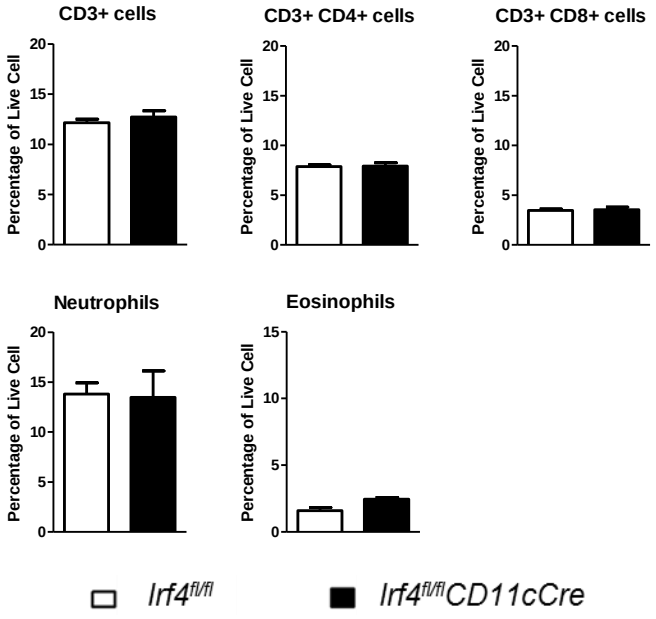
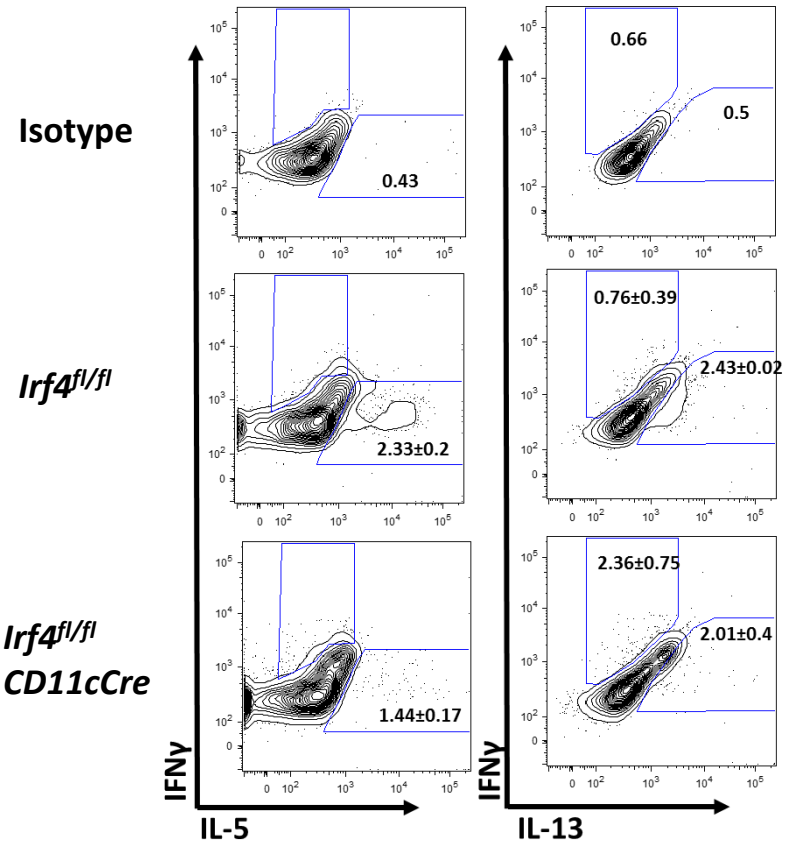
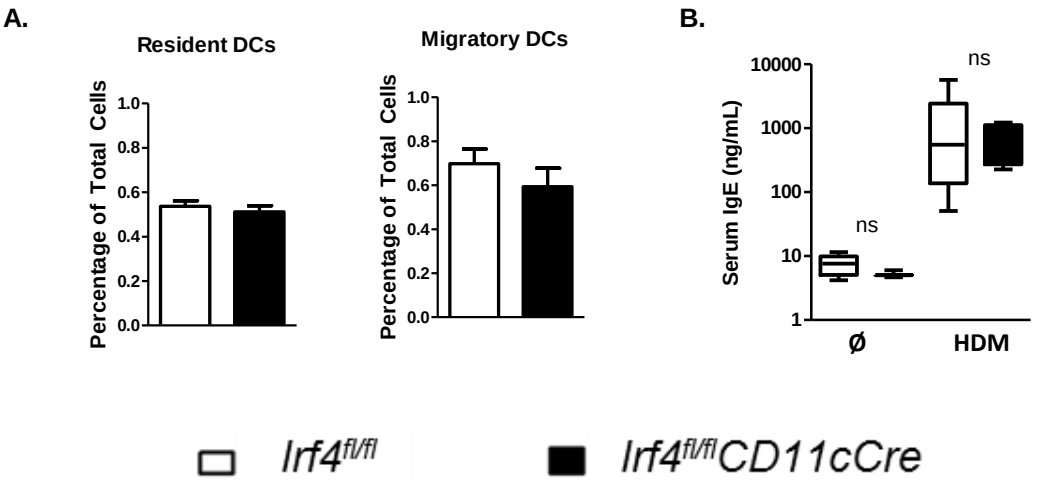
Supplementary Information:



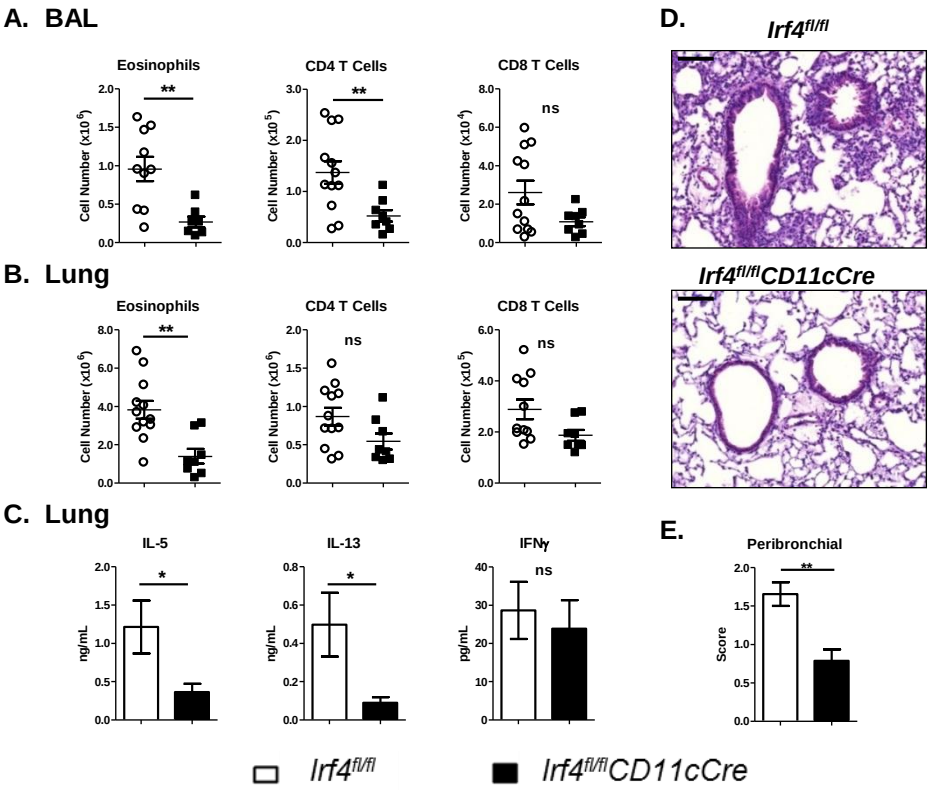
Supplementary Figure S1: *Irf4$^{fl/fl}$CD11cCre* mice have normal lung cellularity. Unsensitized and unchallenged *Irf4$^{fl/fl}$* or *Irf4$^{fl/fl}$CD11cCre* mice were sacrificed and assayed for immune cells in the lungs. The percent of lung CD3^{+} cells, CD4^{+} T cells, CD8^{+} T cells, Neutrophils, and Eosinophils were identified by flow cytometry. Data represent the mean $\pm$ SEM (statistical test by student t-test). Data are from three or four animals per group.



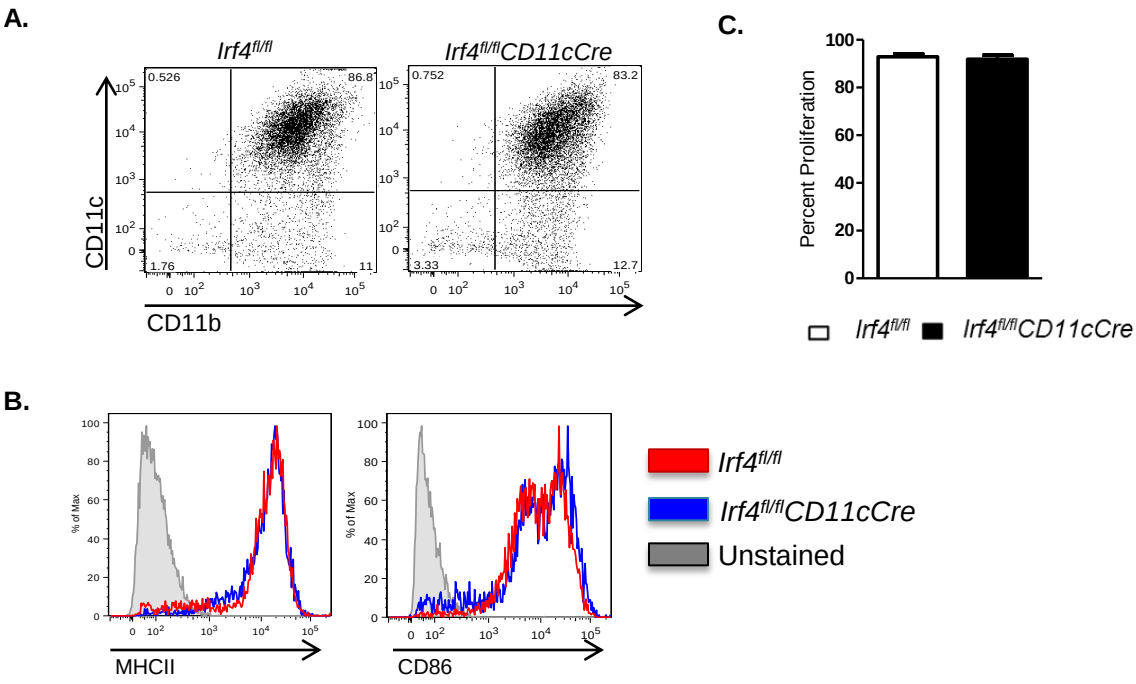
Supplementary Figure S2: Intracellular cytokine staining of T cells from the lungs of HDM-challenged mice. Lung T cells from HDM sensitized and challenged *Irf4*$^{fl/fl}$ or *Irf4*$^{fl/fl}$*CD11cCre* mice were stimulated with PMA/Ionomycin, followed by intracellular cytokine staining for IL-5, IL-13, IFNγ, or appropriate isotype controls. Data represent the mean ±SEM. Data are representative of two independent experiments with three to six mice per group.



Supplementary Figure S3: *Irf4$^{fl/fl}$CD11cCre* mice show similar DC migration and IgE responses following HDM sensitization and challenge. (A) Mediastinal lymph nodes from HDM sensitized and challenged *Irf4$^{fl/fl}$* or *Irf4$^{fl/fl}$CD11cCre* mice were assayed for infiltration of migratory and resident DC populations. (B) Serum from unchallenged or sensitized and challenged mice were assayed for total IgE levels. Data represent the mean $\pm$ SEM (statistical test by student t-test). Data is representative of two independent experiments with four to six replicates per group.

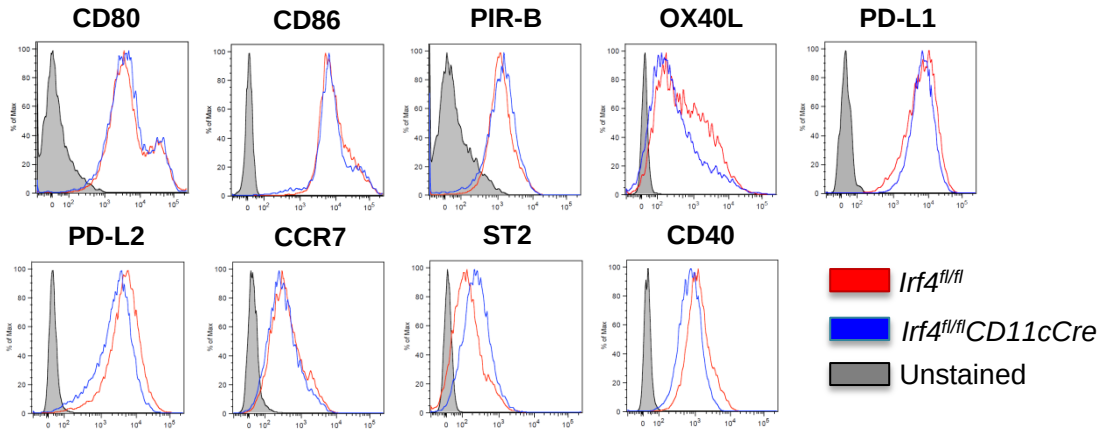


Supplementary Figure S4: IRF4 in DCs regulates the development of Th2 responses toward HDM. *Irf4$^{fl/fl}$* or *Irf4$^{fl/fl}$CD11cCre* mice were sensitized i.p. with HDM/Alum and challenged i.t. with HDM, then sacrificed at the peak of inflammation on day 4 after challenge. (A) BAL eosinophil, CD4$^+$, and CD8$^+$ T cells numbers recovered from sensitized and challenged mice. (B) Lung eosinophil, CD4$^+$, and CD8$^+$ T cell numbers recovered from sensitized and challenged mice. (C) Lung T cells were restimulated and measured for secreted cytokines. (D) H&E stains of lung from sensitized/challenged (top) *Irf4$^{fl/fl}$* and (bottom) *Irf4$^{fl/fl}$CD11c-cre* mice. (E) Peribronchial scoring of lung sections from sensitized and challenged mice for cellular infiltration. Histology bar = 100 µM. Data represent the mean ± SEM (statistical test by student t-test; *, P<0.05; **, P<0.01; ***, P<0.001). Data are representative of three independent experiments, with three to six replicates per experiment.

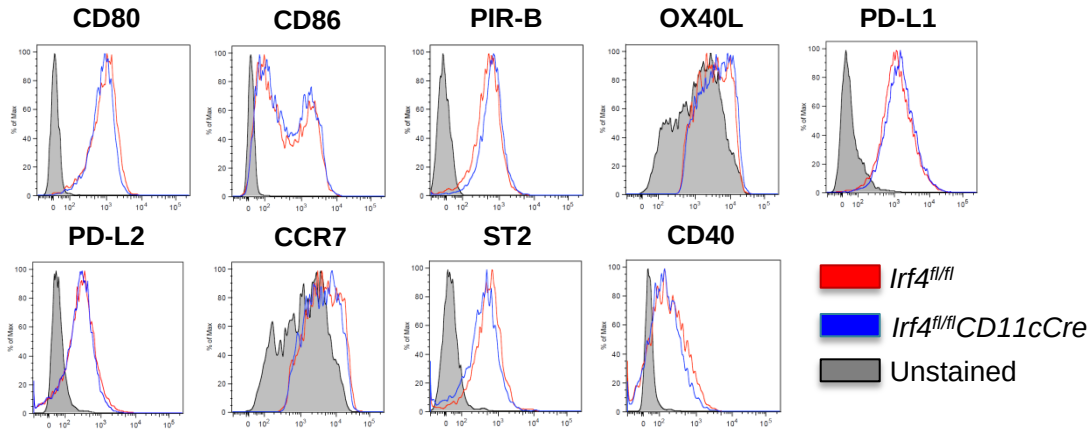


Supplementary Figure S5: *Irf4$^{fl/fl}$CD11cCre* BMDCs develop and are activated similar to *Irf4$^{fl/fl}$* BMDCs. (A) BMDCs from *Irf4$^{fl/fl}$* or *Irf4$^{fl/fl}$CD11cCre* mice were assayed for CD11c^{+} CD11b^{+} cells. (B) BMDCs were activated with LPS for eight hours and assayed for expression of MHCII and CD86. (C) *Irf4$^{fl/fl}$* or *Irf4$^{fl/fl}$CD11cCre* BMDCs were activated with LPS and used to present OVAp to CFSE-labeled OTII cells, and T cell proliferation was measured five days later. Data represent the mean $\pm$ SEM (statistical test by student t-test). Data are representative of three or more independent experiments.

A. GMCSF BMDCs



B. Flt3L BMDCs



Supplementary Figure S6: Phenotypic analysis of GM-CSF and Flt3L-derived Irf4f$^{l/fl}$CD11cCre BMDCs following HDM stimulation. (A) GM-CSF-derived and (B) Flt3L-derived BMDCs from *Irf4$^{fl/fl}$* or *Irf4$^{fl/fl}$CD11cCre* mice were assayed for expression of activation molecules following HDM-treatment. Data are representative of three unique experiments.