Gut-Microbiome Changes Over 4 Years in PLWH With Good Immune Status on ART

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BACKGROUND

- Gut dysbiosis has been associated with HIV infection.
- The gut microbiome of PLWH who has good immune recovery is as diverse as that of healthy individuals, but the composition of bacterial taxa is significantly different.
- We evaluated the correlation between changes in the gut microbiome, clinical information, and inflammation biomarkers.

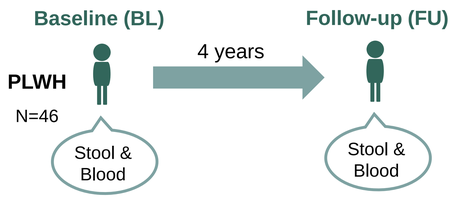
- Loss of specific bacteria in PLWH is linked to **weight gain**.
- **Lack of Vitamin B1** can harm PLWH's intestinal health and increase chronic **inflammation**.

DISCUSSION

- Despite effective antiretroviral therapy, PLWH with chronic inflammation experience persistent dysbiosis, leading to a leaky gut and metabolic consequences.
- Loss of specific bacteria in PLWH is linked to weight gain and may contribute to metabolic diseases.
- Essential nutrients deficiencies for the gut microbiota may disrupt the symbiotic relationship between gut bacteria and increase the risk of inflammation.
- This study highlights a new perspective on the control of the intestinal environment in managing PLWH.

METHODS

- Stool and blood samples were collected from 46 PLWH at baseline (BL) and after 4 years of follow-up (FU).

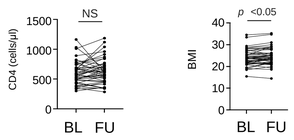


- The microbiome was characterized by sequencing of the 16S rRNA V3-V4 regions on the MiSeq System, and data were analyzed by using QIIME 2 softrware.
- Functional gene predictions of the bacterial microbiome were infurred from the 16S rRNA using PICRUSt2 pipeline.
- The concentration of cytokine and LPS-binding protein (LBP) were quantified using a Bio-Plex System and ELISA, respectively.

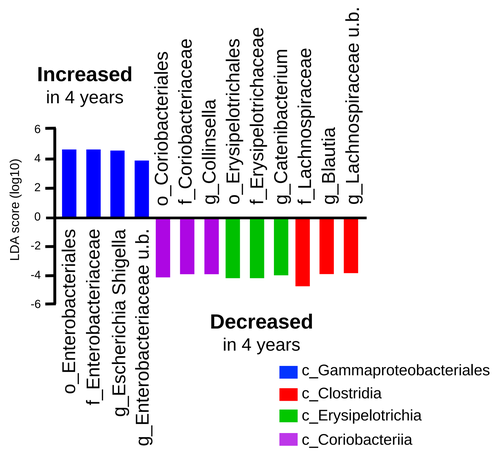
RESULTS

1. Increase in BMI over 4 years

Plasma viral load: VL <50 copies/ml; 97.8 % ► 97.8 %

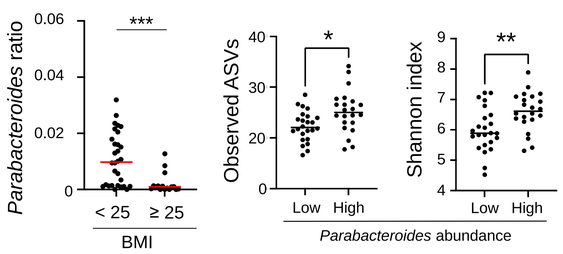


2. Change over 4 years: increase in opportunistic bacteria and decrease in short-chain fatty acid (SCFA)-producing bacteria

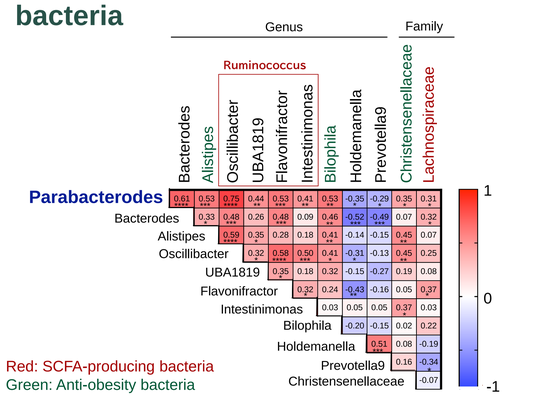


3. Lower level of *Parabacteroides* was associated with:

- High BMI
- Low α diversity

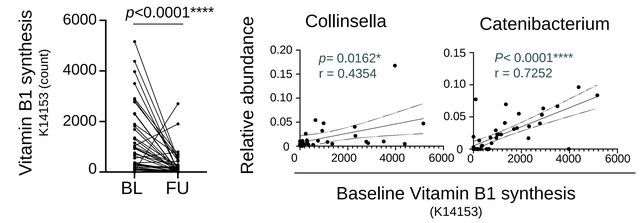


- Low abundance of SCFA-producing bacteria

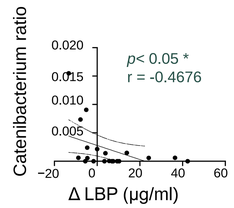


Red: SCFA-producing bacteria
Green: Anti-obesity bacteria

4. Decrease in Vitamin B1 synthesis: prediction from 4-year alteration



Association with markers of bacterial translocation



5. Increase in BMI over four years was correlated with intestinal inflammation

