RESEARCH PAPER ANALYSIS

FLOW SORTING TO IDENTIFY HYBRID PROTOPLASTS

Heterokaryons of *Nicotiana tabacum* and *N. sylvestris* isolated by fluorescence-activated sorting. The cells on the left are viewed using light microscopy. When visualized using fluorescence microscopy (right), the majority of cells exhibit both fluorescein fluorescence (green) and chlorophyll autofluorescence (orange), indicating that they are hybrid protoplasts.

LINCOLN, Nebr.—One of the major obstacles to the full utilization of somatic hybrid technology in plant science has been the difficulty of recognizing and separating hybrid protoplasts (heterokaryons) following fusion. Current methods require either mutant cell lines (to allow genetic complementation in the heterokaryon), toxic chemical treatments (to prevent the growth of parental protoplasts), or painstaking micromanipulation.

In this issue of *Bio/Technology*, David Galbraith and colleagues at the University of Nebraska-Lincoln report the first successful use of fluorescence-activated cell sorting to recover heterokaryons after protoplast fusion. Since this technique is a general method of heterokaryon selection, it should be applicable to any combination of protoplasts for which regeneration of plants is possible.

The fused heterokaryons are recognized and sorted by differential fluorescence labeling of the parental protoplasts. One strategy is to separately label the two parental leaf protoplast populations—one with the fluorescent dye fluorescein isothiocyanate (FITC) and the other with rhodamine isothiocyanate (RITC). Another technique uses FITC-labeled suspension cells as one parental source of protoplasts, and unlabeled leaf protoplasts (possessing chlorophyll autofluorescence) as the other. Parental protoplasts are subjected to a fusion treatment, and heterokaryons are individually sorted based on the presence, within a single cytoplasm, of both types of fluorescence.

Several areas of pure and applied plant biology will benefit from the availability and further development of this technique. It should accelerate the analysis of the molecular and genetic factors controlling heterokaryon development, and the direct transfer of organelles through cytoplast-protoplast fusions (to study cytoplasmic male sterility). It could also speed the construction of agronomically important somatic hybrids within and between many plant genera and species. **—Harvey Bialy**

FUNDING

U.K.'S WARWICK GETS NEW BIOTECH BUILDING

COVENTRY, U.K.—Due to start operations here this October is the University of Warwick's new Biotechnology Building, created with varied financing, including £300,000 donated by the Wolfson Foundation. Although severely hampered by lack of space, Warwick's biotechnology department has become one of Britain's most thriving academic centers, attracting more outside R&D money per capita than any other U.K. university over the past three years. With support from ICI, Boehringer, the Wellcome Foundation, the Rockefeller Foundation, government departments, and the European Economic Community, the department's current operating research budget is around £4.7 million.

The new building is a triumph for Howard Dalton and his colleagues who, in collaboration with local government, are seeking to replace declining traditional industries in the English Midlands.

"Central government is continually urging universities to go out and develop their links with industry, and we at Warwick have done just that. What central government fails to recognize is the need for initial investment if more ambitious projects such as ours are to get off the ground," said Dalton. "Coventry City Council, first through its participation in our Science Park, and now by backing our biotechnology initiative, has demonstrated in a practical way that what is needed is action, not words."

Projects currently underway at Warwick include work on rotavirus vaccines, production of high-grade chemicals through microbial oxidation, use of monoclonal antibodies to target tumor cells, and metal recovery from low-grade ores.

—Bernard Dixon