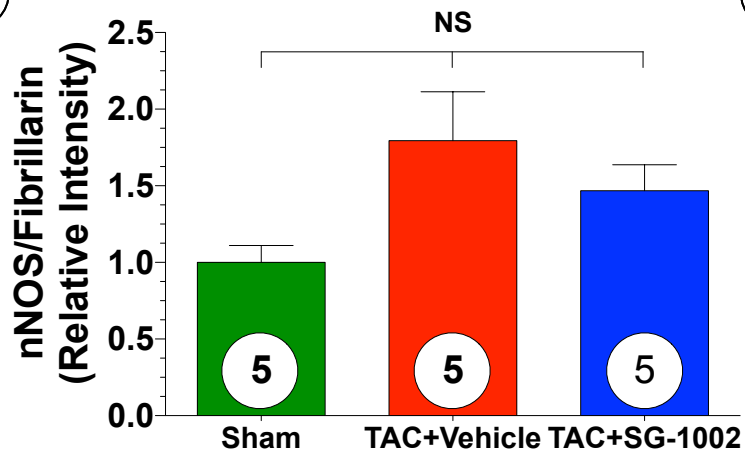
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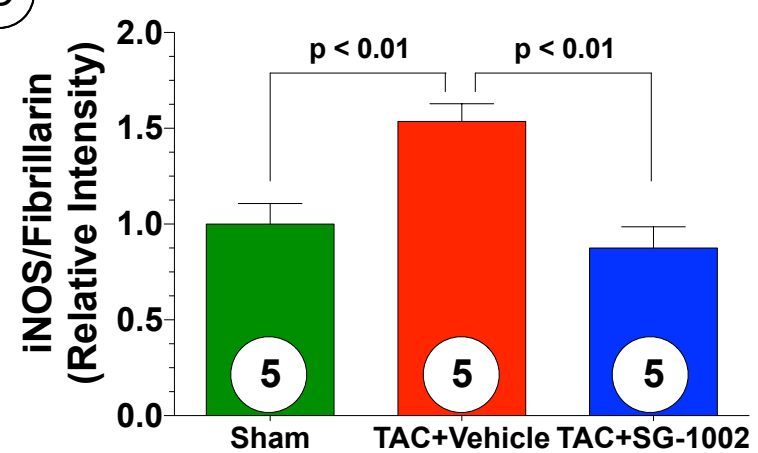
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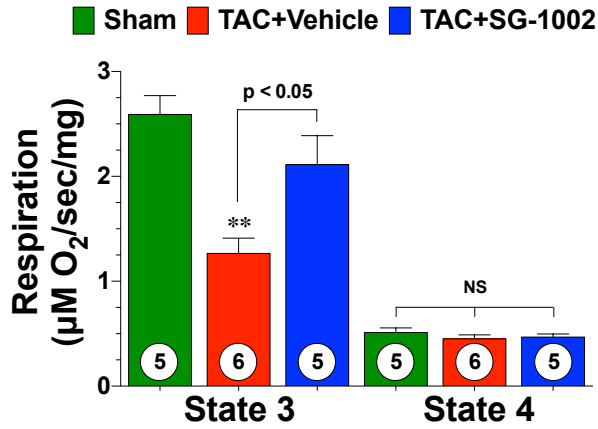


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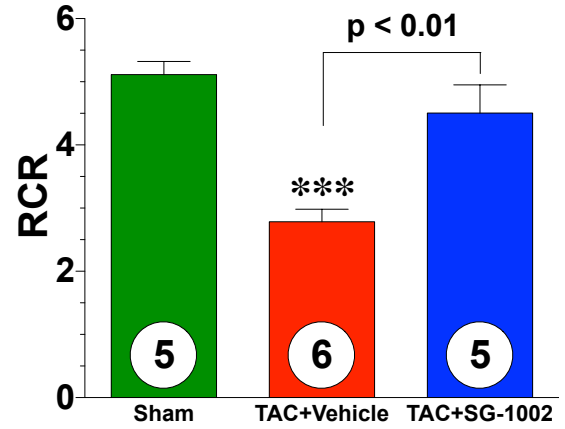


Supplemental Figure 7

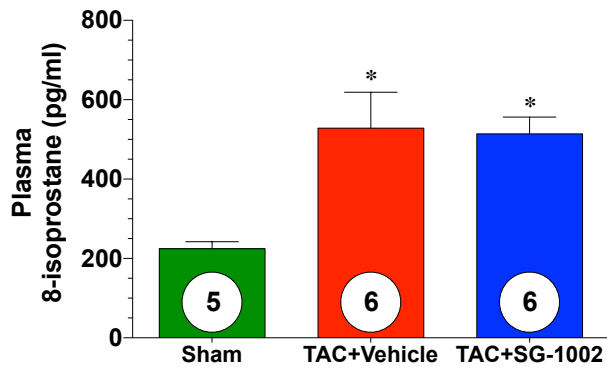
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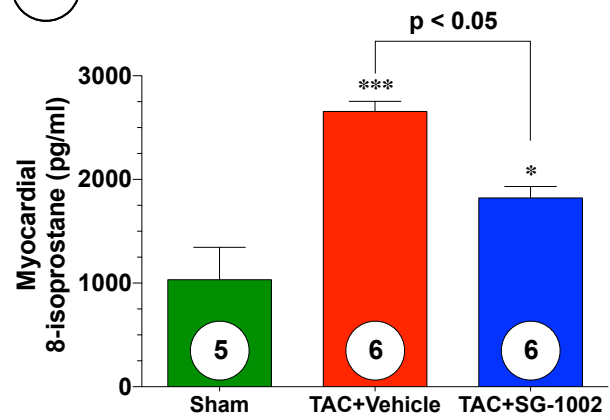
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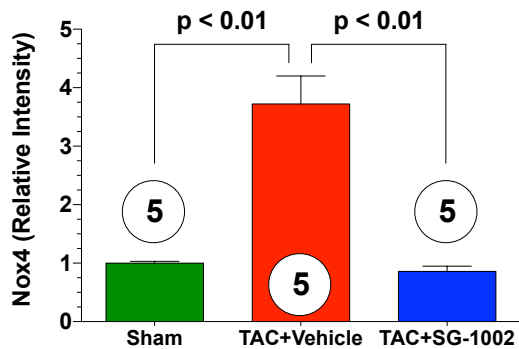
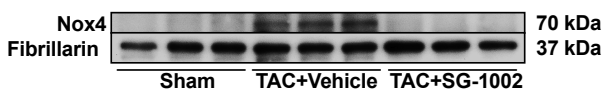
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(D)



(E)



(F)

