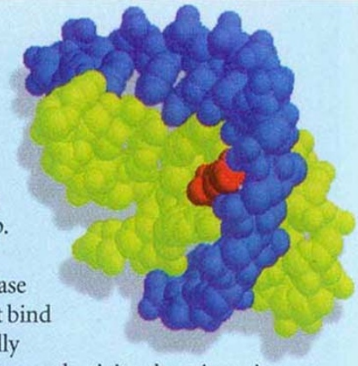
Mouthwatering PCR. Pinkert et al. show that PCR analysis of saliva is a viable alternative to surgical biopsies for monitoring transgene integration in laboratory animals (see p. 1094 and p. 1146). PCR analysis of saliva samples is faster, much cheaper, and more humane than biopsy analysis.

Mirror-image oligos



Combinatorial library screening methods like SELEX can be used to isolate small oligonucleotides (called aptamers) that bind with high affinities to a variety of molecular targets. Naturally occurring RNA ligands, however, are rapidly degraded in vivo, thus diminishing their therapeutic potential. Fürste and colleagues (see pp. 1080, 1112, and 1116) have overcome this problem by synthesizing mirror images of aptamers that resist nuclease attack. Using SELEX, they isolated natural aptamers that bind mirror images of the target molecules and then chemically synthesized mirror images of these binders. Because of stereoselectivity, the mirror-image aptamer was shown to bind to the naturally occurring counterpart of the target molecule. Such unnatural mirror-image apamers are stable in serum for up to 60 hours and thus are potential drug or therapeutic candidates.

IMAGE UNAVAILABLE FOR COPYRIGHT REASONS

Taxol overproduction

Until now, the production in plant cell culture of paclitaxel, the generic name for Taxol, has been too low to be economically useful. Yukimune et al. have found that methyl jasmonate, a plant cell signal transducer, can enhance paclitaxel production in cell suspension culture (see p. 1083 and p. 1129). They demonstrated that paclitaxel accumulates in a dose-dependent manner, with maximal promotion in the presence of 100 mM methyl jasmonate.

Antisense inhibitors

The specificity of antisense oligonucleotides (ON) makes them useful both as tools for the analysis of gene function and as potential therapeutics. Flanagan and coworkers used propyne pyrimidine-modified antisense ONs targeted to the RNA of $p34^{cdc}$ cyclin-dependent kinase (cdc) and cyclin B1—two cell cycle proteins that are aberrantly expressed in breast cancer cells—to obtain dose-dependent and sequence-specific binding of the anti-cdc RNA at nanomolar concentrations (see p. 1139). Although these ONs are able to cause cell cycle arrest in normal cells, the proliferation of breast cancer cells is not inhibited by cdc ONs, illustrating not only the utility of these antisense ONs as biological tools, but the difficulty of overcoming a transformed phenotype.

Tumor radioimaging

Tumors that overexpress specific growth factor receptors can be imaged using isotope-conjugated, receptor-specific, monoclonal antibodies (Mabs). Another tool in tumor imaging and targeting has been demonstrated by researchers at McGill University (Montréal, Canada; see p. 1092 and p. 1120). Radiolabeled, small-molecule, receptor-binding analogs of nerve growth factor (NGF), although having a lower binding affinities than Mabs, were sufficiently specific to target NGF-overexpressing tumors in vivo. In fact, these mimetics exhibited increased tissue penetration, thanks to their ability to cross binding site barriers. Enhanced tumor penetration and fast blood clearance of the NGF mimic allowed the tumor to be visualized 3 hours after the radiolabel injection.

IMAGE UNAVAILABLE FOR COPYRIGHT REASONS

Better bread

Genetic engineering of the bread-making qualities of various wheat cultivars is an attractive prospect. Another step in that direction has now been demonstrated by Vasil and coworkers (see p. 1155). They introduced into endosperm a gene encoding a specific, high-molecular-weight, glutenin subunit (HMW-GS), known to be associated with good bread-making qualities, and demonstrated expression at levels that would presumably confer desirable effects on dough elasticity.

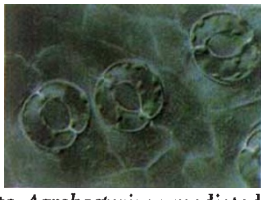
Diabody screening

Bispecific antibodies are finding increased utility as both therapeutic and diagnostic agents. Their effectiveness will ultimately be dependent upon the ability to isolate the single molecules that have the most effective combination of binding specificites. Duncan et al. have designed novel protocols for the selection of phage-display, bispecific antibody repertoires (see p. 1149). Thus large numbers of diabodies can be assembled and cloned, allowing the selection of antigen-binding pairs.

Mass spectrometry sequencing

A need to sequence larger genome sets has fueled the development of novel sequencing methodologies. The application of mass spectrometry (as an alternative to gel electrophoresis) for genome-scale DNA sequencing has taken another step forward. Köster and colleagues have applied solid-phase, Sanger-based, sequencing strategies using biotin/streptavidin magnetic bead technology to mass spectrometry (see p. 1084 and p. 1123).

Sugar beet transformation



Until now, sugar beets, a major source of sugar worldwide, have proven recalcitrant to genetic transformation. As an alternative to *Agrobacterium*-mediated transformation, Hall et al. have used an optimized, PEG-mediated protocol to transform sugar beet guard cell protoplasts (see p. 1088 and p. 1133). This novel protocol has resulted in the isolation of viable transformants that exhibit stable inheritance of the introduced transgene within 8–9 weeks.