Supplementary Figure 1. Cytokine profile in the kidney after IRI with or without VNS.
Mice underwent VNS or sham stimulation surgery 24 h prior to IRI or sham IRI surgery. RNA was isolated from whole kidneys and qPCR was performed. Gene expression was calculated relative to *Gapdh* and then expression for each group was calculated relative to the sham-sham group. *Tnf*, *Lif*, *Csf1*, *Tgfb1*, *Il1b* and *Il7* were significantly upregulated by IRI, and *IL1b* was suppressed significantly by prior VNS. *Vegfa* was upregulated by prior VNS and was suppressed by IRI. *Il15* and *Cxcl9* were suppressed by IRI. n=5-11. Data were analyzed using two-way ANOVA. Means were compared by post hoc multiple-comparison test (Tukey's). * $P< 0.05$, ** $P<0.01$ and *** $P<0.001$. Cluster analysis and heat map are shown in Figure 5.

Supplementary Figure 2. Gating strategy for granulocytes and macrophages/monocytes in kidney.
Single cell suspensions from whole kidney were obtained. Debris was eliminated based on forward scatter and side scatter. After gating on live CD45+ cells, granulocytes were defined based on Ly6G and CD11b double positives, and CD11b+ Ly6G- cells were used for further macrophage gating. Dendritic cells were eliminated based on CD11c and MHCII, and finally F4/80 and CD11b double positive cells were defined as macrophages/monocytes. Numbers on each panel indicate percent of gated population in each panel.

Supplementary Figure 3. Prior VNS changes the expression of *Arg1*, an M2 marker, in the kidney.
WT (progeny controls; A) and *α7nAChR*$^{-/-}$ (α7KO; B) mice underwent IRI 24 h after VNS or sham VNS treatment, and kidneys were harvested 24 h later. RNA was isolated from FACS-sorted macrophages/monocytes from the kidney and qPCR was performed. Relative gene expressions compared to control group (Ctl; untreated mice) were calculated. n=3 for control and n=6 for Sham-IRI and VNS-IRI. Data were analyzed using one-way ANOVA. Means were compared by post hoc multiple-comparison test (Tukey's). * $P< 0.05$.

Supplementary Figure 4. Efferent vagus nerve stimulation has no effect on renal sympathetic nerve activity.
Recording of the renal sympathetic nerve during left intact vagus nerve stimulation (A) and left efferent vagus nerve stimulation (5 Hz, 1 ms, 50 μA for 1 min) (B). Stimulus-triggered rectified renal sympathetic nerve activity (rRSNA) was averaged (3000 sweeps). An arrow indicates when

the nerve was stimulated. The onset latency of the evoked potential was about 50 ms. Afferent vagal nerve stimulation evoked a robust increase in renal sympathetic nerve activity but efferent vagal nerve stimulation was ineffective. Representative data of three independent experiments.

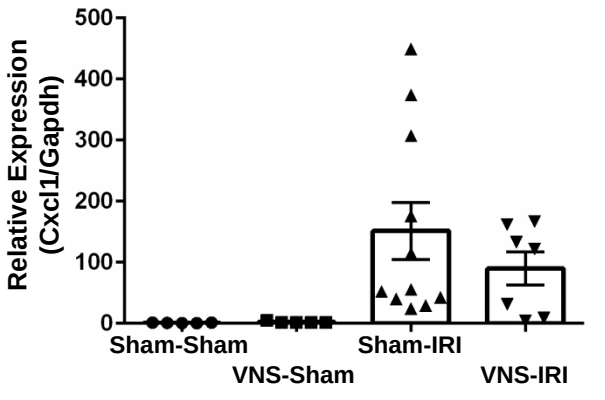
Supplementary Figure 5. Vagus afferent stimulation with contralateral vagal nerve blocked still protects the kidney from IRI.

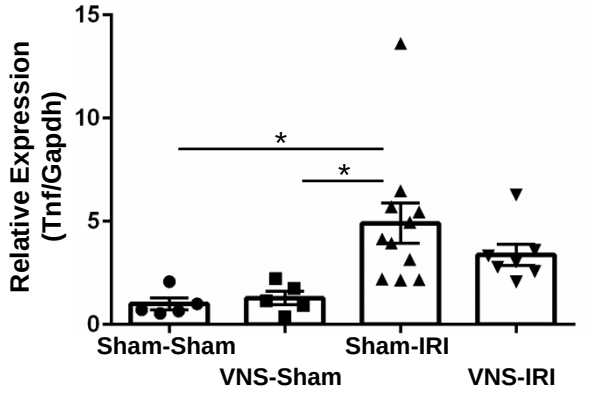
Mice underwent left vagus nerve stimulation (VNS; 1V, 5Hz, 50 μA for 10 sec) with right vagal nerve blocked (bupivacaine) or sham stimulation surgery 24 h prior to ischemia-reperfusion injury (IRI; 26 min ischemia, 24 h reperfusion). n=4 each. Data were analyzed with Student's t-test (2 tailed). *** $P<0.001$.

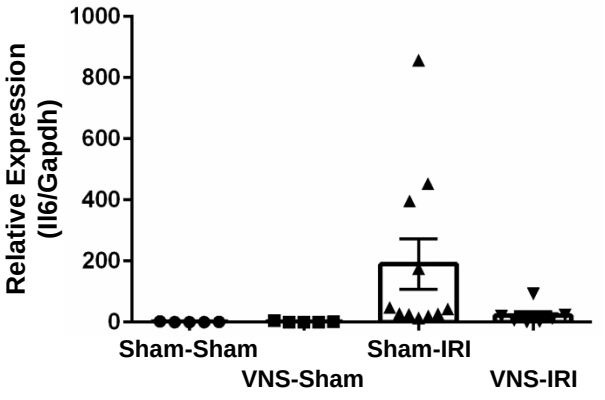
Supplementary Figure 6. Similarity between LC-MS and enzymatic assay for plasma creatinine.

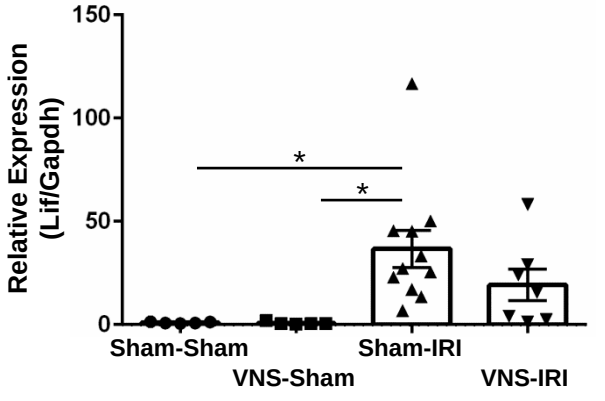
Comparison of analyses of creatinine by LC-MS and enzymatic method for dilutions of creatinine standard (black) and plasma from mice (red). Scatter plot with regression line, regression equation and coefficient of determination (R^2) is shown. Black dots show the data of two-fold serial dilution of the calibrator (standard) provided in the enzymatic assay kit (n=6). Red dots show the data of plasma from mice that were subjected to kidney ischemia-reperfusion injury (IRI; 26 min ischemia, 24 h reperfusion) or sham surgery (n=2 each). The results yield a slope very close to 1 (0.9933) and confirm a very strong correlation between LC-MS and the enzymatic method, as shown previously by others (54).

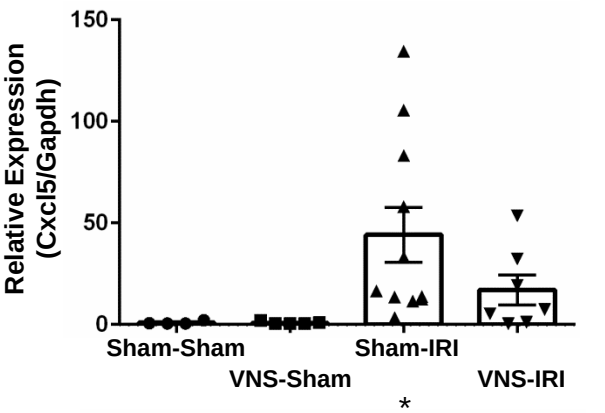
Supplementary Figure 1

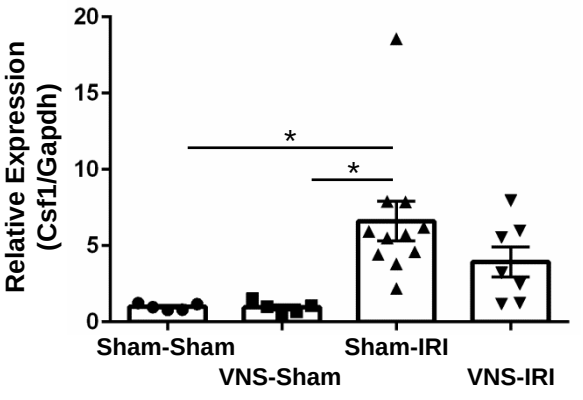


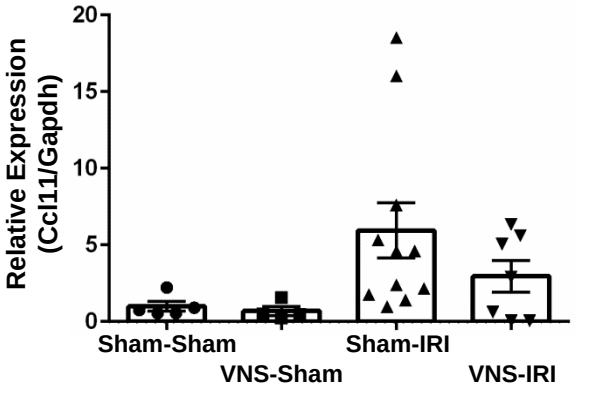


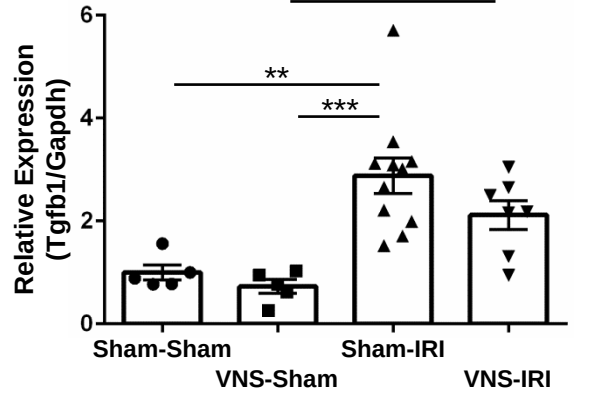


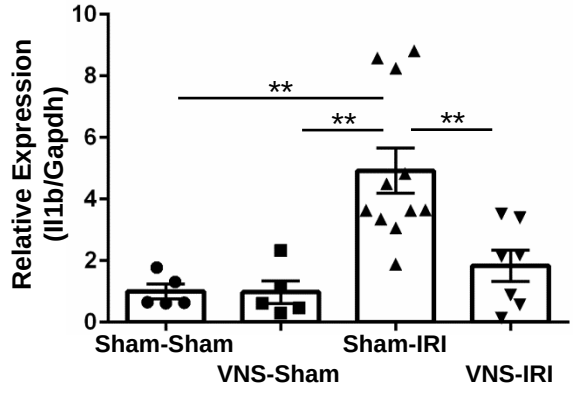


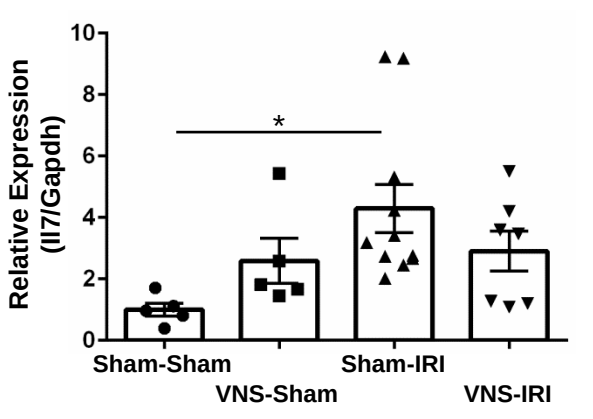


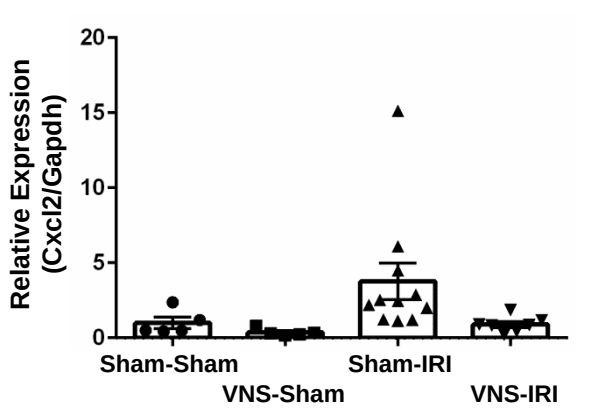


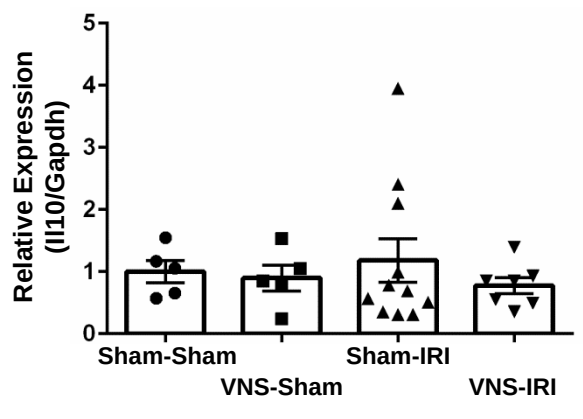


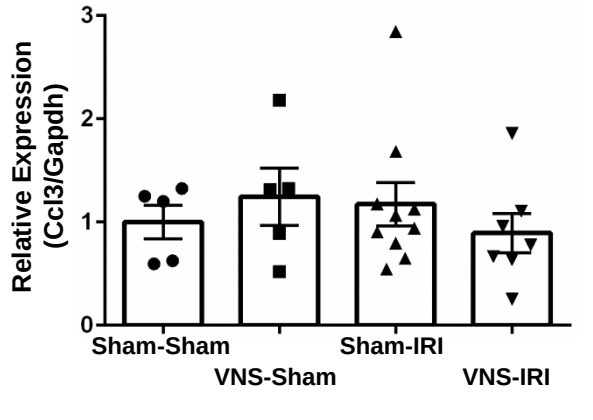


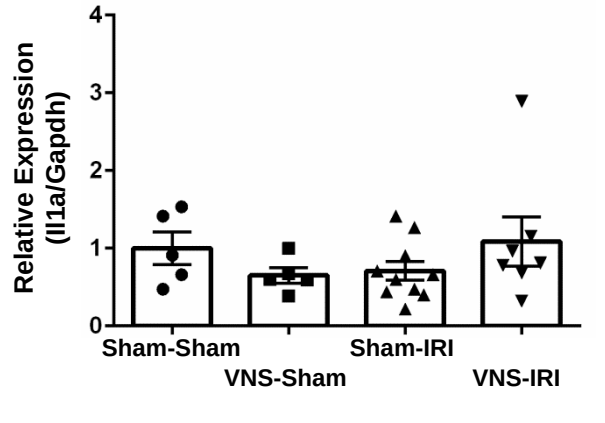


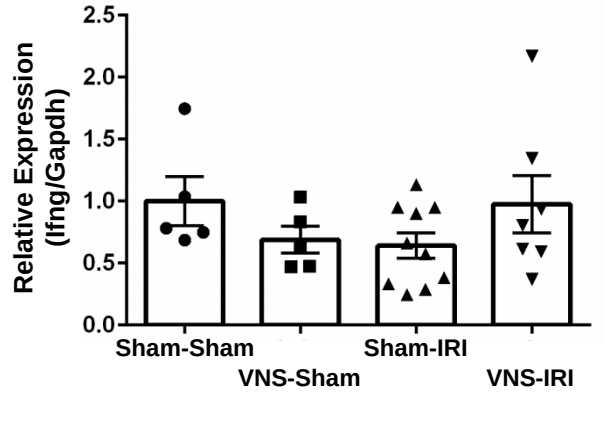


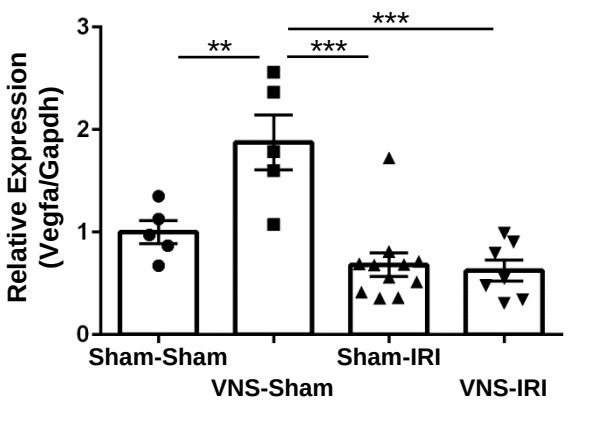


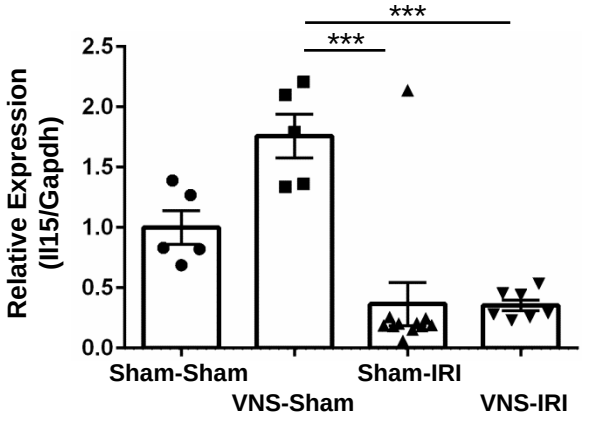


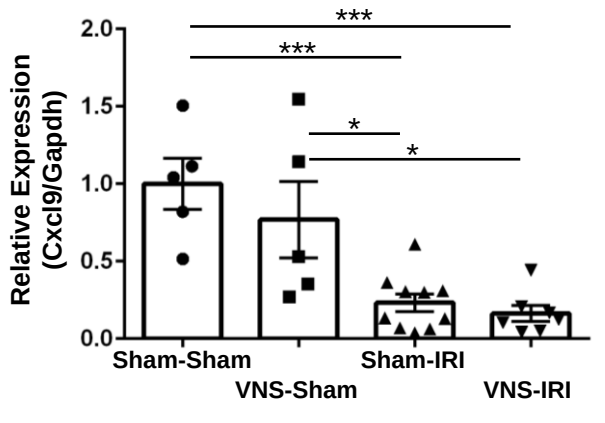




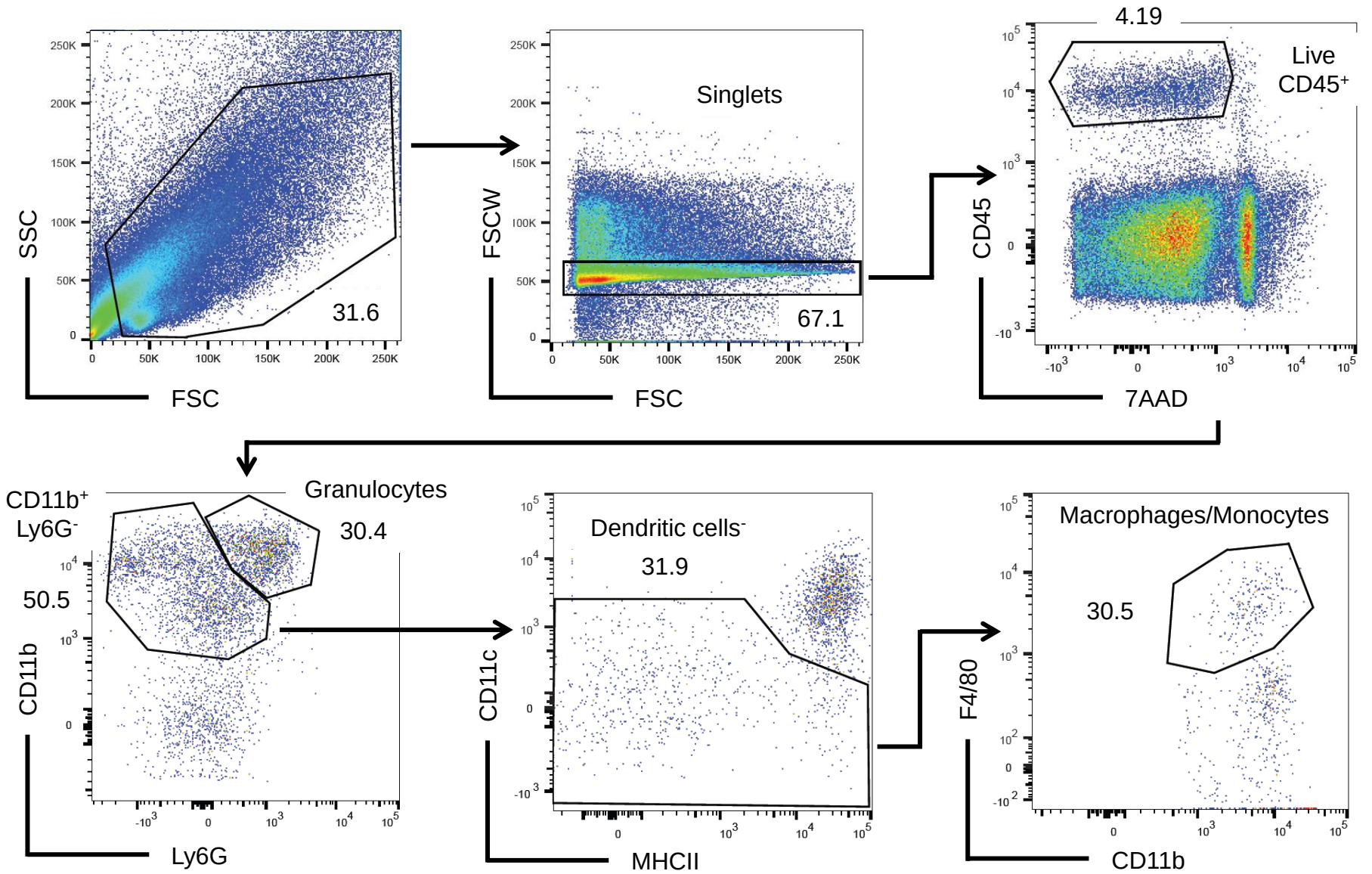








Supplementary Figure 2



Supplementary Figure 3

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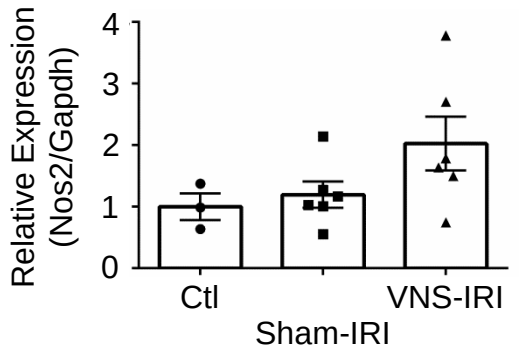

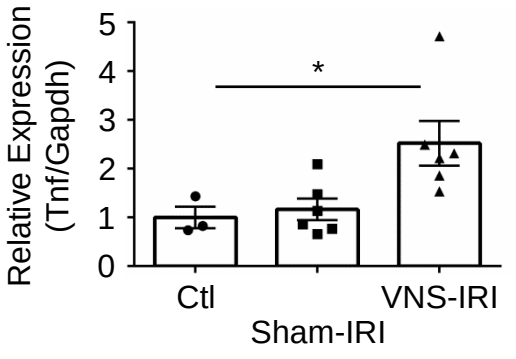

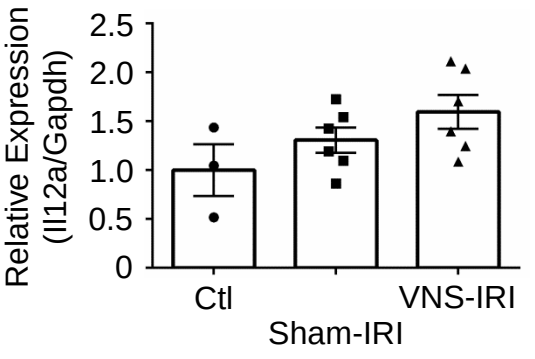

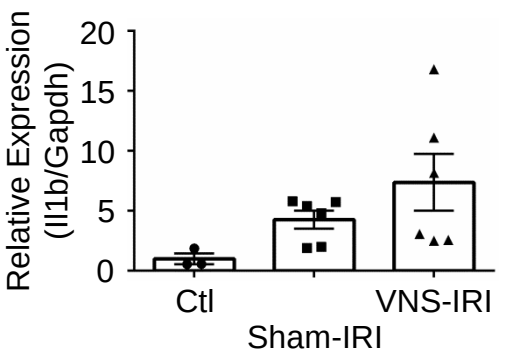

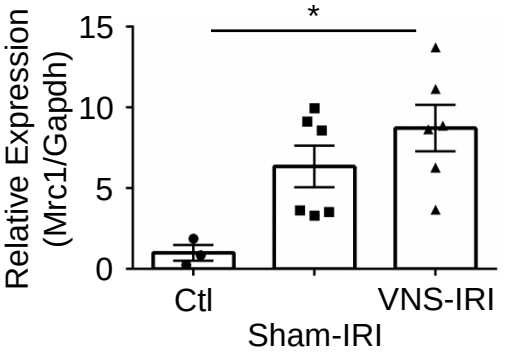

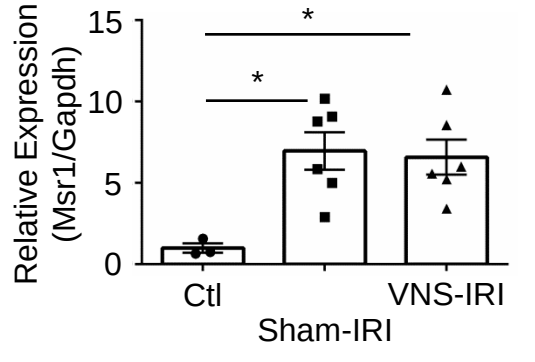

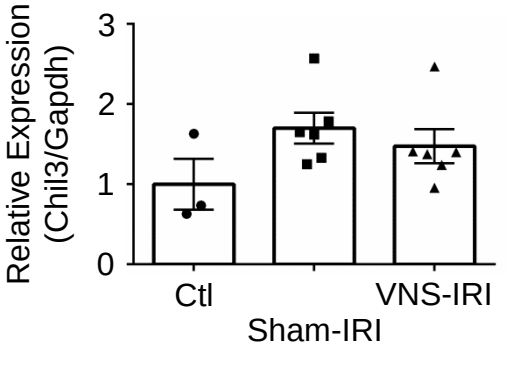

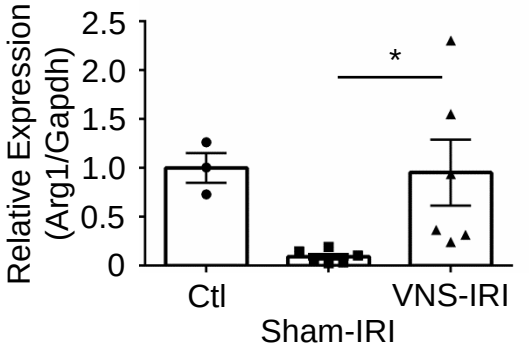

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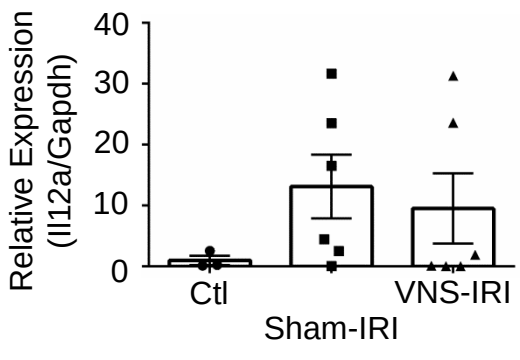

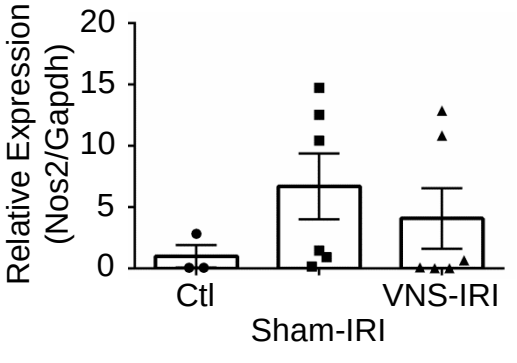

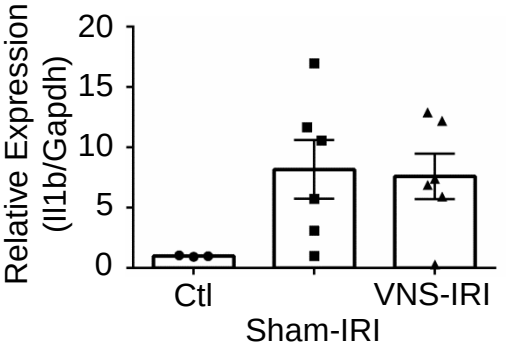

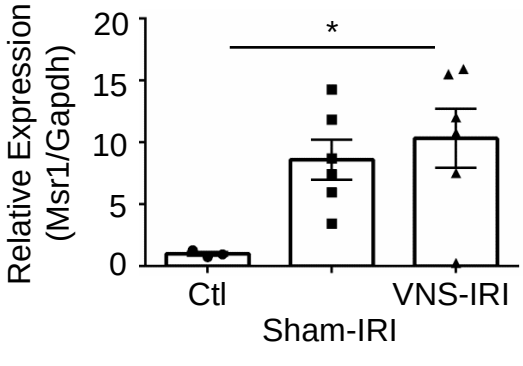

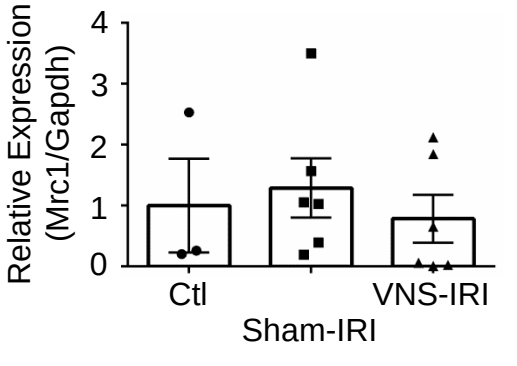

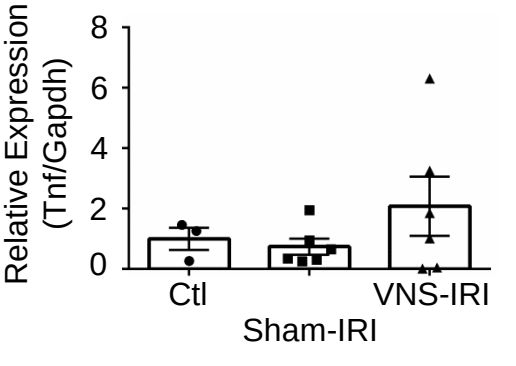

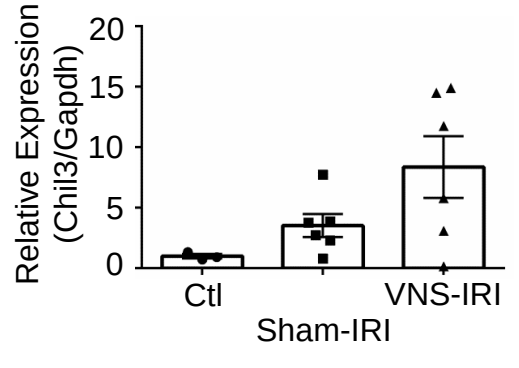

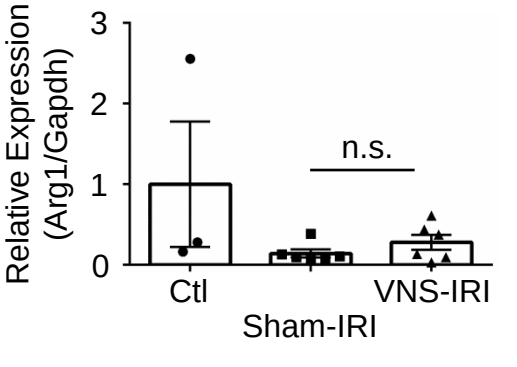

Supplementary Figure 4

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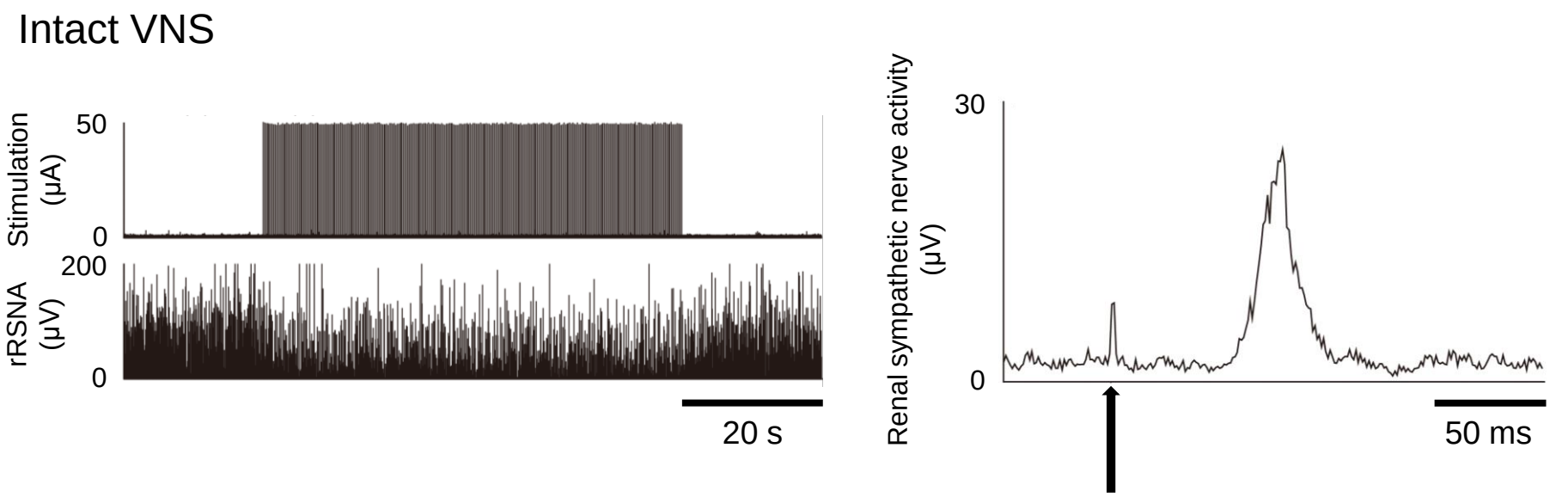

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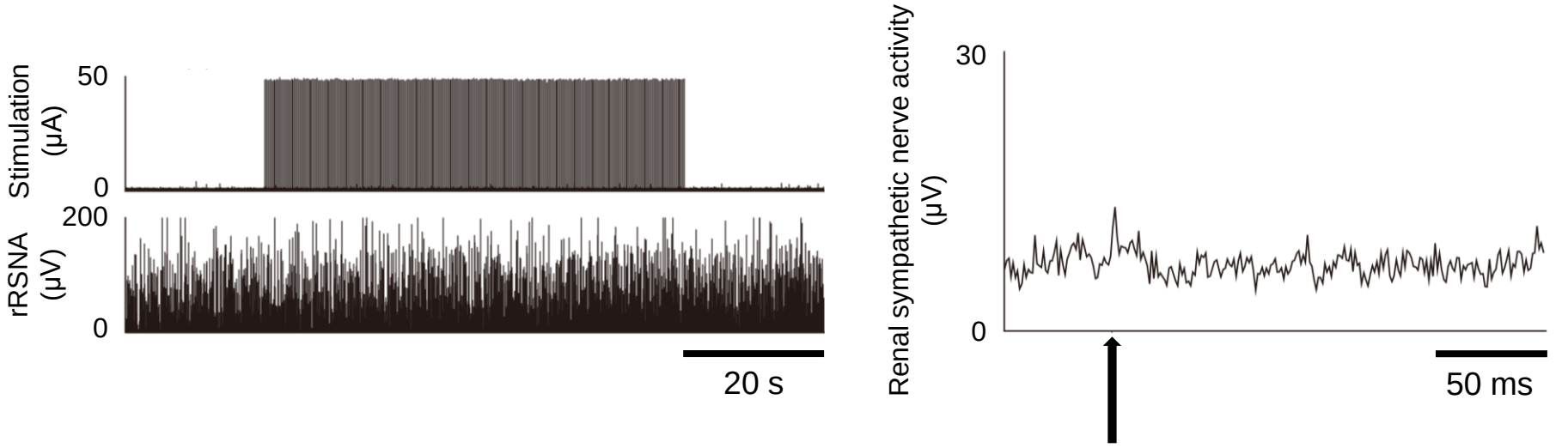

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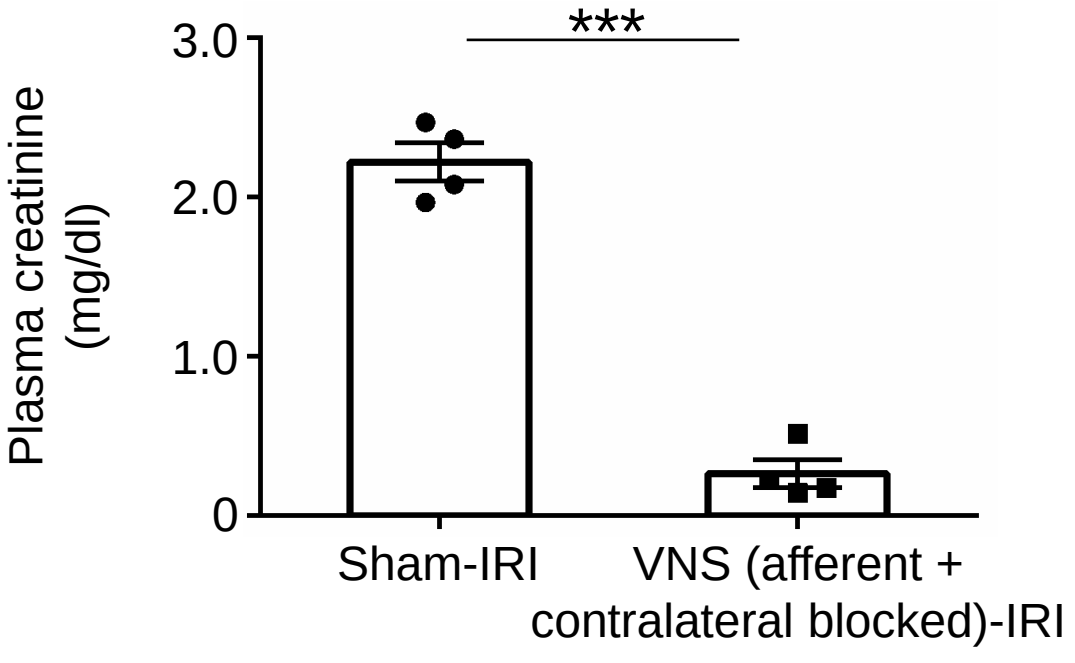

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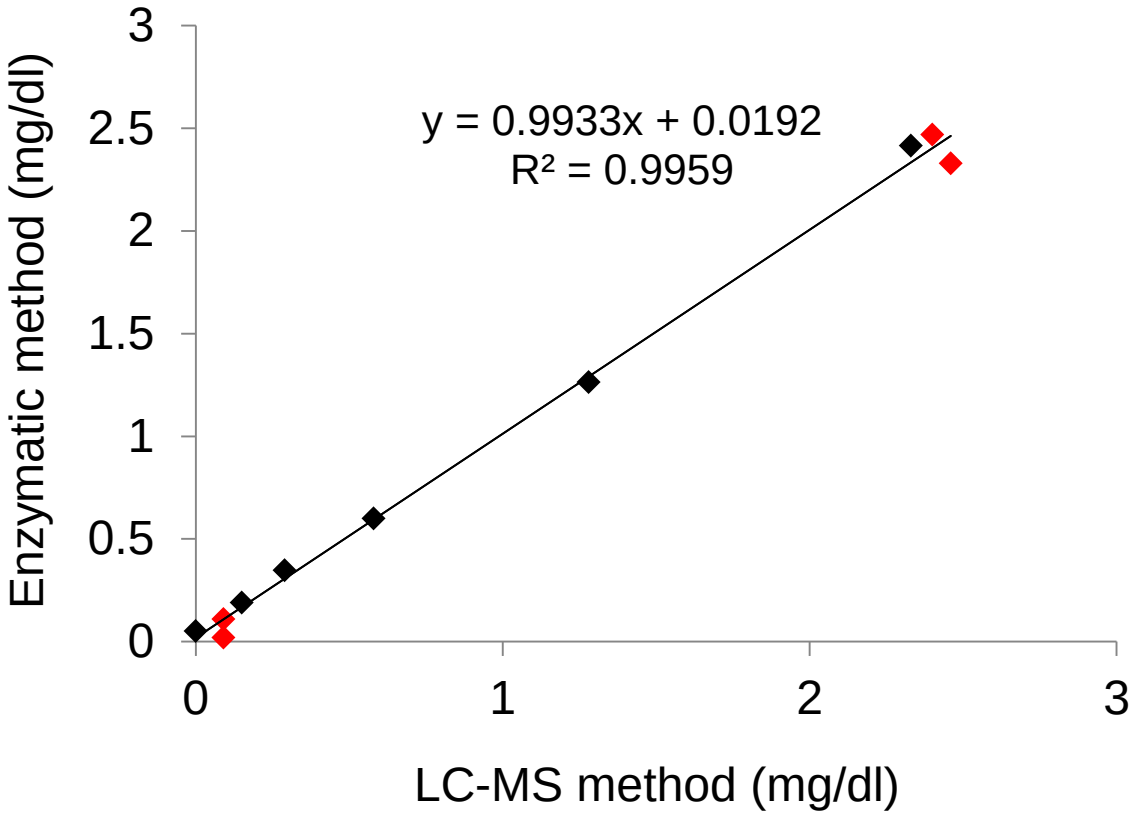

Supplementary Table 1. Primer sequences for real-time quantitative PCR

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Kim-1 (Havcr1)_rev	ACTGCTCTTCTGATAGGTGACA
Cxcl1_fwd	TGGCTGGGATTCACCTCAAGAACA
Cxcl1_rev	TGTGGCTATGACTTCGGTTTGGGT
Tnf_fwd	CCCTCACACTCAGATCATCTTCT
Tnf_rev	GCTACGACGTGGGCTACAG
Il6_fwd	TGGCTAAGGACCAAGACCATCCAA
Il6_rev	AACGCACTAGGTTTGCCGAGTAGA
Lif_fwd	ATTGTGCCCTTACTGCTGCTG
Lif_rev	GCCAGTTGATTCTTGATCTGGT
Cxcl5_fwd	AATGCACTCGCAGTGGAAAGAACG
Cxcl5_rev	TGAGCAGGAAGCTTCAGGGACAAT
Csf1_fwd	ATGAGCAGGAGTATTGCCAAGG
Csf1_rev	TCCATTCCCAATCATGTGGCTA
Ccl11_fwd	GAATCACCAACAACAGATGCAC
Ccl11_rev	ATCCTGGACCCACTTCTTCTT
Tgfb1_fwd	TAAAGAGGTCACCCGCGTGCTAAT
Tgfb1_rev	ACTGCTTCCCGAATGTCTGACGTA
Il1b_fwd	AATGACCTGTTCTTTGAAGTTGAC
Il1b_rev	GTGATACTGCCTGCCTGAAG
Il7_fwd	TTCCTCCACTGATCCTTGTTCT
Il7_rev	AGCAGCTTCCTTTGTATCATCAC
Cxcl2_fwd	ACATCCCACCCACACAGTGAAAGA
Cxcl2_rev	TCCTTCCATGAAAGCCATCCGACT
Il10_fwd	GCTCTTACTGACTGGCATGAG
IL10_rev	CGCAGCTCTAGGAGCATGTG
Ccl3_fwd	TTCTCTGTACCATGACACTCTGC
Ccl3_rev	CGTGGAATCTTCCGGCTGTAG
IL1a_fwd	GCACCTTACACCTACCAGAGT
IL1a_rev	AAACTTCTGCCTGACGAGCTT
Ifng_fwd	GCATAGATGTGGAAGAAAAGAGTC
Ifng_rev	GGTGTGATTCAATGACGCTTATG
Vegfa_fwd	GTGCTGGCTTTGGTGAGG
Vegfa_rev	AGGCTGCTGTAACGATGAAG
Il15_fwd	TGCAGTGCATCTCCTTACGC

Il15_rev	GGTGGATTCTTTCCTGACCTCTCT
Cxcl9_fwd	TCCTTTTGGGCATCATCTTCC
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iNOS(Nos2)_fwd	TCTAGTGAAGCAAAGCCCAACA
iNOS(Nos2)_rev	CCTCACATACTGTGGACGGG
Mrc1_fwd	CTCTGTTCAGCTATTGGACGC
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Msr1_fwd	CCAGCAATGACAAAAGAGATGACA
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Ym1 (Chil3)_fwd	TGTGGAGAAAGACATTCCAAGG
Ym1 (Chil3)_rev	AAGAGACTGAGACAGTTCAGGG
Arg1_fwd	CAGAAGAATGGAAGAGTCAG
Arg1_rev	CAGATATGCAGGGAGTCACC