

# VISUALIZATION OF TYPE III SECRETION SYSTEM COMPONENTS IN YERSINIA ENTEROCOLITICA DOWN TO THE MOLECULAR LEVEL BY MINFLUX MICROSCOPY

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## 1. ABSTRACT

Type 3 secretion systems (T3SS) are essential virulence factors of numerous bacterial pathogens and inject immunosuppressive effector proteins into host cells. The needle-like T3SS machinery consists of more than 20 components, has a length of around 100 nm and its different sections along the length axis are up to 10 nm broad. Its intrabacterial components are highly dynamic and in permanent exchange with other bacterial structures. Therefore, a temporally and spatially resolved visualization of the T3SS in action using fluorescence microscopy techniques has been challenging. By labeling single T3SS components with self-labeling enzymes or nanobodies and employing super-resolution microscopy techniques such as STED [1], STORM and MINFLUX [2], we succeeded to visualize and resolve single components in different sections of the T3SS machinery. Using MINFLUX microscopy we achieved resolutions down to the molecular scale of T3SS components such as YscL and the pore protein YopD. Continuation of this work will allow us to investigate T3SS structure and function with unprecedented resolution and therefore gain new insights into the infection process of human pathogens in order to develop novel treatment and prevention strategies.

## References:

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