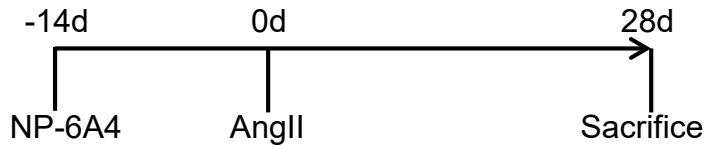


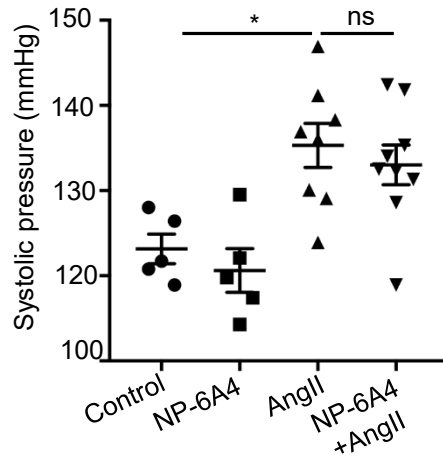
**Supplemental Table 1: List of mouse primer sequences used for qRT-PCR studies**

<b>Gene</b>	<b>Forward Primer (5'-3')</b>	<b>Reverse Primer (5'-3')</b>
<i>Il6</i>	CTA CCC CAA TTT CCA ATG CT	ACC ACA GTG AGG AAT GTC CA
<i>Mmp2</i>	GAT GTC GCC CCT AAA ACA GA	TGG TGT TCT GGT CAA GGT CA
<i>Mmp9</i>	AGA CCT GAA AAC CTC CAA CCT CAC	TGT TAT GAT GGT CCC ACT TGA GGC
<i>Il10</i>	GCTCTTACTGACTGGCATGAG	CGC AGC TCT AGG AGC ATG TG
<i>Tnfa</i>	CCC ACT CTG ACC CCT TTA CT	TTT GAG TCC TTG ATG GTC GT
<i>iNos</i>	CTC GGA GGT TCA CCT CAC TGT	TCC TGA TCC AAG TGC TGC AGA
<i>At2r</i>	ATG ATT GGC TTT TTG GAC CTGT	AAG GGT AGA TGA CCG ATT GGT
<i>At1ar</i>	GGA AAC AGC TTG GTG GTG AT	ACA TAG GTG ATT GCC GAA GG
<i>At1br</i>	TAC GCC AAG GAA TGA TGA CA	GTC CAC TAC GTC CGC AAT TT

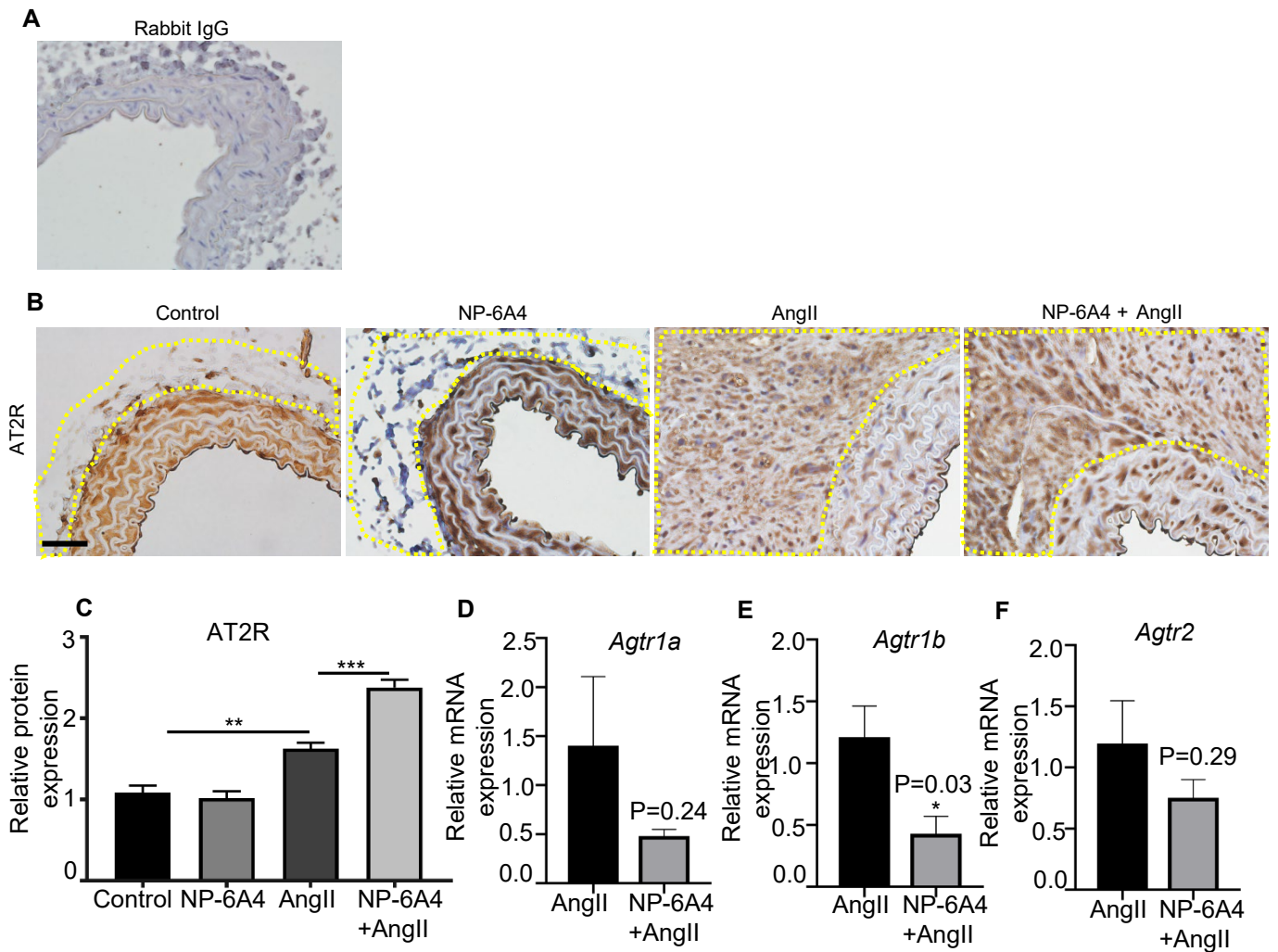


NP-6A4 (2.5 mg/kg/day) was given subcutaneously in *Apoe*<sup>-/-</sup> mice on alternate days starting 14 days before AngII infusion and continued for 28 days after AngII.

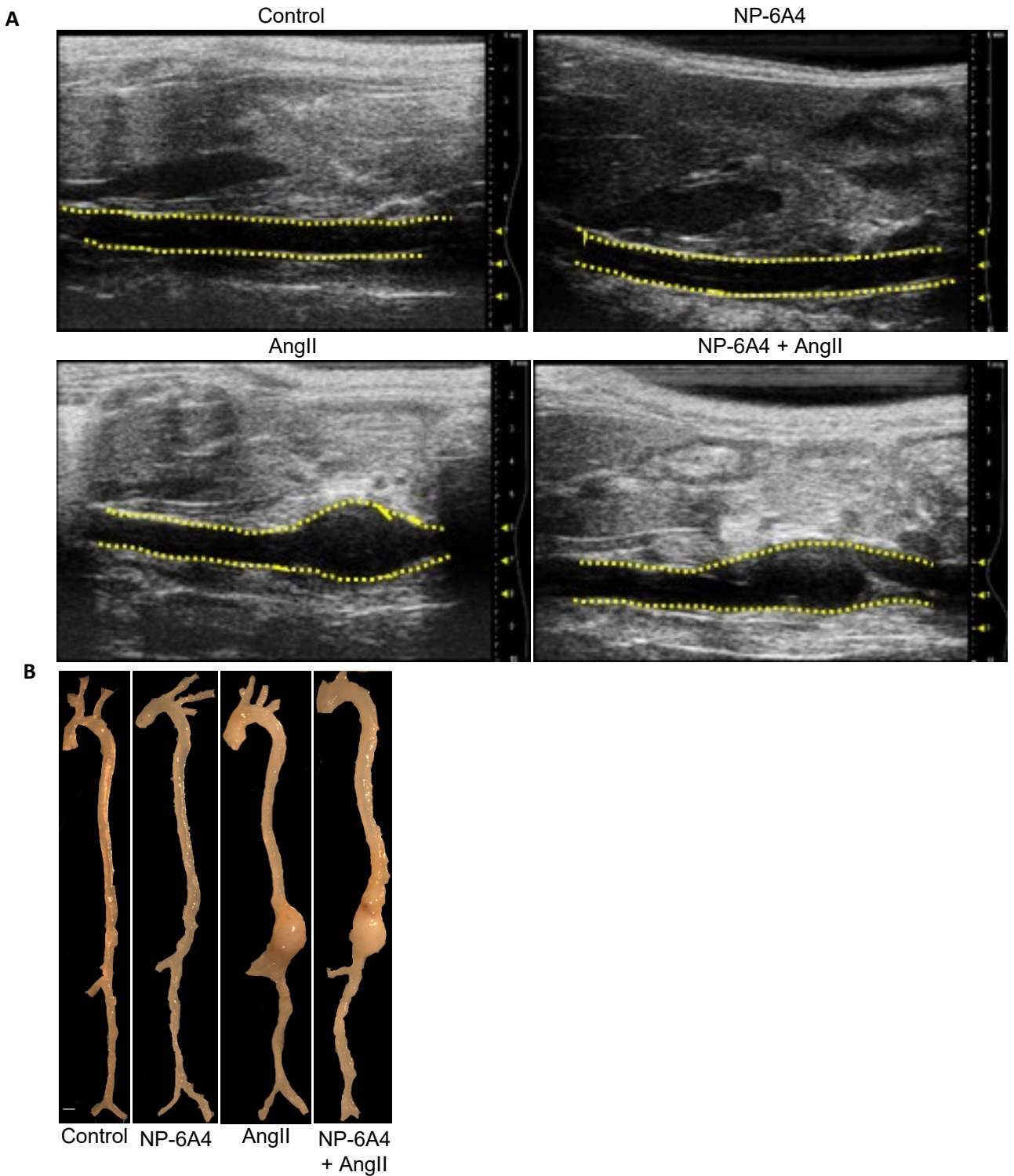
**Supplemental Figure 1.** Experimental strategy for *in vivo* studies.



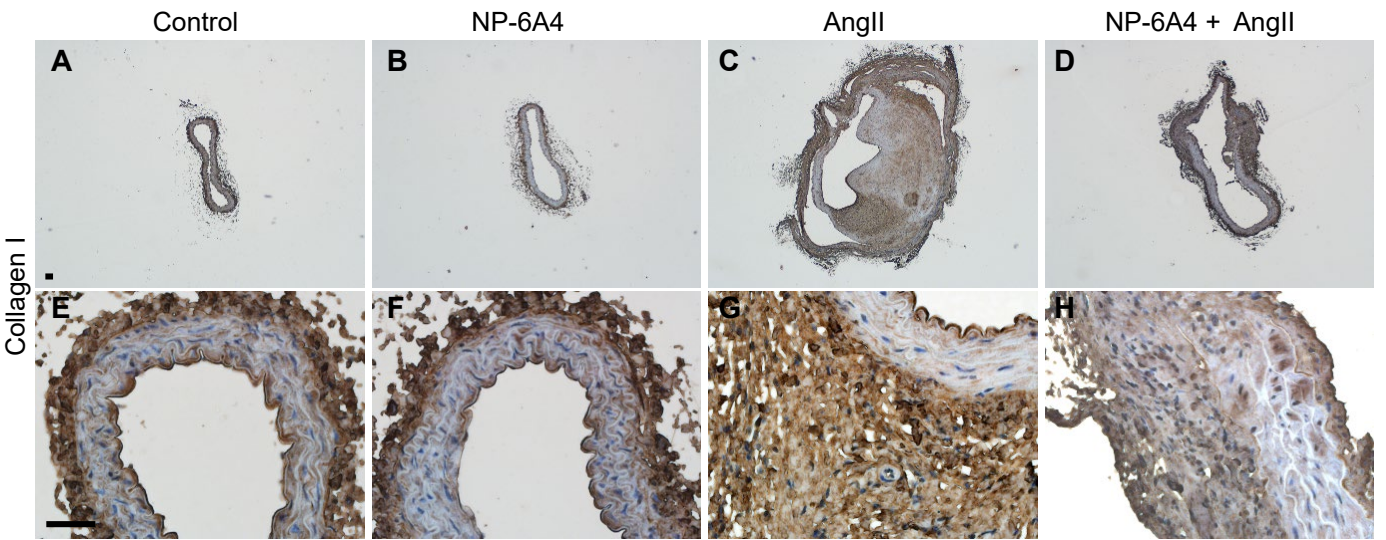
**Supplemental Figure 2.** NP-6A4 treatment did not affect the systolic arterial blood pressure significantly in *Apoe*<sup>-/-</sup> mice at baseline or in response to AngII.



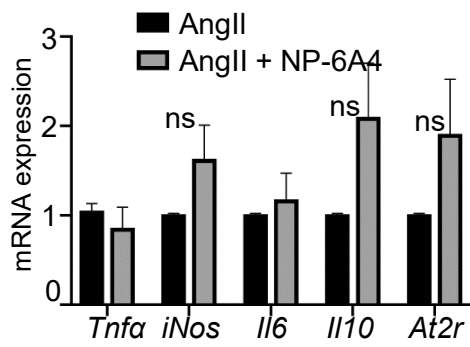
**Supplemental Figure 3.** Increase in AT2R protein ( encoded by *Agtr2* gene) expression in the adventitial region of aorta in response to NP-6A4 treatment and AngII infusion in the *Apoe*<sup>-/-</sup> mice. **(A)** Immunohistochemistry (IHC) showing rabbit IgG staining in place of AT2R primary antibody as a negative control staining. **(B)**, IHC showing expression of AT2R, NP-6A4 agonist, in the aortic tissue at day 28 of indicated mice (Scale bar = 50  $\mu$ m). **(C)**, Quantification of AT2R protein expression in aortic tissues relative to control. **(D-F)**, mRNA expression of mouse *Agtr1a* (AT1a), *Agtr1b* (AT1b) and *Agtr2* in aortic tissues from experimental *Apoe*<sup>-/-</sup> mice in the indicated groups as measured by qRT-PCR (n=4 mice in each group). The indicated values are relative to AngII expression level.



**Supplemental Figure 4.** (A), Representative transabdominal ultrasound images obtained at day 28 using a VisualSonics Vevo2100 showing an increase in the luminal expansion of abdominal aorta in *ApoE*<sup>-/-</sup> mice in response to AngII. (B), Representative aortae from experimental *ApoE*<sup>-/-</sup> mice showing maximal aortic width in the suprarenal region of the aorta. Images were taken using Zeiss Stemi 2000-C microscope. Yellow dotted lines outline the lumen of the aorta in A. Scale bar, 1mm.



**Supplemental Figure 5.** (A - H), Representative IHC images showing expression of collagen I in the aortic tissue at day 28 of experimental *Apoe*<sup>-/-</sup> mice. 4 X and 40 X images are shown in A-D and E-H, respectively. Scale bar = 50  $\mu$ m.



**Supplemental Figure 6.** mRNA expression of *Tnfa*, *iNos*, *Il6*, *Il10* and *Agtr2* in bone-marrow derived macrophages isolated from mice treated with either AngII alone or with AngII plus NP-6A4 treatments as measured by qRT-PCR. ns=non significant in paired two-tailed Student *t* test.