

**Carbon Source and Biofilm Formation: Implications for Bacterial Vaginosis Treatment Strategies**

(Technical Report)

**Women's Reproductive Health in the Military**

(STS Research Paper)

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by

Christina George

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## Preface

Women's reproductive health needs have been under-researched, especially those of women in the military. Bacterial Vaginosis (BV) is the most common vaginal infection in reproductive-age women, yet many aspects of this condition are still not understood.

BV is caused by the overgrowth of pathogenic bacteria in the vagina. In the US, treatment costs \$4.8 billion annually, in part due to recurrent infection. Its cause is not entirely known, but sexual activity and improper hygiene have been associated with the condition. BV can lead to higher chances of contracting certain sexually transmitted infections. *Gardnerella*, the dominant genus in BV, forms a biofilm, but its composition is largely unknown. Current BV treatment options are antibiotics, but *Gardnerella* in the biofilm state confers antibiotic resistance. Scanning Electron Microscopy showed no observable difference between the *Gardnerella* strains. Using crystal violet staining, we found that acetate, glutamate, lactate, and succinate significantly decreased biofilm growth for *G. vaginalis* and *G. piotti*, while mannitol significantly increased growth for *G. piotti*. All enzymes tested disrupted the biofilm ( $p < 0.05$ ), with proteinase-K exhibiting the most significant disruption ( $p = 2.58E-06$ ). These preliminary results offer a foundation for further research to improve BV treatment and prevent recurrent infection.

Although women make up 17.2 percent of US military personnel, military healthcare services tend to neglect servicewomen's distinct physiology and health needs. The resulting injustices include preventable gynecological health risks, higher rates of infections, and consequent psychological and financial burdens. Advocacies such as SWAN and MWHRIG strive to improve these conditions. Proposed legislation to promote healthcare equity in the military have some support in Congress, but some legislators oppose such reforms, citing costs or their opposition to abortion.