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Disruption Of The Nucleoid, Of Chromosome Partitioning, And Of Replication Are Consistent With Bipolar Localization Of Group II Intron Retrotransposition In *Escherichia coli*

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Group II introns are mobile genetic elements that invade their cognate intron-minus gene via an RNA intermediate in a process known as retrohoming. They can also retrotranspose to ectopic sites at low frequency. Previous studies of the Lactococcal intron Ll.LtrB indicated that in *Escherichia coli*, retrohoming and retrotransposition occur primarily by the intron RNA reverse splicing into double-stranded DNA (dsDNA) through an endonuclease-dependent pathway. Further, intron insertions preferentially occurred within the Ori and Ter macrodomain regions of the *E. coli* chromosome (Coros *et al.*, 2005). We therefore investigated whether disruption of the nucleoid, chromosome partitioning and replication affect bipolar localization of Ll.LtrB in *E. coli*. To study these cellular conditions, we examined retromobility in the absence of the nucleoid-associated proteins H-NS, StpA and MukB, in variants of partitioning functions including the centromeric sequence *migS* and the actin homologue MreB, as well as in replication mutants, including *tus*, Δ *oriC*, *seqA* and *topoIV*. Although retrotransposition levels are reduced in some of these hosts, bipolar localization of insertion events is maintained. LtrA localization to the cellular poles (Zhao and Lambowitz, 2005) is also largely preserved in these hosts. Taken together, these results suggest that bipolar localization of group II intron retrotransposition results from the residence of the intron-encoded protein at the poles of the cell, where the DNA is most accessible, and therefore most receptive to intron spread. Coros, C.J., Landthaler, M., Piazza, C.L., Beauregard, A., Esposito, D., Perutka, J., Lambowitz, A.M., and Belfort, M. (2005) Retrotransposition strategies of the Lactococcus lactis Ll.LtrB group II intron are dictated by host identity and cellular environment. *Molecular Microbiology*. Vol. 56, pp. 509-524. Zhao, J., and Lambowitz, A.M. (2005) Inaugural Article: A bacterial group II intron-encoded reverse transcriptase localizes to cellular poles. In *Proceedings of the National Academy of Sciences of the United States of America*. Vol. 102, pp. 16133-16140.