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The People: From left to right: Xhavit Zogaj (Postdoctoral Research Fellow), Karl Klose (Principal Investigator), Jirong Liu (Postdoctoral Research Fellow), and Jeffrey Barker (Graduate Student).

The Research

Very little is known about *Francisella tularensis*, the causative agent of the human disease tularemia. Because of the low infectious dose of aerosolized *F. tularensis* and the high morbidity and mortality rate associated with the disease, the Centers for Disease Control (CDC) has classified it as a category A select agent and potential biological weapon. There is currently no tularemia vaccine available for human use, making the population vulnerable to this disease. Our laboratory is interested in identifying and studying the genes that are responsible for *F. tularensis*' high virulence and its ability to circumvent the host immune response. Our interest is in the genes located within the *Francisella* pathogenicity island (FPI), a cluster of genes that are critical for virulence with unknown function(s). We are currently creating defined *F. tularensis* mutants in FPI genes in hopes of developing an attenuated vaccine candidate for public use.

www.bio.utsa.edu/faculty/klose.html

The Technique

Progress in understanding the genetic basis of *F. tularensis* virulence has been impeded by the lack of genetic tools available for manipulation of the *F. tularensis* genome. The development of a quick and efficient means to inactivate genes in *F. tularensis*, described in this issue, has greatly advanced our ability to study the genes required for *F. tularensis* virulence. *F. tularensis* mutants created by this technique can be tested for their ability to replicate inside mammalian cells and to cause disease in animal models of tularemia. Mutants identified with reduced levels of virulence can be further evaluated for their ability to stimulate a protective immune response and thus serve as a live attenuated vaccine against tularemia. The discovery and characterization of new virulence factors will have a major impact on the field of bacterial pathogenesis. Additionally, the generation of mutants that have the potential to be used as live attenuated vaccines will ultimately benefit human health.

See "Construction of targeted insertion mutations in *Francisella tularensis* subsp. *novicida*" on page 487.