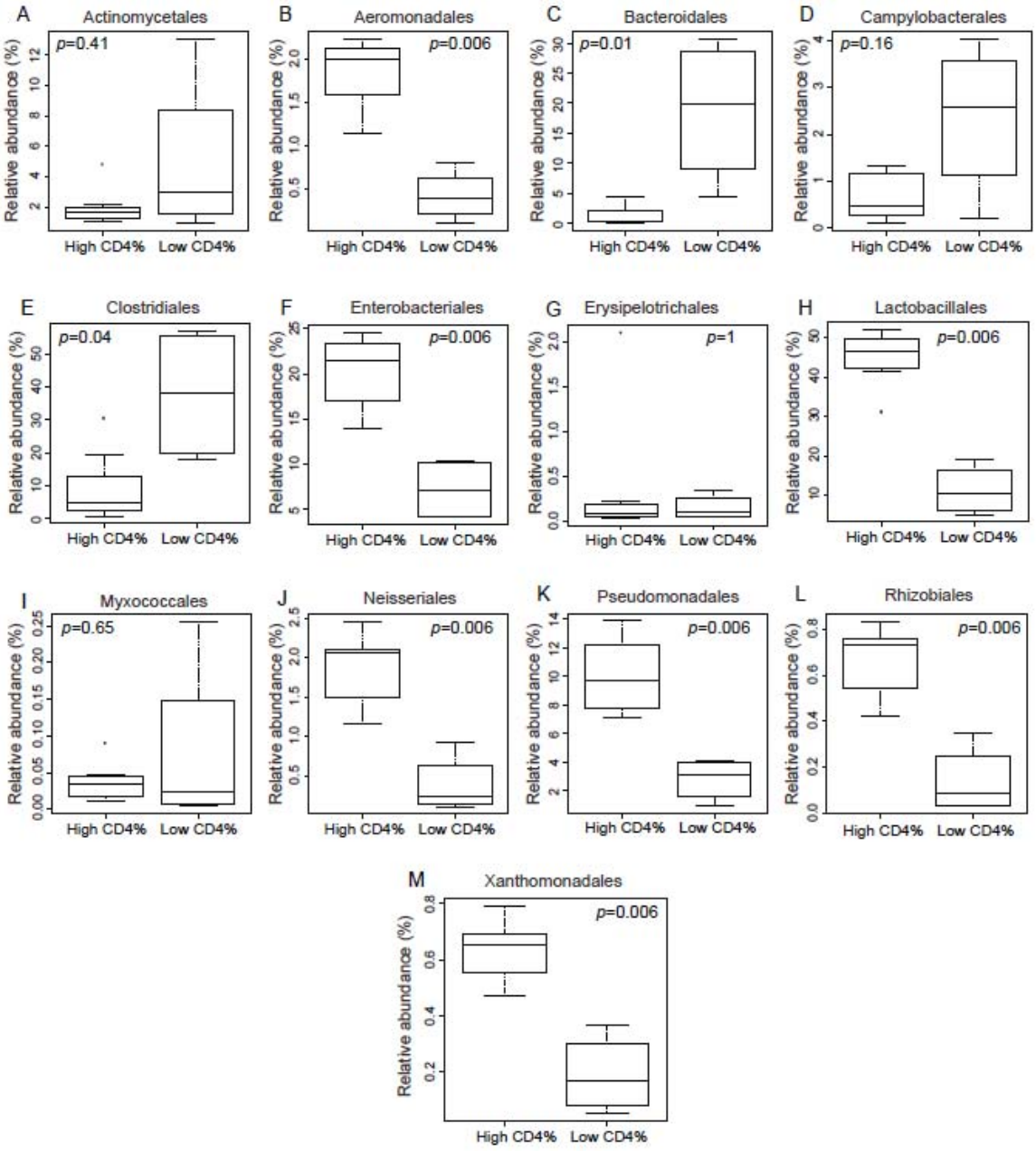
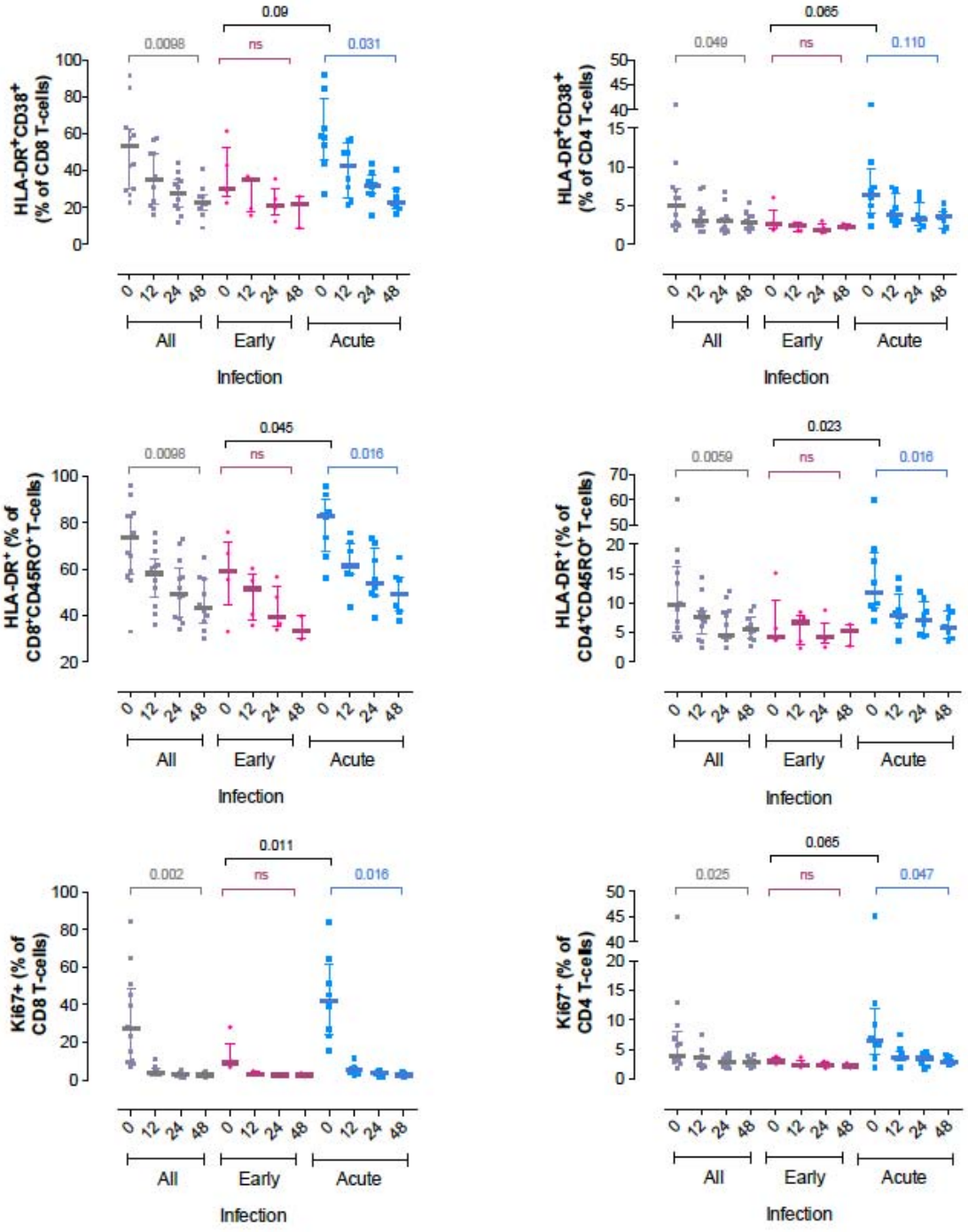
Supplementary Figure 1: Differences in gut bacterial profiles of participants with high versus low CD4%



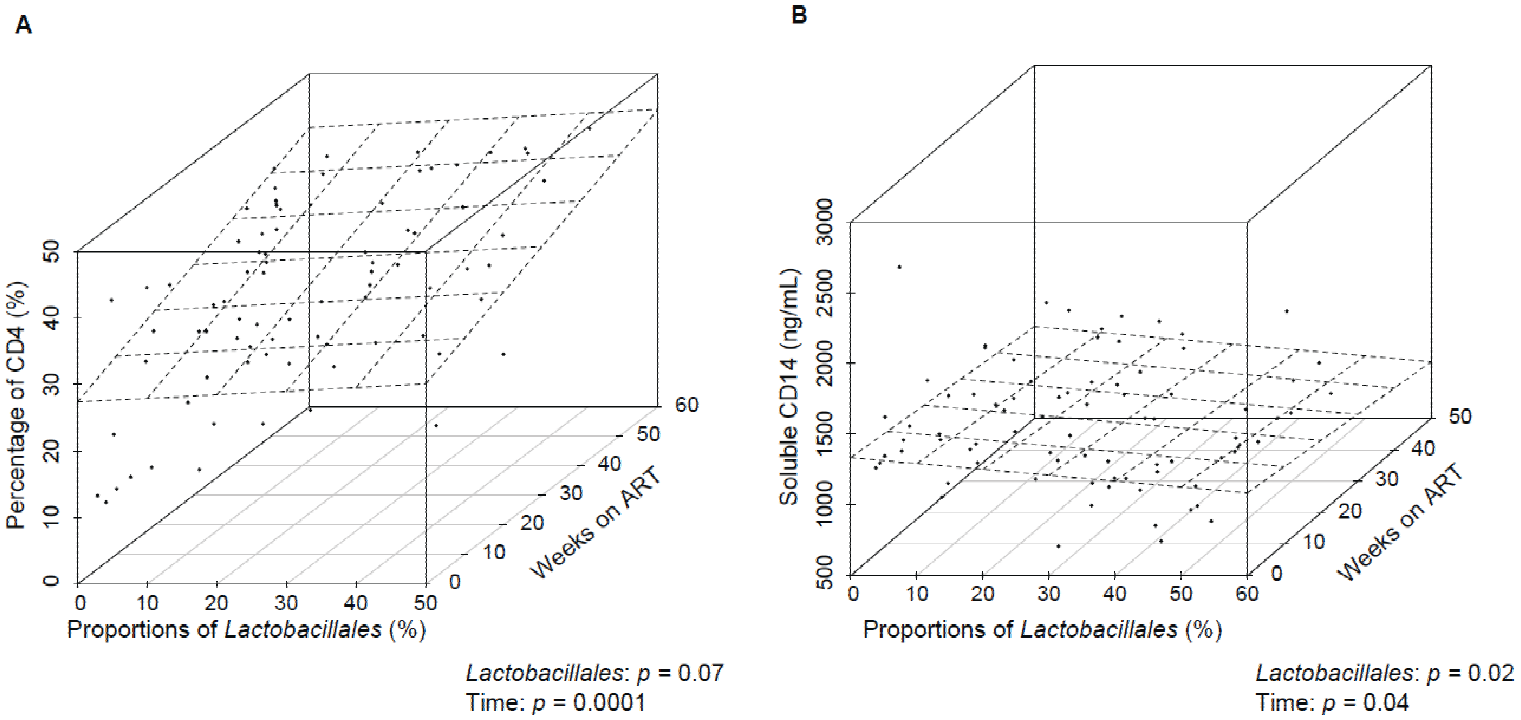
Comparison of gut bacterial profiles of participant with high vs. low CD4% at baseline and before ART. Participants with low CD4% exhibited significant reduced proportions of (A) *Aeromonadales,* (F) *Enterobacteriales,* (H) *Lactobacillales,* (J) *Neisseriales,* (K) *Pseudomonadales,* (L) *Rhizobiales and* (M) *Xanthomonadales* and an increase in (B) *Clostridiales* and (C) *Bacteroidales* when they were subjected to a two-tailed Mann-Whitney test.

Supplementary Figure 2: Immune activation at baseline between acute vs. early infected individuals



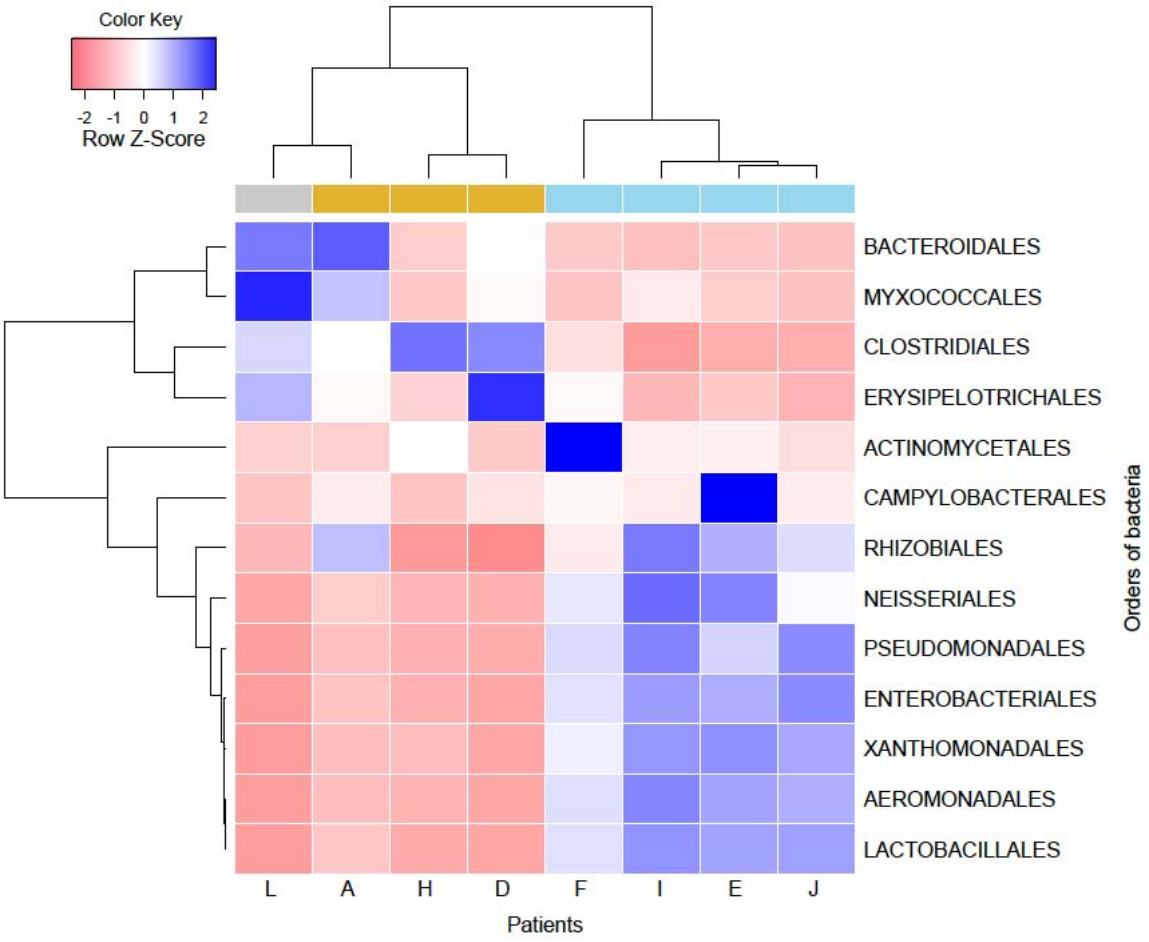
Phenotypic analysis of T lymphocytes subsets in all participants and divided by early vs. acute phase of infection. Participants more recently infected exhibited higher immune activation and proliferation than participants in the early phase.

Supplementary Figure 3: Longitudinal associations of *Lactobacillales* with CD4% and sCD14



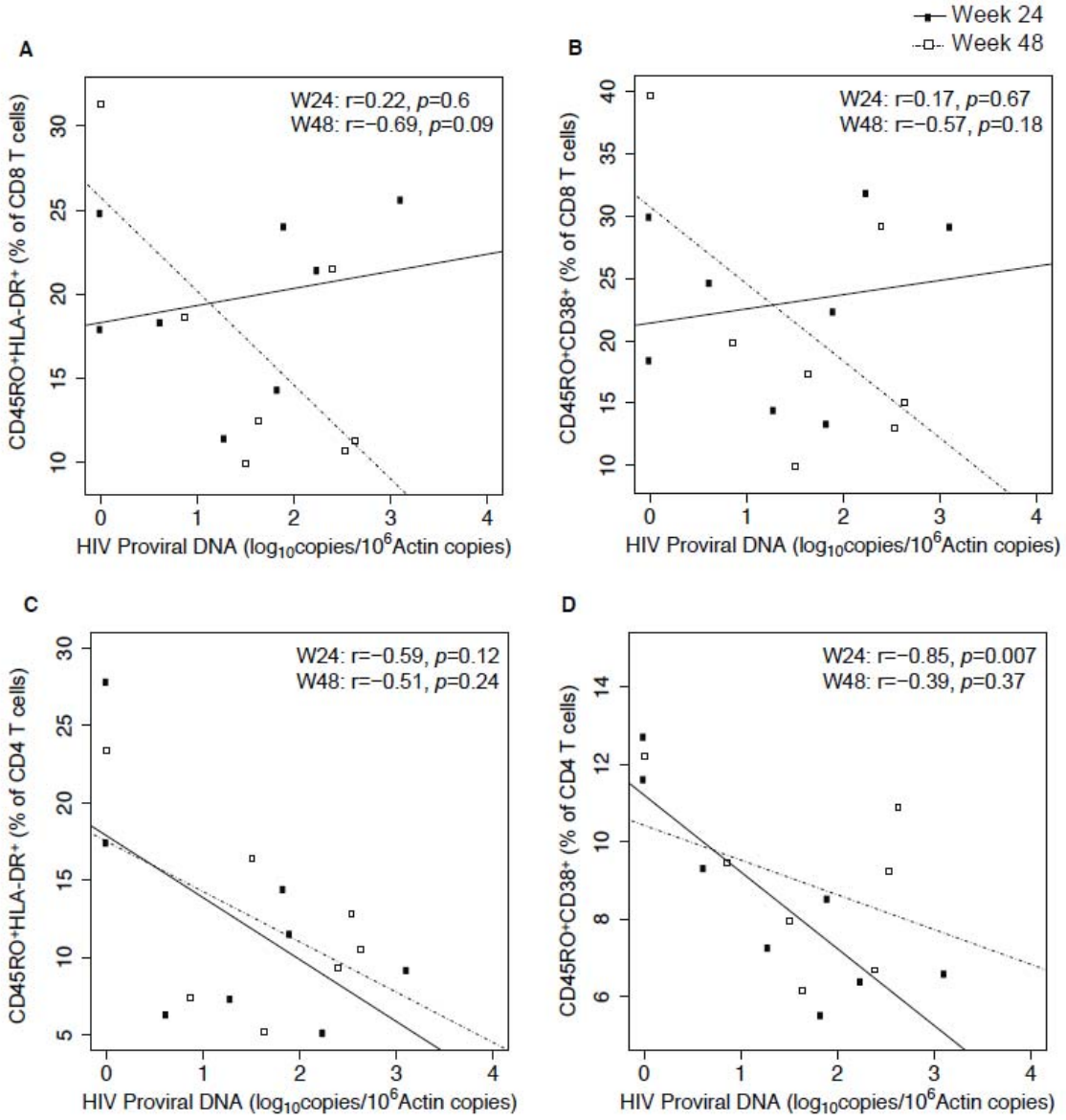
Longitudinal analysis of *Lactobacillales*, CD4% and sCD14 by mixed-effects linear models. (A) CD4% increases with the initiation of ART (p=0.001) and there is a positive trend between CD4% (p=0.07) and *Lactobacillales*. (B) Less microbial translocation is associated with time on therapy (p=0.04) and higher proportions of *Lactobacillales* (0.02).

Supplementary Figure 4: Unsupervised clustering after 24 weeks of ART



Comparisons between gut bacterial profiles after the initiation of antiretroviral therapy. Gut bacterial profiles separated our participants in the two main groups as baseline Participants colored as golden have lower CD4% compared to participants colored as blue and have same classification as baseline. Participant in gray was excluded from baseline analysis because of antibiotic use.

Supplementary Figure 5: Association of immune activation with the HIV latent reservoir



Cross-sectional associations between HIV proviral DNA and T-lymphocyte immune activation. (A and B) Solid and dotted lines represent week 24 and 48 respectively. There was no association between HIV proviral DNA and CD8 lymphocyte activation at weeks 24 and 48. (C) There was no association in CD4 lymphocyte activation (HLA-DR$^+$) but (D) there was a strong negative association with CD38$^+$ at week 24 but no at week 48.#