

Supplementary Tables

Table S1. The Summary descriptives table of all participants.

	EMS	Non-EMS	<i>p</i> -value
Age (year)	34.6 (4.28)	35.2 (3.87)	0.825
BMI (kg/m ²)	20.6 (2.56)	22.8 (3.18)	0.228
Number of gravidities	1.40 (1.14)	2.50 (3.79)	0.609
Number of parities	0.80 (0.84)	1.00 (1.15)	0.782
Number of abortions	0.60 (1.34)	1.50 (3.00)	0.607
No Smoke	5 (100%)	6 (100%)	1.000
Frequency of menstruation	27.2 (1.79)	28.8 (1.10)	0.134
Duration of menstruation	6.60 (0.89)	6.60 (0.89)	1.000

Table S2. The ASRM score and EMS stage of all participants in EMS group.

Sample ID	ASRM	EMS stage
S1	46	4
S2	84	4
S3	24	3
S5	76	4
S11	4	1

ASRM: American Society for Reproductive Medicine; EMS: Endometriosis

Table S3. The Detail of included 88 public data.

Biosample ID	Bioproject ID	Group	Sample Site
SRR9198470	PRJNA546137	Non-EMS	Vagina
SRR9198471	PRJNA546137	Non-EMS	Vagina
SRR9198472	PRJNA546137	EMS	Vagina
SRR9198473	PRJNA546137	Non-EMS	Vagina
SRR9198474	PRJNA546137	Non-EMS	Vagina
SRR9198475	PRJNA546137	EMS	Vagina
SRR9198476	PRJNA546137	Non-EMS	Vagina
SRR9198477	PRJNA546137	Non-EMS	Vagina
SRR9198478	PRJNA546137	Non-EMS	Vagina
SRR9198480	PRJNA546137	Non-EMS	Vagina
SRR9198508	PRJNA546137	EMS	Vagina
SRR9198499	PRJNA546137	Non-EMS	Vagina
SRR9198500	PRJNA546137	EMS	Vagina
SRR9198501	PRJNA546137	EMS	Vagina
SRR9198502	PRJNA546137	Non-EMS	Vagina
SRR9198503	PRJNA546137	Non-EMS	Vagina
SRR9198504	PRJNA546137	EMS	Vagina
SRR9198505	PRJNA546137	EMS	Vagina
SRR9198506	PRJNA546137	Non-EMS	Vagina
SRR6400121	PRJNA424567	EMS	Vagina
SRR6400122	PRJNA424567	EMS	Vagina
SRR6400124	PRJNA424567	EMS	Vagina
SRR6400129	PRJNA424567	Non-EMS	Vagina
SRR6400131	PRJNA424567	Non-EMS	Vagina
SRR6400135	PRJNA424567	EMS	Vagina
SRR6400137	PRJNA424567	EMS	Vagina
SRR6400140	PRJNA424567	Non-EMS	Vagina
SRR6400142	PRJNA424567	EMS	Vagina
SRR6400146	PRJNA424567	Non-EMS	Vagina
SRR6400153	PRJNA424567	EMS	Vagina
SRR6400157	PRJNA424567	Non-EMS	Vagina
SRR6400159	PRJNA424567	Non-EMS	Vagina
SRR6400162	PRJNA424567	EMS	Vagina
SRR6400166	PRJNA424567	EMS	Vagina
SRR6400167	PRJNA424567	Non-EMS	Vagina
SRR6400171	PRJNA424567	EMS	Vagina
SRR6400173	PRJNA424567	Non-EMS	Vagina
SRR6400176	PRJNA424567	EMS	Vagina
SRR6400178	PRJNA424567	EMS	Vagina
SRR6400181	PRJNA424567	EMS	Vagina
SRR6400182	PRJNA424567	Non-EMS	Vagina
SRR6400187	PRJNA424567	EMS	Vagina
SRR6400192	PRJNA424567	EMS	Vagina
SRR6400193	PRJNA424567	EMS	Vagina
SRR6400201	PRJNA424567	Non-EMS	Vagina
SRR6400205	PRJNA424567	Non-EMS	Vagina
SRR6400213	PRJNA424567	EMS	Vagina

SRR6400215	PRJNA424567	EMS	Vagina
SRR6400219	PRJNA424567	EMS	Vagina
SRR6400226	PRJNA424567	EMS	Vagina
SRR6400228	PRJNA424567	EMS	Vagina
SRR6400230	PRJNA424567	EMS	Vagina
SRR6400238	PRJNA424567	EMS	Vagina
SRR6400242	PRJNA424567	Non-EMS	Vagina
SRR6400245	PRJNA424567	Non-EMS	Vagina
SRR6400246	PRJNA424567	EMS	Vagina
SRR6400249	PRJNA424567	Non-EMS	Vagina
SRR6400252	PRJNA424567	Non-EMS	Vagina
SRR6400257	PRJNA424567	Non-EMS	Vagina
SRR6400261	PRJNA424567	Non-EMS	Vagina
SRR6400265	PRJNA424567	EMS	Vagina
SRR6400269	PRJNA424567	EMS	Vagina
SRR6400272	PRJNA424567	EMS	Vagina
SRR6400276	PRJNA424567	Non-EMS	Vagina
SRR15436047	PRJNA753920	EMS	Gut
SRR15435936	PRJNA753920	EMS	Gut
SRR15436045	PRJNA753920	EMS	Gut
SRR15436034	PRJNA753920	EMS	Gut
SRR15436023	PRJNA753920	EMS	Gut
SRR15436019	PRJNA753920	EMS	Gut
SRR15436017	PRJNA753920	EMS	Gut
SRR15436046	PRJNA753920	EMS	Gut
SRR15436012	PRJNA753920	EMS	Gut
SRR15436013	PRJNA753920	EMS	Gut
SRR15436002	PRJNA753920	EMS	Gut
SRR15435991	PRJNA753920	EMS	Gut
SRR15435980	PRJNA753920	EMS	Gut
SRR15435969	PRJNA753920	EMS	Gut
SRR15435947	PRJNA753920	EMS	Gut
SRR15436011	PRJNA753920	Non-EMS	Gut
SRR15436001	PRJNA753920	Non-EMS	Gut
SRR15436000	PRJNA753920	Non-EMS	Gut
SRR15435998	PRJNA753920	Non-EMS	Gut
SRR15435997	PRJNA753920	Non-EMS	Gut
SRR15435996	PRJNA753920	Non-EMS	Gut
SRR15436010	PRJNA753920	Non-EMS	Gut
SRR15435990	PRJNA753920	Non-EMS	Gut
SRR15436009	PRJNA753920	Non-EMS	Gut

Table S4. Result of the power analysis

Power	Effect size	Compared objects	Sample site
0.99±0.01	4.01±0.31	Different microbial gene identified (EMS vs. Non-EMS)	Vagina
0.98±0.04	3.83±0.97	Different microbial gene identified (EMS vs. Non-EMS)	Gut

All power analysis based on alpha=0.05. Mean $\pm$ Standard deviation.

Supplementary Figures

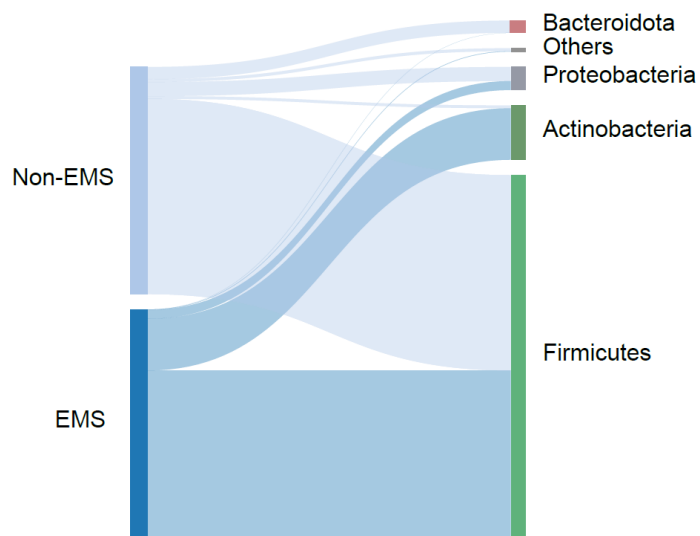


Figure S1. The proportion of vaginal microbiota in two groups (EMS and Non-EMS). Only top four phyla with most relative abundance are shown, and the others are classified as ‘Others’.

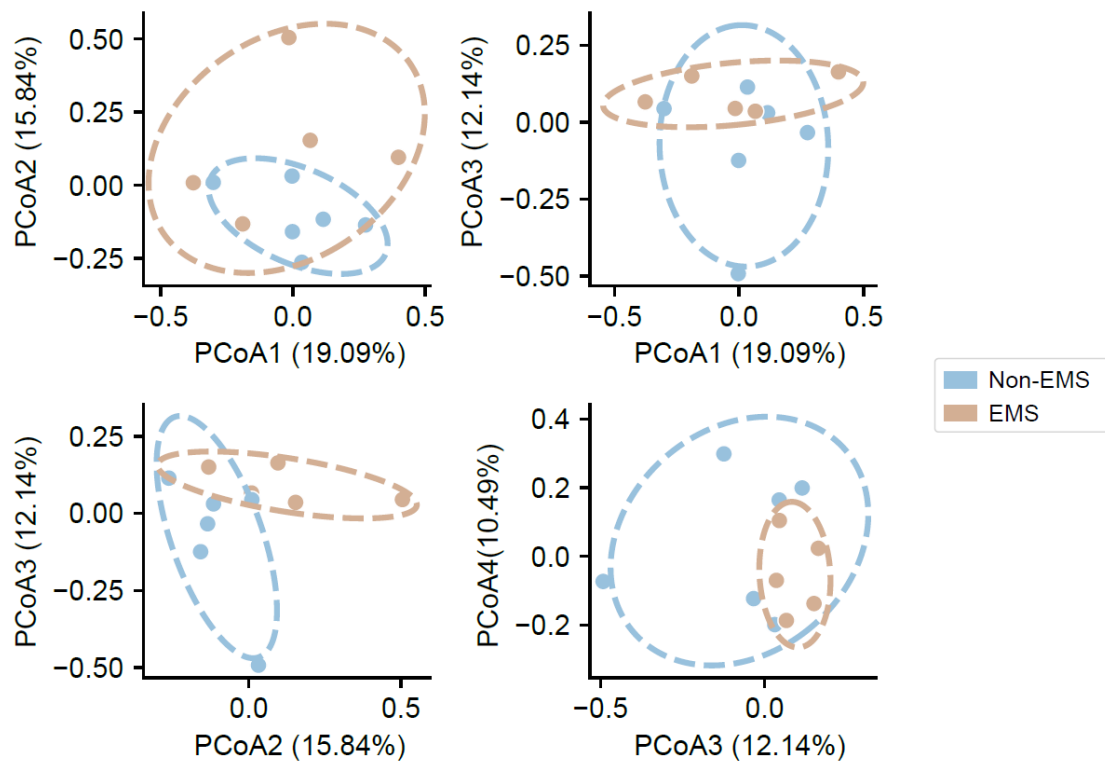


Figure S2. The gut microbial composition based on the PCoA, and the top four axes (PCoA1-4) are shown.

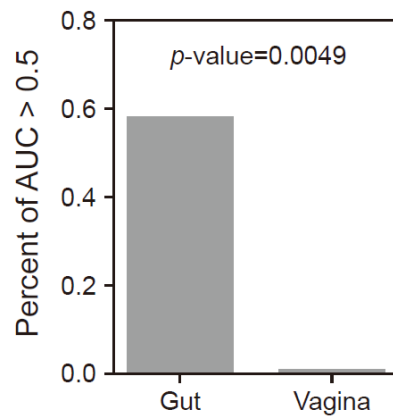


Figure S3. A column graph depicting the proportion of features with AUC more than 0.5 from gut and vagina. The statistical analysis was carried out using a two-sample z-test, two-tailed.

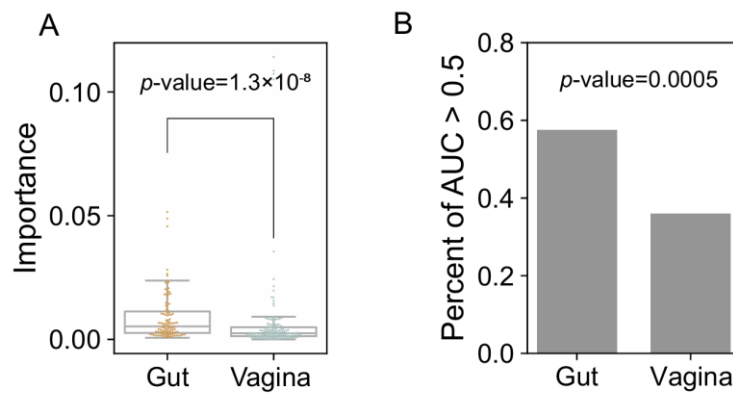


Figure S4. The prediction performance using gut or vaginal microbiome using public dataset. **(A)** The proportion of Importance index from Random Forest algorithm for different features are shown. The statistical analysis was carried out using a two- tailed Mann-Whitney test. **(B)** A column graph depicting the proportion of features with AUC more than 0.5 from gut and vagina. The statistical analysis was carried out using a two-sample z-test, two-tailed.