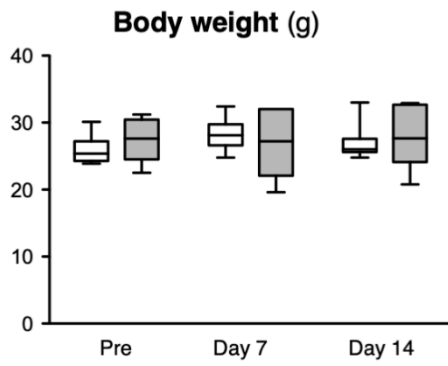
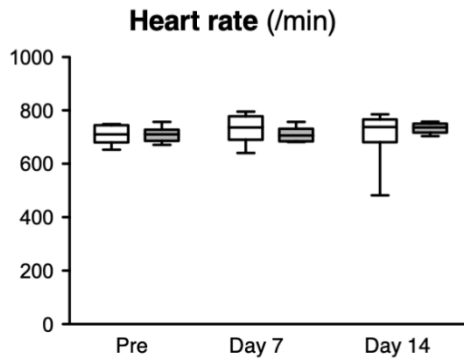
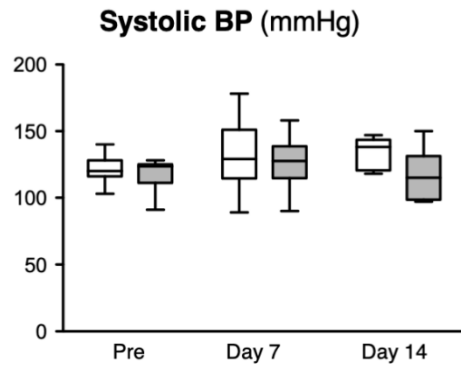


SUPPLEMENTAL MATERIAL

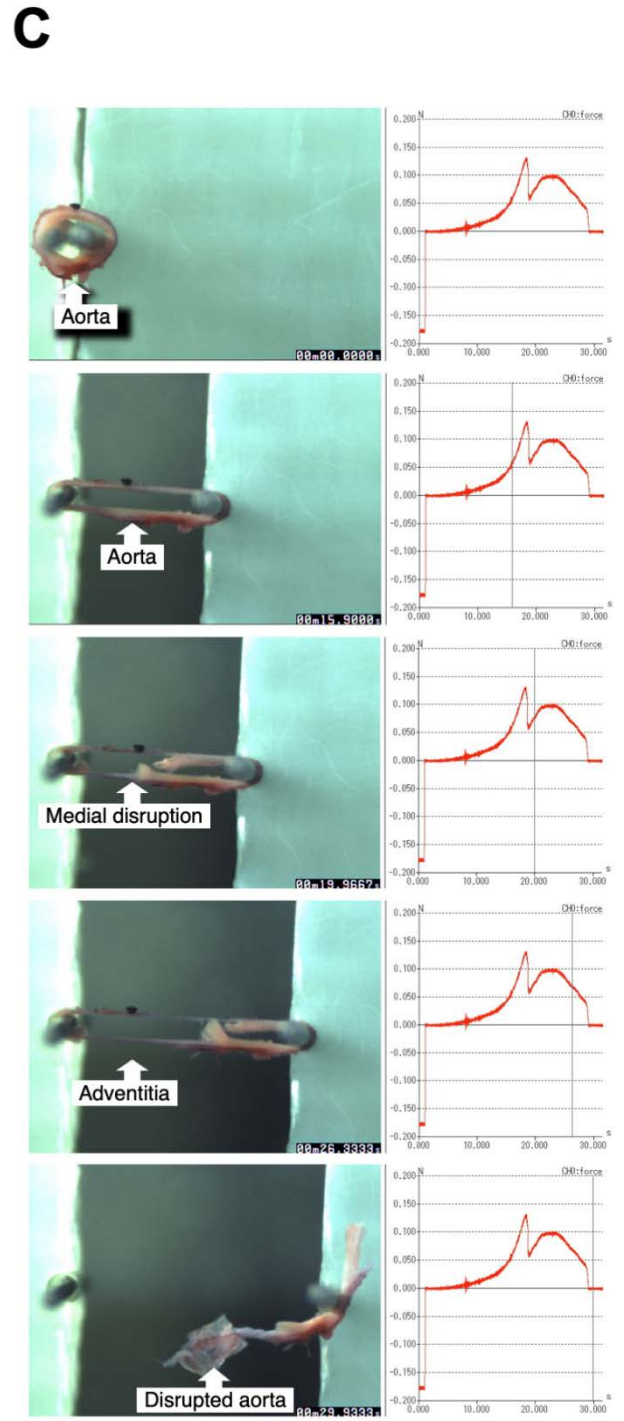
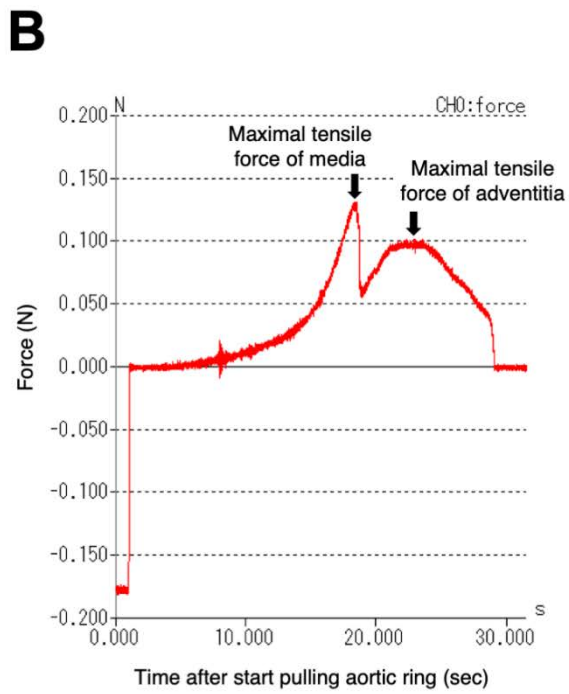
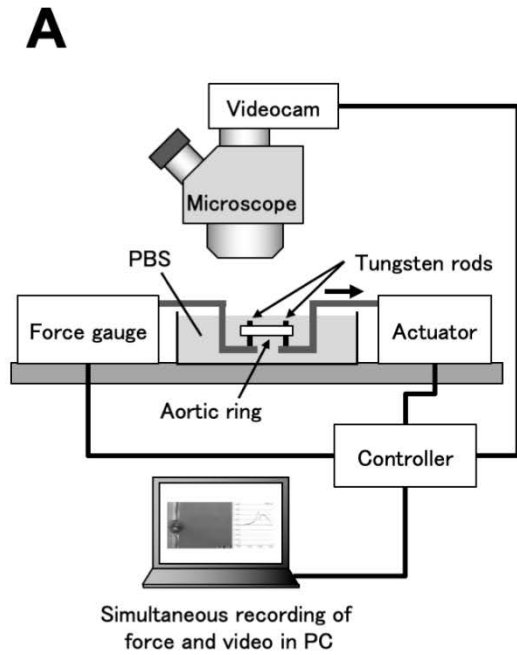
**SUPPLEMENTAL FIGURE S1 Hemodynamic parameters and body weight**

Systolic blood pressure, heart rate, and body weight for each experimental group during the BAPN+AngII challenge.



## **SUPPLEMENTAL FIGURE S2 Blood vessel tensile tester**

(A) Diagram of the blood vessel tensile tester used to measure mechanical properties of the aortic wall. (B) A representative time-force recording shows sharp and blunt peaks, which occurred at the times of maximal tensile forces in the media and adventitia, respectively. (C) A representative series of video images (*left*) and corresponding time-force recordings (*right*), showing the changes observed during force applied by pulling the rods apart. Vertical lines on the recordings indicate the time during the measurement that the image was taken.



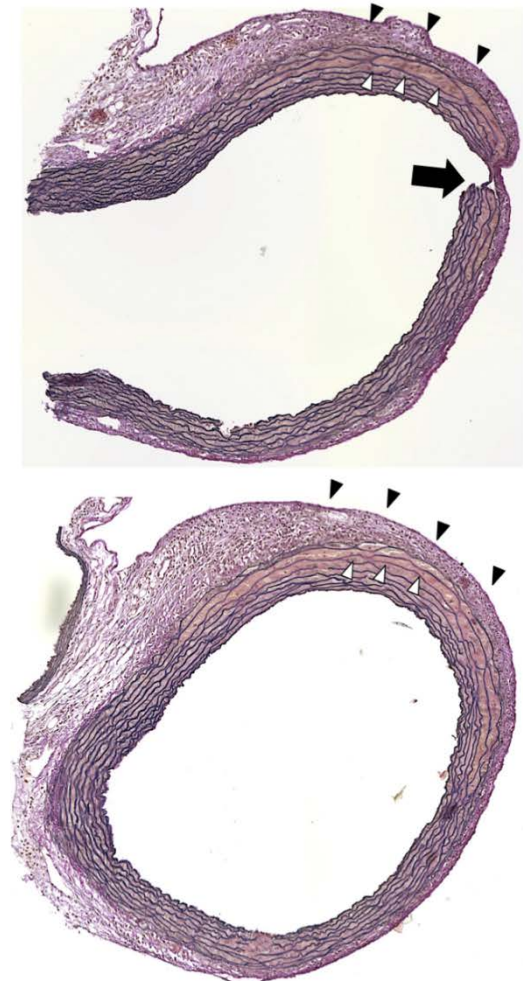
### **SUPPLEMENTAL FIGURE S3 Mouse AD model**

Representative images show signs of AD in serial sections of the distal arch isolated from a BAPN+AngII-treated mouse. (*Left*) Hematoxylin and eosin staining. (*Right*) EVG staining. Upper panels appear U-shaped because they show a part of the aortic arch. Lower panels show the proximal descending aorta. Black arrows indicate the site of tearing. White arrowheads indicate the intramural hematoma adjacent to the tear. Black arrowheads indicate cellular infiltration in the adventitia surrounding the site of entry. Scale bar: 200  $\mu\text{m}$ .

H&E

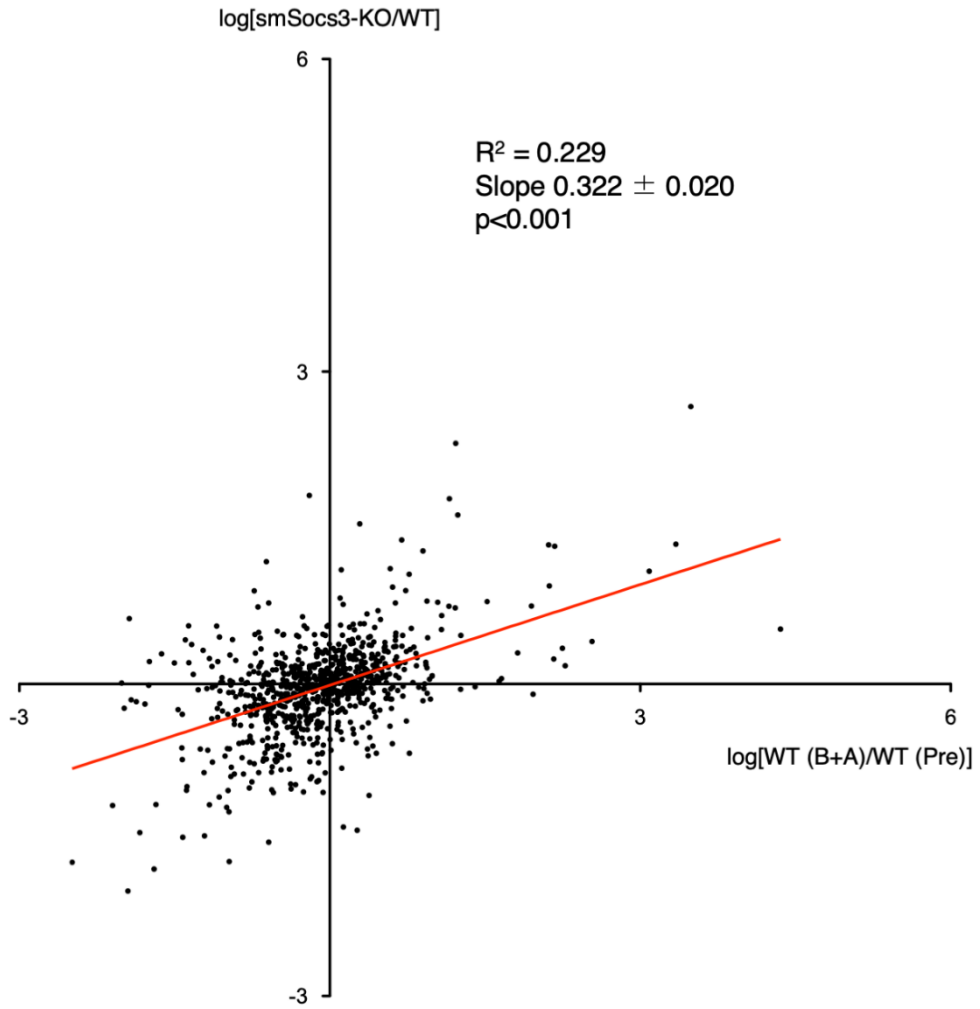


EVG



**SUPPLEMENTAL FIGURE S4 Gene expression pattern induced by smooth muscle *Socs3* deletion or BAPN+AngII challenge**

The gene expression changes induced by smooth muscle *Socs3* deletion (smSocs3-KO) show a correlation with the changes induced by BAPN+AngII (B+A) challenge compared with baseline. Values indicate logarithm of fold changes to base 2. Red line indicates the linear regression for the smSocs3-KO and B+A datasets.

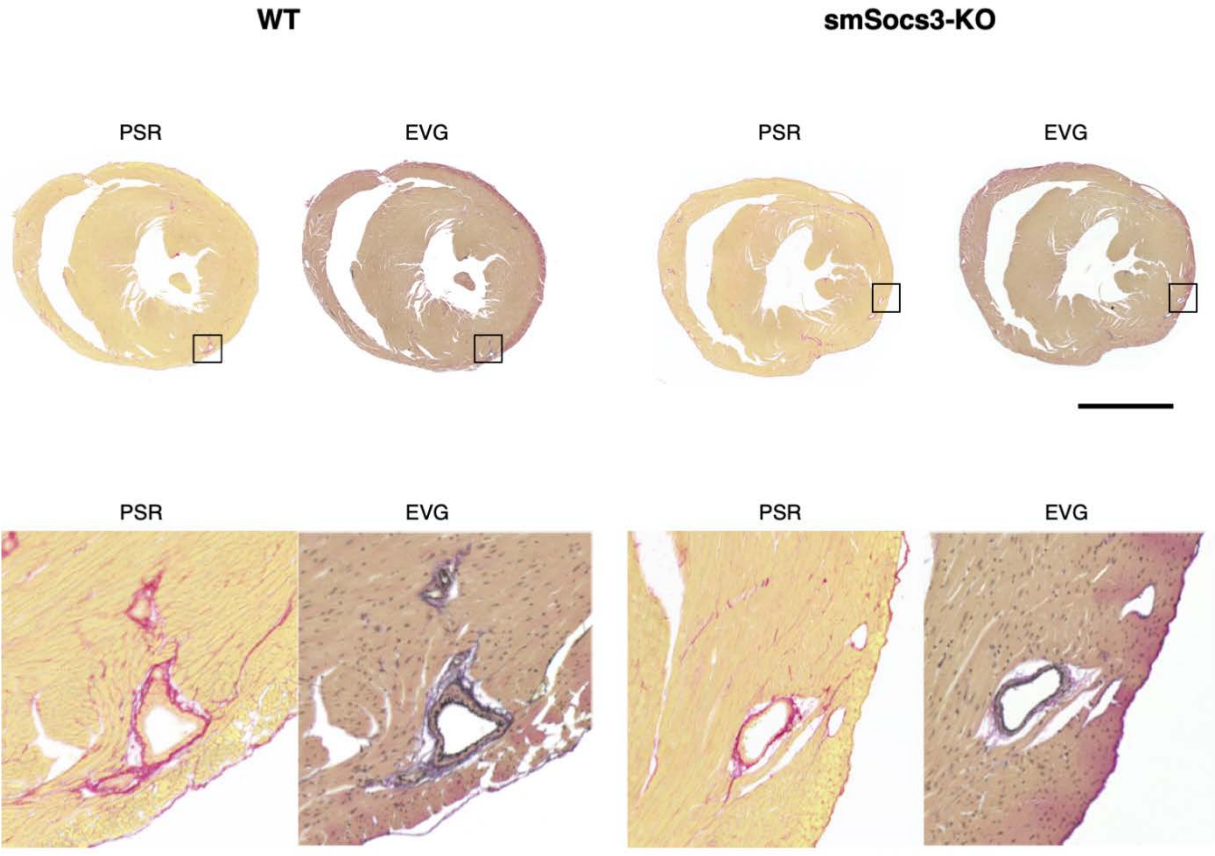


Hirakata, Supplemental Figure S4



### **SUPPLEMENTAL FIGURE S5 Picrosirius red staining of heart tissue**

Representative images are shown for picrosirius red staining of heart tissue sections from wild-type and smSocs3-KO mice. Bar: 1 mm. Rectangular areas in the upper panels correspond to enlarged images in the lower panels.



Hirakata, Supplemental Figure S5

**SUPPLEMENTAL TABLE S1 Induced genes in smSocs3-KO aorta compared with WT aorta  
at the baseline**







Cysltr1	58861	81.81044917	97.81993917	71.83044667	121.6015192	182.8527333	219.1964917	2.039121519	0.007
Grrp1	72690	89.88207159	96.55576748	107.4004732	148.8577861	229.2819804	230.4525026	2.035893895	0.003
Tmem176b	65983	5172.137083	5180.343583	5114.810917	8339.713508	10035.19217	13687.54775	2.029464376	0.003
Slc9a3r1	26941	309.339975	413.855682	216.290525	544.0617833	574.7258583	737.2166	2.026720717	0.010
Gair2	14428	7.011698417	6.310986328	8.705124167	19.690335	17.00248357	9.558440833	2.0252829	0.016
Pibd1	66857	832.0021833	751.428125	538.0607583	1256.06185	1355.173242	1640.132869	2.024637211	0.003
Psd4	215632	12.45036058	10.94017942	5.229777167	12.42553892	23.46231083	20.22622417	2.022881419	0.047
Rbp7	63954	73.20832083	64.99948333	65.47007	262.1103167	114.5090167	85.78133417	2.021782721	0.050
Pcdh12	53601	35.03722417	57.747825	55.38157917	68.24628583	109.5968883	123.2192867	2.018560445	0.017
Tuft1	22156	45.3231475	47.2856525	26.58347583	58.45660167	66.35305417	120.6656042	2.017772754	0.031
Smim14	68552	5.260833917	6.671731167	10.82814192	20.52037564	13.244445	11.48339092	2.017502355	0.026
Trim12a	76681	111.3504008	122.3857075	205.8158333	277.478575	280.1323759	295.813575	2.016368312	0.007
Apold1	381823	17.777655	34.18852083	18.13047667	42.47839917	48.17761667	44.13986583	2.01632322	0.012
Samd10	229011	7.997011417	7.519264833	12.87296758	15.84233167	23.6963175	16.89572167	2.016036133	0.010
Mapkapk3	102626	296.7993417	299.7701833	351.834475	646.647525	419.92785	943.7004442	2.015404542	0.017
Camk1g	215303	23.47066583	26.47621083	20.00704583	47.7918075	48.31762583	43.696515	2.009619125	0.001
Hist1h4i	319158	63.46079727	59.69958083	42.0020575	127.7230358	92.80150167	108.89423	2.009218853	0.004
Rasgrf2	19418	11.543823	19.86248083	7.157514417	20.09667333	22.7754225	28.78423333	2.001855285	0.042
Cdkn1a	12575	33.59787333	45.95797	55.46687333	63.29614667	93.54462402	115.9672265	2.001435913	0.015

**SUPPLEMENTAL TABLE S2 Suppressed genes in smSocs3-KO aorta compared with WT aorta  
at the baseline**





Pcsk6	18553	2860.36325	2911.440917	2165.289917	1101.061942	1635.4617	1118.477017	0.481590587	0.003
Gm8702	667558	30.697825	16.9357825	23.97178167	10.84887058	15.4691475	8.296262833	0.481622471	0.016
Ankrd36	76389	18.74938	13.0126175	11.41295058	10.33790433	3.865698583	7.82066075	0.482375021	0.041
Sec144	103655	48.630985	36.2848975	39.726195	35.37558	12.50619233	17.931635	0.48370162	0.037
Syt1	20979	55.43825833	49.38825167	51.22372917	40.54503331	22.548185	17.46669667	0.484676395	0.017
Csmd2os	74989	25.97878583	16.17659583	23.28609333	8.190739833	12.04660183	11.39475867	0.486142288	0.006
Fam178b	381337	44.17753583	31.25626667	39.16391333	22.89336167	15.48176583	17.55245	0.486348647	0.003
Ildr1	106347	8.36926475	13.4964725	19.49249167	4.815884	8.117915583	6.586606417	0.489030307	0.028
Pabpc2	18459	65.08502917	48.27895083	58.94612583	31.14145083	27.20945833	25.596405	0.489231605	0.001
Gm3871	100042497	36.89673917	37.8660125	33.0973775	17.8422475	15.2910325	20.5874775	0.495244265	0.001
Olf1316	258737	13.65212167	20.75422833	20.502105	15.8011125	6.125121833	7.305044333	0.495571915	0.044
Skor1	207667	129.1217625	57.91846833	102.1128967	51.46538667	36.92027417	48.92666667	0.495613231	0.021
Vsx1	114889	100.8597378	66.425275	88.58083833	71.24480333	36.84981417	27.77005333	0.497116382	0.037
Ceacam20	71601	96.78628649	56.85151	83.5901325	49.99184833	32.73743083	34.52624917	0.497119479	0.010