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Site-specific integration

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Controlled integration of exogenous DNA within the genome is an obvious advantage in gene therapy strategies and could circumvent the dangers associated with random genomic integration. In an Advanced Online Publication in Nature Biotechnology, Eric Olivares *et al.* describe the use of a bacterophage ΦC31 integrase to achieve site-specific integration of therapeutic genes (*Nature Biotechnology*, 15 October 2002, doi:10.1038/nbt753). The integrase directs recombination between the phage *attP* site and the host *attB* site. Olivares *et al.* tested whether this system could be exploited to deliver therapeutic human genes such as alpha1-antitrypsin (hAAT) or Factor IX (hFIX). The integrase functioned effectively to augment hAAT and hFIX expression in murine livers, and expression levels persisted after partial hepatectomy, suggesting the hFIX had integrated into the genome in liver cells. Olivares *et al.* confirmed integration and identified two genomic sequences that resemble the attP site and serve as specific integration sites.

References

1. *Nature Biotechnology*, [http://www.nature.com/nbt]

2. A phage integrase directs efficient site-specific integration in human cells.

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