



## ***Salmonella enterica* Typhimurium *fljBA* operon stability: implications regarding the origin of *Salmonella enterica* | 4,[5],12:i:-**

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**ABSTRACT.** *Salmonella enterica* subsp *enterica* serovar 4,5,12:i:- has been responsible for many recent *Salmonella* outbreaks worldwide. Several studies indicate that this serovar originated from *S. enterica* subsp *enterica* serovar Typhimurium, by the loss of the flagellar phase II gene (*fljB*) and adjacent sequences. However, at least two different clones of *S. enterica* 4,5,12:i:- exist that differs in the molecular events responsible for *fljB* deletion. The aim of this study was to test the stability of the *fljBA* operon responsible for the flagellar phase variation under different growth conditions in order to verify if its deletion is a frequent event that could explain the origin and dissemination of this serovar. In fact, coding sequences for transposons are present near this operon and in some strains, such as *S. enterica* Typhimurium LT2, the Fels-2 prophage gene is inserted near this operon. The presence of mobile DNA could confer instability to this region. In order to examine this, the *cat* (chloramphenicol acetyltransferase) gene was inserted adjacent to the *fljBA* operon so that deletions involving this genomic region could be identified. After growing *S. enterica* chloramphenicol-resistant strains under different conditions, more

than  $10^4$  colonies were tested for the loss of chloramphenicol resistance. However, none of the colonies were sensitive to chloramphenicol. These data suggest that the origin of *S. enterica* serovar 4,5,12:i:- from Typhimurium by *fljBA* deletion is not a frequent event. The origin and dissemination of 4,5,12:i:- raise several questions about the role of flagellar phase variation in virulence.

**Key words:** *Salmonella enterica*; *fljBA* operon; Flagellar phase variation; Mutation;  $\lambda$ -red; Serovar 4,5,12:i:-