Supplementary Figures

Supplementary Figure 1 Isolation and confirmation of mLEC.

Strategy of mLEC sorting from cultured LNs of Prox-1-GFP mice (A), and quality of purified LEC was confirmed by a comparison expression of specific markers to blood endothelial cells (BEC) and fibroblastic reticular cells (FRC) and immunocytochemistry of LEC culture image (B and C). Data are presented as mean ± SEM and representative of three independent experiments (n = 3, Blue: DAPI, Green: Prox-1, Red: PECAM-1, Scale bar = 50 μm).
Supplementary Figure 2 Prox-1 and LYVE-1 mRNA expression with cytokine treatment.

Measurement of Prox-1 and LYVE-1 expression in hLECs treated with indicated cytokines (500 ng mL$^{-1}$) compared to vehicle treatment by real-time PCR. Data are presented as mean ± SEM and representative of three independent experiments (n = 5), * $p < 0.05$ compared with vehicle treated group (Non-parametric Mann-Whitney test).
Supplementary Figure 3 Prox-1 expression after cytokine treatment.

Prox-1 expression following treatment of hLECs with indicated cytokines (500 ng mL⁻¹) was quantified with western blot analysis. Data are representative of two independent experiments (n = 3).
Supplementary Figure 4 Tube formation of hLEC with cytokine treatment.

Primary hLECs (5×10^4 cells) were cultured on Matrigel in EGM media with indicated cytokines (500 ng mL⁻¹), and 24 hours later, image were taken (A) and quantified (B). Data are presented as mean ± SEM and representative of three independent experiments (n = 3), * p < 0.05 compared with indicated group (Non-parametric Mann-Whitney test).
Supplementary Figure 5 Tube formation of LECs following treatment with IL-4.

Purified primary hLECs (5×10^4 cells) were cultured on Matrigel in EGM-2 media with indicated concentration of IL-4. Image were taken and quantified after 4 hours. Data are presented as mean ± SEM and representative of three independent experiments (n = 3), * p < 0.05 and ** < 0.01 compared with control group (Non-parametric Mann-Whitney test).
Supplementary Figure 6 Concentration of cytokines in cultured media from T<sub>H</sub>2 cell differentiation condition.

APCs (5×10<sup>5</sup> cells) and/or T cells (5×10<sup>5</sup> cells) were co-cultured in specific T cell differentiation conditions. After differentiation, levels of IFN-γ, IL-4 and IL-13 in cultured media were quantified. Data are presented as mean ± SEM and representative of three independent experiments (n = 3), ** p < 0.005 and *** < 0.001 compared with indicated group (Non-parametric Mann-Whitney test).
Supplementary Figure 7 Prox-1 expression in mLEC after co-culture with T\textsubscript{H}2 cells.

Prox-1 expression in mLECs with T\textsubscript{H}2 cell co-culture with and without treatment of anti-IL-4 or/and anti-IL-13 blocking antibodies by confocal microscopy (A) and quantified (B). Scale bar = 50 \textmu m. Data are presented as mean ± SEM and representative of three independent experiments (n = 3), * p < 0.05 versus indicated group (Non-parametric Mann-Whitney test).
Supplementary Figure 8 Lung sections and quantification of IL-4 and IL-13 in BAL fluid.

(A) Lung sections of control (C) or allergen-induced asthmatic mice (APO) were stained with Periodic acid-Schiff (PAS). Blue arrow indicates goblet cell metaplasia and green arrow shows inflammatory cells (Scale bar = 100 μm). (B) IL-4 and 13 production of recruited inflammatory cells in the lungs of control and APO administered mice were quantified with or without anti-CD3 and anti-CD28 antibody stimulation. Data are presented as mean ± SEM and representative of three independent experiments (n = 5), * p < 0.05 compared with indicated group (Non-parametric Mann-Whitney test).
Supplementary Figure 9 Confocal images of lungs of asthmatic and control mice.

Gross confocal images of allergen-induced asthmatic lungs with and without anti-IL-4 and IL-13 antibodies (Blue: PECAM-1, Red: LYVE-1, Green: Prox-1, Scale bar = 1 mm).
**Supplementary Figure 10 LEC proliferation and quantification of trachea LVs.**

(A) LEC proliferation (MTT assay) was measured after indicated cytokine treatment. **(B)** Trachea image (high magnification) and LV densities of tracheas were quantified. Three days after final intranasal administration of allergen, LVs of lungs were imaged by confocal microscopy (Red: LYVE-1, Green: Prox-1). **(C)** LV sprouting was measured (Yellow arrowhead: LV sprouting). Data are presented as mean ± SEM and representative of two independent experiments (n = 3), # p < 0.01 compared with vehicle group, * p < 0.05 compared with isotype antibody treated group (Non-parametric Mann-Whitney test).
Supplementary Figure 11 Quantification of CD4 T cells and ILC2 in lungs of asthmatic mice.

(A) Three days after final intranasal administration of allergen, CD4 T cells of lungs were quantified. Strategy for CD4 T cell identification, representative flow data, and compiled quantification data are shown. (B) ILC2 in lungs were quantified in a similar way. Data are presented as mean ± SEM and representative of two independent experiments (n = 3), * p < 0.05 compared with isotype antibody treated group (Non-parametric Mann-Whitney test).
Supplementary Figure 12 Quantification of fluorescence conjugated polystyrene beads remaining in whole lung and LNs using FACS analysis.

Con: control which is saline challenged group, APO+Iso: allergen-induced asthma treated with isotype antibody, APO+Ab: allergen-induced asthma treated with anti-IL-4 and anti-IL-13 antibodies. Dotted circle indicates the levels of fluorescence conjugated polystyrene beads in LNs. Data are representative of two independent experiments (n = 3).
Supplementary Figure 13 Enhanced lung function with blockade of IL-4 and IL-13.

Airway resistances at basal level with or without blockade of IL-4 and IL-13 are shown. Data are presented as mean ± SEM and representative of two independent experiments (n = 3). * p < 0.05 compared with isotype antibody-treated group (Non-parametric Mann-Whitney test).