Title: **New insights into *Trichomonas* - Bacteria Interactions through comparative Genomics, Transcriptomics and Biochemistry**

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Abstract (max 4000 characters)

The *Trichomonas* genus represents a diverse group of parasitic protozoans which can infect a range of animal species (including birds and mammals) with a well-established zoonotic potential. Species include *Trichomonas vaginalis*, which is a Human STI, and *Trichomonas gallinae*, which infects birds, primarily Columbiformes.

They reside at mucosal surfaces of their host, which includes a complex microbiota. *Trichomonas* species have been described as able to damage host tissue and induce inflammatory host responses. Notably, infections of Human and birds by *Trichomonas* species are also associated with changes in the microbiota taxonomic composition. In Humans, change associated *with T. vaginalis* infection of the female urogenital tract are considered to lead to a dysbiotic microbiota that can also contribute to disease states, which are characterised by excessive inflammation and increased susceptibility to other pathogens, such as HIV.

However, interactions between *Trichomonas* and the members of the microbiota are still poorly understood at the molecular and cellular level.

This work aims to gain new insights into *Trichomona*s-Bacterial interactions through integrating microbiological, biochemistry/enzymology, comparative genomic and transcriptomic approaches.

Using *Trichomonas gallinae* as a model we present evidence that *Trichomonas* species, including *T. vaginalis*, have acquired a repertoire of genes encoding enzymes capable of interacting with the bacterial cell wall which have their transcripts significantly modulated in the presence of the bacterial *Escherichia coli*.

These tools can potentially allow *Trichomonas* to out-compete their neighbouring bacteria and/ or liberate molecules that can promote *Trichomonas'* growth. These findings bring new insights into *Trichomonas*-Bacterial interactions and how these evolutionarily conserved interactions can potentially influence the zoonotic ability of *Trichomonas*.