Distinct composition of gut microbiota during pregnancy in overweight and normal-weight women  $^{\rm 1-3}\,$ 

composition were calculated as the difference between microbiota concentrations over pregnancy (microbiota of third trimester – microbiota of first trimester).

To analyze the effect of weight gain on the microbiota over pregnancy, the women were classified into 2 groups, normal weight gain and excessive weight gain over pregnancy, according to the Institute of Medicine recommendations for total weight gain in pregnant women (15). The total normal weight gain ranges according to BMI over pregnancy were 11.5–16.0 kg for normal-weight women (BMI: 19.8–26) and 7.0–11.5 kg for overweight women (BMI 26). Total weight gains above these values, 16 kg for normal-weight women and 11.5 kg for overweight women, were considered excessive weight.

## Analytic methods

## Statistical analyses

Because of nonnormal distribution, clinical data (Table 1) are expressed as medians with interquartile ranges. The Mann-Whitney U test was applied in comparisons between normal-weight and overweight women. A P value 0.05 was considered statistically significant.

Bacterial counts as log10 units are given as means with 95%

## Microbiota composition changes according to weight gain over pregnancy

Results on microbiota composition in the third trimester of pregnancy according to weight gain over pregnancy are shown in **Table 4** 

In conclusion, our findings show that there are aberrancies in gut microbiota associated with overweight and weight gain and that the gut microbiota can thus be seen as one factor contributing to obesity over and above nutrition. Particularly, the *Bacteroides* group and *S. aureus* were altered, and a high concentration of these microorganisms may predispose to enhanced energy storage and obesity and the decreased control of systemic low-grade inflammation typical of obesity. Because overweight pregnant women have heavier newborns with an increased risk of subsequent overweight, our results offer new directions for preventive and therapeutic applications of obesity prevention during pregnancy.

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