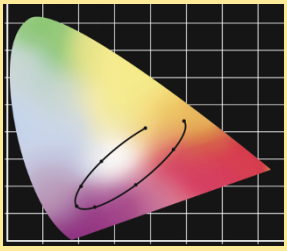
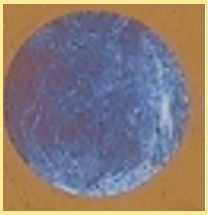
Chloroplast engineering with operons

Most agronomic traits result from the action of several genes, so efficient strategies to express multiple genes in transgenic plants are sorely needed, and not at all trivial undertakings. In this issue, Daniell and colleagues show a way to stably integrate into the chloroplast genome the entire *Bt cry*2Aa2 operon, which codes for production of an insecticidal protein, as well as accessory proteins to help with folding. The insecticidal protein accumulated to extremely high levels in leaves (~35% of total soluble protein) in a crystalline form, and insects recalcitrant to other control methods were totally wiped out after munching on leaves from these plants. This successful expression of multiple genes through a single transformation event may make multigene expression of foreign pathways or pharmaceutical proteins less of a chore (see p. 71). *JJ*



On page 62, Jenison *et al.* describe a biosensor for detecting nucleic acid targets present at only attomolar concentrations. The detector comprises a set of oligonucleotide probes bound to a silicon-based surface that can hybridize to specific nucleic acid targets. Bound nucleic acids are then detected by complementary probes labeled with biotin, which catalyzes an enzymatic reaction that deposits a thin film on the surface of the silicon. The color change that results on the biosensor's surface is detectable by the naked eye, suggesting potential applications in the clinic and field. ***MS***



A screen for ribozyme inhibitors

Catalytic RNA is increasingly viewed as a promising drug target, particularly in that some catalyze activities specific to microorganisms and viruses. On page 56, Jenne *et al.* describe a fluorescence-based assay to find inhibitors of such catalytic RNA. They used a high-throughput FRET-based assay that reports the activity of a hammerhead ribozyme. The ribozyme cleaves a specially designed RNA molecule holding together a fluorophore and a quencher dye, resulting in a fluorescent signal that is reduced by inhibitors of the ribozyme. They used the assay to screen a library of 96 known antibiotics, and extracts of nearly 2,000 different actinomycete strains, and detected a number of inhibitory compounds with potential antibiotic activities, one of which they validated as effective *in vivo*. They estimate that even without automation such an assay could analyze on the order of 500 different ribozyme reactions per day to search for new antibiotics. *ND*