Abstracts

METHODS MtrR was ectopically expressed in HO41 (named as SC4) and confirmed to be functional by western blot and qRT-PCR analyses. HO41 and SC4 were compared for their susceptibility to antibiotics in laboratory media and in the presence of ME180 cervical epithelial with or without IPTG induction.

RESULTS In both laboratory media and in ME180 cell culture, we found that expression of MtrR in SC4 (HO41 mtrR+) decreased mtrCDE gene expression and increased gonococcal susceptibility to beta-lactam antibiotics. Importantly, MtrR-mediated repression of mtrCDE decreased the MIC of penicillin to a level below the MIC breakpoint recommended clinical treatment dose.

Conclusion We demonstrate the MtrR-mediated dampening of mtrCDE can greatly increase gonococcal susceptibility to penicillin. Thus, novel adjunctive therapeutics that decrease levels of MtrCDE may allow for the return of penicillin as an option for treating otherwise resistant strains of gonococci.

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Results We found that lactobacilli cell pellets were the most active fraction in counteracting CT infectivity, particularly by means of an exclusion strategy, and that L. crispatus was the most effective species, even though a strain-specific activity was detected. Moreover, the anti-chlamydial activity was not correlated with the level of lactobacilli adhesion on epithelial cells and it was significantly maintained with low numbers of lactobacilli, although in presence of a dose-response effect.

Conclusion We identified specific vaginal Lactobacillus strains (L. crispatus BC4, L. crispatus BC5, L. crispatus BC7, L. gasseri BC14 and L. plantarum BC19) able to interfere with CT EBs adhesion and entry in epithelial cells and we were able to shed light on the mechanisms displayed by lactobacilli in counteracting CT infectivity. A major potential application lies on the use of these Lactobacillus strains as probiotics for the prophylaxis and/or adjuvant therapy of CT infections.

Introduction Lactobacilli play a fundamental role in maintaining the ecological equilibrium of the vaginal niche, preventing the overgrowth of endogenous microorganisms and impeding the colonisation of pathogens. Although many studies have focused on the mechanisms displayed by lactobacilli in counteracting several urogenital pathogens, a few data are available on the interaction between lactobacilli and Chlamydia trachomatis (CT). The aim of this study was therefore to assess the in vitro activity of different vaginal Lactobacillus strains against CT infectivity, investigating two different fractions of bacteria (cell pellets and cell-free supernatants), by three different mechanisms of action (competition, exclusion and displacement).

Methods A total of 17 Lactobacillus strains, isolated from vaginal swabs of healthy premenopausal women and belonging to L. crispatus (BC1; BC3-BC8), L. gasseri (BC9-BC14), L. vaginosis (BC16-BC17) and L. plantarum (BC18-19) species, were included in the study. The capacity of lactobacilli cell pellets (CP) and cell-free supernatants (CFS) to interfere with CT adhesion and entry in HeLa epithelial cells was evaluated, by means of competition, exclusion and displacement mechanisms. In particular, lactobacilli fractions corresponding to 5×10^6 and 5×10^5 lactobacilli cells, in order to assess the capacity of Lactobacillus strains to adhere to HeLa cells was assessed as well: results were read at light-microscopy and HeLa cells were scored for the presence and number of lactobacilli attached.