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Estradiol effect on vaginal Lactobacillus crispatus

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Introduction
Lactobacilli are the major phylum of the normal human vaginal microbial community. Several studies have revealed that vaginal disorders and dysbiosis are associated to an important decrease of the Lactobacilli population and the emergence of pathogens. Many strategies have been proposed to protect the vaginal epithelium and re-equilibrate the microbiota to inhibit proliferation of undesired bacteria. Their real impact remains insufficient presumably because of the complex interactions between the microbiota and the host. Indeed, events such as menopause or child-birth are associated to an important decrease of the Lactobacilli population in the vagina. L. crispatus strains CIP104459 (Institut Pasteur) and V4 from vaginal swab origin were chosen to investigate the effects of estradiol on their growth, biofilm formation, auto-aggregation and adhesion.

Vaginal environment

Effect of 17β-estradiol on CIP and V4 strains growth

L. crispatus biofilm formation differences

Effect of 17β-estradiol on L. crispatus biofilm formation

Effect of 17β-estradiol on L. crispatus auto-aggregation ability

Effect of 17β-estradiol on L. crispatus adhesion on vaginal cells

Conclusion
This study revealed that CIP and V4 strains have different behaviors in terms of biofilm forming potential and auto-aggregation abilities, and that estradiol can modulate these activities. In addition, in silico studies suggest that the effects of estradiol on L. crispatus could be explained by the expression of ortholog(s) of the human estradiol receptor allowing bacteria to adapt their physiology in response to estradiol.

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