
Prophage taming by the adherent-invasive *Escherichia coli* LF82 upon macrophage infection

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Résumé

Adherent-invasive *Escherichia coli* (AIEC) strains are frequently recovered from stools of patients with dysbiotic microbiota. They have remarkable properties of adherence to the intestinal epithelium, and survive better than other *E. coli* in macrophages. The best studied of these AIEC is probably strain LF82, which was isolated from a Crohn's disease patient. This strain contains five complete prophages, which have not been studied until now. We undertook their analysis, both *in vitro* and inside macrophages, and show that all of them form virions. The Gally prophage is by far the most active, generating spontaneously over 108 viral particles per mL of culture supernatants *in vitro*, more than 100-fold higher than the other phages. Gally is over-induced after a genotoxic stress generated by ciprofloxacin and trimethoprim. However, upon macrophage infection, Gally virion production is decreased by more than 20-fold, and the transcription profile of the prophage indicates that part of the structural module is specifically repressed while the replication module is overexpressed compared to unstressed culture conditions. We conclude that strain LF82 has evolved an efficient way to "tame" its most active prophage upon macrophage infection, which may participate to its good survival in macrophages. The results are discussed in light of the active lysogeny process.

Mots-Clés: prophage, macrophage, lateral transduction, polylysogeny, active lysogeny

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