

Abstract Submitted
for the NWS14 Meeting of
The American Physical Society

A View to a Kill: T6SS-Mediated Cell Killing Visualized by Fluorescence Microscopy¹ JACQUELINE CORBITT, MICHELE LEROUX, JOSEPH MOUGOUS, PAUL WIGGINS, University of Washington — The Type Six Secretion System (T6SS) is a bacterial toxin-delivery system targeting bacterial cells which neighbor the donor, promoting recipient cell death. The T6SS is widely conserved among Gram-negative bacteria and may be a central determinant in bacterial fitness in polymicrobial communities of particular relevance to chronic infection. Sequence homology of secretion system components to the T4 bacteriophage tail spike, cryoEM reconstructions of the secretion system and fluorescence imaging are all consistent with a dynamic mechanism of secretion. The complex system, which is composed of at least 15 proteins, forms a puncturing apparatus/delivery system which uses a donor protein filament to puncture the recipient cell wall to deliver protein toxins. Using quantitative imaging analysis of multiple fluorescent fusions, we present a detailed characterization of T6SS system dynamics visualized in single cells in multiple bacterial species, developing a model of T6SS function. We present quantitative measurements of the dynamics of the secretion system - from the assembly to contraction to disassembly - in conjunction with quantitative measures of system function, including recipient cell lysis.

¹Supported by NSF Graduate Research Fellowship DGE-1256082 and National Institutes of Health under award number R21 AI 105268-01.

Jacqueline Corbitt
University of Washington

Date submitted: 21 Mar 2014

Electronic form version 1.4