Highly recombinant populations of laboratory rodents enable identification of the genetic determinants of behaviour. Recombination events accumulate over generations of outbreeding, giving rise to genomes that are fine-grained mosaics of the founder genomes. CRISPR technology is set to facilitate validation and functional characterisation of the genetic variants and genes that are associated with behaviour. See article by Baud and Flint on page 373. Cover image by Spencer Phillips is licensed under a Creative Commons Attribution 4.0 International licence.