

Figure S1. Semi-quantitative histopathological analysis of vaccinated mouse lungs. Formalin-fixed paraffin-embedded sections of mouse lungs 4 weeks post *M. tuberculosis* challenge were stained with H&E and assessed using a semi-quantitative scoring method for (a) inflammation area, (b, g) lymphoid follicle, lymphoid nodule, or granuloma presence, and (d-f) localized inflammation. Data are expressed as mean (\pm SD) of eight to ten mice per group from two independent experiments. Kruskal Wallis test followed by Dunn multiple comparison posthoc p-values; * $p \leq 0.05$, *** $p \leq 0.001$, **** $p \leq 0.0001$.

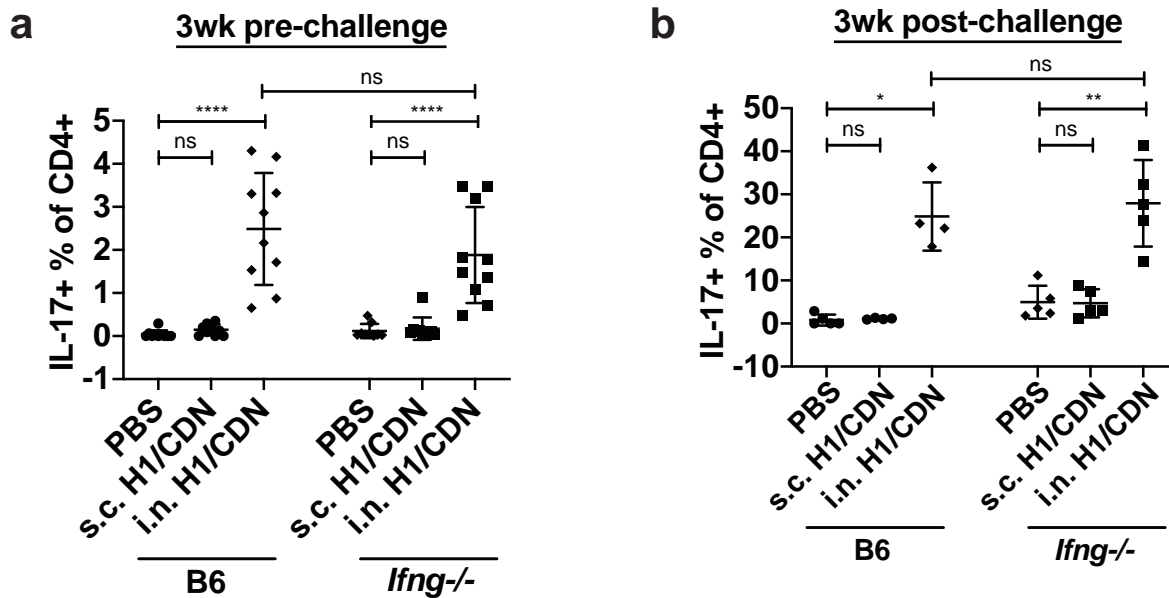


Figure S2. Evaluation of T cells in the lungs of WT and *Ifng*^{-/-} mice. CD4 T cells in the lungs of mice at the indicated timepoints were evaluated for IL-17 production using ICS and flow cytometry. The mice depicted are the same as those depicted in Figure 3a and 3b. Data are expressed as mean (\pm SD) of eight to ten mice per group from two independent experiments with value from each individual animal displayed (a) or as a representative experiment with each animal displayed (b). Mann-Whitney t test p values; * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$.

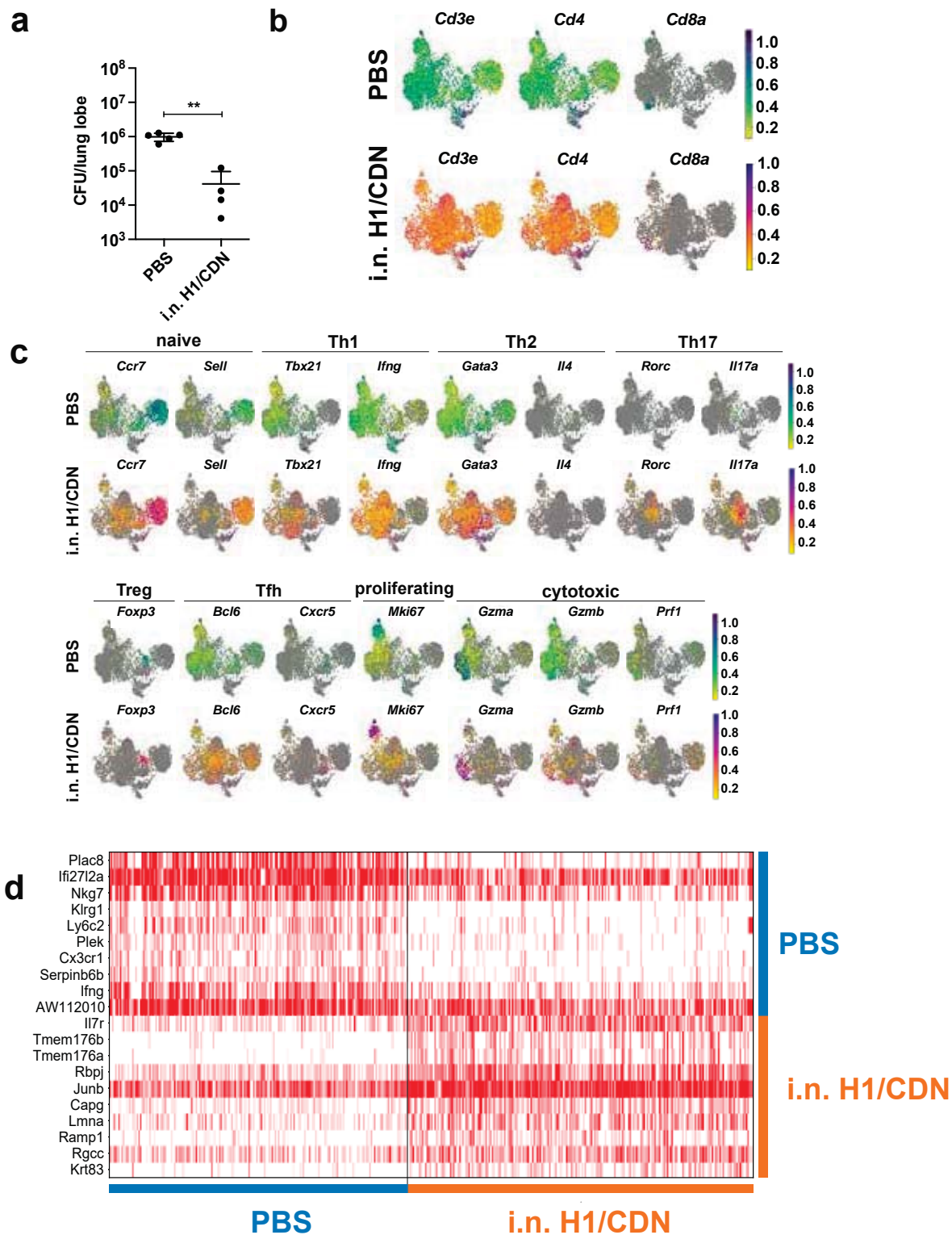


Figure S3. (a) CFU from the scRNA-seq experiment at 4 weeks post challenge. Subsets of CD4 T cells were manually annotated based on signature expression of lineage-specific transcription factor, cytokine, and cell surface markers. (a) UMAP plots of CD4 T cell subsets isolated from mock (PBS) or (b) i.n. H1/ML-RR-cGAMP (i.n. H1/CDN) vaccinated mice 3 weeks post infection. (c) Signature gene expression of CD4 T cell subtypes in mock and i.n. H1/CDN vaccinated mice. The color scale indicates the percentile expression level for each cell that has non-zero expression. (d) heat map depicting genes that are most differentially expressed in mock and i.n. H1/CDN vaccinated mice.

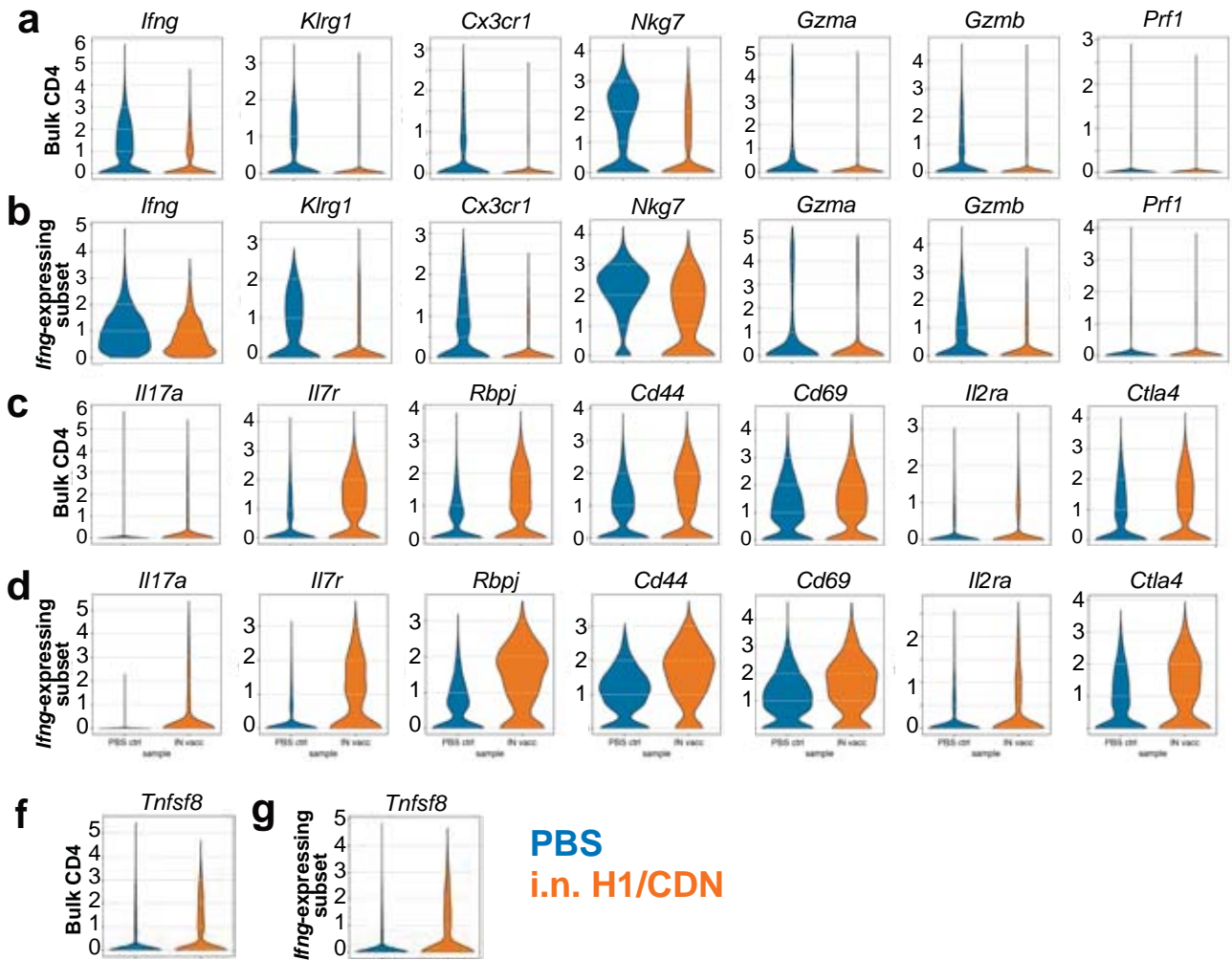


Figure S4. Markers of Th1 lineage, terminal differentiation, and cytotoxicity in (a) bulk and (b) *Ifng*-expressing CD4 T cell populations in mock (blue, PBS) and i.n. H1/ML-RR-cGAMP vaccinated (orange, i.n. H1/CDN) infected mouse lungs. Markers of Th17 lineage, memory, and activation in (c) bulk and (d) *Ifng*-expressing CD4 populations. *Tnfsf8* expression in (f) bulk and (g) *Ifng*-expressing CD4 populations.