

102 The role of flagellum and flagellum-based motility on *Salmonella* Enteritidis and *Escherichia coli* biofilm formation

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Flagella play important roles in early biofilm formation in several Gram-negative bacteria. Flagellar motility, more precisely, has been proposed to be required to overcome surface repulsion, thereby allowing initial surface contact. Additionally, evidence has been provided that flagella can act as cell-to-surface adhesins for some bacteria. In *Escherichia coli*, cells either lacking complete flagella or possessing paralysed flagella are severely hindered in the initial stages of biofilm formation, indicating that motility is the key factor in early biofilm formation (1). For *Salmonella* Typhimurium, a similar behavior was observed for biofilms formed on glass, but for those formed on gallstones, flagella - but not their motility - was found to be necessary for bacterial attachment (2). This indicates that the role of flagellum may depend not only on the species but also on the surface physic-chemistry used for cell adhesion; however, studies have been limited to only one or two types of material. To gain a broader perspective on the link between flagellum/flagellum-based motility and biofilm development, *Salmonella* Enteritidis and *E. coli* mutants with paralysed-flagellum (Δ motA) and lacking flagellum (Δ FliC) were produced and evaluated for their initial adhesion and biofilm formation on 7 different surfaces (polyvinyl chloride, polypropylene, polyethylene, glass, copper, silicone, stainless steel). Results obtained using crystal violet staining, CFU counting and Confocal Laser Scanning Microscopy, will then be associated with the surfaces properties to better clarify the role of flagella on attachment to the different substrata.

- 1- Pratt, L.A. and Kolter, R. 1998. Genetic analysis of *Escherichia coli* biofilm formation: roles of flagella, motility, chemotaxis and type I pili. *Mol Microbiol* 30: 285–293
- 2- Prouty, A. M. and J. S. Gunn. 2003. Comparative analysis of *Salmonella enterica* serovar Typhimurium biofilm formation on gallstones and on glass. *Infect. Immun.* 71: 7154-7158