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INFECTION

Treating *G. vaginalis* biofilms with DNase—a new strategy

Gardnerella vaginalis is the major component in bacterial vaginosis, a condition common in reproductive-age women that is associated with preterm birth and STI transmission. The resistance of *G. vaginalis* biofilms to antibiotic therapy is a contributing factor in bacterial vaginosis treatment failure and relapse. However, new research has demonstrated a mouse model of *G. vaginalis* biofilms, which was used to show that the infection can be treated by targeting extracellular DNA (eDNA) using DNase.

"Many bacteria use eDNA as a component of the biofilm matrix, and we reasoned that enzymatic targeting of eDNA might be useful in a therapeutic setting," explains lead investigator Adam Ratner at Columbia University. "This was an especially attractive approach because DNase has been used safely in humans in several clinical settings."

Using staining and fluorescence microscopy, the researchers confirmed the presence of eDNA in the bacterial cultures, which responded to DNase treatment *in vitro*. They then used a streptomycin-resistant *G. vaginalis* strain to infect female mice to develop an *in vivo* model of bacterial vaginosis, the first of its kind reported. "We were very excited to see that DNase inhibited *G. vaginalis* vaginal colonization in this model," continues Ratner.

Indeed, the mice responded well to DNase treatment, with a 10-fold reduction in bacterial colonization evident after just 48 h. Given that *G. vaginalis* is difficult to treat with conventional antibiotics, these results suggest that nonantibiotic treatment with DNase might be effective.

Ratner's team are currently developing candidate intravaginal DNase preparations for preclinical assessment *in vitro* and *in vivo*. "If these early studies are successful, we anticipate that human trials of DNase in patients with bacterial vaginosis in combination with, or without, antibiotics won't be far away," Ratner concludes.

Mina Razzak

Original article Hymes, S. R. *et al.* DNase inhibits *Gardnerella vaginalis* biofilms *in vitro* and *in vivo*. *J. Infect. Dis.* doi:10.1093/infdis/jit047