

*The obsession started during her student days, when she was exposed to malaria—the renowned malaria group at Edinburgh University, that is. Since then, Dr. Jane Carlton’s fascination with “nasty bugs” has taken the genomicist all over the developing world. It recently brought her to NYU, which has its own illustrious history in malaria vaccine research and can also provide her the “broad diversity of parasites” she craves.*

## Hooked on Parasites

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“Parasitologists like the ‘yuck’ factor, and *Trichomonas vaginalis* (*T. vaginalis*) has loads of that,” declared Dr. Jane Carlton, who led the team that recently finished decoding the unexpectedly large genome of this sexually transmitted human pathogen. According to the World Health Organization, trichomoniasis afflicts some 170 million people a year, and is an under-diagnosed global health problem. *T. vaginalis* latches onto the vaginal lining and destroys epithelial cells.

Sequencing the *T. vaginalis* genome was a four-year project that involved 66 researchers in 10 countries, with expertise in cell biology, biochemistry, and bioinformatics. The findings, published in the January 2007 issue of the journal *Science*, are already providing new approaches to the diagnosis and treatment of this sexually transmitted disease. For example, the researchers discovered several genes and proteins not found in humans—important information for drug developers. One enzyme, a peptidase, is similar to a peptidase in HIV, the virus that causes AIDS. A class of antiretroviral HIV drugs already exists to target this peptidase, and could be used to treat the parasite.

In addition to causing painful symptoms, the *T. vaginalis* parasite increases susceptibility to the HIV virus. “Curing this sexually transmitted disease (STD) in women would decrease vulnerability to HIV transmission in the entire population,” said Dr. Carlton. She is currently working with the New York City Department of Health & Mental Hygiene, Bureau of STD Control, which has ten STD clinics where Dr. Carlton is collecting samples to learn more about the prevalence of *T. vaginalis* in New York’s culturally diverse population.

In a color-enhanced scanning electron micrograph, *Trichomonas vaginalis* float behind Dr. Carlton. Sequencing the genome of *T. vaginalis* has given NYU researchers gory reading material on some of the pathogen’s foul habits. The parasite latches onto vaginal tissue and forms tendril-like projections into it. The pathogen also secretes a series of proteins that destroy the vaginal epithelial cells—the cells that make up the vaginal tissue surface. *T. vaginalis* is just one of several eukaryotic parasites of interest to the Carlton lab, which focuses on the comparative genomics of infectious parasites—including those that cause tropical diseases such as malaria.

