IN BRIEF

GENE THERAPY

Stem cell-mediated transfer of a human artificial chromosome ameliorates muscular dystrophy

Tedesco, F. S. *et al. Sci. Transl. Med.* **3**, 96ra78 (2011)

Gene therapy for Duchenne muscular dystrophy (DMD) is hampered by the difficulty of transfecting target cells with the large (2.4 Mb) affected gene, dystrophin. This study reports the first successful use of human artificial chromosomes (HACs) as gene therapy delivery vectors. Using a HAC, the wild-type human dystrophin locus was transferred *ex vivo* to the blood vessel stem cells from a DMD mouse model; these cells engrafted readily into the mutant muscle, leading to functional and morphological improvements that lasted 8 months.

EVOLUTION

Chromosomal rearrangements maintain a polymorphic supergene controlling butterfly mimicry

Joron, M. *et al. Nature* 14 Aug 2011 (doi:10.1038/nature10341)

This paper highlights how genomic rearrangements strengthen the allelic associations that underlie complex adaptive phenotypes. The tightly linked *Pushmipullyu* (*P*) supergene locus controls polymorphic wing morphology in the mimetic butterfly *Heliconius numata*. Experimental crosses between sympatric *H. numata* morphs showed a lack of recombination across a 400 kb interval of the *P* locus containing 18 genes. Alternative gene arrangements at *P*, which are caused by inversion breakpoints, correlate with distinct *H. numata* wing-morphs in wild populations, suggesting that supergenes often keep adaptive allele combinations together.

COMPARATIVE GENOMICS

A comprehensive map of mobile element insertion polymorphisms in humans

Stewart, C. *et al. PLoS Genet.* **7**, e1002236 (2011)

Retrotransposon sequences constitute ~30% of human genomic DNA and have increasingly appreciated roles in host gene regulation. Stewart *et al.* investigated the human genomic variation caused by mobile retrotransposons. They identified 7,380 insertion site polymorphisms from 185 whole-genome sequences, most of which had not previously been identified. Interestingly, the rates of novel insertions differed among geographically distinct populations, although the causes and consequences of this are unclear.

TECHNOLOGY

Derivation of haploid embryonic stem cells from mouse embryos

Leeb, M. & Wutz, A. *Nature* 7 Sep 2011 (doi:10.1038/nature10448)

Transposon- or chemical-mediated mutagenesis is inefficient in diploid cells because lesions must typically be homozygous before phenotypic effects can be observed. To overcome this hurdle, Leeb *et al.* generated haploid embryonic stem cells by activating unfertilized mouse oocytes. Carefully controlled culture conditions and flow-cytometry-based sorting enabled maintenance of the haploid state for over 35 passages in culture. The value of these cell lines for loss-of-function genetic screens was verified by a transposon-based screen that identified DNA mismatch repair genes.