

Invasion of Epithelial Cells Is Correlated with Secretion of Biosurfactant via the Type 3 Secretion System (T3SS) of *Shigella flexneri*

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Abstract : Biosurfactants are amphipathic molecules produced by many microorganisms, usually bacteria, fungi, and yeasts. They possess the property of reducing the tension of the membrane interfaces. No studies have been conducted on *Shigella* species showing the role of biosurfactant-like molecules (BLM) in pathogenicity. The aim of this study is to assess the ability of *Shigella* environmental and clinical strains to produce BLM and investigate the involvement of biosurfactants in pathogenicity. Our study has shown that BLM is secreted in the extracellular medium with EI24 ranging from 80% to 100%. The secretion depends on the type III secretion system (T3SS). Moreover, our results have shown that *S. flexneri*, *S. boydii*, and *S. sonnei* are able to interact with hydrophobic areas with 17.64%, 21.42%, and 22.22% hydrophobicity, respectively. BLM secretion is totally prevented due to the inhibition of T3SS by 100 mM benzoic and 1.5 mg/ml salicylic acids. *P. aeruginosa* harboring T3SS is able to produce 100% of BLM in the presence or in the absence of both T3SS inhibitors. The secreted BLM are extractable with an organic solvent such as chloroform, and this could entirely be considered a lipopeptide or polypeptide compound. Secretion of BLM allows some *Shigella* strains to induce multicellular phenomena like 'swarming.'

Keywords : *shigella flexneri*, biosurfactant, T3SS, Lipopeptide

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