INTRAMOLECULAR INTEGRATION ASSAY VALIDATES INTEGRASE PHI C31 AND R4 POTENTIAL IN A VARIETY OF INSECT CELLS

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Abstract. Phage ϕC31 and R4 integrases are site-specific and unidirectional serine recombinases. We have analyzed the ability of these integrases to mediate intramolecular integration between their *attB* and *attP* sites in 7 important insect cell lines as a means of predicting their relative mobility in the corresponding insect species. Both integrases exhibit significantly higher frequencies in *Drosophila* S2 cells than in the other insect cell lines examined, but do work well in all of the species tested. Our results, coupled with previous results of the activity of ϕC31 integrase in *D. melanogaster* and *Aedes aegypti*, suggest the family of serine catalyzed integrases will be useful site-specific integration tools for functional genome analysis and genetic engineering in a wide range of insect species.

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