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Data of this study and additional information on the methods can be obtained upon reasonable request to the corresponding author.

Animals

Specific pathogen-free (SPF) male C57BL/6J mice aged 7-8 weeks weighing 20-22 g were purchased from Beijing Vital River Laboratory Animal Technology Co., Ltd. (Beijing, China). The DEREG mice expressing a diphtheria toxin (DT) receptor under the control of the foxp3 gene locus were purchased from the Jackson Laboratory (ME, USA). The KikGR/B6-ROSA transgenic mice were purchased from RIKEN BioResource Research Center (Tokyo, Japan). The mice used in this study were maintained in individually ventilated cages under a strict 12-hour light/dark cycle in the SPF animal facility of Huazhong University of Science and Technology (Wuhan, China). Mice aged 7-8 weeks were randomly assigned to different groups and provided *ad libitum* access to a chow diet and water as indicated for the different experiments. All mouse studies were approved by the Animal Care and Utilization Committee of Huazhong University of Science and Technology (no. [2017]-S100). All procedures were conducted in accordance with the National Institutes of Health guidelines. Sample size was calculated with G*power software (Heinrich-Heine-Universität Düsseldorf) and an estimated effect size determined from the literature. The minimal sample size n was used based on ethical considerations.

SCFA administration

Mice were randomly assigned and provided *ad libitum* access to sodium acetate (200 mmol/L) (791741, Sigma–Aldrich; MO), sodium propionate (200 mmol/L) (P1880, Sigma–Aldrich; MO) or sodium butyrate (200 mmol/L) (B5887, Sigma–Aldrich; MO) that was dissolved in the autoclaved water, with a pH- and sodium-matched chloride solution serving as the control. These solutions were

changed every three days throughout the experiment.

Measurement of fasting serum lipids

Mice were fasted for 12 hours prior to the collection of blood samples. The blood was centrifuged at 1000 G for 10 minutes to obtain the fasting serum. The Cholesterol Quantitation Kit (MAK043, Sigma–Aldrich; MO) and Triglyceride Quantitation Kit (MAK266, Sigma–Aldrich; MO) were used to determine the levels of total cholesterol (TC) and triglyceride (TG), respectively. HDL and LDL/VLDL Quantitation Kit (MAK045, Sigma–Aldrich; MO) was used to determine the levels of high-density lipoprotein (HDL) and the sum of very low-density lipoprotein (VLDL) and low-density lipoprotein (LDL). The measurements were all performed according to the manufacturer's instructions.

$Ca_3(PO_4)_2$- and elastase-induced AAA mouse models

Male mice were used to induce AAA. The mice were anesthetized with an induction dose of 4% (vol/vol) isoflurane in an induction chamber (RWD; Shenzhen, China). After the mice had difficulty standing, the isoflurane was delivered via a mouse anesthesia mask and the dose of isoflurane was adjusted to 2% (vol/vol). If the mouse did not respond to a moderate press on the toes by an index finger, the amount of anesthesia was deemed appropriate.

Mice were fixed supine on a heating pad to maintain their body heat throughout the surgery. The hair on the abdomen was shaved, and the skin and muscle layers were cut along the abdominal midline at a length of 1.5 cm. An elastase-induced AAA model was established as previously described [(1)]. Briefly, the infrarenal region of the abdominal aorta was exposed under stereomicroscope and a small piece of gauze soaked in 10 μL of porcine pancreatic elastase (E1250, Sigma–Aldrich; MO) was applied around the aorta

for 10 minutes. Then the peritoneal cavity was rinsed twice, and the muscle and skin layers were closed with interrupted sutures.

The $Ca_3(PO_4)_2$-induced AAA model was also established as previously described [2]. Similarly, a piece of gauze soaked in 0.5 mol/L calcium chloride solution was applied around the aorta for 10 minutes and replaced with a piece of PBS-soaked gauze for 5 minutes. Then the peritoneal cavity was rinsed twice, and the muscle and skin layers were closed with interrupted sutures.
After the surgery, the mouse was kept in fresh air for 5-10 minutes, allowing resuscitation. To alleviate pain, buprenorphine (0.1 mg/kg) was administered subcutaneously every 12 hours for the first 48 hours after the procedure.

Measurement of aortic enlargement

Mice were euthanatized by an overdose of intraperitoneal sodium pentobarbital solution (200 mg/kg). After euthanasia, blood was washed out by the injection of heparin-saline into the left ventricle of each mouse. The abdominal aorta was separated from peri-aortic connective tissue and photographed *ex vivo* (Nikon D7200). To determine aneurysmal dilation, Image J software (NIH; MD) was used to measure the maximal external diameter, which was defined as the adventitial width at the maximal expanded portion of the infrarenal aorta. At least 3 measurements of the maximal external diameter for each mouse were made and averaged. All measurements were performed by an investigator blinded to the treatment groups.

EVG and immunohistochemistry Staining

Each aneurysm was fixed in 4% paraformaldehyde for 24 hours prior to being embedded in paraffin. To more comprehensively examine the pathology, 4-8 cross sections at a 200 μm interval were prepared from each aneurysm, and 4 sections were placed on a slide. Each section was 4 μm thick. Paraffin sections were heated and deparaffinated in xylene and rehydrated through a

series of gradient ethanol bathes.

Serial sections were analyzed using the Elastica van Gieson (EVG) staining kit according to the manufacturer's protocol (115974, Sigma–Aldrich, MO) for elastin assessment. EVG, which stains elastin in a dark color, allows the visualization of the degradation of elastin. Immunohistochemistry staining was performed using the following primary antibodies: anti-CD3 (ab5690, 1/100; Abcam; UK), anit-CD68 (ab283654, 1/100; Abcam; UK), anti-MMP2 (ab37150, 1/100; Abcam; UK), anti-MMP9 (ab38898, 1/100; Abcam; UK), and IgG isotype control (ab37415; Abcam; UK) with the same concentration as the corresponding antigen specific IgG. RGB images as TIFF files were acquired at 10 X or 20 X magnification using an OLYMPUS BX51 microscope (Olympus; Japan) and analyzed with Image Pro Plus (Media Cybernetics, Inc.; MD) and Adobe Photoshop (Adobe; CA).

Quantitative analysis was performed by a trained investigator who was blinded to the experiment design. EVG positive dark black staining was chosen manually in Adobe Photoshop software. The total sectional aortic area without the area of the lumen was also calculated. The EVG positive area ratio was expressed as the percentage of the positively stained area to the total sectional aortic area. The number of $CD3^+$ T cells and $CD68^+$ macrophages were assessed by counting positively stained cells in every cross section of the aneurysm. MMP2 or MMP9 staining was calculated by the ratio of the positive staining area to the total sectional aortic area. The mean value was calculated from 4-8 serial sections of each mouse.

Cell isolation from lymphoid organs and blood

The spleens, lymph nodes of mice were isolated, placed on a 70 μm cell strainer and gently homogenized with the end of a 1 ml syringe plunger. Lymph nodes cells were eluted from the strainer with 10 ml PBS. For spleens, the strainer was washed with 10 ml erythrocyte lysis buffer (420302, BioLegend,

CA), and the eluted cells were incubated for 5 min at room temperature and washed with 40 ml PBS. Blood samples were taken from the tail vein or retrobulbar vein into tubes containing sodium heparin, and then diluted with PBS. The blood cell suspensions were then loaded onto lymphocyte separation medium (0850494X, MP Biomedicals, CA) and centrifuged at 800 G for 20 minutes at room temperature with acceleration and no braking. The peripheral blood mononuclear cells (PBMCs) were collected at the interface. Cells isolated from lymphoid organs and blood were subsequently used for flow cytometry or cell sorting.

Isolation of single cells from the intestine and aorta

LP lymphocytes were separated as previously reported [(3)]. Briefly, small and large intestines free of mesenteric fat were separately collected and longitudinally cut in ice-cold PBS. After the intestinal content was removed, Peyer patches (PP), which existed only in the small intestine, were excised from the outer side of the small intestine, and the small and large intestines of each mouse were cut into 1 cm pieces and incubated twice at 37°C for 20 minutes in D-Hank's solution containing 5 mM ethylenediaminetetraacetic acid (EDTA) and 1 mM dithiothreitol (DTT) to remove epithelial cells. Intestinal pieces were then extensively washed with ice-cold PBS to remove EDTA and DTT. The tissue was then minced and digested in HBSS containing 2mg/ml collagenase type I (C0130, Sigma–Aldrich; MO) and 0.5 mg/ml deoxyribonuclease I (D4527, Sigma–Aldrich; MO) twice at 37°C for 40 minutes. The cell suspension was centrifuged and resuspended in 40% Percoll (17-0891-01, GE Healthcare; IL). The total cell suspension in 40% Percoll was loaded onto 80% Percoll and centrifuged at 800 G for 20 minutes at room temperature with acceleration and no braking. The LP lymphocytes were collected at the interface. PPs were digested via the same method to release PP lymphocytes. Cells were stained for flow cytometric analysis.

Lymphocytes from the aneurysm were separated as described previously [2]. Briefly, the whole aorta containing the aneurysm was cut into small pieces and incubated three times for 20 minutes at 37°C with gentle shaking (120 r.p.m.) in a mixture of 237 U/ml collagenase type I (C0130, Sigma–Aldrich; MO), 190 U/ml collagenase type XI (C7657, Sigma–Aldrich; MO), 120 U/ml hyaluronidase (H3506, Sigma–Aldrich; MO), and 120 U/ml deoxyribonuclease I (D4527, Sigma–Aldrich; MO) in PBS. The total digestion solution was collected and filtered through a 40 μm microfilter. Cells were stained for flow cytometric analysis.

Fluorescence activated cell sorting of naïve T cells

Cell suspensions harvested from the spleens, mesenteric lymph nodes of untreated C57BL/6J mice were centrifuged at 500 G for 7 min and subsequently stained with the following surface marker antibodies: PE-labeled anti-CD25 antibody (101904, BioLegend, CA), APC-labeled anti-CD62L antibody (104412, BioLegend, CA), FITC-labeled anti-CD44 antibody (103006, BioLegend, CA), PE/Cy7-labled anti-CD4 antibody (25-0041-82, eBioscience, CA). After staining in PBS at 4°C for 30 minutes, $CD4^+CD25^-CD62L^{hi}CD44^-$ naïve T cells were sorted using FACSAria IIu (BD Immunocytometry Systems; CA). The whole procedure was performed under sterile condition.

***In vitro* assay**

Lymphocytes from spleen and lymph nodes of untreated C57BL/6J mice were harvested and $CD4^+CD25^-CD62L^{hi}CD44^-$ naïve T cells sorted by FACS were used for *in vitro* assay. The *in vitro* Foxp3 induction assay was performed by incubating 10^5 naïve T cells with TGFβ1 (7666-MB-005, R&D Systems; MN) and IL-2 (402-ML-100/CF, R&D Systems; MN) in 96 flat-bottom plates coated with anti-CD3 (100313, BioLegend; CA) and anti-CD28 antibodies (102112, BioLegend, CA) in the presence or absence of 0.1 mmol/L propionate (P5436,

Sigma–Aldrich; MO). After 96 hours, cultured cells were collected and analyzed by flow cytometry.

Depletion of Tregs

For depletion of Tregs in DEREG mice, male DEREG mice of C57BL/6 background were used. The depletion of Tregs was performed by the intraperitoneal injection of 500 ng DT (D0564; Sigma–Aldrich; MO) at three time points, that is, 2 days before, 1 day before and 7 days after the induction of AAA. Mice in the control group were injected with PBS.

For depletion of Tregs with anti-CD25 IgG (102040, BioLegend; CA) experiment, male C57BL/6 mice were used. Intraperitoneal injection with 300 μg anti-CD25 IgG was performed 2 days before, 1 day before, and 7 days after the induction of AAA. Mice in the control group were injected with 300 μg of the IgG isotype control antibody (401916, BioLegend; CA).

Photoconversion of the colon of KikGR mouse

The whole procedure was performed as previously described [(3)]. Briefly, KikGR mice, which universally express a photo-convertible green fluorescent reporter protein (Kik-green$^+$) that turns red (Kik-red$^+$) after exposure to 405 nm ultraviolet light, were anesthetized with isoflurane. After shaving the hair on the abdomen, an incision was made on the midline of the abdomen and the colon was carefully exposed. Photoconversion (phC) was performed with a defocused (1.5-cm beam diameter) ultraviolet laser source (405 nm, peak power 4.5 mW, ThorLabs, NJ). The colon was illuminated for 20 minutes and the surrounding tissue was covered with sterile aluminum foil avoiding exposure to the ultraviolet light. During phC, saline was continuously applied to the colon to keep it hydrated. After placing the colon back into the peritoneal cavity and rinsing twice, the muscle and skin layers were closed with interrupted sutures. The mice were kept warm with a heating pad throughout

the surgery. To alleviate pain, buprenorphine (0.1 mg/kg) was administered subcutaneously every 12 hours after the procedure. To assess the specificity of phC for colon, Kik-red^{+} Tregs in adjacent organs, including colonic dLNs, small intestinal dLNs, SI-LP and circulating blood, were analyzed immediately after exposure to ultraviolet light. To assess the efficacy of phC, Kik-red^{+} Tregs in the colon were analyzed immediately after exposure to ultraviolet light. 36 hours after phC, the mice were sacrificed for assessing the recirculation of cLP-Tregs.

Localization and removal of colonic draining lymph nodes

Colonic dLNs were localized as previously reported [4]. Briefly, after the mouse was anesthetized with isoflurane, the entire colon was exposed, and 1% Evans blue dye (E2129, Sigma–Aldrich; MO) was injected with a 31 G needle into the sub-serosal layer under the stereomicroscope. The dye quickly entered into afferent lymphatics and the dLNs were stained dark blue two minutes later while the dLNs of small intestine remained unstained. Colonic dLNs were distinguished from the small intestine dLNs.

For the colonic dLNs removal experiment, the colonic dLNs were exposed and removed carefully to prevent bleeding. After the surgery, the colon was placed back into the abdominal cavity and rinsed with saline twice, followed by suturing of the muscle and skin layers and administration of the analgesic buprenorphine.

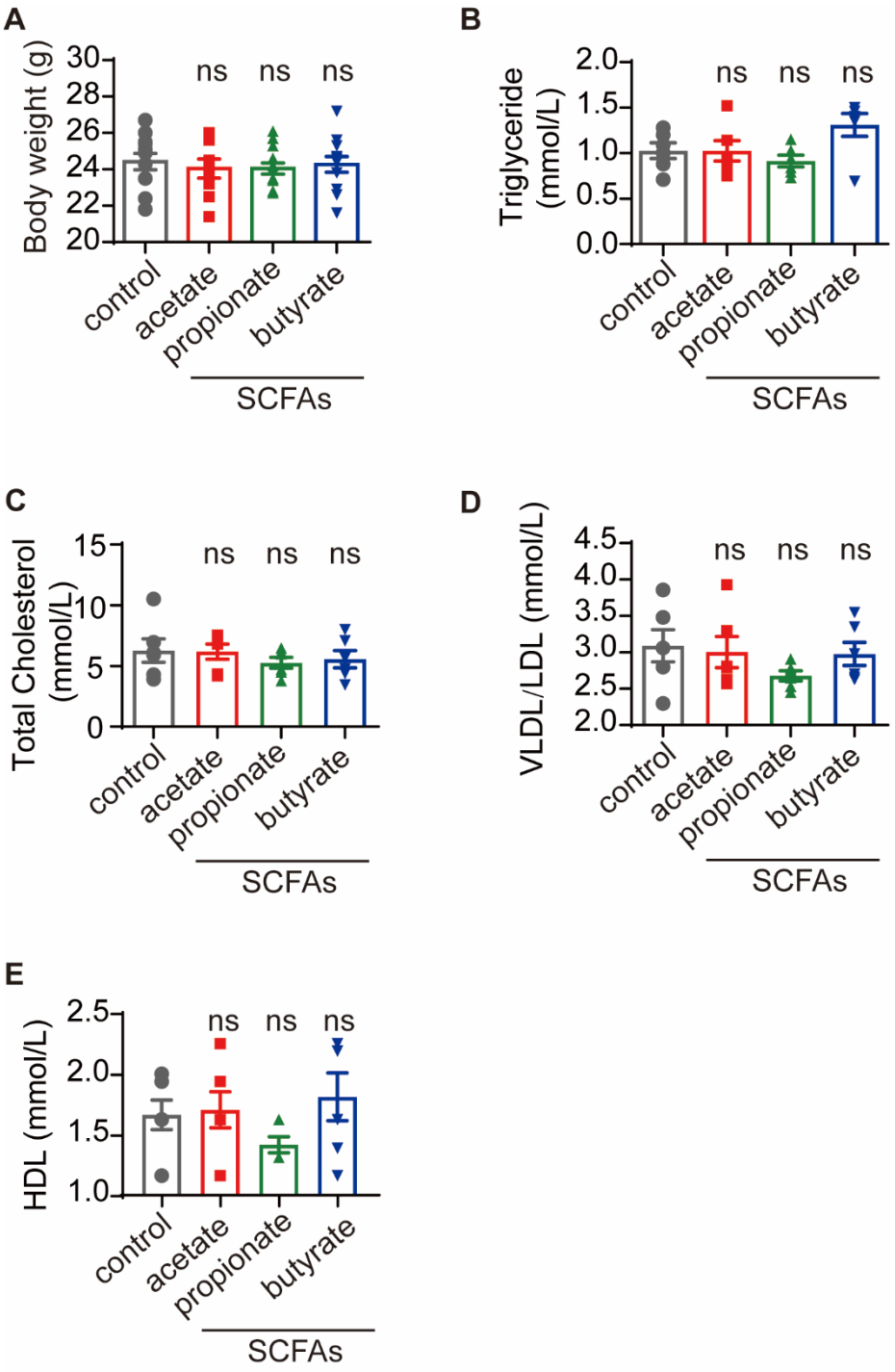
Flow cytometry staining and analysis

Cell samples were stained with fluorochrome-conjugated antibodies against surface or intracellular markers to identify desired populations. Surface markers were stained with the following antibodies in different experiments: PE-cy7-labeled anti-CD4 antibody (25-0041-82, eBioscience; CA), FITC-labeled anti-CD45 antibody (103108, BioLegend; CA), Bv421-labeled

anti-CCR7 antibody (120120, BioLegend; CA), and FITC-labeled anti-CD69 antibody (104505, BioLegend; CA) in PBS at 4°C for 30 minutes. After staining for surface marker, the cells were washed and then fixed, and permeabilized for the staining of intracellular transcription factor Foxp3 and the proliferation antigen Ki67 with the Foxp3 Fix/Perm Buffer Set (00-5523-00, eBioscience; CA). Intracellular staining was performed at 4°C for 30 minutes using the following antibodies: PE-labeled anti-Foxp3 antibody (12-5773-82, eBioscience; CA) and APC-labeled anti-Ki67 antibody (17-5698-82, eBioscience; CA). For flow cytometry analysis of kikGR mice, PerCP/Cy5.5-labeled anti-CD45 antibody (BioLegend; CA), PE-cy7-labeled anti-CD4 antibody (25-0041-82, eBioscience; CA), and APC-labeled anti-CD25 antibody (101910, BioLegend; CA) were used. Flow cytometry analysis was performed using an LSR Fortessa machine (BD Biosciences; CA), and data were analyzed with FlowJo 10.0.5 software (TreeStar Inc; OR).

Extraction of mRNA and real-time polymerase chain reaction (RT–PCR)

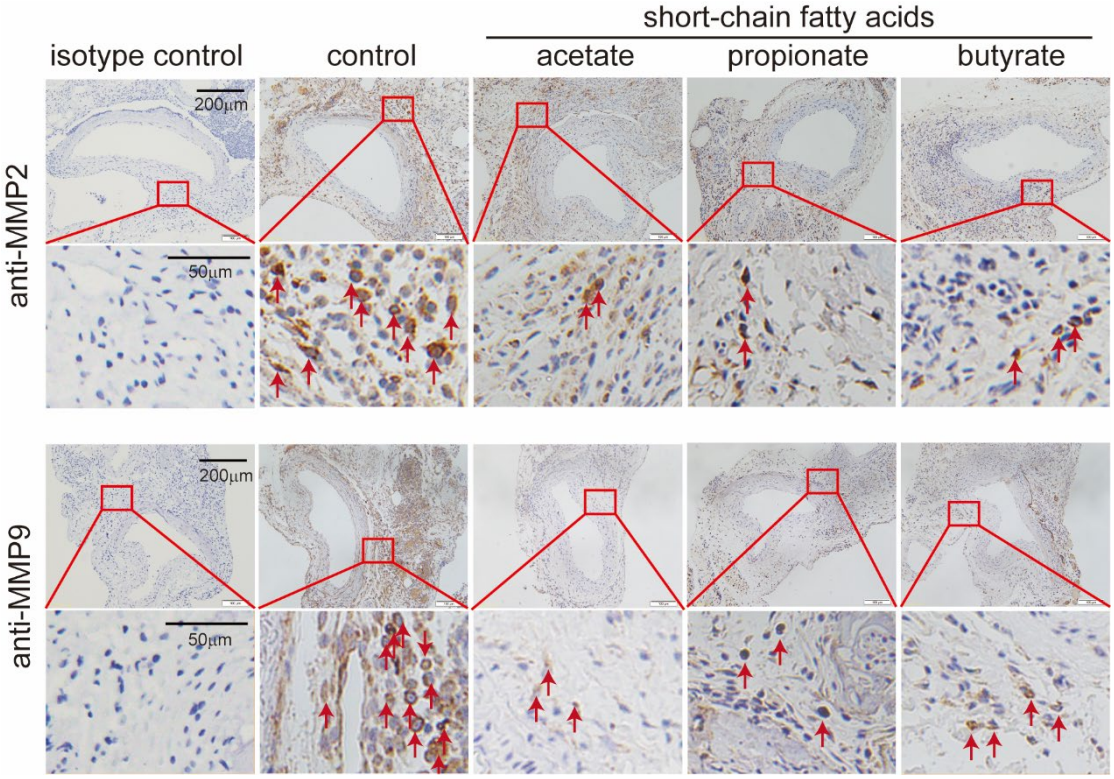
Total RNA was isolated from the whole aorta using TRIzol isolation reagent (15596018, Invitrogen; CA). Reverse transcription was performed on 1μg total RNA using PrimeScript RT Master Mix (RR036A, Takara, Japan) and RT–PCR was completed using SYBR Green Master Mix (RR066A, Takara; Japan) on the CFX manager 96X instrument (Bio–Rad, CA). The RT–PCR procedure was as follows: (1) 95°C for 3 minutes, (2) 95°C for 3 seconds, (3) 60°C for 30 minutes, (4) repeat from (2) to (3) for additional 40 times, and (5) melting from 65°C to 95°C at 0.5°C increments. The levels of mRNA were standardized to those of GAPDH, and all measurements were performed completed in duplicate. The primers used for RT–PCR are listed in the supplemental material.



Supplemental Figure 1. SCFAs administered via the oral route are well-tolerated by mice and had no influence on serum lipids.

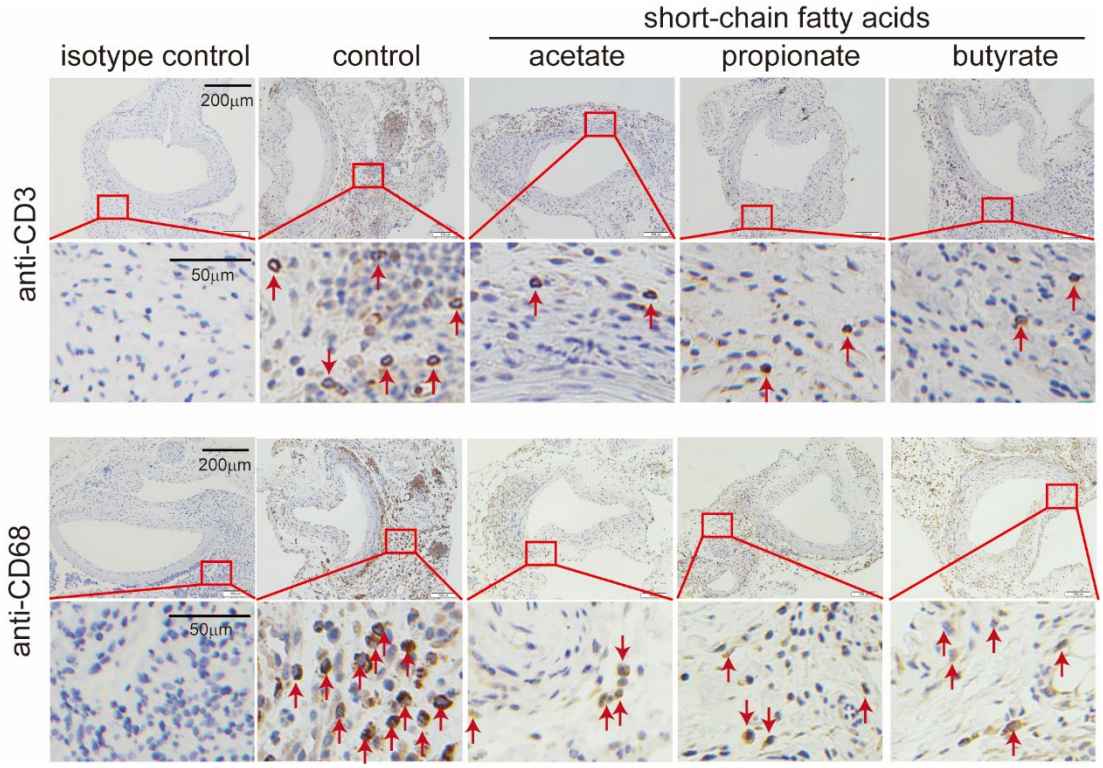
C57BL/6J mice were treated as described in figure 1A. The mice were weighed and the fasting serum of each mouse was harvested just before sacrifice. **(A)** The weights of the mice (n=9-13). **(B)** The serum triglyceride, **(C)** total cholesterol, **(D)** VLDL/LDL, and **(E)** HDL levels (n=6). Each symbol represents a value from an individual mouse. Error bars represent the mean ±

SEM. One-way ANOVA followed by Dunnett's multiple comparisons test. Data shown are representative of 2-3 independent experiments. HDL, high-density lipoprotein; LDL, low-density lipoprotein; ns, not significant; SCFAs, short-chain fatty acids; VLDL, very low-density lipoprotein.



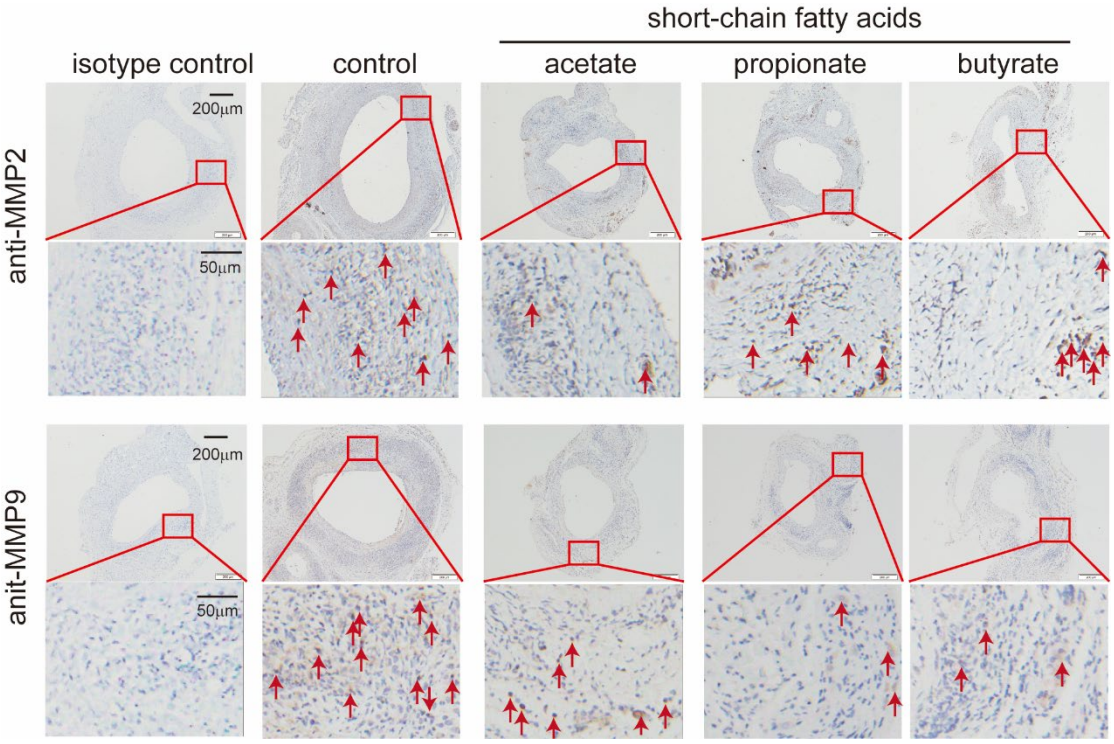
Supplemental Figure 2. SCFAs decrease the expression of MMP2 and MMP9 in the aneurysms of mice with $Ca_3(PO_4)_2$-induced AAA.

Representative Immunohistochemistry staining of the aneurysm sections from mice treated as figure 1A with anti-MMP2, anti-MMP9 antibodies or corresponding IgG isotype control. Scale bars are depicted in the images. Red arrows denote positive staining.



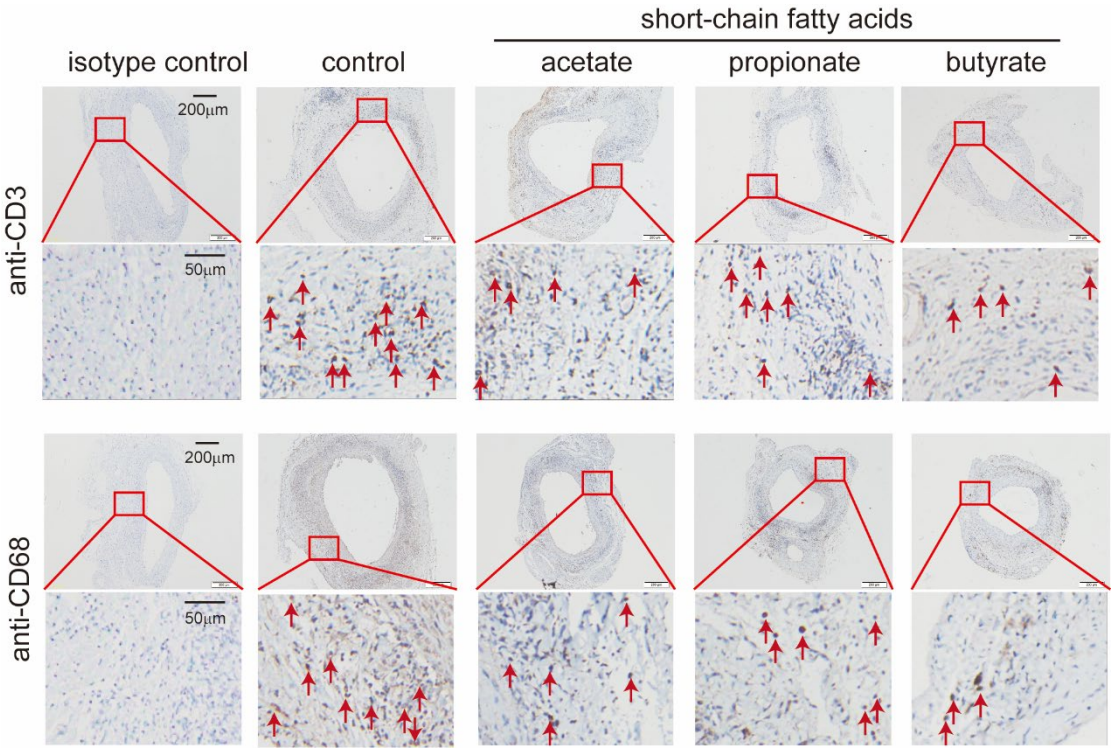
Supplemental Figure 3. SCFAs decrease the infiltrations of $CD3^+$ T cells and $CD68^+$ macrophages to the aneurysms of mice with $Ca_3(PO_4)_2$-induced AAA.

Representative immunohistochemistry staining of the aneurysm sections from mice treated as figure 1A with anti-CD3, anti-CD68 antibodies or corresponding IgG isotype control. Scale bars are depicted in the images. Red arrows denote positive staining.



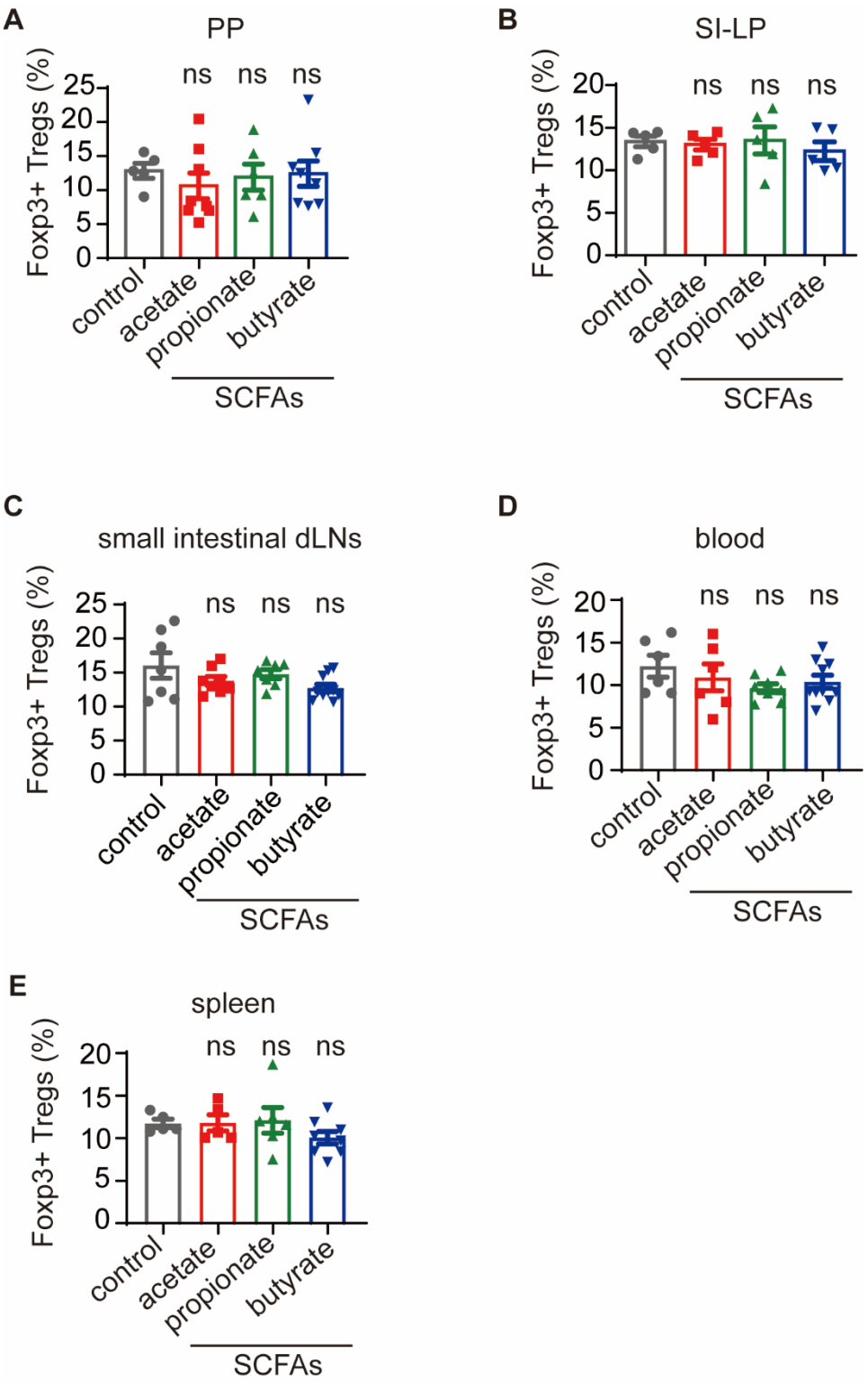
Supplemental Figure 4. SCFAs decrease the expression of MMP2 and MMP9 in the aneurysms of mice with elastase-induced AAA.

Representative immunohistochemistry staining of the aneurysm sections from mice treated as figure 2A with anti-MMP2, anti-MMP9 antibodies or corresponding IgG isotype control. Scale bars are depicted in the images. Red arrows denote positive staining.



Supplemental Figure 5. SCFAs decrease the infiltrations of $CD3^+$ T cells and $CD68^+$ macrophages in the aneurysms of mice with elastase-induced AAA.

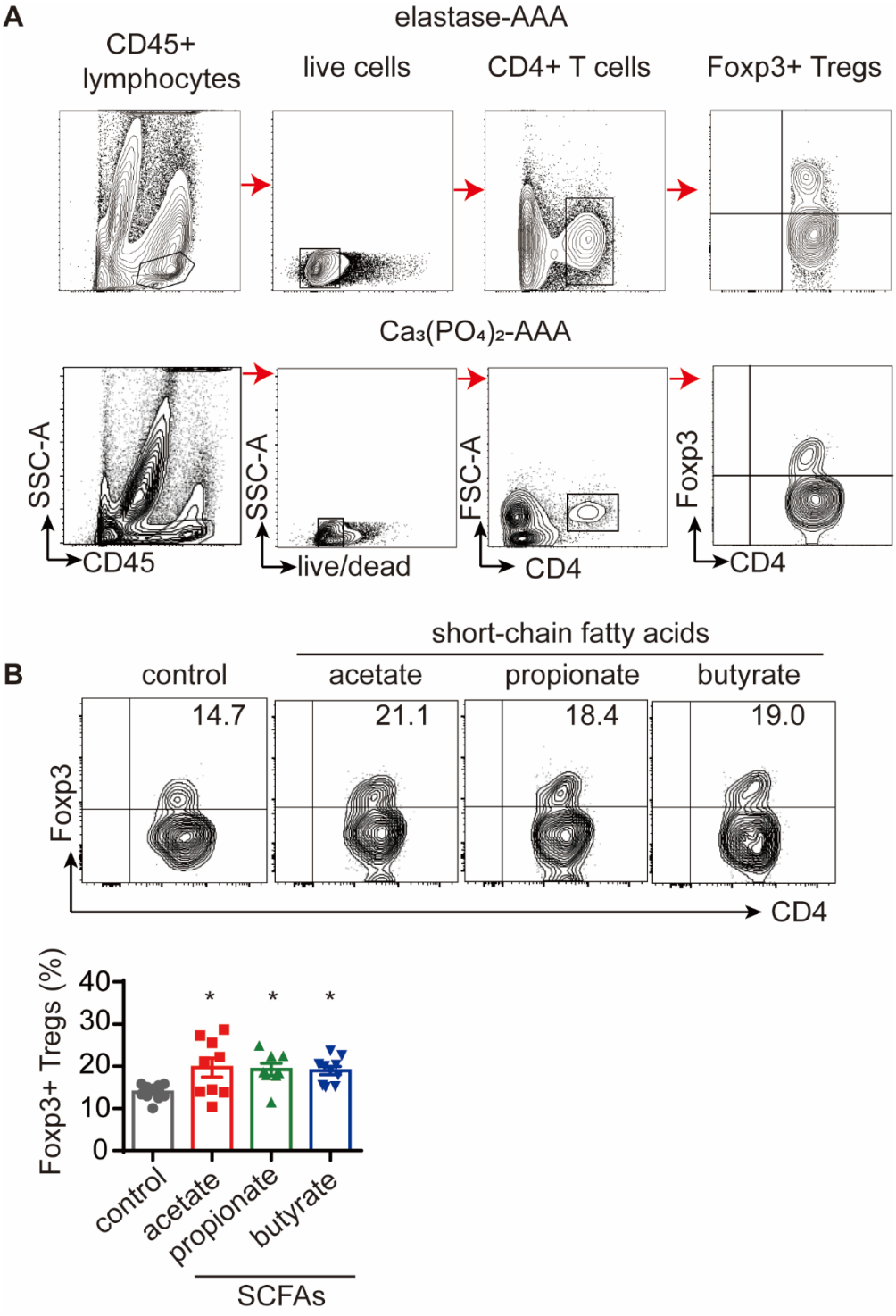
Representative immunohistochemistry staining of the aneurysm sections from mice treated as figure 2A with anti-CD3, anti-CD68 antibodies or corresponding IgG isotype control. Scale bars are depicted in the images. Red arrows denote positive staining.



Supplemental Figure 6. Foxp3^{+} Tregs in the Peyer's patches, small intestinal lamina propria, small intestinal dLNs, blood and spleen are not altered by propionate.

C57BL/6J mice of SPF grade were administered sodium chloride (control), acetate, propionate or butyrate via their drinking water without AAA induction

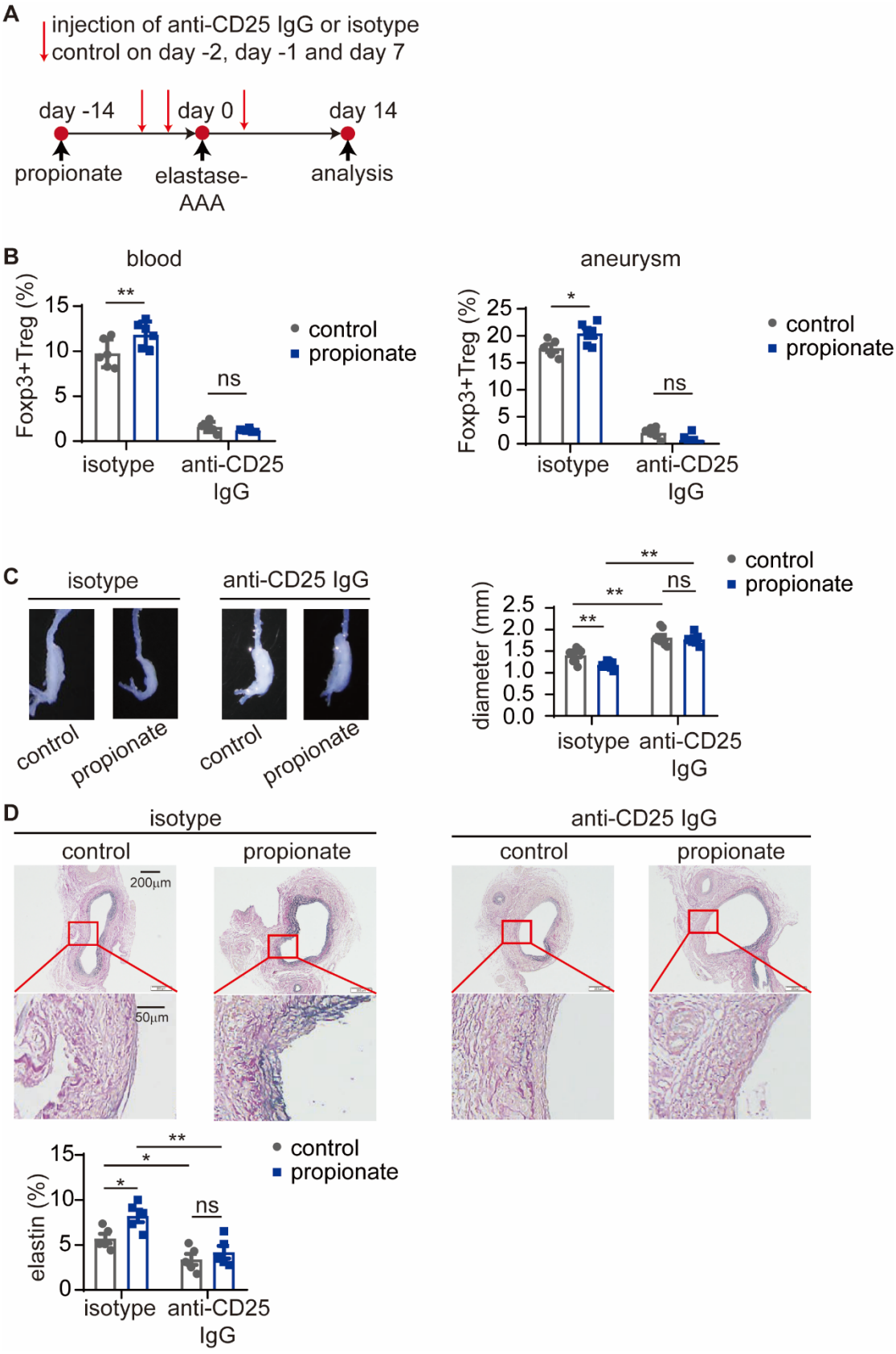
for 4 weeks. The percentages of $Foxp3^+$ Tregs among $CD4^+$ T cells in the **(A)** PPs (n=5-8), **(B)** SI-LP (n=5), **(C)** small intestinal dLNs (n=7-10), **(D)** blood (n=6-10), and **(E)** spleen (n=5-8) were determined by flow cytometry. Each symbol represents a value acquired from an individual mouse. Error bars represent the mean ± SEM. One-way ANOVA followed by Dunnett's multiple comparisons test. Data shown are representative of 2-4 independent experiments. dLNs, draining lymph nodes; ns, not significant; PP, Peyer's patch; SCFAs, short-chain fatty acids; SI-LP, small intestinal lamina propria.



Supplemental Figure 7. SCFAs increase the accumulation of Tregs in aneurysms.

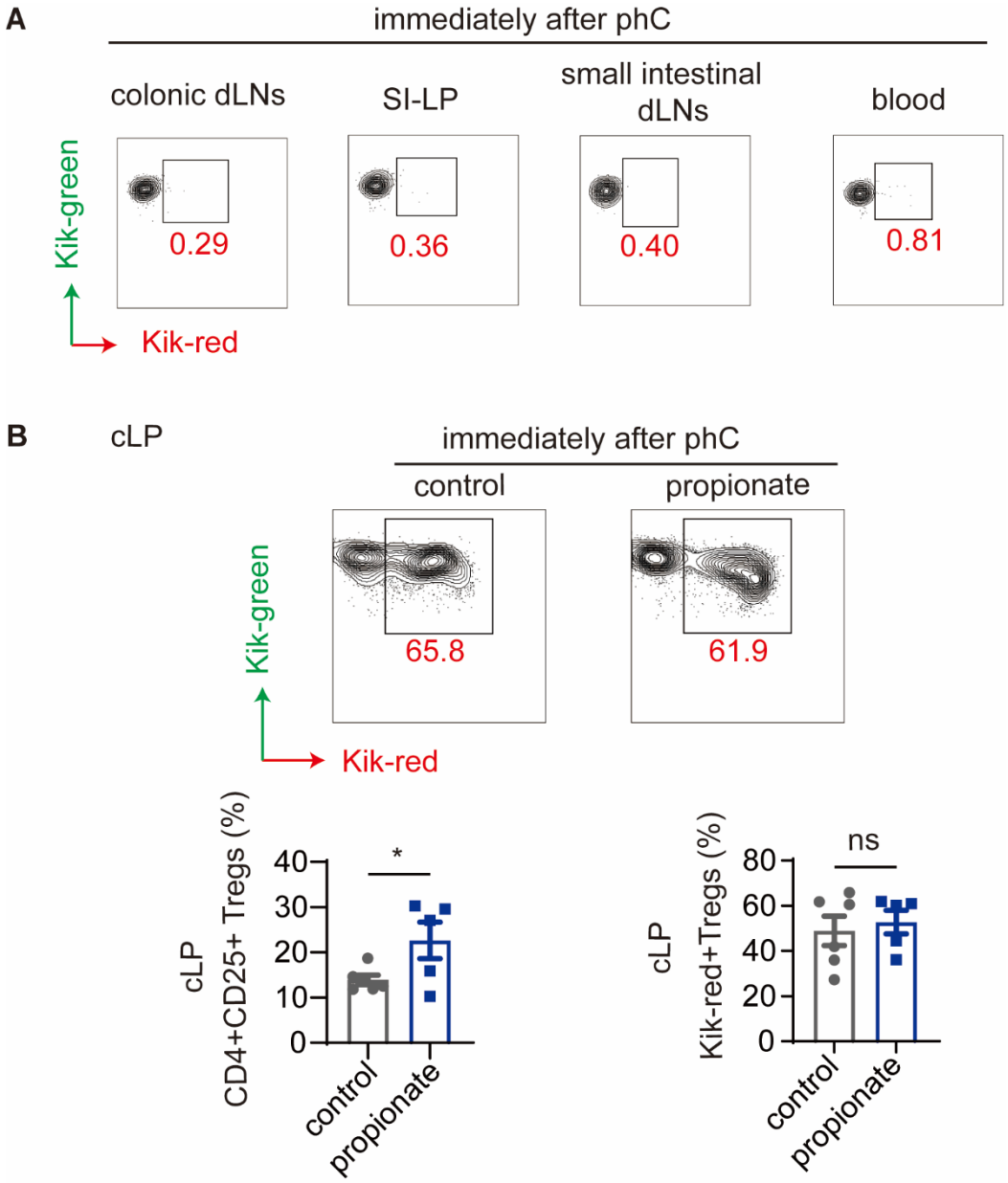
(A) The gating strategies for Tregs harvested from the aneurysms of mice with elastase-induced AAA and $Ca_3(PO_4)_2$-induced AAA. **(B)** The mice were treated as figure 1A. Representative contour plots and the percentage of $Foxp3^+$ Tregs among $CD4^+$ T cells in the aneurysms (n=8-10). Each symbol represents a

value acquired from an individual mouse. *P < 0.05. Error bars represent the mean ± SEM. One-way ANOVA followed by Dunnett's multiple comparison test. Data shown in B are representative of 3 independent experiments. AAA, abdominal aortic aneurysm; SCFAs, short-chain fatty acids.



Supplemental Figure 8. Propionate protects against elastase-induced AAA in a Treg-dependent manner.

(A) Study overview: C57BL/6J mice of SPF grade were administered sodium chloride or propionate from day -14 to day 14 and AAA was induced by elastase on day 0. The injection of anti-CD25 IgG or the isotype control was performed on day -2, day -1 and day 7, and the mice were sacrificed on day 14. **(B)** The percentage of $Foxp3^+$ Tregs among $CD4^+$ T cells in blood (n=6) and the aneurysms (n=5-6) at the time of sacrifice. **(C)** Representative images of the aneurysms and the maximum external diameters of the aneurysms measured *ex vivo* (n=8-10). **(D)** Representative EVG staining of the aneurysms and the percentage of elastin area (of the total aortic area) (n=5) calculated from the EVG staining sections. Each symbol represents a value from an individual mouse. In D, a mean value of 4-8 consecutive sections was calculated. Scale bars are depicted in the images. $*P < 0.05$, $**P < 0.01$. Error bars represent the mean ± SEM. Two-way ANOVA followed by Bonferroni's multiple comparisons test. Data shown are representative of 2-3 independent experiments. IgG, immunoglobulin G; ns, not significant.



Supplemental Figure 9. Exposure of the colon to ultraviolet light photoconverts cLP-Tregs with specificity and high efficacy.

(A) Kik-red$^+$ Tregs in the colonic dLNs, SI-LP, small intestinal dLNs and blood of KikGR mice were detected by flow cytometry immediately after phC. **(B)** The KikGR mice were treated with sodium chloride (control) or propionate for 14 days before AAA was induced with elastase. 12 days after AAA induction, the colons were exposed to ultraviolet light and the mice were sacrificed immediately after phC. Representative contour plots of Kik-red$^+$CD4$^+$CD25$^+$ Tregs and the percentages of CD25$^+$ Tregs among CD4$^+$ T cells and Kik-red$^+$ Tregs among CD4$^+$CD25$^+$ Tregs in the cLPs (n=5-6) determined by flow

cytometry. Each symbol represents a value acquired from an individual mouse. *P < 0.05. Error bars represent the mean ± SEM; Unpaired Student's t test. Data shown are representative of 3 independent experiments. cLP, colonic lamina propria; dLNs, draining lymph nodes; phC, photoconversion; SI-LP, small intestinal lamina propria.

Major Resources

Antibody information.

Immunostaining antibodies	**Dilutions**	**Concentrations**	**Catalog numbers**	**Company names and addresses**
CD3	1:100	2 μg/ml	ab5690	Abcam, Cambridge, UK
CD68	1:100	4.7 μg/ml	ab283654	Abcam, Cambridge, UK
MMP2	1:100	10 μg/ml	ab37150	Abcam, Cambridge, UK
MMP9	1:100	10 μg/ml	ab38898	Abcam, Cambridge, UK
Rabbit IgG, polyclonal isotype control	-	Same concentration as the corresponding antigen specific IgG	ab37415	Abcam, Cambridge, UK
Goat Anti-Rabbit IgG H&L(HRP)	1:2000	1 μg/ml	ab205718	Abcam, Cambridge, UK
FACS antibodies	**Dilutions**	**Concentrations**	**Catalog numbers**	**Company names and addresses**
PerCP/Cy5.5-anti-CD45	1:80	2.5 μg/ml	103132	BioLegend, San Diego, CA
FITC-anti-CD45	1:200	5 μg/ml	103108	BioLegend, San Diego, CA
PE/Cy7-anti-CD4	1:80	2.5 μg/ml	25-0041-82	eBioscience, San Diego, CA
APC-anti-CD25	1:80	2.5 μg/ml	101910	BioLegend, San Diego, CA
PE-anti-Foxp3	1:80	2.5 μg/ml	12-5773-82	eBioscience, San Diego, CA
APC-anti-Ki67	1:300	0.67 μg/ml	17-5698-82	eBioscience, San Diego, CA
BV421-anti-CD197	1:80	50 μg/ml	120120	BioLegend, San Diego, CA
BV421™ Rat IgG isotype Control Antibody	-	50 μg/ml	400535	BioLegend, San Diego, CA
FITC-anti-CD69	1:50	10 μg/ml	104505	BioLegend, San Diego, CA
Fixable Viability Dye eFluor™ 506	1:100	Not available	65-0866-14	Invitrogen, Carlsbad, CA

PE-anti-CD25	1:20	10 μg/ml	101904	BioLegend, San Diego, CA
APC-anti-CD62L	1:80	2.5 μg/ml	104412	BioLegend, San Diego, CA
FITC-anti-CD44	1:200	2.5 μg/ml	103006	BioLegend, San Diego, CA
Other antibodies	**Dilutions**	**Concentrations**	**Catalog numbers**	**Company names and addresses**
LEAF™ Purified anti-mouse CD3ε	1:200	5 μg/ml	100313	BioLegend, San Diego, CA
LEAF™ Purified anti-mouse CD28	1:200	5 μg/ml	102112	BioLegend, San Diego, CA
Ultra-LEAF™ Purified anti-mouse CD25	-	1 μg/μl	102040	BioLegend, San Diego, CA
Ultra-LEAF™ Purified Rat IgG1, λ Isotype Ctrl Antibody	-	1 μg/μl	401916	BioLegend, San Diego, CA

Reagent information.

Enzymes	**Concentrations**	**Catalog numbers**	**Company names and addresses**
Collagenase from Clostridium histolytic Type XI	190 U/ml	C7657	Sigma–Aldrich, Saint Louis, MO
Hyaluronidase from bovine testes	120 U/ml	H3506	Sigma–Aldrich, Saint Louis, MO
Collagenase type I	2 mg/ml	C0130	Sigma–Aldrich, Saint Louis, MO
Deoxyribonuclease I from bovine pancreas	0.5 mg/ml	D4527	Sigma–Aldrich, Saint Louis, MO
Elastase from porcine pancreas	10 mg/mL	E1250	Sigma–Aldrich, Saint Louis, MO
Chemicals	**Concentrations**	**Catalog numbers**	**Company names and addresses**
Sodium acetate	200 mM	791741	Sigma–Aldrich, Saint Louis, MO
Sodium propionate	200 mM	P1880	Sigma–Aldrich, Saint Louis, MO
Sodium propionate (cell culture)	0.1 mM	P5436	Sigma–Aldrich, Saint Louis, MO
Sodium butyrate	200 mM	B5887	Sigma–Aldrich, Saint Louis, MO
Buprenorphine	0.1 mg/kg	B-044	Sigma–Aldrich, Saint Louis, MO
Isoflurane	2%, 4%	R510-22	RWD, Shen Zhen, China
Diphtheria toxin	5 ng/μl	D0564	Sigma–Aldrich, Saint Louis, MO
Recombinant Mouse TGF-beta 1	2 ng/ml	7666-MB-005	R&D Systems, Minneapolis, MN
Recombinant Mouse IL-2	10 ng/ml	402-ML-100/CF	R&D Systems, Minneapolis, MN
Commercial Kits		**Catalog numbers**	**Company names and addresses**
Foxp3 Staining Buffer Set	-	00-5523-00	eBioscience, San Diego, CA
Cholesterol Quantitation Kit	-	MAK043	Sigma–Aldrich, Saint Louis, MO
Triglyceride Quantitation Kit	-	MAK266	Sigma–Aldrich, Saint Louis, MO

HDL and LDL/VLDL Quantitation Kit	-	MAK045	Sigma–Aldrich, Saint Louis, MO
Others		**Catalog numbers**	**Company names and addresses**
LSM-Lymphocyte Separation Medium	-	0850494X	MP Biomedicals, CA
RBC lysis buffer	-	420302	BioLegend, San Diego, CA
Precision Count Beads™	-	424902	BioLegend, San Diego, CA
Percoll	-	17-0891-01	GE healthcare, Chicago, IL
TRIzol Isolation Reagent	-	15596018	Invitrogen, Carlsbad, CA
PrimeScript™ RT Master Mix	-	RR036A	Takara, Japan
SYBR Green Master Mix	-	RR066A	Takara, Japan
Elastica van Gieson (EVG) staining kit	-	115974	Sigma–Aldrich, Saint Louis, MO
Evans Blue dye	-	E2129	Sigma–Aldrich, Saint Louis, MO

RT-PCR primers.

GAPDH	F:5’-AAATGGTGAAGGTCGGTGTGAAC
	R:5’-CAACAATCTCCACTTTGCCACTG
MMP2	F:5’-CAAGTTCCCCGGCGATGTC
	R:5’-TTCTGGTCAAGGTCACCTGTC
MMP9	F:5’-CTGGACAGCCAGACACTAAAG
	R:5’-CTCGCGGCAAGTCTTCAGAG
MCP-1	F:5’-CTTCTGGGCCTGCTGTTCA
	R:5’-CCAGCCTACTCATTGGGATCA
IL-6	F:5’-TAGTCCTTCCTACCCCAATTTCC
	R:5’-TTGGTCCTTAGCCACTCCTTC
IL-17a	F:5’-TCAGCGTGTCCAAACACTGAG
	R:5’-CGCCAAGGGAGTTAAAGACTT
IL-1β	F:5’-CAGGCAGGCAGTATCACTCA
	R:5’-AGCTCATATGGGTCCGACAG
TNFα	F:5’-CCCTCACACTCAGATCATCTTCT
	R:5’-GCTACGACGTGGGCTACAG

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2. Li J, Xia N, Wen S, et al. IL (Interleukin)-33 Suppresses Abdominal Aortic Aneurysm by Enhancing Regulatory T-Cell Expansion and Activity. *Arterioscler Thromb Vasc Biol*. 2019;39: 446-458.

3. Benakis C, Brea D, Caballero S, et al. Commensal microbiota affects ischemic stroke outcome by regulating intestinal γδT cells. *Nat Med.* 2016;22: 516-523.

4. Esterhazy D, Canesso MCC, Mesin L, et al. Compartmentalized gut lymph node drainage dictates adaptive immune responses. *Nature.* 2019;569: 126-130.