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Thesis: Host immune evasion by the *Pseudomonas aeruginosa* virulence factor LecB

Abstract

Pseudomonas aeruginosa is one of the most common multidrug-resistant bacteria. It produces a wide array of virulence factors that together with its high intrinsic resistance to many antibiotics lead to persistent infections associated with high morbidity and mortality. The severity and outcome of these infections depend on the appropriate response of the host and the bacterial virulence factors that subvert host responses. The *P. aeruginosa* lectin LecB, a fucose-binding protein, has been shown *in vitro* to be involved in the adhesion of the bacterium to host cells and to play a role in biofilm formation. Its interaction with cells of the immune system, however, is still to be elucidated. Here, we show that LecB targets endothelial cells within the draining lymph nodes (LNs) after cutaneous injection in mice. Twenty-four hours after injection, LecB causes an accumulation of lymphocytes within the skin-draining LNs. While injection of traceable lymphocytes revealed that LecB does not enhance the recruitment of lymphocytes into the LN, we show instead in lymphocyte entry-blocking experiments that LecB impedes lymphocyte egress. We demonstrate that LecB modifies endothelial cells *in vivo* and *in vitro*, suggesting a reinforced endothelial barrier function and a possible role for LecB in disturbing lymphocyte circulation between the blood and the LN, which is essential for immunosurveillance and the establishment of protective adaptive immune responses.

Key words: *Pseudomonas aeruginosa*, lectin, LecB, lymph node, endothelial cells