

Can a specific sub-group of biofilm forming *Gardnerella vaginalis* strains be the real causative agent of bacterial vaginosis?

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In the past half century, bacterial vaginosis (BV) has been a controversial topic in medical microbiology, and despite the wealth of information on this topic, the etiological agent hasn't yet been found. The first advances on BV pointed *Gardnerella vaginalis* as the infectious causative agent of BV but soon after it was found that *G. vaginalis* was also present in healthy women. Also, *G. vaginalis* was not able to cause BV consistently. Furthermore, other microorganisms started to be commonly associated to BV, and this resulted on the prevalent theory of the multispecies infection. However, epidemiological data revealed inconsistencies with this latter theory. A couple of years ago the first descriptions of multispecies biofilm communities were described in BV. Interestingly, *G. vaginalis* was present in most situations and accounted for the majority of the biofilm biomass. Further studies demonstrated that biofilm forming *G. vaginalis* presented higher tolerance to external stresses. We then hypothesized that, such as in other bacterial species, variants of *G. vaginalis* that were able to form biofilms could be the causative agent of BV, due to its potential higher virulence. To test this, we isolated *G. vaginalis* from BV patients or healthy women and tested biofilm formation ability, initial adhesion to human vaginal cells, cytotoxic activity, and gene expression of known virulent genes. Our results revealed that all strains from BV original were more virulent than strains colonizing healthy women. Then, we tested virulent *G. vaginalis* against other known BV associated pathogens and concluded that while some of the other pathogens do enhance *G. vaginalis* biofilm formation activity, *G. vaginalis* outcompeted them in initial adhesion, suggesting that biofilm formation in BV starts with *G. vaginalis* over-competition against vaginal lactobacilli.

Biography

Nuno Cerca was a Fulbright fellow at Harvard Medical School and later graduated from Minho University, Portugal. He was a post-doc in Virginia Commonwealth University and currently is a PI in Minho University. His research group interests are pathogenic biofilms. He is the vice-president of the Portuguese National Association of Researchers in Science and Technology and serves as an editorial member of BMC Research Notes. He has published 37 original peer-reviewed papers in international journals and edited several books.

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