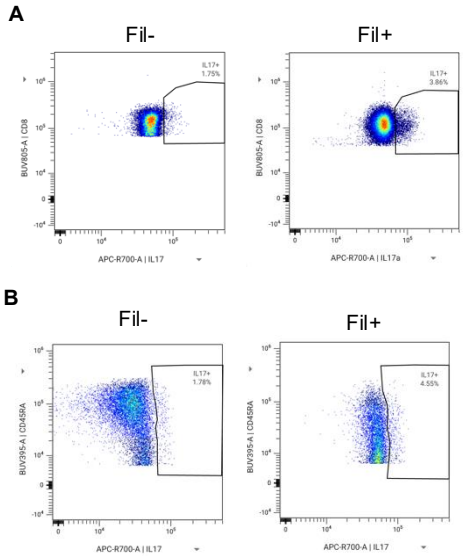
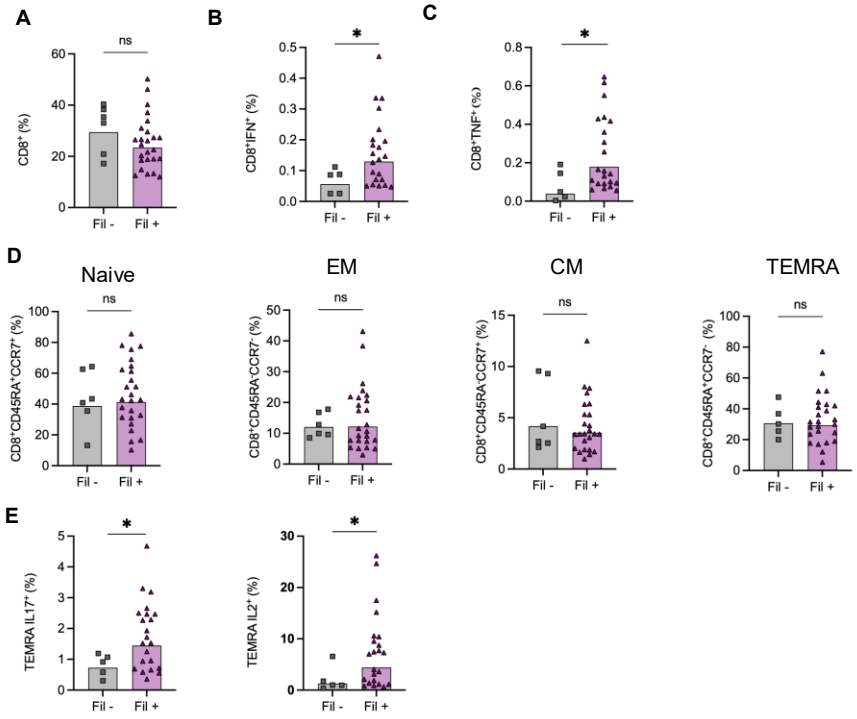
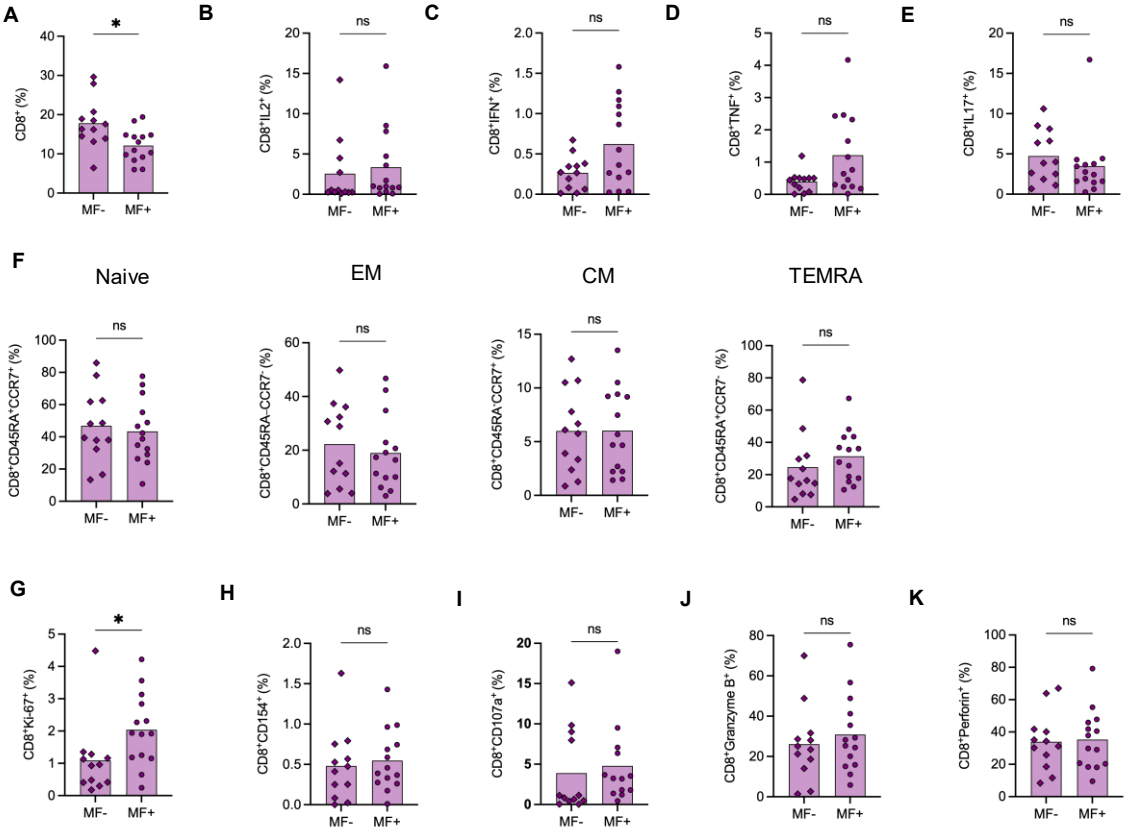


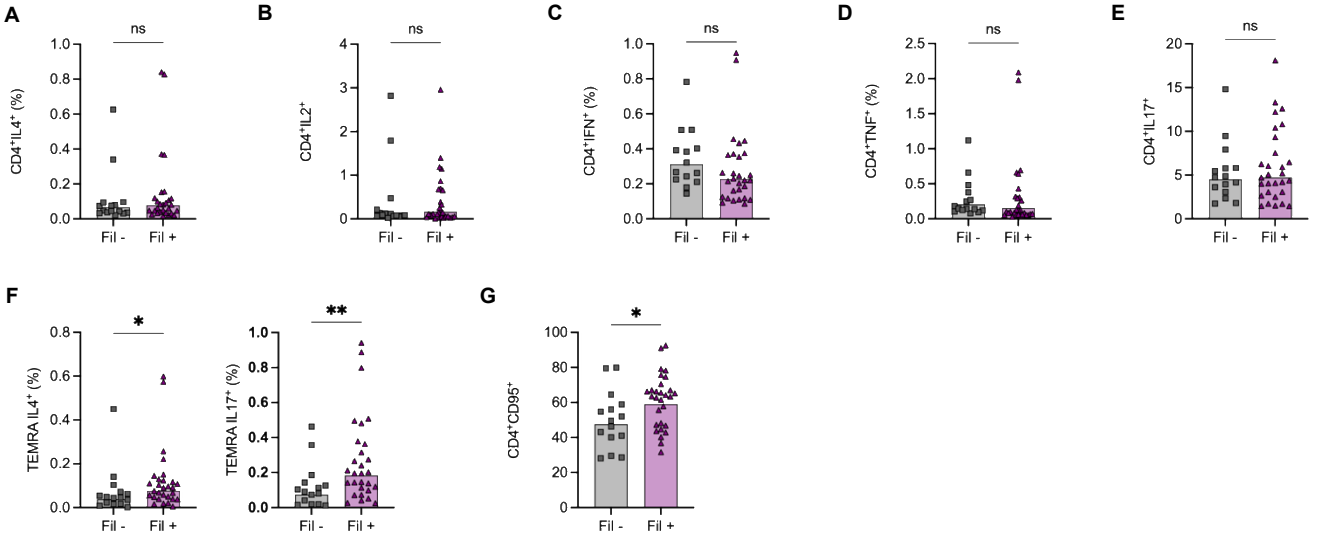

**Supplemental Figure 1. Representative flow cytometry plots of IL-17 expression in CD8⁺ T cell subsets. (A)** $CD8^+IL\text{-}17^+$ T cells, (**B**) $CD8^+CD45RA^+CCR7^-IL\text{-}17^+$ (TEMRA – effector memory re-expressing CD45RA).



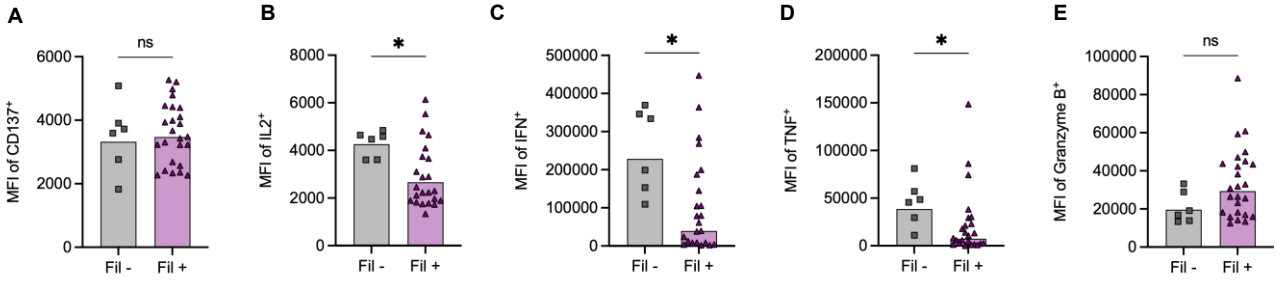

**Supplemental Figure 2. Baseline CD8⁺ T cell alterations are independent of CMV serostatus.** Flow Cytometry data from Fil- and Fil+ individuals were filtered and re-analyzed to include only CMV seropositive individuals. Frequency of total CD8⁺ T cells (**A**), gated on live CD3⁺, and single cytokine producing CD8's, IFN-γ (**B**) and TNF-α (**C**). (**D)** Percentage of naïve T cells (gated on CD45RA⁺CCR7⁺), effector memory (EM) (gated on CD45RA⁻CCR7⁻), central memory (CM) (gated on CD45RA⁻CCR7⁺), and effector memory re-expressing CD45RA (TEMRA) (gated on CD45RA⁺CCR7⁻). (**E)** Frequency of TEMRA producing IL-17 or IL-2. Fil- (n=6), Fil+ (n=25). Each symbol represents a single individual, and the horizontal bars are the GMs. Mann-Whitney test. *p<0.05 compared to Fil-.




**Supplemental Figure 3. Presence of circulating microfilaria does not influence the phenotype of CD8⁺ T cells.** Flow Cytometry data from Fil+ individual were stratified by the presence (MF+; purple diamonds) or absence (MF-; purple circles) of circulating microfilaria. Frequency of total $CD8^+$ T cells (**A**), gated on live $CD3^+$, and single cytokine producing CD8's, IL-2 (**B**), IFN-$\gamma$ (**C**), TNF-$\alpha$ (**D**), or IL-17 (**E**). **(F)** Percentage of naïve T cells (gated on $CD45RA^+CCR7^+$), effector memory (EM) (gated on $CD45RA^-CCR7^-$), central memory (CM) (gated on $CD45RA^-CCR7^+$), and effector memory re-expressing CD45RA (TEMRA) (gated on $CD45RA^+CCR7^-$). Frequency of $CD8^+$ T cells expressing/producing Ki-67 (**G**), CD154 (**H**), CD107a (**I**), granzyme B (**J**), or perforin (**K**). MF- (n=14), MF+ (n=16). Each symbol represents a single individual, and the horizontal bars are the GMs. Mann-Whitney test. *$p<0.05$ for comparisons between MF+ and MF- individuals.

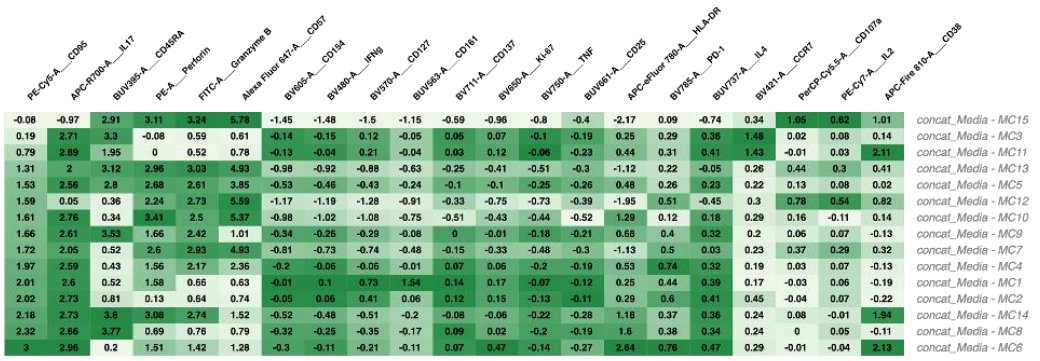



**Supplemental Figure 4. TEMRA CD4⁺ T cell functional and apoptotic profiles differ between filaria-infected and uninfected individuals.** Frequency of single cytokine producing CD4's, IL-4 (**A**), IL-2 (**B**), IFN-γ (**C**), TNF-α (**D**), or IL-17 (**E**), gated on live CD3⁺. (**F)** Percentage of TEMRA producing IL-4 or IL-17. (**G)** Frequency of CD4⁺CD95⁺. Fil- (n=15), Fil+ (n=29). Each symbol represents a single individual, and the horizontal bars are the GMs. Mann-Whitney test. *p<0.05 **p<0.01 compared to Fil-.

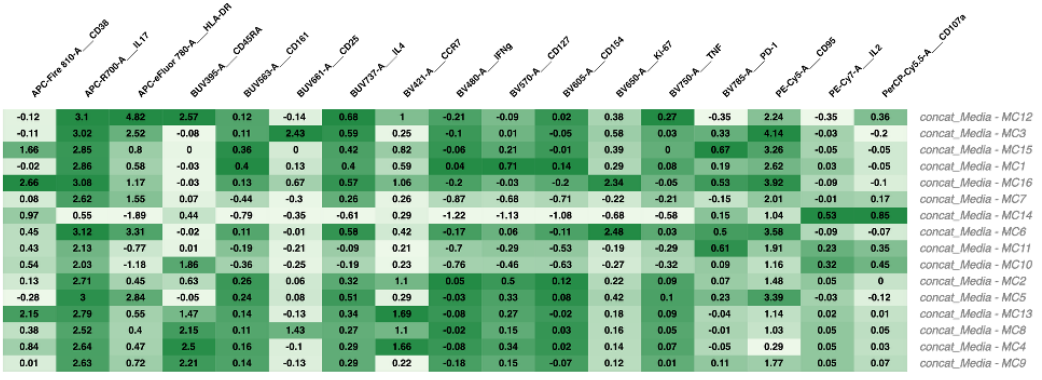



**Supplemental Figure 5. Filarial infection reduces per-cell cytokine production, but not cytotoxic granule content, among CMV responding CD8⁺ T cells.** Median fluorescence intensity (MFI) of CD137 (**A**), IL-2 (**B**), IFN-γ (**C**), TNF-α (**D**), and Granzyme B (**E**), within the CD8⁺CD137⁺ population from filaria-infected (Fil+, purple triangles) and uninfected (Fil-, grey squares) individuals following CMV peptide re-stimulation, corresponding to the same gating strategy as Figure 4B. Fil- (n=6), Fil+ (n=25). Each symbol represents a single individual, and the horizontal bars are the GMs. Mann-Whitney test. *$p<0.05$ compared to Fil-.

**A**



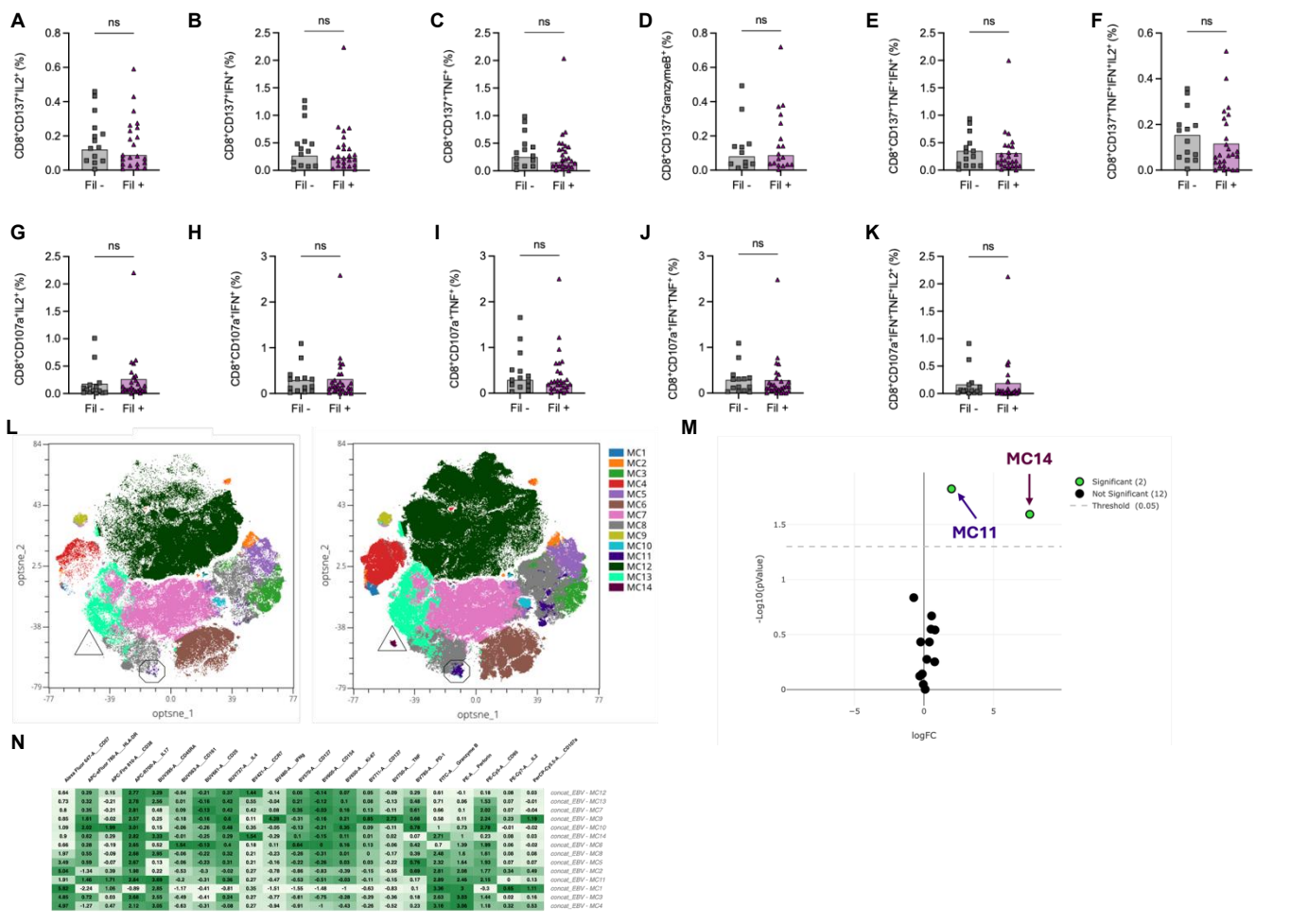

**B**



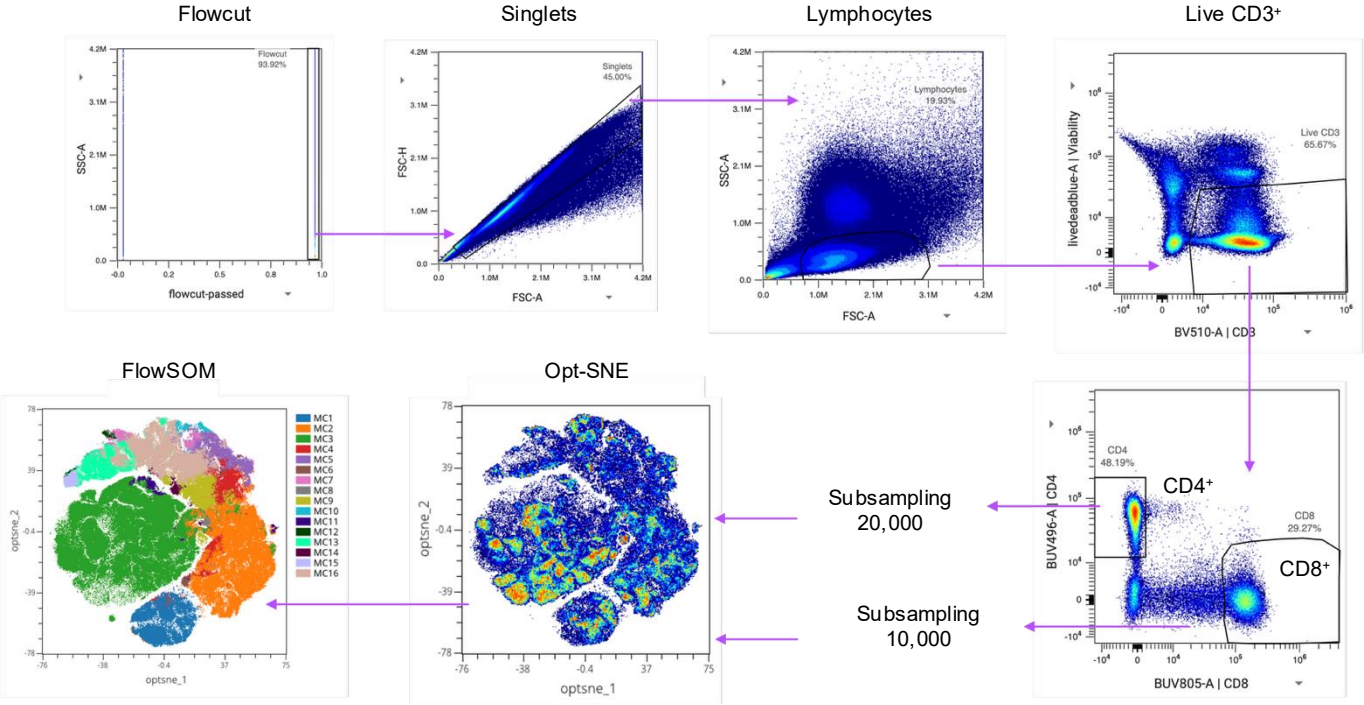

**C**




**Supplemental Figure 6. Heatmap visualization of marker expression across FlowSOM-defined T cell metaclusters.** Heatmap showing the relative expression levels of markers used for phenotypic annotation of FlowSOM-derived metaclusters identified following opt-SNE dimensionality reduction, for baseline CD8⁺ T cells (**A**), baseline CD4⁺ T cells (**B**), and CMV re-stimulated CD8⁺ T cell (**C**) analysis.




**Supplemental Figure 7 Human filarial infection does not alter the functional programming of CD8⁺ T cells in response to Epstein-Barr Virus (EBV) stimulation.** Peripheral blood mononuclear cells from filaria infected patients (Fil+, purple triangles) and uninfected controls (Fil-, grey squares) were thawed, rested, stimulated with EBV peptide pools, for 6 hours, and stained for flow cytometry. Frequency of CD8⁺CD137⁺ cells, gated on live CD3⁺, single cytokine producers, IL-2 (**A**), IFN-γ (**B**), TNF-α (**C**), Granzyme B (**D**), or polyfunctional, IFN-γ⁺TNF-α⁺ (**E**), IFN-γ⁺TNF-α⁺IL-2⁺ (**F**). Frequency of CD8⁺CD107a⁺ cells, gated on live CD3⁺, single cytokine producers, IL-2 (**G**), IFN-γ (**H**), TNF-α (**I**), or polyfunctional, IFN-γ⁺TNF-α⁺ (**J**), and IFN-γ⁺TNF-α⁺IL-2⁺ (**K**). Polyfunctional populations were determined by the Boolean filter (and filter). Representative maps of the multidimensional analysis, opt-SNE followed by FlowSOM, of the CD8 populations after EBV re-stimulation (**L**). Each color indicates a different metacluster. MC11, defined by: CD95⁺HLA-DR⁺CD38⁺IL-4⁺IL-17⁺, is highlighted by the octagon. MC14, defined by: CD45RA⁺Ki-67⁺GranzymeB⁺IL-4⁺IL-17⁺, is highlighted by the triangle. The map includes: 150,000 events for Fil- and 3000,000 events for Fil+. Volcano plot, generated by edgeR analysis, showing the difference of abundance of each cluster between Fil- and Fil+ groups, for the CD8 population (**M**). The green dot indicate cluster significantly different among the groups ($p<0.05$), while black dots represent clusters with similar distribution. Heatmap showing the relative expression levels of markers used for phenotypic annotation of FlowSOM-derived metaclusters identified following opt-SNE dimensionality reduction (**N**). Fil- (n=15), Fil+ (n=30). Each symbol represents a single individual, and the horizontal bars are the GMs.




**Supplemental Figure 8 Flow cytometry data processing and analysis workflow.** FCS files were first cleaned using flowCut to remove events associated with abnormal flow signals. Cells were then gated sequentially to identify singlets, lymphocytes, live CD3$^+$ T cells, and subsequently CD8$^+$ or CD4$^+$ subsets. From the CD8$^+$ gate, 10,000 events per sample were used for opt-SNE dimensionality reduction, incorporating all panel markers. CD4$^+$ T cells were analyzed similarly using 20,000 events per sample. The resulting opt-SNE maps were clustered using FlowSOM.