JAPAN ROUNDUP

Using recombinant DNA (rDNA) techniques, Japanese scientists have inserted the *erb*B-2 oncogene into a vaccinia virus. Mice injected with the recombinant virus produced anti-*erb*B-2-antibodies which protected them against a later injection of breast cancer cells. Masashi Yamamoto's group at Tokyo University's Medical Sciences Research Institute isolated the oncogene two years ago. In a collaborative effort, researchers at Ajinomoto (Tokyo) then inserted a full-length cDNA encoding the *erb*B-2 protein into the viral thymidine kinase gene. When grown in LtK cells, the recombinant virus produced a 100-kilodalton fusion protein containing *erb*B-2 sequences. Although mice can produce highly specific anti-*erb*B-2-antibodies, vaccinia virus's toxicity is a problem still to be solved.

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Researchers at Matsushita Electronic's Central Research Laboratories (Osaka) have developed an ultra-sensitive method for detecting trace quantities of trinitrotoluene (TNT) using monoclonal antibodies specific for this small molecule. The ability to detect small amounts of this explosive promises to be useful in the war against terrorism. Currently, high performance liquid chromatography (HPLC) is used to pick up TNT traces; it takes about five hours to finish the analysis. In contrast, the monoclonal assay takes only one minute and is 1,000 times more sensitive than HPLC. The monoclonal antibody assay can detect TNT at concentrations as low as 0.1 nanogram per milliliter.

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Akira Harada's research group at Osaka University has synthesized cyclodextrin (CD) derivatives that have properties similar to those of antibodies. Cyclodextrins are circular polymers of glucose that can be used as carriers for drugs and other molecules since they have hollow, relatively hydrophobic centers. The synthetic CDs are bifunctional; they can recognize and bind specific molecules ("antigens") and—similar to real antibodies—become cross-linked and clump together or precipitate from solution upon binding multivalent "antigens." These bifunctional CDs may be useful in sensors to detect specific molecules in solution or to remove harmful molecules from the blood.

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Musk oil (together with sperm whale ambergris) is one of the most expensive ingredients in perfume. In fact, this scent is becoming more valuable all the time: there has been a dramatic decline in the population of musk deer, which once ranged through China and central Asia; moreover, a single male deer yields only 30 grams of musk oil. Now, scientists at Nippon Kogyo Inc. (Tokyo), which produces petroleum and non-ferrous metal, have developed a method for synthesizing musk oil from petroleum products. Normal paraffin (isolated from petroleum) is fed to a special strain of yeast (isolated from an oil field in Akita Prefecture), which converts it to cyclopentadecanone, the substance that gives musk oil its unique odor.

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