In the news

MODIFYING MONKEYS

In the past 12 months, there has been a rush of papers showing that the CRISPR (clustered regularly interspaced short palindromic repeats)–Cas9 system, which naturally functions as an archaeal and bacterial immune system, can be used to edit the genome of mammalian cell lines and model organisms, including mice and rats. A team led by Jiahao Sha, Weizhi Ji and Xingxu Huang, Nanjing Medical University, China, has now published a study in *Cell* showing that this method can be used to generate monkeys with targeted gene mutations.

The authors co-injected *cas9* mRNA and subgenomic RNAs (sgRNAs) into one-cell stage cynomolgus monkey embryos. sgRNAs guide the Cas9 nuclease to sites targeted for mutation and, in this case, resulted in directed mutations in the genes encoding PPAR γ (peroxisome proliferator-activated receptor- γ) and RAG1 (recombination activating gene 1) in twin monkeys. No mutations were identified in other genes, demonstrating the efficiency and reliability of this process. “The amount of genome engineering in monkeys is pretty small,” said George Church, a professor of genetics at Harvard Medical School, USA. “So yes, this [paper] is a pretty big deal.” (*Scientific American*, 31 Jan 2014).

This study serves as a ‘proof of principle’ that the CRISPR–Cas9 system can efficiently modify primates and suggests that it can be used to generate non-human primate models for studying human disease and testing new therapies, which many researchers feel would be valuable; as Robin Lovell-Badge, head of genetics at the MRC National Institute for Medical Research, UK, said “If you are trying to develop a stem cell therapy and want to graft cells back into the brain, it’s difficult to know how it will work in a complex brain, and mice or rats are not suitable.” (*The Guardian*, 30 Jan 2014).

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