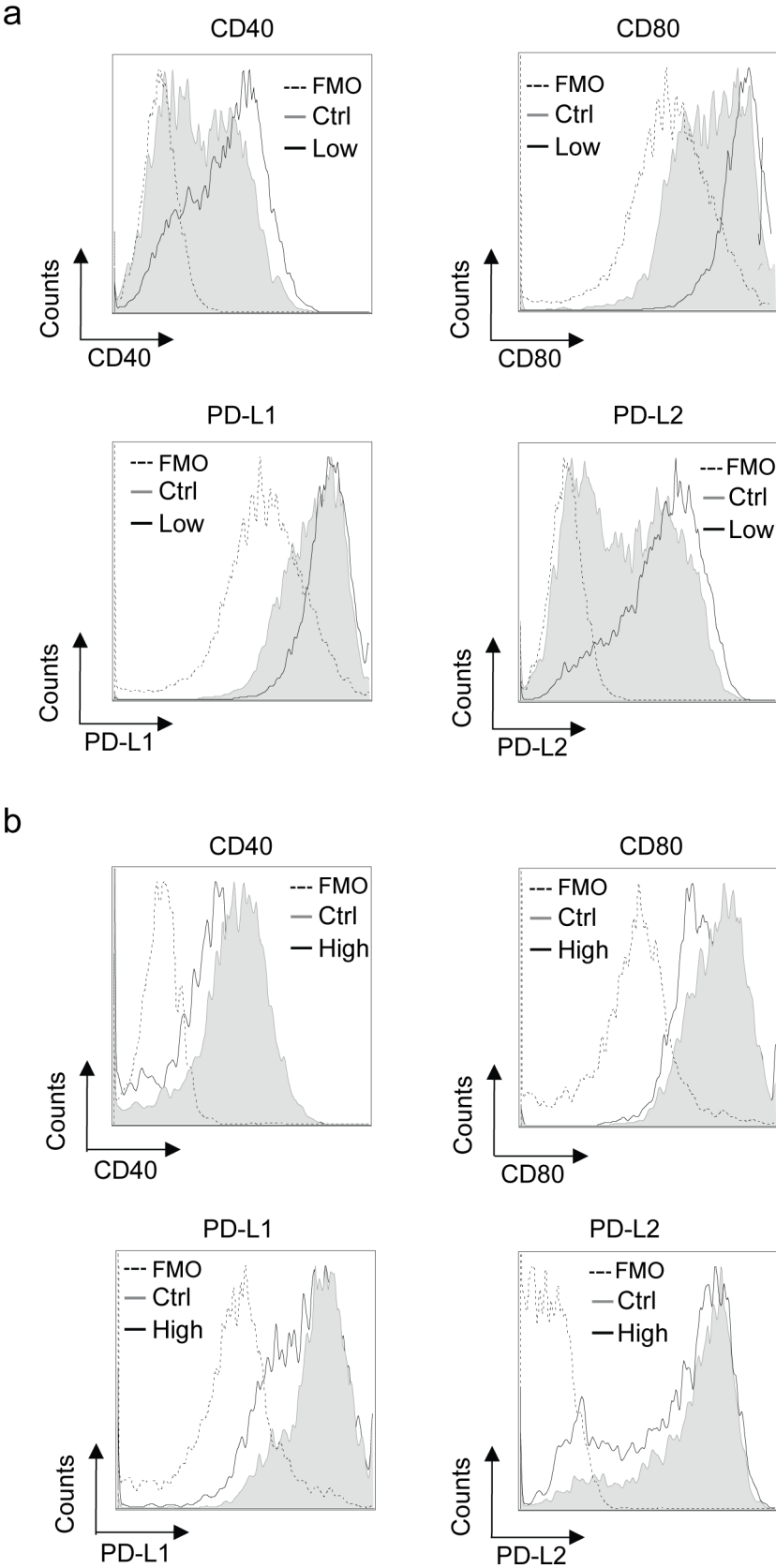


**Dietary fiber influences the severity of allergic airway inflammation through GPR41 mediated host-microbial-metabolite cross-talk.**

Aurélien Trompette<sup>1</sup>, Eva Gollwitzer<sup>1</sup>, Koshika Yadava<sup>1</sup>, Anke K. Sichelstiel<sup>1</sup>, Norbert Sprenger<sup>2</sup>, Catherine Ngom-Bru<sup>2</sup>, Carine G. Blanchard<sup>2</sup>, Tobias M. Junt<sup>3</sup>, Laurent P. Nicod<sup>1</sup>, Nicola L. Harris<sup>4</sup>, Benjamin J. Marsland<sup>1</sup>

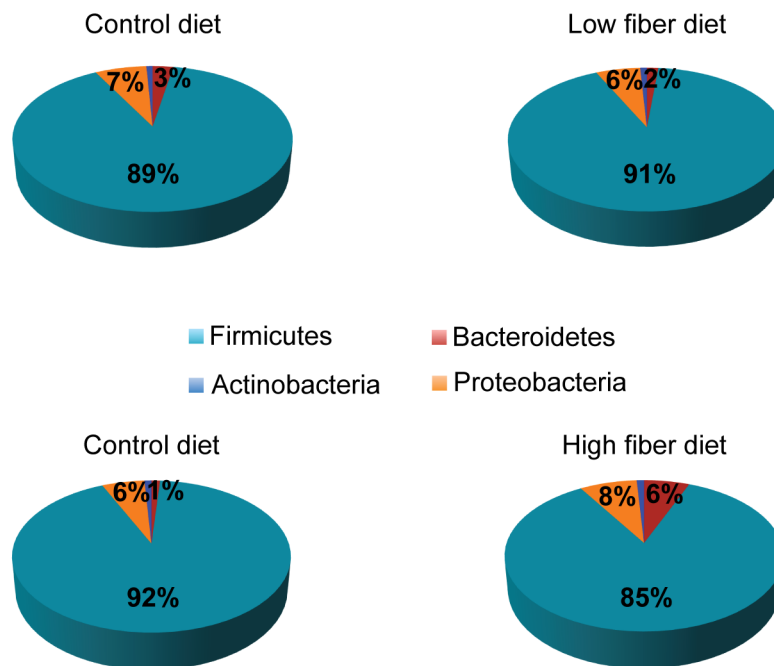
Supplementary Figure 1



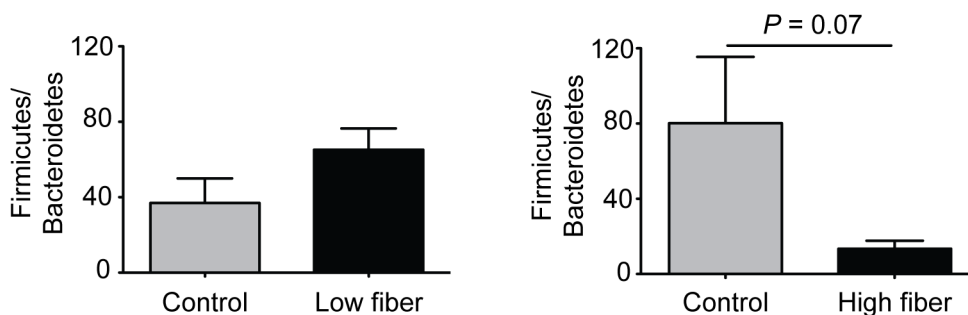
**Supplementary Figure 1. Activation profile of CD11b<sup>high</sup> Dendritic cells from lung draining lymph node of mice fed a low or high fiber diet differs from mice on control diet.** (a) Histograms depicting the surface expression of CD40, CD80, PD-L1 and PD-L2 on the CD11b<sup>high</sup> DC population of low fiber diet versus regular diet fed mice. (b) Histograms depicting the surface expression of CD40, CD80, PD-L1 and PD-L2 on the CD11b<sup>high</sup> DC population of high fiber diet versus regular diet fed mice. Results are representative of data generated in three different experiments. Data are expressed as mean  $\pm$  SEM (n = 5 control mice and 5 low fiber diet mice/ group or n = 5 control mice and 6 high fiber diet mice/ group).

## Supplementary Figure 2

a



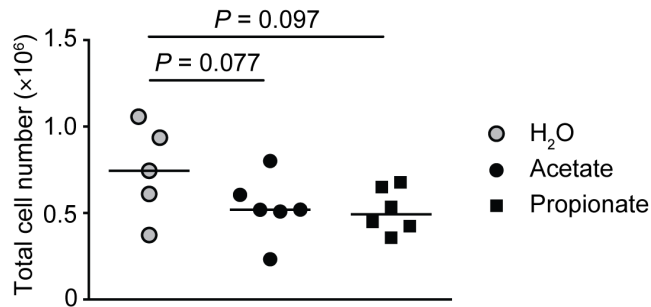
b



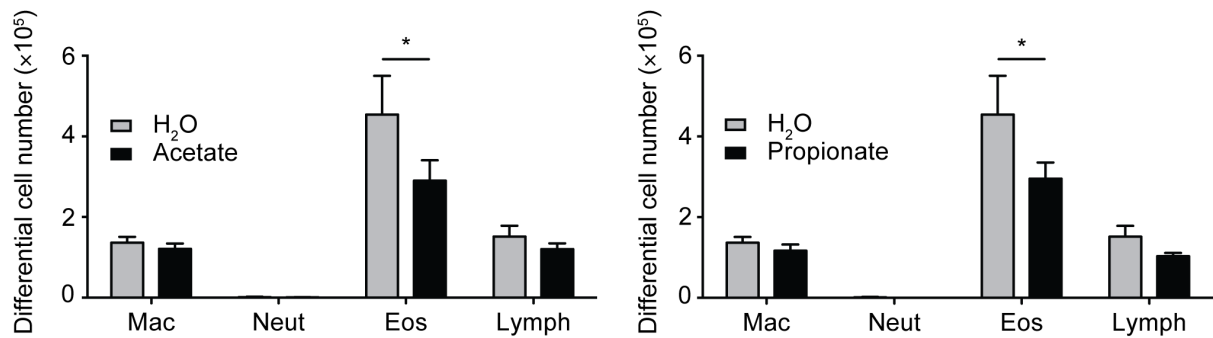
**Supplementary Figure 2. Dietary fiber content influences the constituents of the lung microbiota.** (a) Analysis of the different microbial communities (Firmicutes, Bacteroidetes, Actinobacteria and Proteobacteria) from the lungs of mice fed either low, high fiber or control diets by quantitative PCR. (b) Representation of the Firmicutes/Bacteroidetes ratios. Data are expressed as mean  $\pm$  SEM (n = 5 control and 5 low fiber diet fed mice/ group; 4 control and 5 high fiber diet fed mice/ group).

### Supplementary Figure 3

a



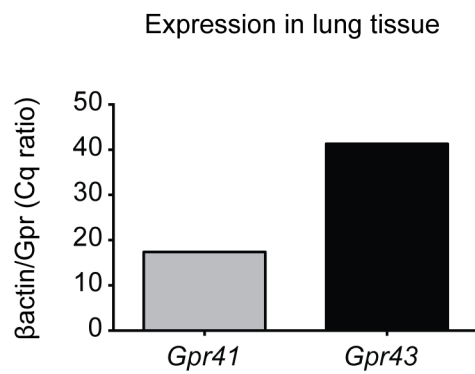
b



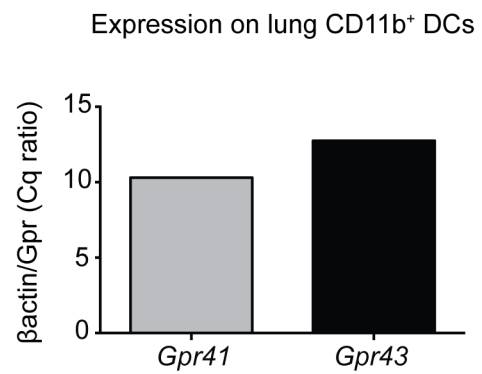
**Supplementary Figure 3. Acetate and propionate supplementation in the drinking water dampens allergic airway inflammation to HDM.** (a) Quantification of the total number of cells infiltrating the airways in the BALF. (b) Analysis and quantification of the differential cell counts in the BALF. Results are representative of data generated in two different experiments. Data are expressed as mean  $\pm$  SEM (n = 5 control mice and 6 treated mice/ group). \*p = 0.05.

## Supplementary Figure 4

a

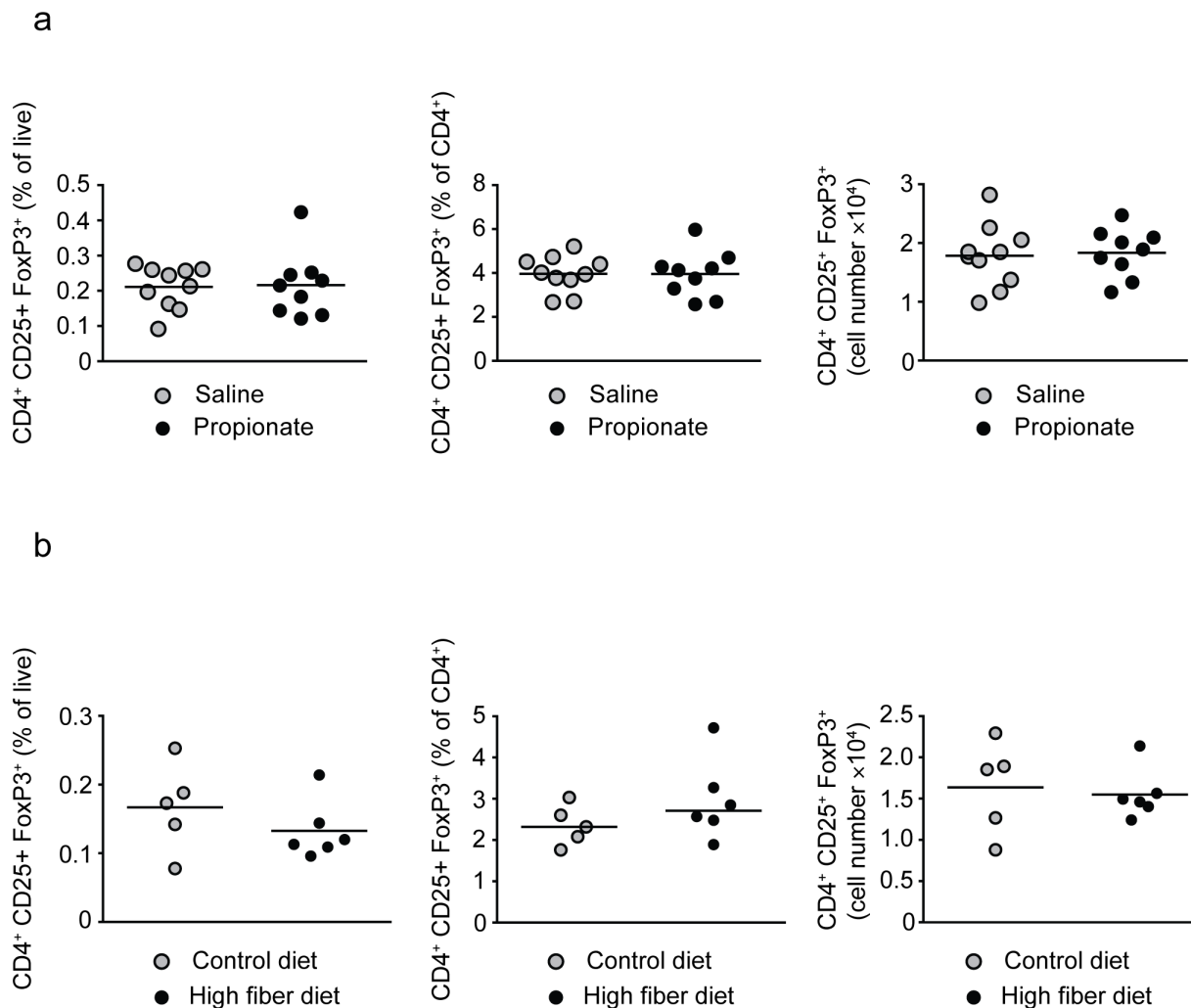


b



**Supplementary Figure 4. Lung CD11b<sup>+</sup> Dendritic cells express both SCFA receptors GPR41 and GPR43.** (a) Analysis of GPR41 and GPR43 mRNA expression levels in the whole lungs, or on (b) FACS-purified CD11c<sup>+</sup> CD11b<sup>+</sup> lung DCs.

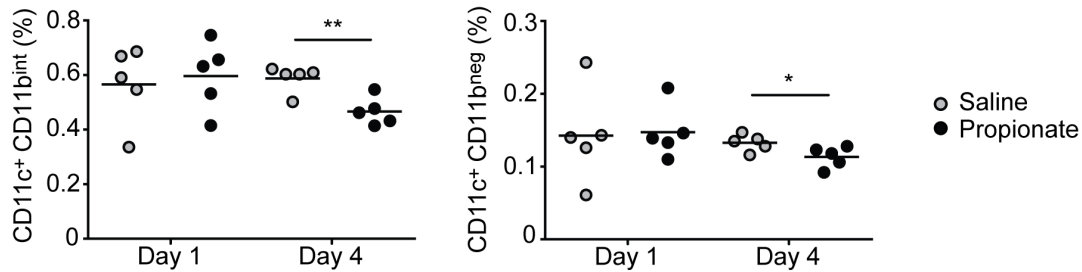
## Supplementary Figure 5



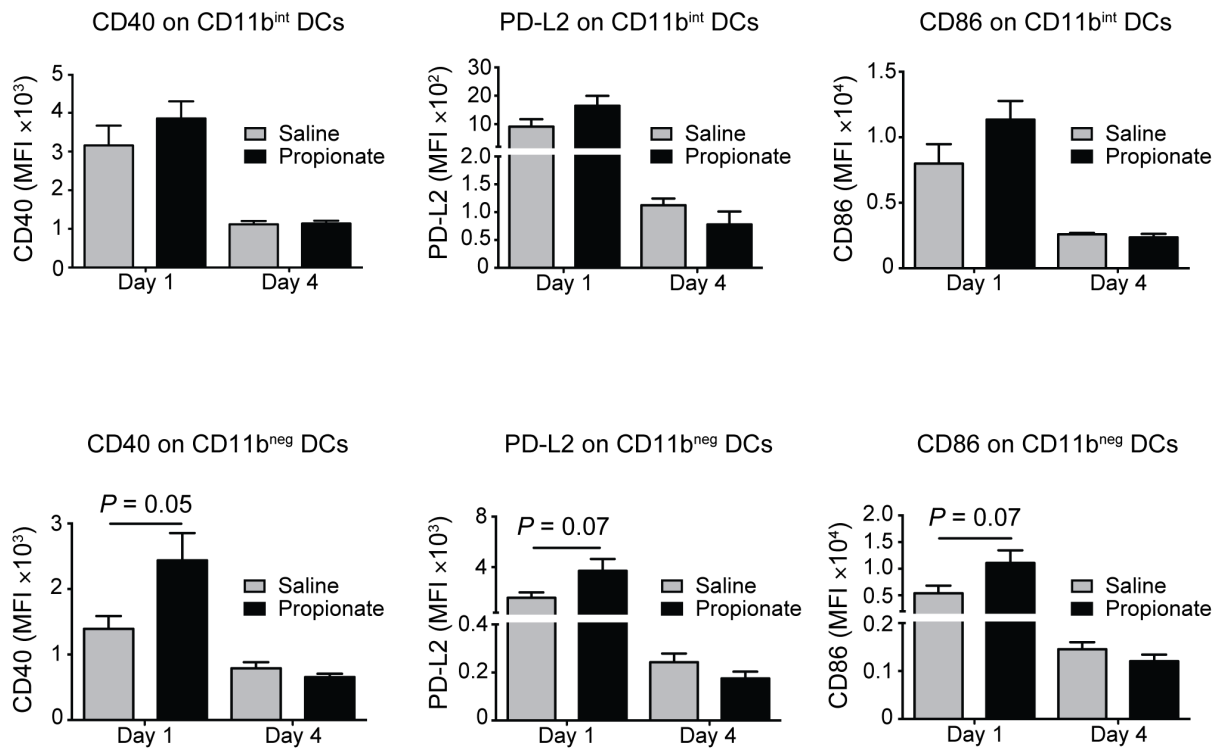
**Supplementary Figure 5. The protective effect of propionate or high fiber diet on allergic airway inflammation is not associated with increased regulatory CD4<sup>+</sup> T cell numbers.** (a) Proportion and total numbers of FoxP3<sup>+</sup> CD25<sup>+</sup> CD4<sup>+</sup> regulatory T cells in mice treated with saline or sodium propionate, or (b) on a control diet supplemented with cellulose or enriched with pectin. Results are representative of data generated in two different experiments. Data are expressed as mean  $\pm$  SEM (n = 10 control mice and 9 propionate treated mice; 5 control and 6 high fiber diet fed mice/ group).

## Supplementary Figure 6

a



b

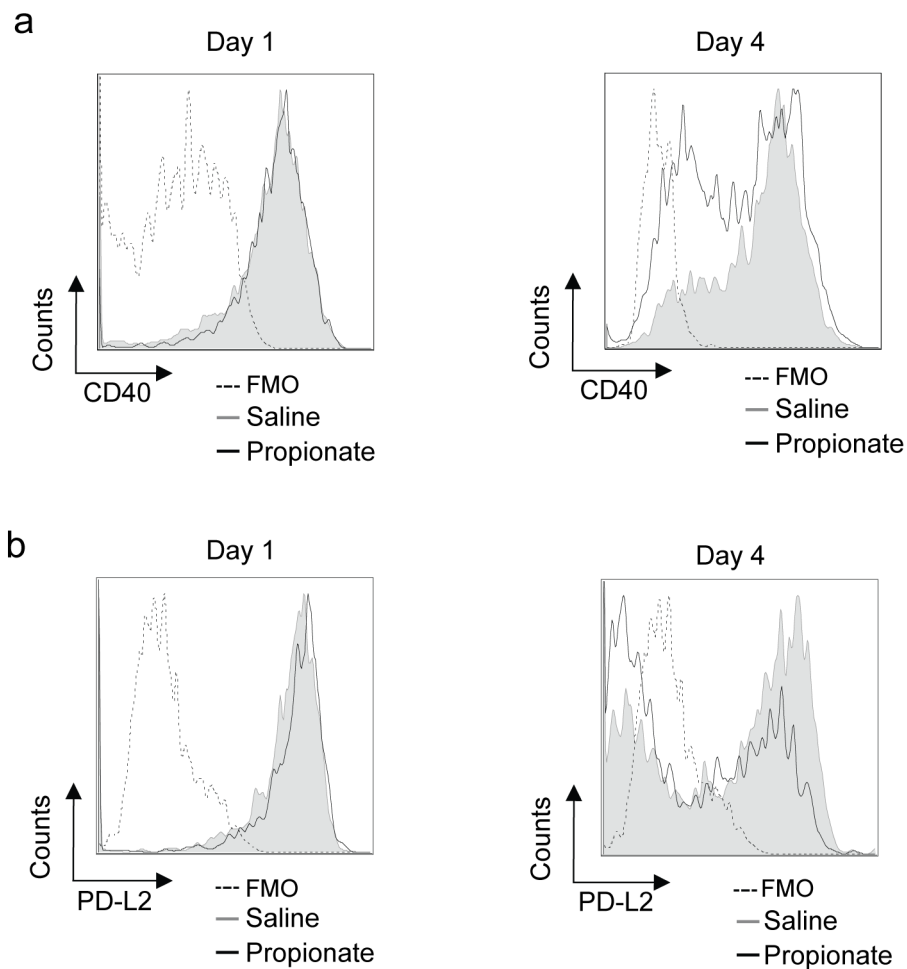


**Supplementary Figure 6. CD11b<sup>neg</sup> and CD11b<sup>int</sup> Dendritic cells from the lung draining lymph node of mice treated with propionate behave similarly to their CD11b<sup>hi</sup> counterparts.** (a) The percentage and total number of the indicated DC subpopulations either 1 day or 4 days post the final HDM challenge. (b) Surface expression analysis of CD40, PD-L2 and CD86 on the CD11b<sup>int</sup> DC population. (c)



Surface expression analysis of CD40, PD-L2 and CD86 on the CD11b<sup>neg</sup> DC population. Results are representative of data generated in two different experiments. Data are expressed as mean  $\pm$  SEM (n = 5 mice/ group). \*p = 0.05, \*\*p = 0.01.

## Supplementary Figure 7



**Supplementary Figure 7. Activation profile of CD11b<sup>high</sup> Dendritic cells from lung draining lymph node of propionate treated mice differs from control mice.**

(a) Histograms depicting the surface expression of CD40 on the CD11b<sup>high</sup> DC population of propionate treated versus control mice on day 1 and day 4 after the last HDM challenge. (b) Histograms depicting the surface expression of PD-L2 on the CD11b<sup>high</sup> DC population of propionate treated versus control mice on day 1 and day 4 after the last HDM challenge. Results are representative of data generated in two different experiments. Data are expressed as mean  $\pm$  SEM (n = 5 control mice/group).