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Candida albicans forms Biofilms on the Vaginal Mucosa.

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Abstract

Current understanding of resistance and susceptibility to vulvovaginal candidiasis (VVC) challenges existing paradigms of host defense against fungal infection. While abiotic biofilm formation has a clearly established role during systemic Candida infections, it is not known whether C. albicans forms biofilms on the vaginal mucosa and their role in disease. In vivo and ex vivo murine vaginitis models were employed to examine biofilm formation by scanning electron and confocal microscopy. C. albicans strains included 3153A (lab strain), DAY185 (parental control strain), and mutants defective in morphogenesis and/or biofilm formation in vitro (efg1/efg1 and bcr1/bcr1). Both 3153A and DAY815 formed biofilms on the vaginal mucosa in vivo and ex vivo as indicated by high fungal burden and microscopic analysis demonstrating typical biofilm architecture and presence of extracellular matrix (ECM) co-localized with the presence of fungi. In contrast, efg1/efg1 and bcr1/bcr1 mutant strains exhibited weak to no biofilm formation/ECM production in both models compared to wildtype strains and complemented mutants despite comparable colonization levels. These data show for the first time that C. albicans forms biofilms on in vivo on vaginal epithelium, and that in vivo biotic biofilm formation requires regulators of biofilm formation (BCR1) and morphogenesis (EFG1).

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