Bt rice makes its debut

High-yield hybrid rice is a boon throughout Asia, not only for the increased yield but for its responsiveness to fertilizer and its adaptability to diverse environments. However, with these positive attributes comes a higher susceptibility to diseases as well as insect pests. Datta and colleagues describe here their development of a transgenic rice line, Minghui 63, and its derived hybrid, Shanyou 63, that express a *Bt* fusion gene truncated from CryIA(b) and CryIA(c), under the control of the rice *actinI* promoter. Field evaluation of both homozygous and heterozygous hybrids of the transgenic plants showed strong resistance against extremely high, repeated infestations of two important lepidopteran pests, yellow stem borer and leaffolder, with little or no effect on yield (see p. 1101). *JJ*

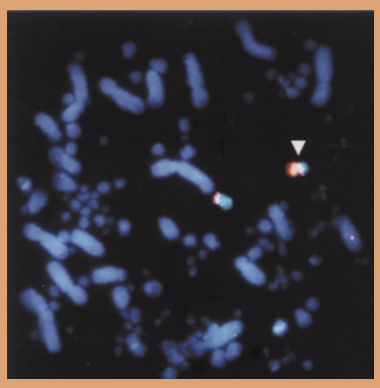
A two-hybrid system for integral membrane proteins

The study of protein–protein interactions that involve integral membrane proteins has been thwarted by the difficulty of biochemical approaches and the unsuitability of genetic two-hybrid approaches. On page 1075, Ehrhard et al. describe a way of unraveling such interactions using a yeast genetic approach that exploits the G-protein signaling pathway. One binding partner is a soluble protein fused to the G-protein γ-subunit, and the other is an integral membrane protein. Interaction between the two binding partners disrupts the G-protein signaling pathway, leading to reduced transcription of a reporter gene and growth arrest. The authors validated the approach by detecting interactions between the fibroblast-derived growth factor receptor 3 and the cytoplasmic protein SNT-1, and went on to study mutations that disrupt interactions between the the neuronal proteins syntaxin 1a and and nSec1. *JJ*

Electrocatalytic DNA mismatch detection

In this issue, Boon et al. describe a way to electrochemically detect mismatches in DNA duplexes by sensing perturbations in base pair stacking. The method is distinct from previously reported electrocatalytic methods in that it does not rely on application of stringent hybridization conditions to prevent mismatch duplexes from forming. Instead, preformed DNA duplexes are deposited on gold electrodes, and then a redox-active methylene blue DNA intercalator inserts into the helices. If duplexes are completely base-paired the intercalator produces an electrocatalytic signal. However, the presence of a mismatch prevents charge transport and reduces the signal. The method detects even thermodynamically stable GT and GA mismatches that pose problems with hybridization-based approaches (see pp. 1042 and 1096). *ND*

Mammalian artificial chromosomes



On page 1086, Kuroiwa et al. describe a chromosome-cloning system that can handle large segments of genomic DNA. They cloned large fragments of human chromosomes into a mitotically stable human minichromosome using Cre/LoxP-mediated translocation and telomere-directed truncation of the chromosome fragments in a homologous recombination-proficient cell line. Using this approach, a minichromosome containing a 10 Mb fragment of chromosome 22 was introduced and stably maintained in various cell lines, including ES cells and in mice. The human genes present on the insert were functionally expressed in mice. *MS*

Cloned piglets parte trois

In this issue, Bishop and colleagues present the third in a series of pig cloning reports using somatic cell nuclear transfer (see p. 1055). Nuclei were harvested from porcine fetal cells that had been cultured up to 87 days and passed as many as seven times, without visible signs of senescence. Nuclei were injected into oocytes that had been artificially activated by treatment with ionomycin. The method yielded four healthy piglets in two litters. The use of an in vitro system for culturing the donor cells may offer advantages over previously reported methods for scaling up pig cloning for breeding programs or making transgenics for xenografting. *ND*

Therapy for mucosal infections

Despite the vulnerability of mucosal surfaces to entry by microbial invaders, the technology for mucosal protection is severely limited. In this issue Beninati and colleagues describe a way around this problem, by engineering recombinant human commensal bacteria to display or secrete microbicidal single-chain antibodies that mimic the activity of a killer toxin from *Pichia anomala*. The bacteria secreting these antibodies were shown to be effective in treating an in vivo model of rat vaginal candidiasis. Through this approach it should be possible to locally deliver molecules that are both expensive to produce and limited by their short half-life, potentially providing a valuable treatment of mucosal infections (see pp. 1038 and 1060). *MS*