

Crystallisation and Initial Characterization of the periplasmic domain of TraG, the Conjugative Entry Exclusion Protein from the F-plasmid

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Type IV Secretion Systems (T4SS) are a significant contributor to bacterial evolution and the emergence of antibiotic resistance as they have the unique ability of transmitting mobile DNA elements through bacterial conjugation. The F-plasmid of *E. coli* is representative of conjugative T4SSs found in other clinically relevant gram negative pathogens including *Shigella sp.*, *Salmonella sp.*, *Helicobacter pylori* etc. TraG is one of the largest proteins expressed from the F-plasmid and plays several roles in the conjugative process. The membrane bound N-terminal domain of TraG is involved in F-pilus synthesis, while the C-terminal periplasmic domain, denoted TraG*, is responsible for entry exclusion (Eex) and mating pair stabilization (Mps). Redundant F-plasmid transfer is prevented by Eex, which occurs when TraG in the donor cell interacts with a cognate TraS in the inner membrane of the recipient cell. Should the TraG-TraS interaction not occur, TraG then interacts with TraN within the outer membrane of donor cell to facilitate Mps; the periplasmic TraG* plays a dynamic role in the Eex/Mps checkpoint of F-mediated conjugative DNA transfer. We have recently crystallized TraG*, and present an initial characterization of the protein.