

Type II protein secretion in *Pseudomonas aeruginosa*: the pseudopilus is a multifibrillar and adhesive structure

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The type II secretion pathway of *Pseudomonas aeruginosa* is involved in the extracellular release of various toxins and hydrolytic enzymes such as exotoxin A and elastase. This pathway requires the function of a macromolecular complex called the Xcp secreton. The Xcp secreton shares many features with the machinery involved in type IV pilus assembly. More specifically, it involves the function of five pilin-like proteins, the XcpT-X pseudopilins. We show that, upon overexpression, the XcpT pseudopilin can be assembled in a pilus, which we call a type II pseudopilus. Image analysis and filtering of electron micrographs indicated that these appendages are composed of individual fibrils assembled together in a bundle structure. Our observations thus revealed that XcpT has properties similar to those of type IV pilin subunits. Interestingly, the assembly of the type II pseudopilus is not exclusively dependent on the Xcp machinery but can be supported by other similar machineries, such as the Pil (type IV pilus) and Hxc (type II secretion) systems of *P. aeruginosa*. In addition, heterologous pseudopilins can be assembled by *P. aeruginosa* into a type II pseudopilus. Finally, we showed that assembly of the type II pseudopilus confers increased bacterial adhesive capabilities. These observations confirmed the ability of pseudopilins to form a pilus structure and raise questions with respect to their function in terms of secretion and adhesion, two crucial biological processes in the course of bacterial infections.

References :

Session 3: Transport and secretion

Poster presentation