Supplemental Figure Legends

Fig. S1. pDCs pulsed with anti-Siglec-H-OVA plus CpG *in vitro* expressed MHCI-OVA complexes recognized by anti-H-2K^{b}-SIINFEKL. Freshly isolated pDCs were untreated or pulsed with anti-Siglec-H-OVA and CpG, washed extensively and then co-cultured with freshly isolated cDCs as in Fig 3C. Expression of surface MHCI-OVA (H-2K^{b}-SIINFEKL) on gated pDCs was shown. Data are representative of three independent experiments.

Fig. S2. Batf3-depedent cDC1s played a critical role in pDC-mediated cross-priming *in vivo*. **(A to C)** Increasing pDCs and cDCs in Batf3$^{-/-}$ mice led to increased proliferation of naive OTI cells. WT, Batf3$^{-/-}$ and Flt3L-treated Batf3$^{-/-}$ mice were immunized with anti-Siglec-H-OVA plus CpG (n=4) following adoptive transfer of naive OTI CD8 T cells, and spleen and LN cells were examined for pDCs/cDCs and cross-priming. The percentages of pDCs and cDCs in spleen were increased after Flt3L treatment as shown in (A). The percentages of Thy1.1^{+} OTI cells out of total CD8 T cells are depicted in (B), and the percentages of Thy1.1^{+} OTI cells that had undergone >5 cycles of proliferation in (C). **(D)** WT but not Batf3$^{-/-}$ cDCs were able to induce OTI cell proliferation by WT pDCs *in vitro*. WT pDCs pulsed with anti-Siglec-H-OVA plus CpG were co-cultured with naive OTI cells (1x10^{5} cells). 2x10^{4} WT or Batf3$^{-/-}$ cDCs were added as indicated. Percentages of proliferated cells (CFSE^{low}) out of total OTI cells were shown. **(E)** Batf3$^{-/-}$ cDCs were efficient in acquiring functional MHCI-antigen complexes (H-2K^{b}-SIINFEKL) from cross-presenting pDCs. WT pDCs pulsed with anti-Siglec-H-OVA plus CpG were cultured with WT or Batf3$^{-/-}$ cDCs, and subjected to flow cytometry. Expression of MHCI-OVA (H-2K^{b}-SIINFEKL) on gated cDCs on day 5 were shown, and the percentages of MHCI-OVA^{+} cells were similar in WT CD8^{+} cDC1s (4.4/12=37%) and WT CD8^{-} cDC2s (22/61=36%).

Data are representative of at least two independent experiments. NS=P>0.05%, *P<0.05, **P<0.01, and ***P<0.001.

Fig. S3. Antigen-presenting pDCs conferred cDCs expression of functional MHCI-antigen complexes to prime naive CD8 T cells through a cell contact-independent mechanism. **(A)** pDCs induced cDCs to prime naive OTI cells through a cell contact-independent mechanism. OTI cells were co-cultured with WT cDC in the inner chambers, and various numbers of pDCs pulsed with anti-Siglec-H-OVA plus CpG were added to the inner chambers or out chambers as indicated. Percentages of proliferated ($CFSE^{low}$) $Thy1.1^{+}$ OTI cells out of total OTI cells were shown. **(B)** pDC culture supernatants transferred antigens to naive WT cDCs resulting in their expression of MHCI-OVA complexes (H-$2K^{b}$-SIINFEKL). cDCs were cultured alone or with culture supernatants of pulsed WT pDCs, and subjected to flow cytometry. Expression of MHCI-OVA on cDCs was shown. Data shown are representative of two or more independent experiments.

Fig. S4. Exosomes from pDCs targeted through siglec-H with a TLR7 agonist and a tumor antigen similarly primed antigen-specific CD8 T cells with bystander cDCs. **(A)** Exosomes from WT pDCs cultured with anti-Siglec-H-OVA plus R848 induced cDC-dependent priming of naive OTI CD8 T cells. WT pDCs were cultured with anti-Siglec-H-OVA plus R848 and isolated exosomes were added to OTI cells in the presence or absence of naive WT cDCs, and subjected to flow cytometry. Percentages of total proliferated cells ($CFSE^{low}$) and proliferated IFN-γ^{+} cells ($CFSE^{low}$IFN-γ^{+}) out of total OTI cells were shown. **(B)** Exosomes from pDCs targeted with anti-Siglec-H-hgp100 mediated cDC-dependent priming of gp100-specific CD8 T cells. WT pDCs were cultured with with anti-Siglec-H-hgp100 plus CpG and isolated exosomes were added to

gp100-specific CD8 T (pmel-1) cells in the presence or absence of naive WT cDCs, and subjected to flow cytometry. Percentages of total proliferated cells ($CFSE^{low}$) and proliferated IFN-γ^+ cells ($CFSE^{low}$IFN-γ^+) out of total pme-1 cells were shown. Data shown are representative of two independent experiments.

Supplemental Figures:

Fig. S1

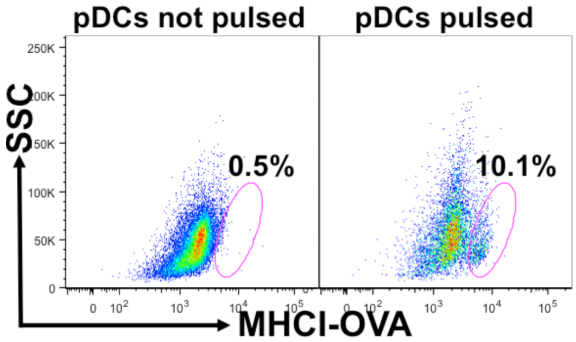


Fig. S2

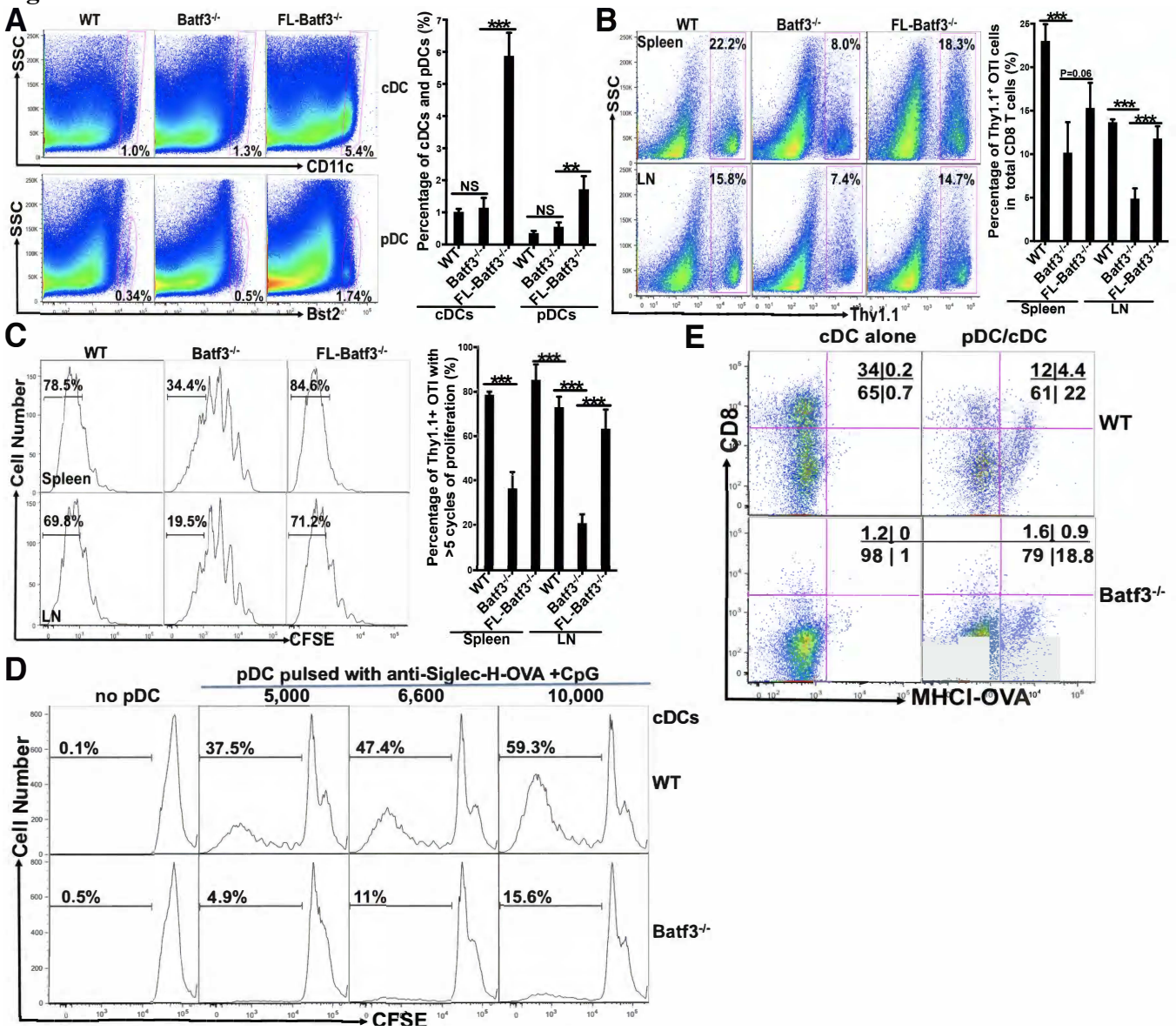


Fig. S3

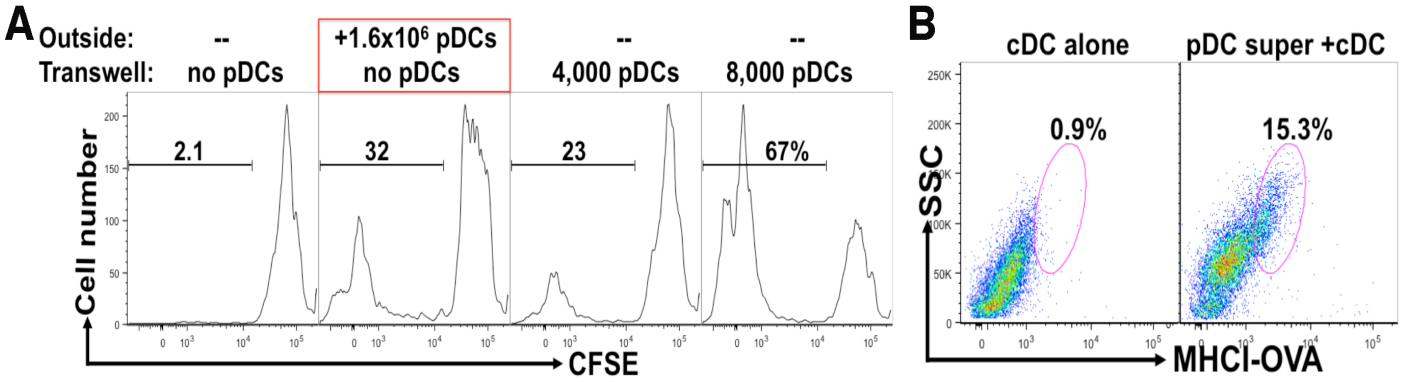
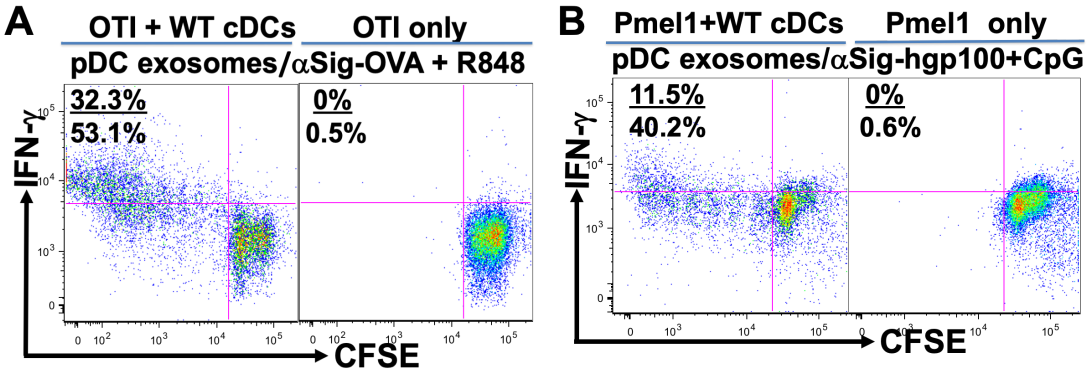

A
Outside:
Transwell:
--
no pDCs
+1.6x10⁶ pDCs
no pDCs
--
4,000 pDCs
--
8,000 pDCs
Cell number
2.1
32
23
67%
CFSE
B
cDC alone
pDC super +cDC
0.9%
15.3%
SSC
MHCI-OVA

Fig. S4


A
OTI + WT cDCs
OTI only
pDC exosomes/αSig-OVA + R848
32.3%
53.1%
0%
0.5%
IFN-γ
CFSE
B
Pmel1+WT cDCs
Pmel1 only
pDC exosomes/αSig-hgp100+CpG
11.5%
40.2%
0%
0.6%
IFN-γ
CFSE