



MUTAGENESIS OF THE FLGM GENE AND ITS EFFECTS ON SECRETION

Ana Rosas, KT Hughes, FFV Chevance

Department of Biology

Background: The *Salmonella* flagellum is a complex molecular machine, made up of a basal body motor, a flexible hook, and a filament propeller. The formation of these structures utilizes a type three secretion system (T3SS). This system is not fully understood as the signal sequence that targets substrates for secretion has yet to be defined. FlgM is a regulatory protein, and its secretion couples the flagellar assembly process to proper gene regulation.

Objective: To better understand the secretion signal of regulatory protein FlgM, which is necessary for the secretion and formation of the bacterial flagellum.

Methods: Oligonucleotide mutagenesis was conducted on the coding sequences for amino acids 38 to 44 of FlgM, which was shown to be important for secretion. Mutants were screened for phenotypes characteristic of defects in secretion. Mutants with these phenotypes were characterized by DNA sequence analysis and single mutations were kept for further characterization. The expression and secretion of the mutant proteins were assayed.

Results: Eleven single mutants were found from 850 colonies screened. Of these mutants, all except for one frameshift mutant were expressed. Data has indicated that certain single mutants were defective in secretion in comparison to the wild type strain.

Conclusion: Certain substitution mutations in the coding region for amino acids 38 to 44 of FlgM were defective in secretion, indicating this region's importance for FlgM secretion. Future works will focus on further characterizing important regions in FlgM for secretion.