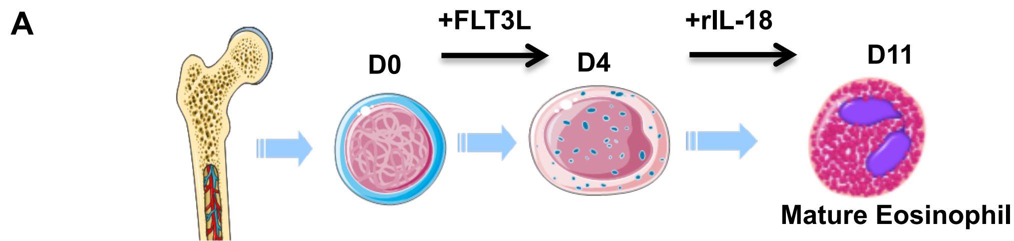
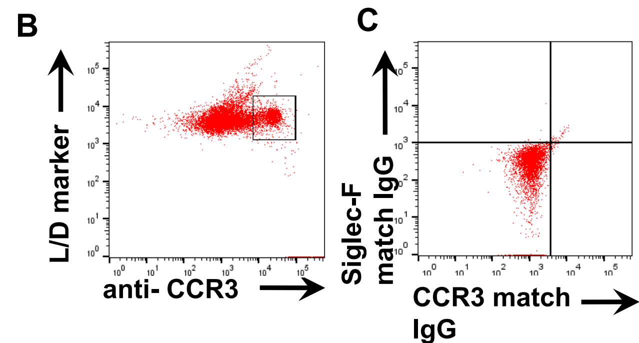
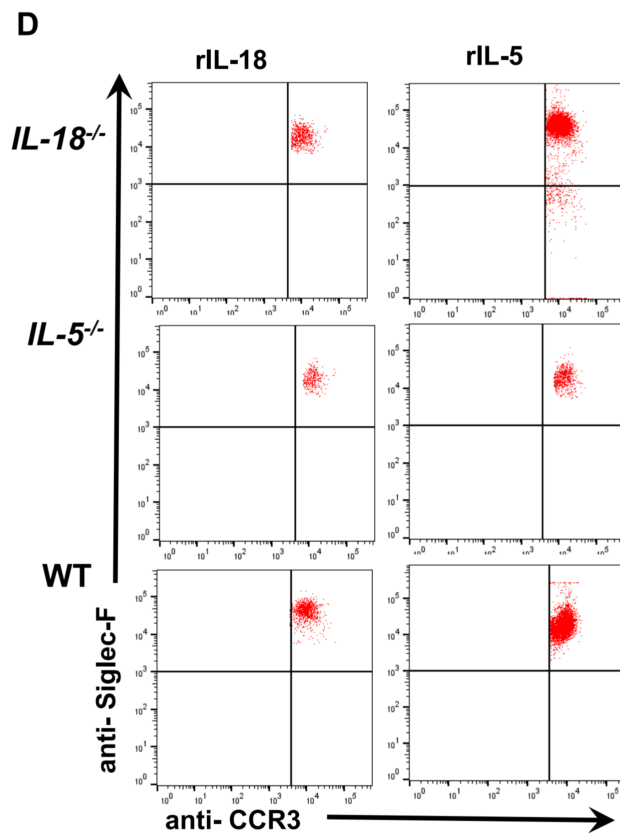
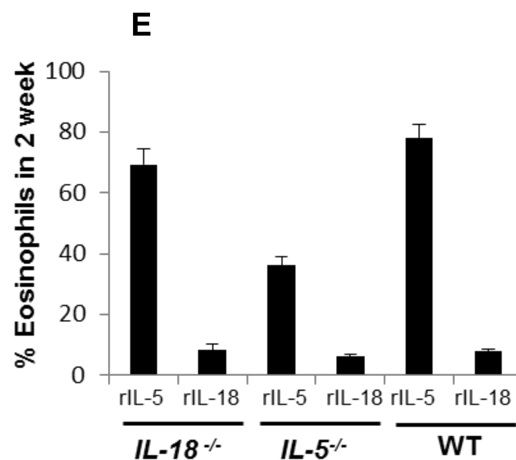
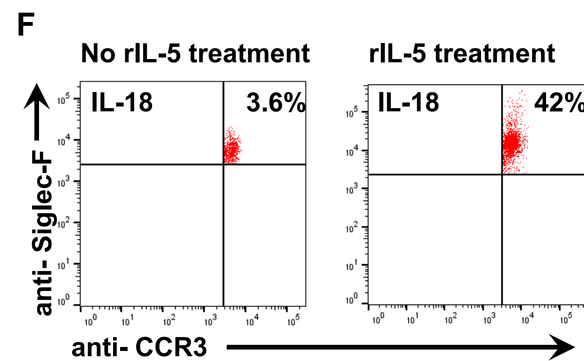

A
+SCF
+FLT3L
+rIL-5 or
+rIL-18
D0
D4
D11
Mature Eosinophil


B
L/D marker
anti- CCR3
C
Siglec-F match IgG
CCR3 match IgG


D
rIL-18
rIL-5
IL-18-/-
IL-5-/-
WT
anti- Siglec-F
anti- CCR3


E
% Eosinophils in 2 week
100
80
60
40
20
0
rIL-5
rIL-18
rIL-5
rIL-18
rIL-5
rIL-18
IL-18 -/-
IL-5-/-
WT


F
No rIL-5 treatment
rIL-5 treatment
IL-18
3.6%
IL-18
42%
anti- Siglec-F
anti- CCR3

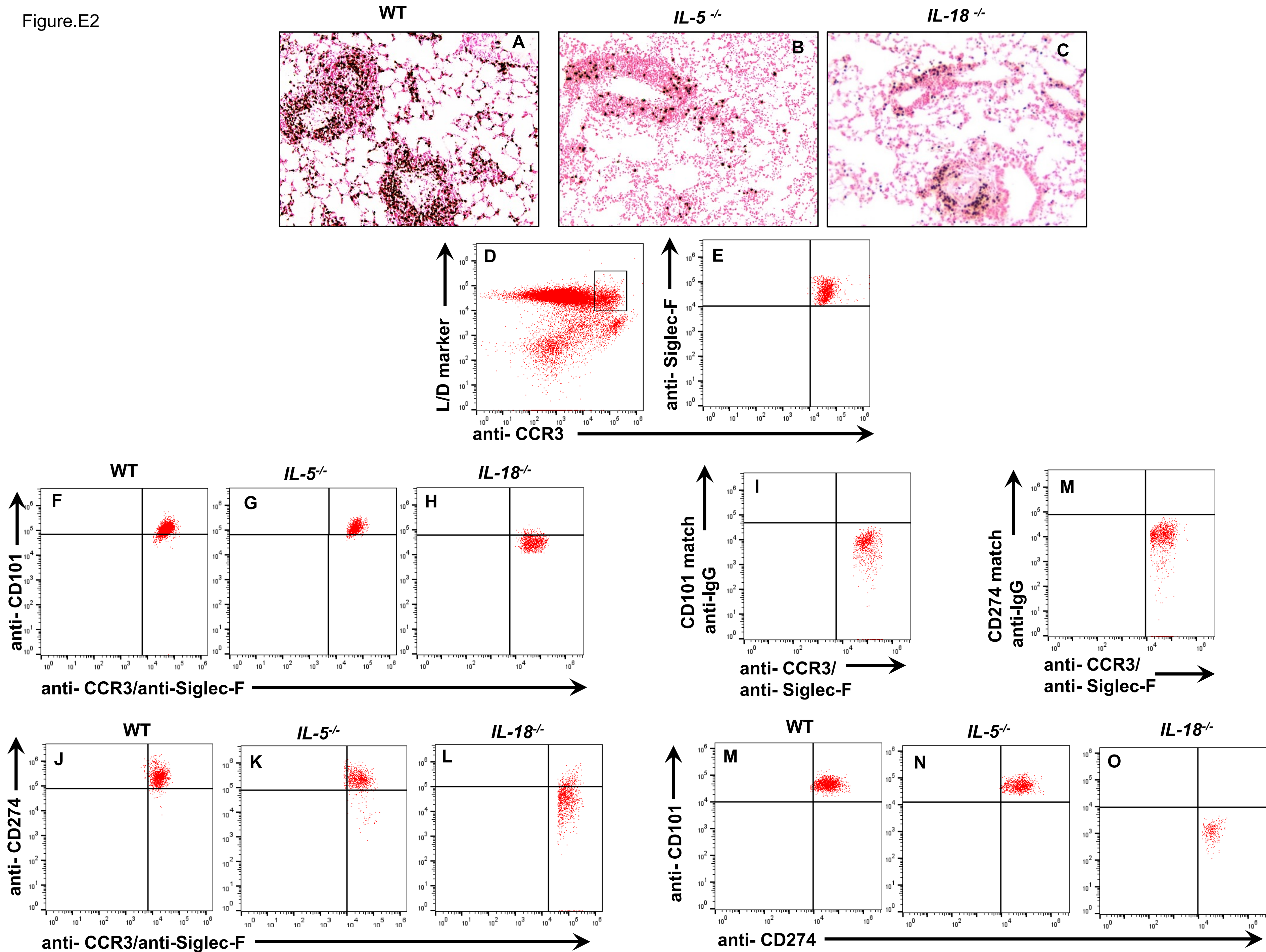


Figure.E2
WT
IL-5 -/-
IL-18 -/-
A
B
C
D
E
L/D marker
anti- CCR3
anti- Siglec-F
F
G
H
anti- CD101
anti- CCR3/anti-Siglec-F
I
CD101 match
anti-IgG
anti- CCR3/
anti- Siglec-F
M
CD274 match
anti-IgG
J
K
L
anti- CD274
N
O

Supplementary Figure Legends

Figure E1. *Ex vivo* generation and proliferation of endogenous IL-5-independent IL-18-differentiated eosinophils. The schematic protocol used to generate eosinophils from $CD34^+$ LDEBM myeloid precursors in response to rIL-5 or rIL-18 **(A)**. Differentiated CCR3 positive live cells were selected **(B)**, based on isotype matched Siglec-F and CCR3 anti-IgG stained cells **(C)** to detect $CCR3^+$/Siglec-F double positive eosinophils in response to rIL-5 and rIL-18 from the LGEBM of *IL-18*$^{-/-}$, *IL-5*$^{-/-}$ and WT mice **(D)**. The average percentage of eosinophils differentiated from multiple independent experiments in response to rIL-5 and rIL-18 are presented as the mean ± SD, n=5 **(E)**. A representative flow cytometer analysis of one-week rIL-18 differentiated from $CD34^+$ LDEBM in response to another week with rIL-5, n=3 **(F)**.

Figure. E2. $CD101^+CD274^+$ eosinophils are not detected in IL-18 gene deficient mice following the induction of *A. fumigatus*-induced experimental asthma. A representative photomicrograph of anti-MBP antibody immunostained lung sections shows eosinophils in *IL-5*$^{-/-}$, *IL-18*$^{-/-}$ mice and WT mice **(A-C)** following allergen-induced experimental asthma (n=6 mice/group). A representative flow cytometer dot blot analysis of BALF CCR3 positive leukocytes were selected for the detection of $CCR3^+$Siglec-F^+ eosinophils **(D, E)**. The $CCR3^+$Siglec-F^+ eosinophils of *IL-5*$^{-/-}$ *IL-18*$^{-/-}$ and WT mice were analyzed for the expression of CD101 and CD274. Representative flow cytometer analysis detected high expression of $CD101^+$ **(F-H)** or $CD274^+$ **(J-L)** in eosinophils from BALF detected based on isotype matched anti-IgG of CD101 or CD274 **(I, M)**, n=4 independent experiments.

1 **Supplementary Material**

2 **Material and Methods**

3 **Mice.**

4 Pathogen-free BALB/c and IL-18 gene-deficient (*IL-18*$^{-/-}$) C57 background mice
5 were purchased from the Jackson Laboratory (Bar Harbor, ME). IL-5 gene-
6 deficient *(IL-5*$^{-/-}$*)* mice were kindly provided by Marc Rothenberg, MD, PhD
7 (Cincinnati Children's Hospital Medical Center, Cincinnati OH). Mice were
8 maintained in a pathogen-free barrier facility. All experiments were conducted with
9 gender-matched, 6-8 week old mice. The Tulane Institutional Animal Care and
10 Use Committee (IACUC) approved the animal protocol in accordance with
11 National Institute of Health (NIH) guidelines.

12

13 **Mouse bone marrow-derived eosinophils.**

14 Bone marrow cells were collected from the femurs and tibiae of WT mice, *IL-5*
15 gene-deficient mice (*IL-5*$^{-/-}$*)* and *IL-18* gene-deficient mice (*IL-18*$^{-/-}$*)* by flushing the
16 cut opened bones with IMDM medium (Invitrogen). RBCs were lysed using RBC
17 lysing buffer (Sigma-Aldrich). The RBCs lysed bone marrow cells were washed
18 with PBS containing 0.1% BSA and low-density eosinophil bone marrow cells
19 (LDEBM) precursors obtained via Percoll density gradient were cultured at 10^6/ml
20 in medium containing RPMI 1640 (Invitrogen) with 20% FBS (Cambrex Corp), 100
21 IU/ml penicillin and 10 µg/ml streptomycin (Cellgro), 2 mM glutamine (Invitrogen),
22 25 mM HEPES and 1x nonessential amino acids and 1 mM sodium pyruvate (Life
23 Technologies), and 50 µM 2-ME (Sigma-Aldrich) supplemented with 100 ng/ml

24 stem cell factor (SCF; PeproTech) and 100 ng/ml FLT3 ligand (FLT3-L;
25 PeproTech) from days 0 to 4. On day 4, the medium containing SCF and FLT3-L
26 was replaced with medium containing 10 ng/ml mouse rIL-5 or rIL-18 (R&D
27 Systems) as per the method described earlier. [E1] On day 7, all non-adherent cells
28 were removed and supplemented with10 ng/ml rIL-5 or rIL-18. The medium with
29 rIL-5 or rIL-18 was replaced on every 3rd day for 3-4 weeks. A flow cytometer
30 using $5x10^5$ cells was performed for eosinophil analysis following staining the cells
31 with a combination of anti-CCR3, anti-Siglec-F,and anti-CD274 antibodies.

32

33 **Allergic patient characteristics and eosinophil subsets analysis.**

34 Asthma and eosinophilic esophagitis (EoE) patients, along with normal patients,
35 were selected without regard to age, gender or race in collaboration with the
36 Tulane Eosinophilic Disorder Center (TEDC). The CD101 and CD274 expressing
37 eosinophils analysis will be performed by flow cytometer analysis in the blood and
38 nasal lavage, tissues biopsies of allergic and non-allergic patients using anti-CCR3,
39 anti-siglec-8, anti-CD274 and anti-CD101 antibodies with their respective isotype
40 controls obtained from BD Biosciences, BioLegend, and eBiosciences. Detailed
41 subject characteristics are provided in the supplementary Table 1.

42

43 **Flow cytometer analysis.**

44 Mouse bone-marrow derived eosinophils and CD-2 IL-5 tg mice spleen eosinophils
45 were stained with the following combination of antibodies along with a live/dead
46 cell marker and different fluorochrome-labeled: anti-mCCR3, anti-mSiglecF, anti-

47 mCD274 and anti-mCD101 with their respective isotype controls obtained from BD
48 Biosciences, BioLegend, eBiosciences and Miltenyi Biotec. A live/dead marker
49 (BioLegend) was used to exclude dead cells. Data were acquired with a BD Accuri
50 flow cytometer or FACSCalibur flow cytometer (BD Biosciences) and analyzed
51 with FlowJo software version 7.1 (Tree Star). Positive cells were identified by
52 comparison to the appropriately conjugated isotype controls.
53
54 **Confocal microscopy.**
55 FACS purified rIL-5 and rIL-18 generated eosinophils were fixed in 4%
56 paraformaldehyde followed by ice-cold methanol. Anti-MBP and rat IgG-Alexa
57 Fluor 647 antibody (Molecular Probes) were applied for the immunofluorescence
58 staining of the eosinophils followed by 4', 6-diamidino-2-phenylindole
59 dihydrochloride (DAPI; Molecular Probes) mounting. Images were collected using
60 a confocal microscope (Leica Microsystems). FITC was excited using an argon
61 laser at 488 nm, and DAPI, nuclear stain, was excited using a 405 nm diode laser
62 (Coherent) and eosinophil cytoplasm and nucleus images were taken and
63 analyzed by IMARIS software (Biplane AG).
64
65 **Electron microscopy.**
66 Cultured eosinophils were fixed in 3% glutaraldehyde and Cacodylate buffer
67 overnight at $4^{o}C$ followed by 1% osmic acid in Cacodylate buffer for 1 hour and
68 dehydrated in ethanol. They were embedded in LX 112 resin and polymerized for

69 2 days at 60°C. Sections were cut, mounted and examined with a Zeiss EM 912
70 electron microscope.
71
72 **RT-PCR analysis.**
73 The rIL-5 and rIL-18 derived eosinophils were suspended in RNAzol B (Tel-Test)
74 at a concentration of 1ml/10^6 cells and extraction proceeded as per the
75 manufacturer's instructions. The precipitated RNA was harvested by centrifugation,
76 washed in 70% ethanol, dried, and suspended in sterile diethyl pyrocarbonate
77 (DEPC)-treated water. RNA (1μg) prepared as described was subjected to DNase
78 I treatment (Invitrogen) and reverse transcribed using a First Strand cDNA
79 Synthesis Kit for RT-PCR (avian myeloblastosis virus reverse transcriptase; Roche
80 Diagnostics). cDNA (1μl) was subjected to TaqMan (Q) PCR using a FAM-labeled
81 probe and primers for each eosinophil granular genes (*MBP, ECP, EDN, and*
82 *EPO*). All experiments included a no-reverse transcriptase and no-template
83 controls and mouse β-actin was used as the endogenous control. Transcripts at
84 each time point are normalized to β-actin. Values were expressed in relative
85 expression; fold change (mean ± SD). The primers that were used in the study:
86 *mMBP,* F- 5' AACTTGCCTAGGGATGCAGA-3'; R-5′-
87 GAGGTAGCGACAGGTCTTGC-3'; *mEPO,* F-5′-ATGGAGACAGATTCTG GTGG-
88 3'; R-5′-AGTATTGTCGCATACAATC C-3'; *mECP* F-5′-CCGTGGACCCAC
89 AGTGACAGC-3'; R-5′-TCTGGGAAGGGGTTGGTCGCT-3'; *mEDN,* F-5′-ATTGAC
90 CCCCTCCCGGTGGTTT-3'; R-5′-TGTGTAACTGTTAACGGCCCGCAT-3';
91 mCD101, F-5'-CAGGGTAACCTTCGGCTCTG-3'; R5'-
92 GATGCGGTACCCTGGGAATTA-3'. *mCD274,* F-5′-TCACAGCCTGCTGTCACTT-

93 3’; R-5′-TAAGGTCCTCCTCTCCTG CC-3’; β-Actin, F-5′-
94 CGATGCCCTGAGGCTCTTTTCC-3’; R-5′-CATCCTGTCA GCAATGCCTGGG-
95 3’.

96 **Microarray Analysis.**

97 The Agilent Bioanalyzer was used to test the RNA quality (2100 Hewlett Packard)
98 using the RNA 6000 Pico Assay and Ovation Pico WTA System v2 (Nugen) was
99 used to synthesizing cDNA target from 1 -10 ng of total RNA. Further, the Encore
100 Biotin Module (NuGEN) was used to both chemical fragment and biotin – label the
101 cDNA target. The samples are hybridized to a standard Probe Array Cartridge
102 (GeneChip Mouse Gene 1.0 ST Array, Affymetrix) in the GeneChip Hybridization
103 Oven 640 (Affymetrix). Probe arrays were washed and stained using the Fluidics
104 Station 450 (Affymetrix). The arrays were scanned with the Affymetrix GeneChip
105 Scanner 3000 7G. Command Console and Affymetrix operating software program
106 was used to create raw data files.

107

108 **Experimental allergic airway murine model of asthma.**

109 A mouse model of allergic asthma was established using methods described
110 previously. [E2] In brief, mice were lightly anesthetized with isoflurane (Iso-Flo;
111 Abbott Laboratories), and 100 μg (50 μl normal saline) of *Aspergillus fumigatus*
112 (Greer Laboratories) or 50 μl of normal saline alone was given intranasal using a
113 micropipette with the mouse held in the supine position.

114

115 **Bronchoalveolar Lavage Fluid (BALF).**

116 The mice were euthanized by CO_2 inhalation. Immediately thereafter, a midline
117 neck incision was made, and the trachea was cannulated. The lungs were lavage
118 2 times with 1.0 ml PBS containing 1% FCS and 0.01 mM EDTA. The recovered
119 BALF was centrifuged at 400*g* for 5 minutes at 4℃ and re-suspended in PBS
120 containing 1% FCS. Total cell numbers were counted with a hemocytometer.
121 Cytospin preparations of 5 x 10^4 cells were stained with Giemsa-Diff-Quick (Dade
122 Diagnostics), and differential cell counts were determined. The BALF eosinophil
123 counts were expressed as an indication of lung eosinophilia.

124 **Lung tissue eosinophils analysis.**

125 5-μm tissue paraffin sections of mouse lung sections were immunostained with
126 antiserum against the mouse eosinophil major basic protein (anti-MBP) as per the
127 method described previously. [E3]

128

129

130 **Statistical analysis.**

131 The nonparametric Mann–Whitney *U*-test was employed for comparison of data
132 between two groups, and Krustal–Wallis for comparison of more than two groups.
133 Parametric data were compared using *t* -tests or analysis of variance. Values are
134 reported as mean ± S.D. *P* -values < 0.05 were considered statistically significant.

135

136

137

Supplementary References

E1. Dyer KD, Moser JM, Czapiga M, Siegel SJ, Percopo CM, Rosenberg HF. Functionally competent eosinophils differentiated ex vivo in high purity from normal mouse bone marrow. J Immunol 2008; 181:4004-9.

E2. Rajavelu P, Rayapudi M, Moffitt M, Mishra A, Mishra A. Significance of para-esophageal lymph nodes in food or aeroallergen-induced iNKT cell-mediated experimental eosinophilic esophagitis. Am J Physiol Gastrointest Liver Physiol 2012; 302: G645-54.

E3. Venkateshaiah SU, Zhu X, Rajavelu P, Niranjan R, Manohar M, Verma AK, et al. Regulatory effects of IL-15 on allergen-induced airway obstruction. J. Allergy Clin Immunol 2017.

164 **Supplementary T 1: Patient clinical Characteristics.**

	Age (Year)	Gender	Diagnosis	Treatment
Healthy Individual				
1	32	F	Normal	None
2	29	M	Normal	None
3	50	F	Normal	None
4	24	F	Normal	PPI
5	37	F	Normal	PPI
6	35	M	Normal	None
7	31	F	Normal	None
8	64	M	Asthma/COPD	INH GCS
9	33	F	Asthma/sarcoid	INH GCS
10	47	F	Asthma	Prednisone
11	28	F	Asthma	INH GCS
12	29	F	Asthma	Prednisone, INH GCS, Nasal steroid
13	54	F	Asthma	Xolair
14	52	M	Asthma	INH GCS
15	14	M	Asthma	INH GCS, Omeprazole
16	60	F	Asthma	Prednisone, INH GCS, Nasal steroid
17	54	F	Asthma/ rhinitis	Xolair
18	29	F	Asthma/ rhinitis	Prednisone, INH GCS, Nasal steroid
19	33	F	Asthma/ rhinitis	INH GCS, Nasal steroid
20	34	M	Asthma/ rhinitis	Prednisone, INH GCS, Nasal steroid
21	36	F	Asthma/ rhinitis	Prednisone, INH GCS, Nasal steroid
22	53	F	GERD/ EoE	Famatodine
23	18	M	EoE	None
24	20	F	GERD/ EoE	Milk and wheat elimination
25	48	F	Dysphagia/EoE	Nasal steroid
26	58	F	GERD/Dyspagia	Omeprozole
27	16	M	GERD/EoE	Protonix

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172

173 **Table T2: Differentially regulated genes of IL-18 generated Vs. IL-5 generated**
174 ***in vitro* eosinophils.**

Gene Symbol	Fold change	Hpgds	1.9841925	Epsti1	3.393537	H2-T24	1.5814703	Cd97	-1.4712859	Gm15922	-1.7750001
Itpr1	1.5977836	Ctsl	20.004852	AF251705	2.4778054	Ubl4	-1.5257152	Def6	-1.8332913	Pip5k1b	-2.396449
Dleu2	-1.2108622	Mx1	3.9526718	Plxna1	1.7617811	Gm10320	-1.5535886	Csgalnact2	-2.0309918	Vcl	-2.4301975
Parp8	1.8107626	Gm6166	5.084049	Gnb2l1	-1.4399115	Ppp2r5c	-1.5187649	Dstn	-1.4871391	Paqr7	-2.0677285
Ccnd2	1.6703563	Ifi27l2a	5.4732757	AC133103.2	1.572595	Tkt	-1.9188772	Diap1	-1.6124141	Gm6517	-2.9642704
Pdcd4	1.3898603	Ifit2	11.631666	Peli1	1.5920957	Junb	1.3013182	Hk2	-1.8108288	Pygl	-1.8751411
Ctla2a	1.4508667	Thbs1	2.9893436	Rabl5	1.527117	Acot7	-1.6113366	Sipa1l3	-1.6871387	Ikzf2	-2.3662126
Ms4a4c	4.0642414	Tlr1	2.3581104	Rel	1.9529502	Adk	-1.5886397	Zxdc	-1.7815939	F630111L10Rik	-1.9037659
Trps1	2.006977	Cd36	3.0666277	Cyb5r3	1.5066248	Mfsd10	-1.5169681	Cbara1	-1.7736956	Tob1	-1.692371
Alpk1	1.647012	Parp14	2.166224	Usp18	7.8723907	Fryl	-1.6886102	Gse1	-1.7454232	C1rl	-2.3206272
AI504432	1.5917554	Cxcl16	1.970302	Med9	1.521023	Zfp36	2.0194001	Ppox	-1.6222917	Acss1	-2.8179855
Mnd1	1.2185938	I830012O16Rik	15.621455	Ccdc86	1.7083136	Fos	5.027671	Nomo1	-2.061887	Cib1	-2.6545062
Ptprj	1.9493752	Prdx4	2.0452628	Sepp1	2.6875854	Fam108c	-1.5891843	Hcfc2	-1.6870457	Acss2	-2.132123
Cd93	1.5982546	Cd69	2.445385	Ly96	2.5889127	BC037034	-1.9473037	Tmem2	-1.4963788	Gfod1	-2.60839
Map4k4	1.6367196	Apobec1	2.7568455	Cln8	2.0609653	Men1	-1.5465966	Ncoa7	-1.560232	Ctsh	-2.0736647
Sap30	1.9946864	Gstm1	1.8203621	Anxa4	2.8591878	Spcs3	-1.6081345	Dnpep	-1.6616567	Nucb1	-2.097302
Gm12699	1.4532923	Irgm1	8.79289	Oasl1	4.075188	Ier3	2.0692282	Ier2	-1.09599	Axin2	-2.256172
Ndufaf2	1.4074521	Stat1	3.0624382	Ttc1	1.7535148	Ints4	-1.6848999	Lta4h	-1.921311	Tmem164	-2.8008623
Gm9766	1.3354632	Fam49a	1.999489	Gbp4	7.4034925	Asxl1	-1.6510412	Tmem208	-1.8208532	Sla	-2.761573
Tlr2	1.8701211	Ms4a7	9.70932	Trim30d	19.20999	Tmem40	-1.6089977	Lrrfip2	-1.49742	Atp2a3	-2.5959554
Ms4a6c	2.0411248	Eif2ak2	2.615751	Mdfic	2.1775117	Scap	-1.5101694	Chd7	-1.6990633	Prkca	-2.6650074
Rbm47	2.0544372	AW112010	17.292887	Ripk3	1.6081029	Yif1b	-1.5571955	Limd2	-1.8764482	41153	-2.4064417
Trim30a	4.5958433	Herc6	4.325467	Ptms	1.8795764	Gm8995	1.3895621	Gm12481	-1.6043015	Cnr2	-2.2237759
Cd14	2.0183291	Gm7984	1.5757091	Lgals8	2.9053535	Plagl2	-1.5618947	Rab27a	-1.9380895	Mylk	-2.3797207
Ifi203	3.4930694	Zeb2	1.6093024	AC122806.1	1.5706496	Strn	-1.582299	Tcp11l2	-1.7039105	Pdlim7	-2.7596223
BC147527	2.3367753	Tubb6	2.0245323	Irg1	8.512985	Mmp12	601.8838	S1pr4	-1.6158768	Il1rl1	-2.857577
Lpcat1	1.4403828	Aim2	1.6162112	Mitf	1.825419	Tbc1d9b	-1.5107901	Stim1	-1.8123893	Nbeal2	-3.096066
Cd180	1.7696785	Alcam	1.9731284	Gpr97	-1.4328309	Uqcrh	-1.7609415	Adipor1	-1.4647644	Npl	-2.3963356
Ly6c1	2.066024	Abi3	1.6878219	Arl8b	2.0313382	Mtmr12	-1.6600503	Ngly1	-1.9669108	Nt5c3	-1.9857137
1700034H14Rik	1.2264786	Rsad2	11.947412	D14Ertd668e	11.769002	Gmip	-1.6130192	Gm9034	-1.5897671	Rnf125	-2.5210266
Saa3	38.04057	Igsf6	1.7265439	Gngt2	2.0476813	Abca7	-1.5264024	Myl12b	-1.6752338	Glipr2	-2.3607166
Ms4a6d	4.2108917	Dnajc13	1.6322272	Lbr	-1.5130674	Bri3bp	-1.7257515	Acsl4	-1.6573985	Hck	-2.597085
Ifitm3	2.536096	Lgmn	10.475298	Igf1	9.080402	Reep5	-1.5449005	Rcsd1	-1.7468522	Rnd1	-3.2602549
Slfn5	3.679039	Snx5	1.5547254	Gm7582	1.893151	Fam118b	-1.5715077	Orai2	-1.7930597	Itgb2	-3.0201294
Snx30	1.530436	Ly9	1.586905	Isg20	2.0548358	Stk11	-1.5361586	Rgs14	-2.2524917	5330426P16Rik	-2.3279762
Msr1	6.787488	Arhgap26	1.5419935	Wwp1	2.0136096	Zwint	-1.62781	Adrbk1	-2.1084225	Cox7a1	-2.2780817
AI607873	4.034886	Phf11	4.417819	Myo1e	2.5291796	Rin3	-1.5096706	Kif3b	-1.6142254	Mboat1	-3.141216
Ifi44	5.9145155	Appl2	2.319764	Gm16026	2.0666752	Mtmr3	-1.5180544	Ptpn7	-2.4368784	Il5ra	-3.0260603
Cd68	2.3707697	Trim34a	2.838317	B2m	1.9421402	Syne2	-1.6590618	Camk2g	-2.1510744	Rab37	-3.1478179
Gm11428	12.909967	Fnbp1l	3.0818894	Galnt7	1.6674182	Alas1	-1.9266717	Arid3a	-1.8358113	Arap3	-2.8308287
Pyhin1	5.2381287	Mx2	10.208	Ccnl1	2.0315342	Eif4a2	-1.7619184	Pmm1	-1.7191224	Gfi1b	-3.6903563
Srsf3	1.2443994	A530032D15Rik	1.9416376	Gm4070	2.1340377	Exoc6	-1.6927879	Alox5ap	-1.664606	Klrb1f	-3.5296092
Ly6a	22.300526	Oas1a	8.057089	Phyh	1.8854586	Kcnab2	-1.8443729	Rps6ka1	-2.415727	Pglyrp1	-3.07828
Marcks	3.954168	Plscr1	2.03441	Il15	20.505178	Nfyb	-1.6428541	Dennd4a	-1.6555367	Tspan5	-3.6011093
Ms4a6b	7.0100217	Fundc1	1.5792446	Jun	24.776539	Lypla2	-2.0106568	Mrpl41	-2.1595097	Cln3	-3.73777
Oas2	5.130382	Zbp1	8.634837	Gbp7	2.7920806	Tagln2	-1.7500385	Pdlim1	-2.5039122	Nfe2	-4.1209526
Ifit3	83.09525	Nup210	-1.1503824	Gbp1	3.9991295	Wbp2	-1.7273291	Myh9	-1.7557539	Pla2g3	-3.4533517
Tubb2a	1.9485376	Trafd1	2.0318599	Plin2	2.8494685	Etf1	-1.6895021	Derl1	-2.1947746	4632428N05Rik	-3.5165362
Ifi204	9.950549	Srgap2	1.7607462	BC006779	1.9156773	Heatr5a	-1.8025247	Nqo2	-1.8265634	Adra2a	-3.6569436
Clec4a3	2.7477698	Slc31a1	1.8545415	Reep4	-1.5094303	Sykb	-1.343742	Trerf1	-1.8164843	Cnn2	-4.8107405
Tgtp1	10.20353	Zufsp	2.2652657	Sp100	2.7064753	Amfr	-1.6828454	Sec24a	-2.4293616	Upp1	-3.3261774
Ifi202b	3.372781	Clec4e	3.990909	G530011O06Rik	7.281815	Megf9	-1.5186616	Rsu1	-2.0358117	Rab44	-4.3490653
Taf1d	1.4182425	Ifih1	19.620697	Nmi	1.9290936	Surf4	-1.9854017	Id1	-1.7393795	F2rl2	-3.7633297
Lgals3bp	3.1869497	Gm5582	1.5670313	Gm4951	7.056487	Tmed4	-1.3150674	Hyal3	-1.7204657	Grina	-3.0084548
Mpeg1	1.8432044	Gm15026	1.5919882	SNORA76	-1.5688239	Cdk2ap2	-1.5101179	Hist1h1c	-1.3317913	Spns3	-5.970436
Cops7b	-1.1929224	Oas3	5.4294505	Ptgs2	19.029766	Traf3ip3	-1.9486462	Mboat7	-2.269088	Tuba8	-3.967948
Tpm4	1.976	Elk3	1.6321967	Znfx1	2.4855525	Ccni	-1.7309895	Gba2	-2.0378454	Cotl1	-4.6846633
Pf4	3.4205542	Lpp	1.9768475	Rrbp1	1.5798213	Nrm	-1.934019	St3gal4	-2.3724773	Cd55	-4.6093554
Lztfl1	1.4622722	Mmp8	5.1751037	Daxx	1.8969448	Grk6	-1.7189924	Vasp	-2.299901	Iqsec1	-3.725634
Kif23	1.2860837	Cd86	2.448642	Nlrc5	3.7413154	Gm11868	-1.5353901	Prr13	-1.9195843	Anxa11	-4.9368744
Zfp187	1.4285791	Abhd12	1.510997	Ccl4	7.764238	Atg9a	-1.4084349	Ltb4r1	-2.037916	Neu1	-4.461438
Npy	6.7258596	Gpr137b-ps	1.9402564	n-R5s1	1.4611309	Rabif	-1.4196776	Mfsd5	-1.9127399	Arsb	-5.342794
Clec4d	3.5702777	Sh3glb1	2.8271368	Ddx58	3.005823	Fes	-1.6357335	Pnpla7	-1.8462437	Bhlhe40	-3.2740574
Osgep	1.3689857	C230081A13Rik	1.8339324	Cdca5	-1.530798	41167	-1.6868688	Flot1	-2.1492026	Lpcat3	-4.7379913
Slfn8	6.2340865	Sgpl1	2.37972	Hist1h1a	-1.629668	Ing1	-1.4901292	Itga2b	-2.2351594	Lilra6	-4.4367967
Gm13768	1.9032629	Lipa	1.5414226	CD274	17.519873	Gss	-1.2931271	Ankrd44	-2.1265647	Tesc	-5.558256
Oas1g	10.454556	Rin2	1.7562006	Anxa1	1.8857256	Pik3cb	-1.3274628	Eef2k	-2.7220473	Siglec 5(F)	-5.692438
Ifi205	6.5848107	Gbp9	11.357385	Mlkl	1.7992138	Cisd2	-1.6667881	Ckap4	-1.8515227	Perp	-5.7366967
Casp4	2.322265	Isg15	5.915503	Rbm38	-1.6857207	Kdm5b	-1.4688559	Kif21b	-2.0265846	Padi4	-5.543704
Macf1	1.4001329	Parp12	2.5202184	H2-Q8	1.545866	Add1	-1.6443403	Ston2	-1.7715594	Aqp9	-6.228664
Slfn1	6.699837	Atf3	4.752628	Il18bp	1.6569332	G6pdx	-1.6915126	Akna	-2.1130443	Suox	-7.910738
Rnf213	3.1720839	Emp1	2.4648194	Ccl12	8.664734	Ptk2b	-1.5647969	Btk	-2.309672	Galnt6	-8.33286
Oasl2	23.614346	Spp1	72.07334	Mpp1	1.7258685	Stim2	-1.6033244	St14	-2.2296848	Adora3	-7.8491
Zcchc11	1.7631749	Dennd1a	1.5679296	Pdpn	3.034531	Atrn	-1.5403583	Atxn1	-1.7044345	Olfm4	-8.865338
Apoe	3.0230672	Casp1	3.1738133	Gla	2.6233373	Eno1	-1.3115609	Aldh2	-2.78948	Gm9847	-7.881515
Gp5	1.2778836	Vegfa	1.61019	n-R5s54	2.1668146	B4galt3	-1.763353	Unc13d	-2.1860797	Ly6g	-16.465357
Dpep2	1.7120758	H2-Q6	2.2867665	Ada	1.6585665	Sh3bgrl3	-1.5216616	Ubac2	-2.6121612	Rasgrp4	-11.843885
A530040E14Rik	1.9734762	Fnip2	2.6148233	Lamp2	1.3534625	Mknk1	-1.7818584	St3gal1	-2.742279	Cish	-8.985856
Lpl	3.8852677	Atp7a	1.7834997	Mrps28	-1.5213538	Lrmp	-1.6776307	Cat	-2.19086	Myo1d	-15.248414
Il7r	4.769913	Slamf9	1.5775619	H2-D1	1.3600413	Sbf1	-1.7682605	Ccdc109a	-2.1741357	Naaladl1	-20.464846
Rtp4	177.6522	Psme2b-ps	2.0942347	Mbnl3	-1.6823198	Tbc1d10c	-1.9262218	Man2b1	-1.8768756	Cyp11a1	-53.097454
Xaf1	7.7757535	Abca1	2.172051	Map4k2	-1.5072157	Cd37	-2.1850789	2310001A20Rik	-2.7356675	Mgll	-38.62288
Zfp36l1	4.3627143	Slfn10-ps	3.5452497	Fosb	5.6951118	Ndel1	-1.4616419	Taldo1	-2.5140522	Enah	-73.25011
Ltn1	-1.2647562	Dtx3l	3.0860522	H2-T22	3.588243	Acadsb	-2.066481	Cd300lb	-1.8606455	Epx	-113.93973
		Ifit1	48.24167	Prkag1	-1.534945	Ccng2	-1.6520759	Gpx4	-1.9749722	Lipg	-317.05554
										Selm	-1619.0679