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► **COVER:** 'Monkey business' by Simon Bradbrook, inspired by the review on p717.



LUCY BIRD



KIRSTY MINTON



OLIVE LEAVY

**A**lthough vaccines are key to the control of several infectious diseases, vaccinologists are still struggling to develop an effective vaccine against HIV. Indeed, despite preclinical studies of potential HIV vaccines in non-human primates showing effective protection against simian immunodeficiency virus, no protection was observed when these vaccines were tested in clinical trials in humans. This raises questions, posed by David Weiner and colleagues on page 717, about how much we should rely on challenge studies in rhesus macaques when progressing to the clinical setting and how rhesus macaques might be better used to determine protective immunity for future HIV vaccines.

Lessons relevant to the development of new vaccines can also be learnt from understanding how successful empirically derived vaccines work. Bali Pulendran (page 741) describes how recent advances in our understanding of the innate immune system and the use of systems biological approaches have helped us to understand the mechanism of action of the yellow fever vaccine. He proposes that these approaches could be used to predict the immunogenicity and protective capacity of virtually any vaccine in the future.

In addition to vaccines, enhancing the function of the immune system through the adoptive transfer of genetically engineered lymphocytes is a promising immunotherapeutic strategy. However, since the first clinical trial in 1990, translating this approach to the clinic has been problematic owing to possible risks of cancer, and therefore this strategy has been held to higher safety standards than many other experimental therapies. On page 704, Carl June, Bruce Blazar and James Riley describe the new techniques that have increased the efficacy and safety of modifying lymphocytes for therapeutic benefits and discuss the progress and pitfalls in translating these advancements to the clinic.

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