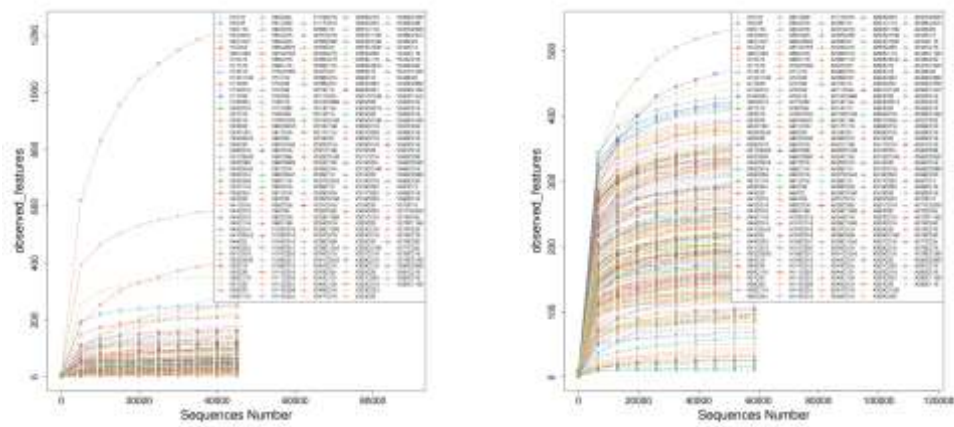
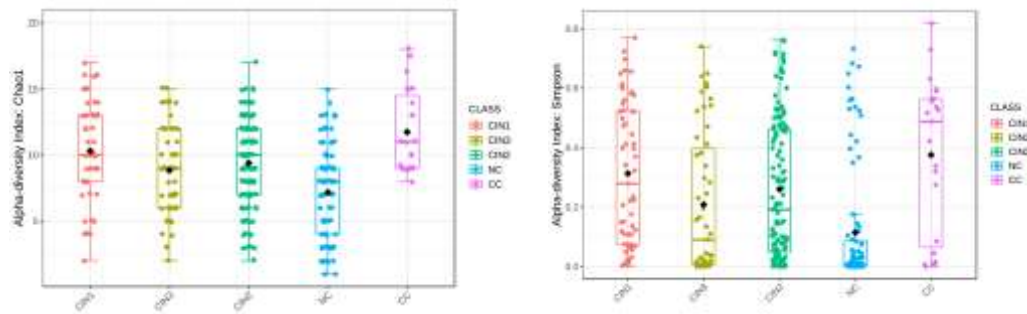


Supplementary data
Supplementary Figure 1.



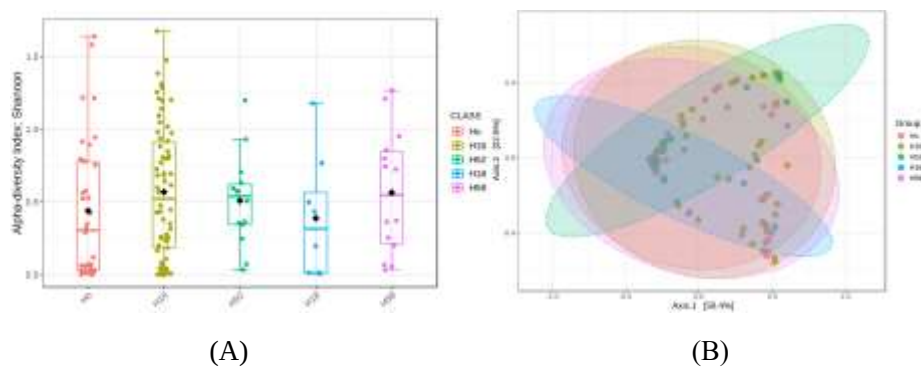
Supplementary Figure 1. The rarefaction curve of indicated that the observed features of all vaginal (left) and fecal (right) samples.

Supplementary Figure 2.



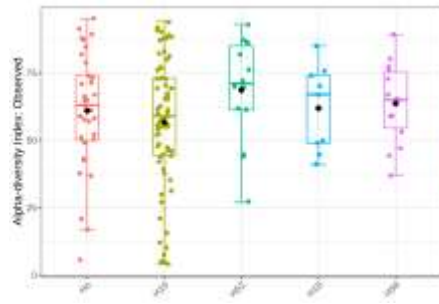
Supplementary Figure 2. The α -diversity Chao1 (left) and Simpson (right) indexes of the vaginal samples.

Supplementary Figure 3

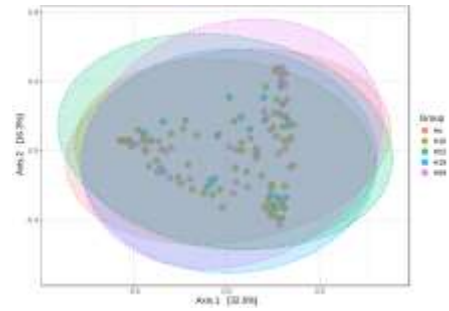


(A)

(B)



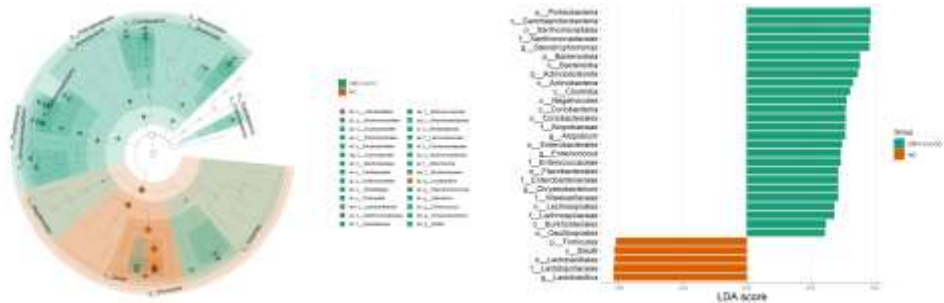
(C)



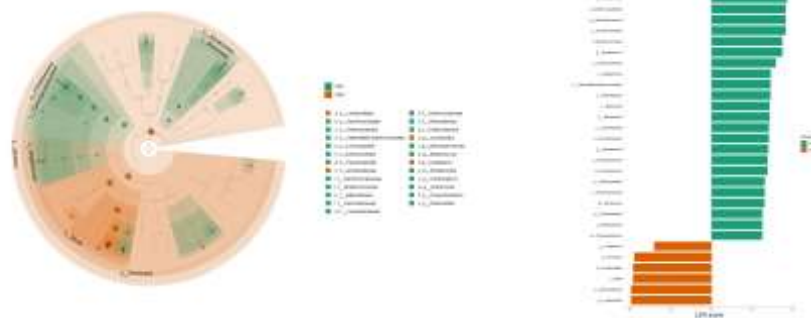
(D)

Supplementary Figure 3. When only one subtype of HPV is present, changes occur in the vaginal and gut microbiota. Specifically: (A) α -diversity of the vaginal microbiota; (B) β -diversity of the vaginal microbiota; (C) α -diversity of the gut microbiota; (D) β -diversity of the gut microbiota.

Supplementary Figure 4



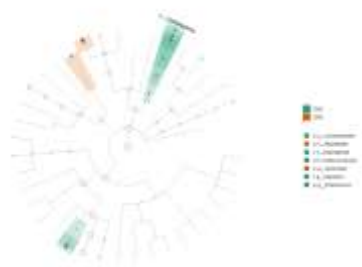
A



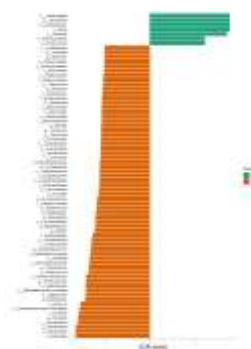
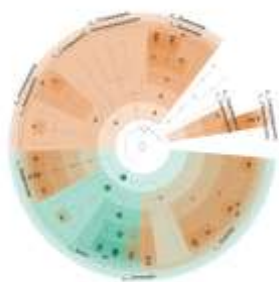
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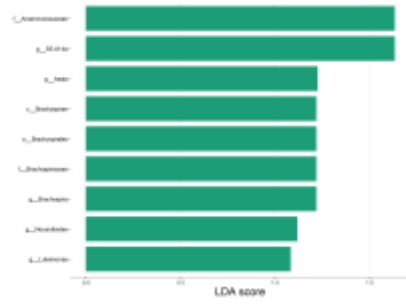
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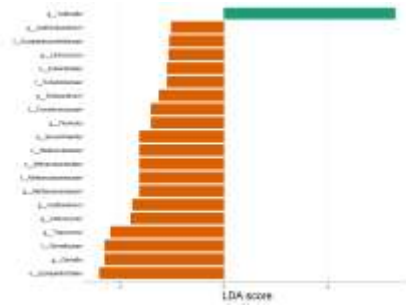
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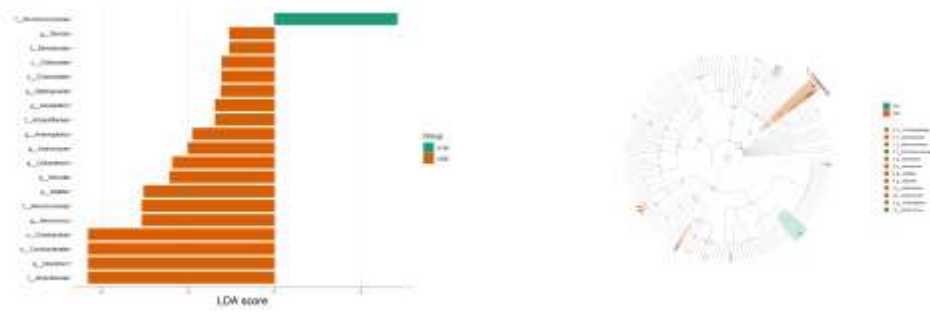
E



F



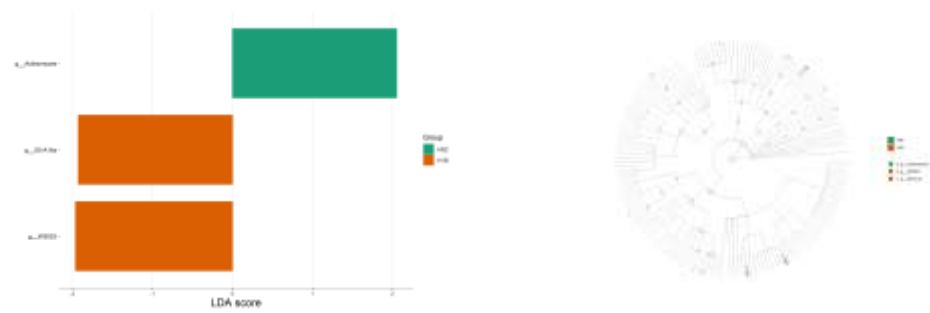
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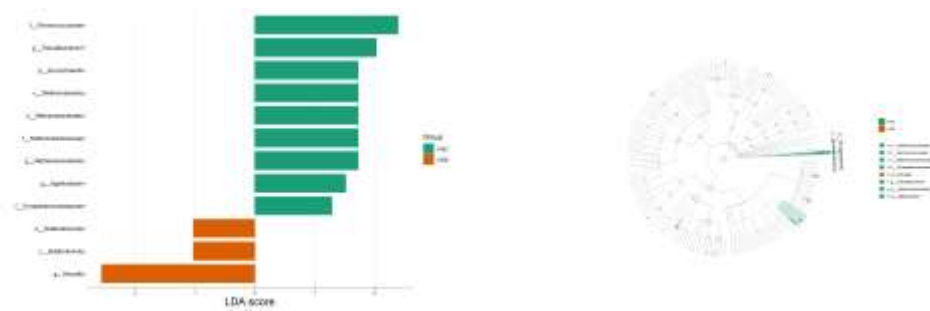
H



I



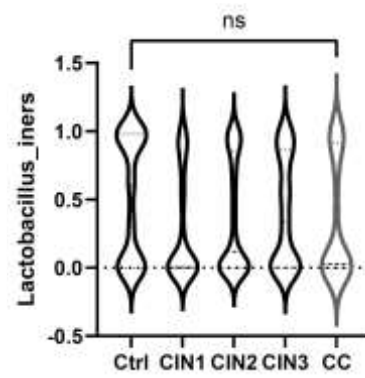
J



K

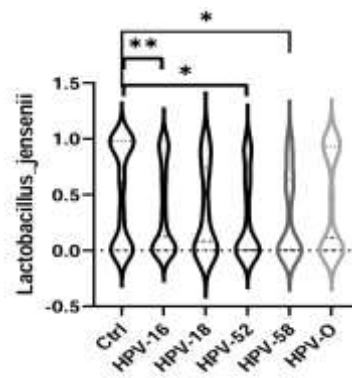
Supplementary Figure 4. The structure of the vaginal and intestinal microbiota and the bacteria that differ significantly as cervical neoplasia progresses.

Supplementary Figure 5



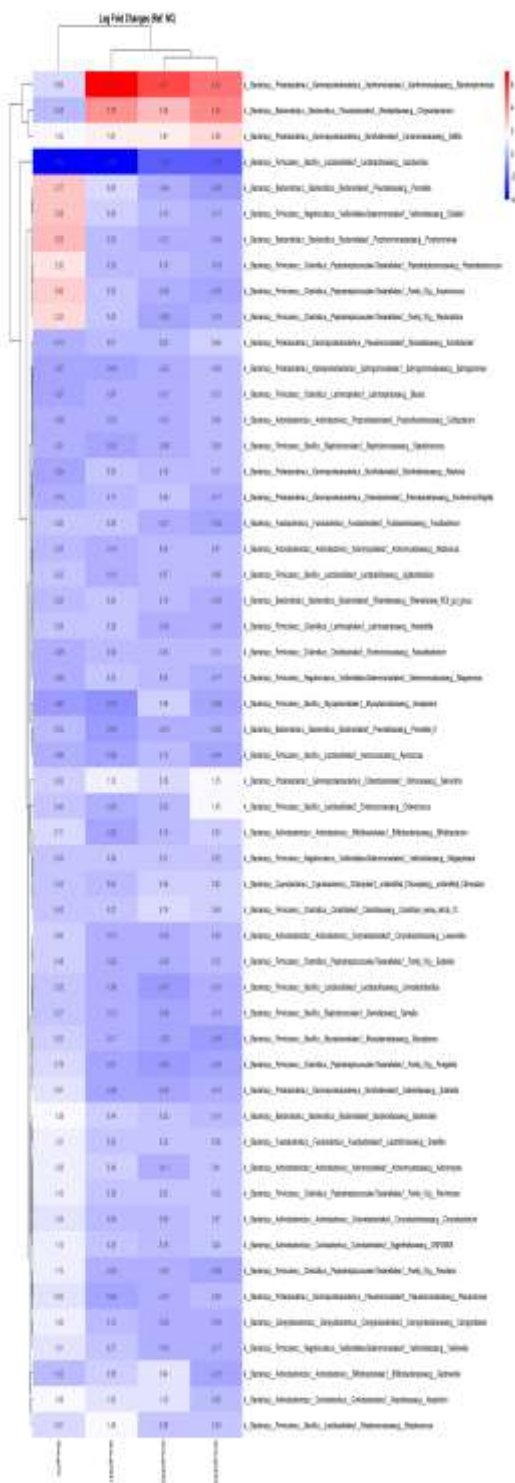
Supplementary Figure 5. The abundance of vaginal *L. iners* at different stages of cervical cancer development.

Supplementary Figure 6.

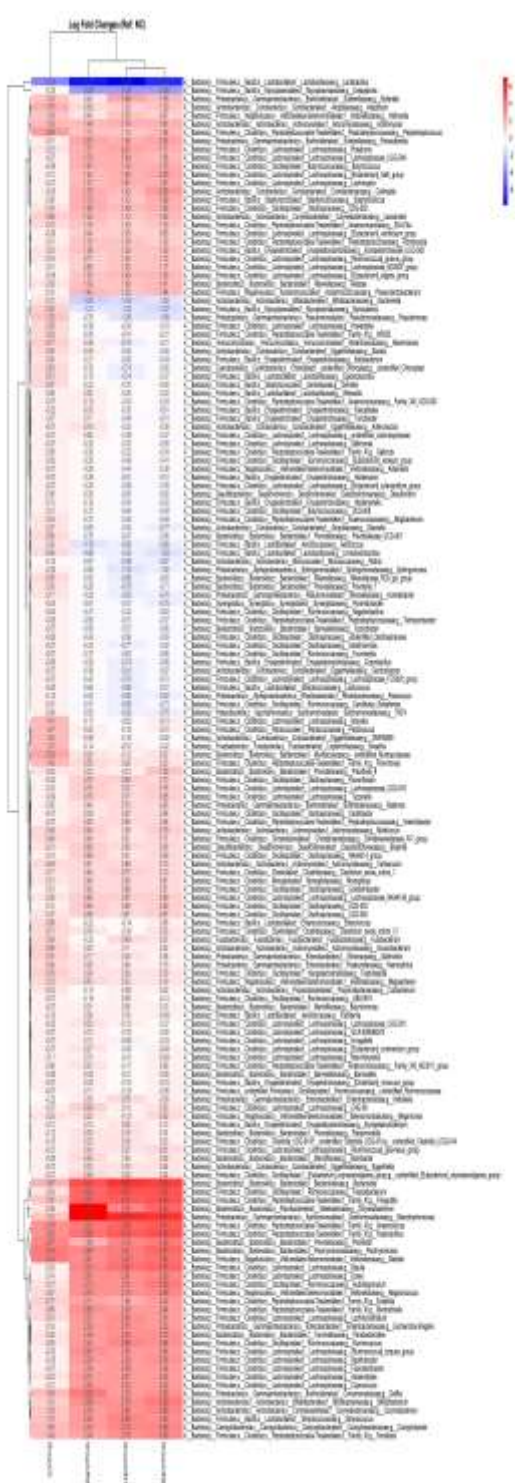


Supplementary Figure 6. The abundance of vaginal *L. iners* in different HPV infection scenarios.

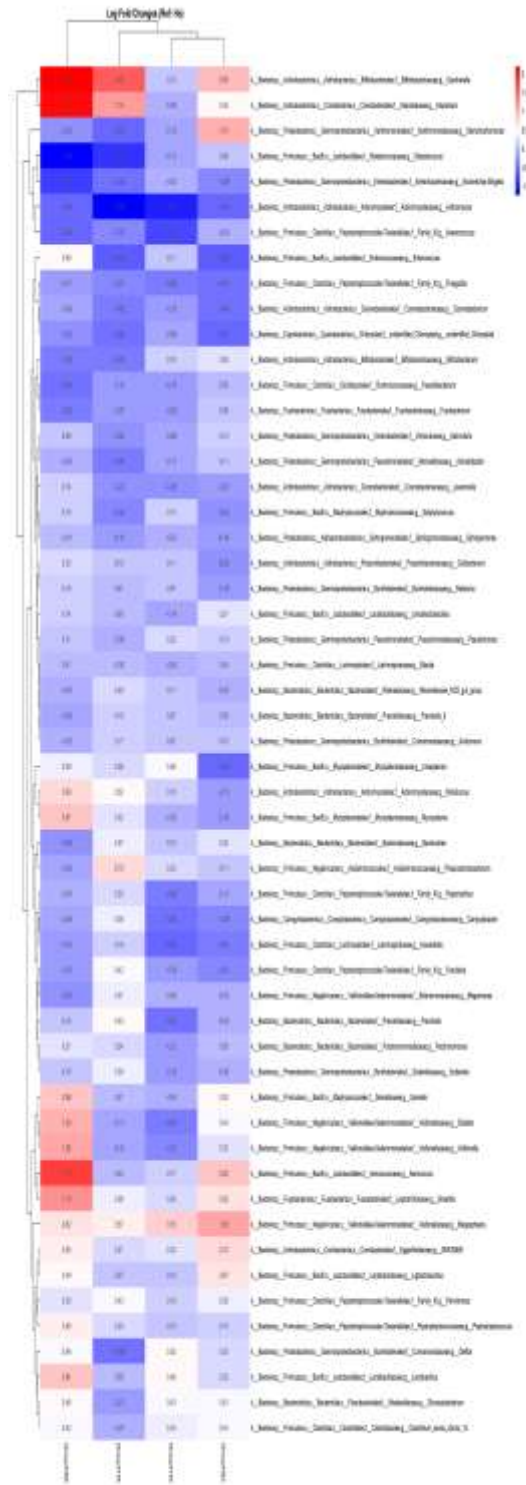
Supplementary Figure 7.



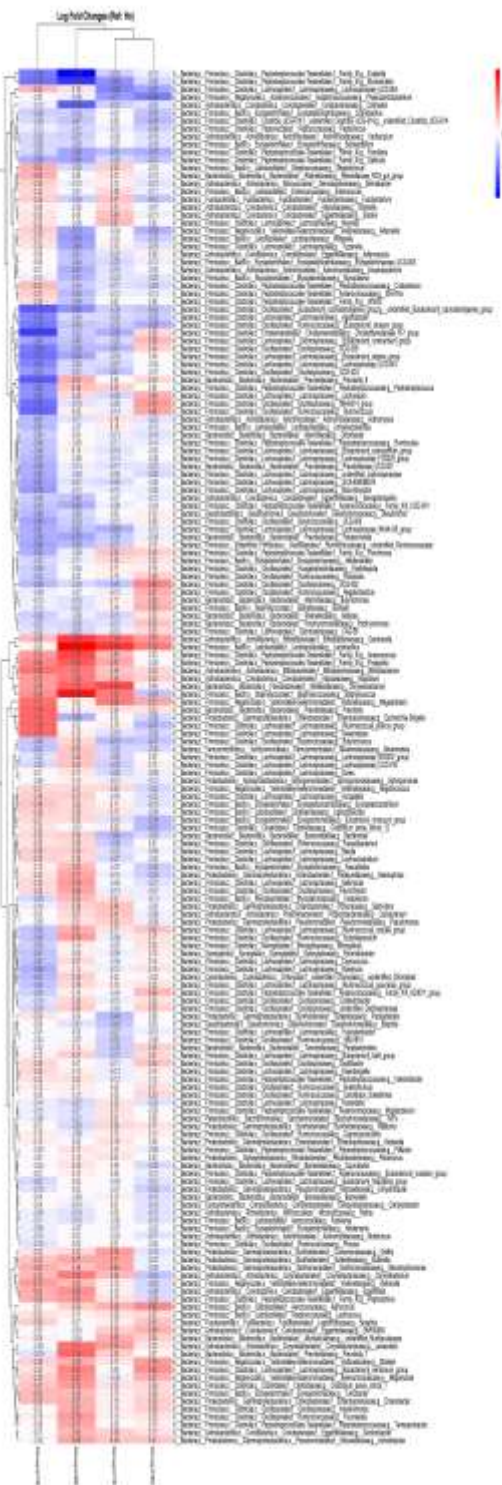
(A)



(B)



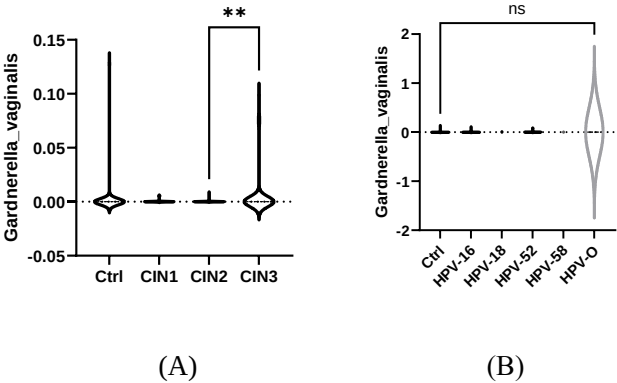
(C)



(D)

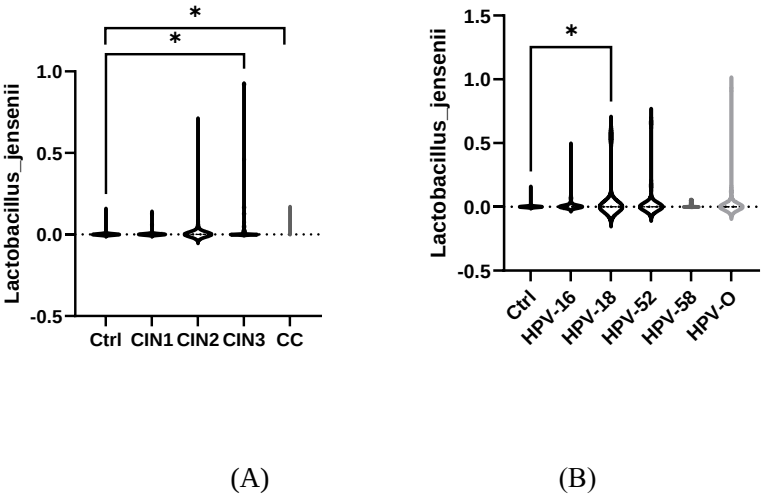
Supplementary Figure 7. ANCOM analysis of microbiota variations. (A) Vaginal bacterial variation with different stages of cervical cancer; (B) Intestinal bacterial variation with different stages of cervical cancer; (C) Vaginal bacterial variation with different HPV subtypes; (D) Intestinal bacterial variation with different HPV subtypes.

Supplementary Figure 8



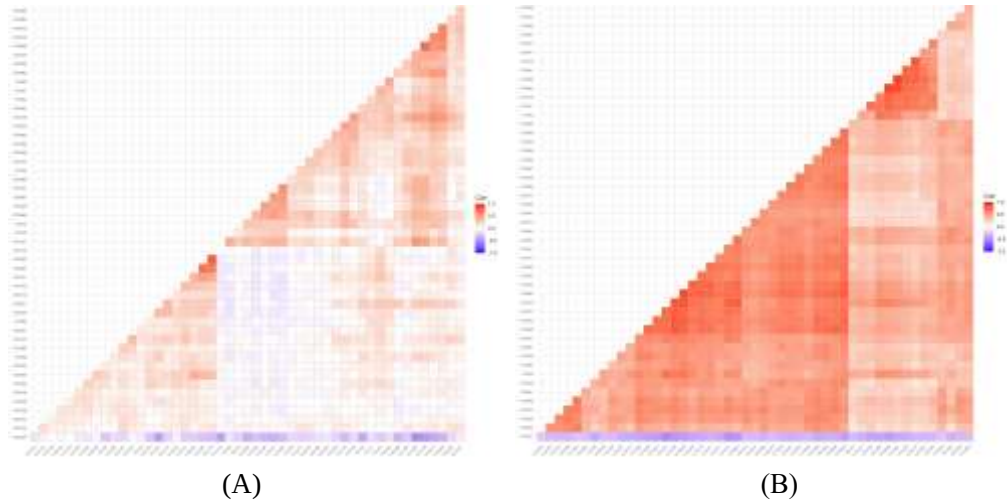
Supplementary Figure 8. The abundance variation of *G. vaginalis* under the circumstance of (A) different stages of cervical cancer (B) Infection with different HPV subtypes.

Supplementary Figure 9



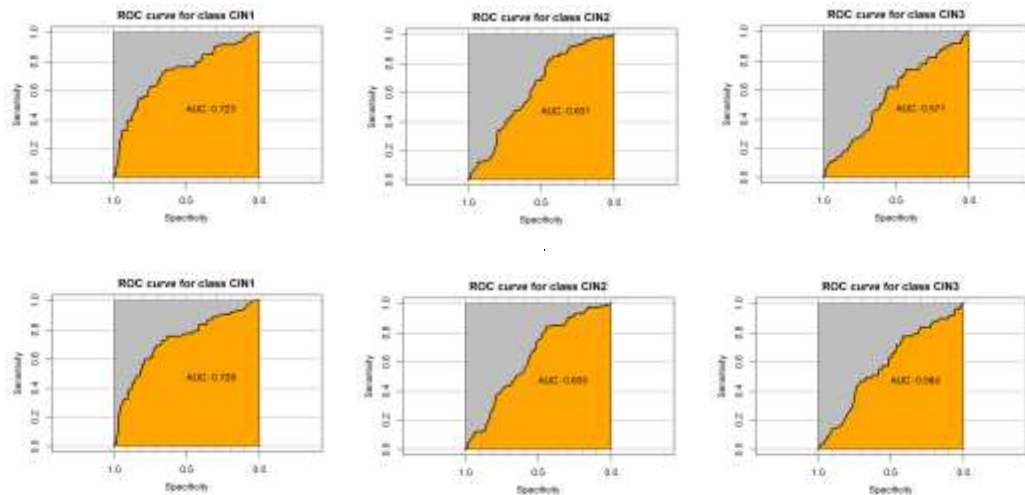
Supplementary Figure 9. The abundance variation of *L. jensenii* under the circumstance of (A) different stages of cervical cancer (B) Infection with different HPV subtypes.

Supplementary Figure 10



Supplementary Figure 10. SparCC_correlations of (A) Vaginal microbiota; (B) Intestinal microbiota.

Supplementary Figure 11|



Supplementary Figure 11. A simpler clinical baseline Random forest model that only considered age. (Up) Volunteers for vaginal samples; (Down) Volunteers for intestinal samples. Among the 236 CIN volunteers, 230 provided paired samples of vaginal and anal swabs, while the remaining 6 individuals each provided a single sample, either a vaginal or an anal swab.